

**CITY OF MIDLAND, TEXAS
BRIEFING SESSION AGENDA**

May 28, 2013 - 9:00 AM

Basement Conference Room
300 North Loraine
Midland, Texas

These items, as well as any other items on the regular posted agenda for the City Council Meeting on this date, may be discussed:

1. Receive a presentation on Pictometry Imagery and its use within the City.
2. Receive a presentation from Jody Sneed on the operations and programming of Community and Senior Services.
3. Receive a presentation from Transportation Manager Gary Saunders regarding the downtown parking concept.

AGENDA FOR CITY COUNCIL MEETING

May 28, 2013 – 10:00 AM
Council Chamber - City Hall

The Midland City Council agenda is posted for public notice at least 72 hours prior to the Tuesday meetings. All requests to be placed on the Council agenda by the public must be submitted to the City Manager, in writing, at least one week before the Council meetings. Such written requests must be in sufficient detail to identify the subject matter as well as the contact person who will represent the matter before the Council. The City Council reserves the right to not consider matters over which the City has no jurisdiction.

OPENING ITEMS

1. Invocation - Pastor Mickey Eckles, Mid-Cities Community Church
2. Pledge of Allegiance

PRESENTATIONS

3. Presentation of special events, organizations, individuals, or periods of time including, but not limited to:
 - a. Presentation of Certificates of Completion to the 2013 Midland 101 graduates.
 - b. Presentation of a Proclamation for Midland Christian Track & Field Team Day.
 - c. Presentation of a Proclamation for Midland Christian Lady Mustang Track & Field Team Day.

PUBLIC COMMENT

4. Receive public comments where individuals may address the City Council on City related issues and projects. Any deliberation of or decision by the City Council regarding the item being discussed shall be limited to a motion to place the item on the agenda for a subsequent meeting.

CONSENT AGENDA

5. Consider a motion approving the following minutes:
 - a. Regular meeting of May 14, 2013.

6. Consider a resolution awarding a contract for the construction of Fire Station #10 to J.C. Roberts Construction Company, Incorporated, of Odessa, Texas, at a total estimated cost of \$3,582,274.00; and appropriating funds in the amount of \$4,408,019.00. (GENERAL SERVICES) (2013 - 150)
7. Consider a resolution authorizing the execution of a Professional Services Agreement with Kimley-Horn and Associates, Incorporated, of Irving, Texas, for professional design, development and project management services for the Doug Russell Outdoor Pool Renovation Project; and appropriating \$30,000.00 for said professional services. (GENERAL SERVICES) (2013 - 152)
8. Consider a resolution of the City Council of the City of Midland, Texas approving the Juneteenth Celebration Parade to be held on June 15, 2013; and the Council finds that the parade will cross Business Interstate 20 and the Texas Department of Transportation has approved the route; and the parade route will cross the Union Pacific Railroad and the Council finds that the Union Pacific Railroad has approved the route and the crossing of the railroad tracks; and waiving the application and clean-up fee. (CITY MANAGER'S OFFICE) (2013 - 154)
9. Consider a resolution appointing Robert Isbell to the Board of Managers of the Midland Emergency Communication District. (CITY MANAGER'S OFFICE) (2013 - 155)
10. Consider a resolution authorizing the execution of a Professional Services Agreement with AMD Engineering, LLC for surveying, design and construction administration services in connection with the extension of Tradewinds Boulevard from Thomason Drive to the Gateway Plaza Addition; and authorizing payment therefor in the amount of \$479,477.00. (ENGINEERING SERVICES) (2013 - 156)
11. Consider a resolution accepting a grant award from the 2012 Assistance to Firefighters Grant in the amount of \$50,000.00, Grant Number EMW-2012-FO-06522, this grant will allow the City of Midland to purchase breathing air equipment for firefighting; this grant is an 80% federal grant with the City of Midland providing 20% of the costs; the federal grant portion is \$50,000.00 and the city's portion will be \$10,000.00 totaling \$60,000.00. (FIRE) (2013 - 157)
12. Consider a resolution authorizing the submission of an application to the Office of the Texas Attorney General for Fiscal Year 2014-2015 Victim Coordinator and Liaison Grant Program Funding; this grant will designate an individual to serve as a representative to consult with the Texas Attorney General in order to ensure that victims, guardians of victims, or relatives of deceased victims are afforded the rights granted to them. (POLICE) (2013 - 158)

SECOND READINGS

13. Consider an ordinance on second reading changing the zoning classification by amending Chapter One, Title XI, of the City Code of Midland, Texas, by permitting Lot 1, Block 10, Lot 15, Block 11, and the adjacent vacated 0.23-acre alley right-of-way, all out of Trueland Addition, Section 2, City and County of Midland, Texas, which is presently zoned LR-1, Local Retail District, in part, and MF-1, Multiple-Family Dwelling District, in part, to be used as a PD, Planned District for a Shopping Center (Generally located on the southwest corner of the intersection of East Scharbauer Drive and North Fairgrounds Road); providing for such use to be subject to certain special conditions and restrictions as set out herein; containing a cumulative clause; containing a savings and severability clause; providing for a maximum penalty or fine of two thousand dollars (\$2,000.00); and ordering publication. (DEVELOPMENT SERVICES)(First reading held May 14, 2013.)(9142)
14. Consider an ordinance on second reading amending Title III, "Departments," Chapter 1, "Water Department," Section 10, "Permitted Uses of the Optional Litter Abatement and Beautification Fee," of the City Code of Midland, Texas, so as to reflect the current Ordinance No. 9065 which made said fee mandatory; containing a cumulative clause; containing a savings and severability clause; and ordering publication. (SOLID WASTE)(First reading held May 14, 2013.)(9144)
15. Consider an ordinance on second reading amending Title III, "Departments," Chapter 1, "Water Department," Section 11, "Billing of the Optional Litter Abatement and Beautification Fee," of the City Code of Midland, Texas, so as to reflect the current Ordinance No. 9065 which made said fee mandatory; containing a cumulative clause; containing a savings and severability clause; and ordering publication. (SOLID WASTE)(First reading held May 14, 2013.)(9145)

PUBLIC HEARINGS

16. At approximately 10:30 a.m. hold a public hearing and consider an ordinance changing the zoning classification by amending Chapter One, Title XI, of the City Code of Midland, Texas, by permitting a 0.95-acre tract of land out of Lots 1 and 2, Block 3, Mayfield Place Addition, Section 2, City and County of Midland, Texas, which is presently zoned PD, Planned District for a Shopping Center, to be used as an O-1, Office District (Generally located on the north side of Mockingbird Lane, 860 feet east of Midkiff Road); containing a cumulative clause; containing a savings and severability clause; providing for a maximum penalty or fine of two thousand dollars (\$2,000.00); and ordering publication. (DEVELOPMENT SERVICES) (9146)

17. At approximately 10:33 a.m. hold a public hearing and consider a request for the annexation of a 40.498-acre tract (Tract 1) of land out of Section 37, 38 and 48, Block 40, T-1-S, T&P RR Co. Survey, Midland County, Texas. (Generally located at the south extension of Avalon Drive, approximately 700 feet south of Hall of Fame Boulevard.) This is a public hearing only. No action will be taken. (DEVELOPMENT SERVICES)
18. At approximately 10:36 a.m. hold a public hearing and consider a request of the annexation of a 305.17-acre (Tract 2) of land out of Section 37, Block 41, T-1-S, T&P RR Co. Survey, Midland County, Texas. (Generally located on the north side of State Highway 191 west of North Farm-to-Market Road 1788.) This is a public hearing only. No action will be taken. (DEVELOPMENT SERVICES)
19. At approximately 10:39 a.m. hold a public hearing and consider a request for the annexation of a 2.47-acre tract (Tract 3) of land out of Section 8, Block 40, T-2-S, T&P RR Co. Survey, Midland County, Texas. (Generally located on the west side of Wright Drive, approximately 850 feet south of Loop 40.) This is a public hearing only. No action will be taken. (DEVELOPMENT SERVICES)
20. At approximately 10:42 a.m. hold a public hearing and consider a resolution authorizing the temporary use of land for an outdoor amusement function on Lots 7-9, Block 61, Original Town, City and County of Midland, Texas (Generally located on the northeast corner of West Missouri Avenue and Carrizo Street); and making said permit subject to certain special conditions and restrictions contained herein. (DEVELOPMENT SERVICES) (2013 - 159)
21. At approximately 10:45 a.m. hold a public hearing and consider an ordinance changing the zoning use classification of the property described as Lot 5, Block 44, Fairmont Park Addition, Section 26, City and County of Midland, Texas (Generally located on the south side of West Loop 250 North, approximately 450 feet west of North Midland Drive), which is presently zoned PD, Planned District for a shopping center, by permitting said property to be used under a Specific Use Permit with Term for the sale of all alcoholic beverages in a restaurant for on-premises consumption; making said permit subject to certain conditions and restrictions contained herein; containing a cumulative clause; containing a savings and severability clause; providing for a maximum penalty or fine of two thousand dollars (\$2,000.00); and ordering publication. (DEVELOPMENT SERVICES) (9147)
22. At approximately 10:48 a.m. hold a public hearing regarding a proposed oil and gas permit to Petroplex Energy, Inc. (Operator), for a Permit to Drill an Oil & Gas Well within the City Limits, (Western-T 8 #2) located 1260 feet from the north line and 672 feet from the east line located in Section 8, Block 39, T-1-S, T&P RR Co. Survey, City and County of Midland, Texas. (Generally located on the west side of the extension of North Midkiff Road, approximately 3/4 mile north of the extension of Green Tree Boulevard.) This is a public hearing only. No action will

be taken. (DEVELOPMENT SERVICES)

MISCELLANEOUS

23. Consider an ordinance vacating and abandoning a 0.30-acre alley adjacent to Lots 1-5, Block 5, a 1.45-acre alley adjacent to Lots 1-14, Block 6, a 0.90-acre portion of Mandy Lane right-of-way adjacent to Lots 1-9, Block 6, and to Lots 1-9, Block 7, and a 1.78-acre portion of Corporate Drive right-of-way and Spring Park Drive right-of-way adjacent to Lots 1-5, Block 5, and to Lots 10-14, Block 6, all out of Corporate Plaza, Section 4, City and County of Midland, Texas (Generally located on the east side of Edwards Street, approximately 870 feet north of East Wadley Avenue); adopting the appraisal by the City Manager of \$19,321.00; and ordering recordation by the City Secretary. (DEVELOPMENT SERVICES) (9148)
24. Consider a resolution authorizing the City Manager to select the most advantageous bidder, and to negotiate and execute a contract with the chosen bidder for the construction of the Lamesa Road Pedestrian Access Project. (GENERAL SERVICES) (2013 - 153)
25. Consider a motion making appointments to various Boards and Commissions.

EXECUTIVE SESSION

26. Pursuant to Texas Government Code §551.101, the Council will hold an Executive Session which is closed to the public to discuss the following matters as permitted under the following Texas Government Code Sections:

Respectfully Submitted,

Courtney B. Sharp
City Manager

MEETING ASSISTANCE INFORMATION: The Midland City Hall and Council Chamber are wheelchair accessible. If you need special assistance to participate in this meeting, please contact the City Secretary's Office at (432) 685-7430. Notification 48 hours prior to the meeting will enable the City to make reasonable arrangements to ensure accessibility to this meeting.

**MIDLAND CITY COUNCIL
MINUTES
May 14, 2013**

BRIEFING SESSION

The City Council convened in a Briefing Session in the basement conference room, City Hall, Midland, Texas, at 9:00 a.m. on May 14, 2013.

Council Members present: Mayor W. Wesley Perry, Council Member Scott Dufford (At-Large), Mayor Pro Tem Jeff Sparks (District 1), Council Member John Love (District 2), and Council Member John James (District 3).

Council Members absent: Council Member Jerry Morales (At-Large) (Morales arrived at 9:05 a.m.), and Council Member Michael Trost (District 4) (Trost arrived at 9:03 a.m.).

Staff members present: City Manager Courtney Sharp, City Attorney Keith Stretcher, Deputy City Manager Tommy Hudson, Assistant City Manager Jim Nichols, City Secretary Amy Turner, General Services Director Robert Patrick, Utilities Director Stuart Purvis, Administrative Services Director Catherine Clifton, Engineering Services Director Jose Ortiz, Airports Director Marv Esterly, Chief Information Officer Sharlett Chowning, Solid Waste Director Morris Williams, Downtown Development Director Genora Young, City Engineer David Beard, Building Official Steve Thorpe, GIS Manager Bill Hodge, Acting Planning Division Manager Ken VanDyne, Transportation Manager Gary Saunders, Assistant Code Administration Manager Ron Jenkins, and Public Information Officer Sara Higgins.

1. Receive a report from Administrative Service on the proposed Compensation and Classification study.

Deputy City Manager Tommy Hudson reported the City will be conducting a Compensation and Classification study noting the last study was done in-house in 1999. This briefing will tie into Agenda Item number 7 on the regular agenda.

Administrative Services Director Catherine Clifton reported that everyone understands the compensation portion of the study but the other portion is the classification. They will be looking at ways the City values and places employees in specific job categories. Recommendations for suggested changes will be made. She reported it will take the consultant about 4-5 months to complete the study.

When asked how this would tie into the budget, City Manager Sharp noted the study would not be completed before the next year's budget is in place but he intended to set aside money in the budget to address a portion of the recommendations made. Deputy City Manager Hudson noted that the City is losing employees such as mechanics to the private sector and that the consultant will make recommendations on changes that need to be implemented.

Ms. Clifton confirmed that the study will also look at similar positions in the private sector noting the difficulty to obtain accurate information because the private sector is not required to share information; she also noted that the implementation may be made over several years.

2. Receive a presentation regarding the proposed Transportation Action Plan.

Engineering Services Director Jose Ortiz, in response to concerns of the City Council expressed at the retreat, put together a proposed Transportation Action Plan. He reported that over the last 4 years there has been a 33 percent increase in traffic. He noted his plan included short term enhancements that could be completed in less than one year, mid-term enhancements that would take one to five years to complete and long-term enhancements that would take more than five years.

Short term enhancements included conducting a citywide traffic analysis (re-time and re-phase signals and capacity improvements), preparing guidelines for the Traffic Impact Analysis, developing an Access Management Guidelines, coordinating with TXDOT, MOTOR MPO, and EZ Rider, and evaluating multi-modal alternatives.

Mid-term enhancements included installing Pan-Tilt-Zoom cameras at numerous signalized intersections, capital improvement projects, mid-term construction projects, other recommendations to be identified in the Citywide Traffic Analysis, and the introduction of traffic calming devices to minimize speeding and cut through traffic.

Long-term enhancements included other enhancements identified in Traffic Study currently under review, Loop 250 improvements, extending Avalon from Highway I-20 to Business I-20, Fairground Road expansion, and implementation of the Master Thoroughfare Plan.

Mr. Ortiz also identified they were looking at signal communication to provide better progression through intersections. City Manager Sharp noted that in the short term the Police Department will be addressing enforcement issues.

3. Receive a presentation on Pictometry Imagery and its use within the City.

Due to a lack of time, this item was moved to the Briefing Session of the May 28, 2013 City Council Agenda.

The foregoing agenda items were discussed by the City Council with no formal action taken. The Briefing Session was adjourned at 9:55 a.m.

REGULAR SESSION

The City Council convened in regular session in the Council Chamber, City Hall, Midland, Texas, at 10:04 a.m., May 14, 2013.

Council Members present: Mayor W. Wesley Perry, Council Member Jerry Morales (At-Large), Council Member Scott Dufford (At-Large), Mayor Pro Tem Jeff Sparks (District 1), Council Member John Love (District 2), Council Member John James (District 3), and Council Member Michael Trost (District 4).

Staff members present at the annex table: City Manager Courtney Sharp, City Attorney Keith Stretcher, Deputy City Manager Tommy Hudson, and Assistant City Manager Jim Nichols.

The Agenda Items were heard in the following order: 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 9, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 28, 29, 30, 31 (lunch recess) 34, 32, 33 (recess) 25.

OPENING ITEMS

1. Invocation - Father Ricardo Lopez, Saint Ann's Catholic Church
2. Pledge of Allegiance

PRESENTATIONS

3. Presentation of special events, organizations, individuals, or periods of time including, but not limited to:
 - a. Council Member Sparks presented a Proclamation for National Missing Children's Day.
 - b. Council Member Love presented a Proclamation for Motorcycle Safety Awareness Month.
 - c. Mayor Perry received a presentation from Midland Retired School Personnel Program. There were 177,787 volunteer hours in Midland for a value of \$3,936,204.18.

PUBLIC COMMENT

4. Receive public comments where individuals may address the City Council on City related issues and projects. Any deliberation of or decision by the City Council regarding the item being discussed shall be limited to a motion to place the item on the agenda for a subsequent meeting.

Ryan Lovell, 1917 Huntington, distributed letters to the City Council and spoke regarding Fire Station Number 5. He asked the Council to overturn the decision of Fire Chief Isbell and return the fire truck to the station.

Brent Hilliard, 4800 Island Drive, spoke regarding Fire Station 5. He reported he met with Fire Chief Isbell and reviewed data. He noted that a very small percentage of calls were fire related and that fire trucks spend most of their time chasing EMS calls. He noted the Fire Department is first focused on saving lives and reported they have done their job. He acknowledged it is an emotional decision but should be based on community needs.

Chad Clark, 4605 Woodbar Court, spoke regarding Fire Station 5. He is a retired fire fighter and was involved in the process of deliberating the response time for calls. He

felt the issue needed to be resolved by the Fire Chief and his staff, as they are the most competent and knowledgeable about what the community needs. He felt that resources should be placed at appropriate places based on the data.

Council Member Morales reported he has received many calls regarding Fire Station 5 and the citizens are concerned. He suggested a town hall meeting so that the decision that was made could be clarified to the public.

Council Member James noted that of the three fundamental things cities do, public safety is the largest responsibility. The community leaders need to ensure that the citizens feel safe. He backs the decision that was made to move the fire truck because it was data-driven but that information has not been conveyed to the public. He suggested the fire truck be brought back, communicate with the members of the community about the data, and then make a decision together as a community.

Council Member Sparks felt it would be a shame to move the fire engine back noting what matters most is that the fire fighters arrive at the scene. He is in favor of overall faster response times and noted that the situation on St. Claire is a prime example of how critical response times are.

CONSENT AGENDA

Council Member Dufford moved to approve Consent Agenda items 5 - 16 excluding 9, 15, 16; seconded by Council Member Love. The motion carried by the following vote: AYE: Love, Morales, Trost, Perry, Dufford, James, Sparks. NAY: None. ABSTAIN: None. ABSENT: None.

5. Approved a motion approving the following minutes:
 - a. Regular Meeting of April 23, 2013.
6. Received information regarding second quarter Fiscal Year 2012 - 2013 Investment Report. (FINANCE)
7. Approved a resolution authorizing a professional services agreement for a Classification and Compensation Study for the Administrative Services Department. (GENERAL SERVICES)

RESOLUTION NO. 2013 - 136

RESOLUTION AUTHORIZING THE EXECUTION OF A PROFESSIONAL SERVICES AGREEMENT WITH PUBLIC SECTOR PERSONNEL CONSULTANTS, INCORPORATED, OF DALLAS, TEXAS, TO PERFORM A CLASSIFICATION AND COMPENSATION STUDY FOR THE ADMINISTRATIVE SERVICES DEPARTMENT; AND APPROPRIATING FUNDS

8. Approved a resolution approving the purchase of 27 Panasonic CF-31 laptops including 3 years of Panasonic Protection Plus for police vehicles through Texas DIR Contract SDD-1365 from Visual Pro 360 for the Garage Division. (GENERAL SERVICES)

RESOLUTION NO. 2013 - 137

RESOLUTION APPROVING THE PURCHASE OF TWENTY-SEVEN (27) PANASONIC

CF-31 LAPTOP COMPUTERS FOR USE IN POLICE VEHICLES, INCLUDING A 3-YEAR PROTECTION PLAN, THROUGH THE TEXAS DEPARTMENT OF INFORMATION RESOURCES AT A TOTAL COST OF \$111,105.00; AND THIS ITEM WAS NOT BID BUT PURCHASED THROUGH A STATE OF TEXAS COOPERATIVE PROGRAM

10. Approved a resolution authorizing the execution of first amendment to the Lease Agreement for Hangar Facility between COG Realty LLC, a Texas Limited Liability Company and the City of Midland, Texas. (AIRPORTS)

RESOLUTION NO. 2013 - 139

RESOLUTION AUTHORIZING THE EXECUTION OF A FIRST AMENDMENT TO THE LEASE AGREEMENT BETWEEN COG REALTY LLC AND THE CITY OF MIDLAND REGARDING AN AIRPORT HANGAR FACILITY AT MIDLAND INTERNATIONAL AIRPORT

11. Approved a resolution authorizing the execution of a Memorandum of Lease Agreement for Airport Hangar Facility between COG Realty LLC, a Texas Limited Liability Company and the City of Midland, Texas. (AIRPORTS)

RESOLUTION NO. 2013 - 140

RESOLUTION AUTHORIZING THE EXECUTION OF A MEMORANDUM OF LEASE AGREEMENT FOR AIRPORT HANGAR FACILITY BETWEEN COG REALTY LLC AND THE CITY OF MIDLAND; AND ORDERING RECORDATION BY THE CITY SECRETARY

12. Approved a resolution authorizing the execution of an Affidavits and Indemnity as to Debts, Liens and Possession Amendment with reference to the Lease Agreement for Hangar Facility between COG Realty LLC, a Texas Limited Liability Company and the City of Midland, Texas. (AIRPORTS)

RESOLUTION NO. 2013 - 141

RESOLUTION AUTHORIZING THE EXECUTION OF AN AFFIDAVITS AND INDEMNITY AS TO DEBTS, LIENS AND POSSESSION REGARDING THE AIRPORT HANGAR FACILITY LEASE AGREEMENT BETWEEN COG REALTY LLC AND THE CITY OF MIDLAND

13. Approved a resolution accepting preclearance from the U.S. Department of Justice regarding annexations effective April 26, 2013. (CITY SECRETARY'S OFFICE)

RESOLUTION NO. 2013 - 142

RESOLUTION ACCEPTING PRECLEARANCE FROM THE UNITED STATES DEPARTMENT OF JUSTICE REGARDING ANNEXATIONS BY ORDINANCE NOS. 9077, 9078, 9079 AND 9080 EFFECTIVE IN 2012; PRECLEARANCE BEING EFFECTIVE APRIL 26, 2013

14. Approved a resolution authorizing the acceptance of a \$20,000.00 grant award from Community National Bank for the Owner Occupied Housing Assistance Program; and appropriating funds. (DEVELOPMENT SERVICES)

RESOLUTION NO. 2013 - 143

RESOLUTION AUTHORIZING THE ACCEPTANCE OF A GRANT AWARD FROM COMMUNITY NATIONAL BANK FOR THE OWNER OCCUPIED HOUSING ASSISTANCE PROGRAM; THE GRANT AWARD IS IN THE AMOUNT OF \$20,000.00; THE AWARD WILL BE UTILIZED FOR RECONSTRUCTION PROJECT COSTS FOR THE CITY'S OWNER OCCUPIED HOUSING ASSISTANCE PROGRAM; AUTHORIZING THE EXECUTION OF ACCEPTANCE DOCUMENTS; AND APPROPRIATING GRANT FUNDS THEREFOR

The following items were pulled from Consent Agenda and considered individually.

9. Consider a resolution rescinding resolution 2013-065, rejecting all bids and authorizing re-advertisement for bids for Lamesa Road Pedestrian Access Improvements for the Engineering Services Department. (GENERAL SERVICES)

RESOLUTION NO. 2013 - 138

RESOLUTION RESCINDING RESOLUTION NO. 2013-065; REJECTING ALL BIDS RECEIVED FOR BID NUMBER 6078-13 FOR THE LAMESA ROAD PEDESTRIAN ACCESS PROJECT; AND RATIFYING ALL ACTIONS TAKEN BY THE ENGINEERING SERVICES DEPARTMENT AND THE GENERAL SERVICES DEPARTMENT REGARDING THE RE-BID OF THE LAMESA ROAD PEDESTRIAN ACCESS PROJECT

Council Member Love noted that the Lamesa Road Project had been going on since 2009 and asked that the process be expedited.

City Manager Sharp reported that the contractor was unable to comply with the terms of the contract and explained the bid process.

When asked about Council's prior direction about not rejecting all bids, City Attorney Stretcher replied that staff needs to make sure the specs allows for the opportunity to go to the second lowest bidder.

City Engineer Beard noted the bids would open on May 22 and an item for approval would be on the May 28 agenda.

Council Member Love moved to adopt Resolution No. 2013 - 138; seconded by Council Member Morales. The motion carried by the following vote: AYE: Love, Morales, Trost, Perry, Dufford, James, Sparks. NAY: None. ABSTAIN: None. ABSENT: None.

15. Consider a resolution authorizing the execution of a Right-of-Way License Agreement between the City of Midland and Rust Oil Company for the purpose of placement, operation and maintenance of a four (4) inch poly gas pipeline contained within a thirteen and three/eighths (13 3/8) inch diameter steel casing pipe, in a portion of Garfield Street right-of-way and a portion of the Midland Draw Floodway, Section 9, Block "X", H.P. Hilliard Survey, City of Midland, Midland County, Texas. (ENGINEERING SERVICES)

RESOLUTION NO. 2013 - 144

RESOLUTION AUTHORIZING A RIGHT-OF-WAY LICENSE BETWEEN THE CITY OF MIDLAND, TEXAS AND RUST OIL CORPORATION; SAID RIGHT-OF-WAY LICENSE

IS FOR THE PURPOSE OF ENTERING THE CITY OF MIDLAND'S RIGHT-OF-WAY FOR THE PURPOSE OF PLACEMENT, OPERATION AND MAINTENANCE OF A FOUR (4) INCH POLY GAS PIPELINE CONTAINED WITHIN A THIRTEEN AND THREE/EIGHTS (13 3/8) INCH DIAMETER STEEL CASING PIPE, IN A PORTION OF GARFIELD STREET RIGHT-OF-WAY AND A PORTION OF THE MIDLAND DRAW FLOODWAY; THE PIPELINE IS LOCATED WITHIN THE CITY OF MIDLAND RIGHT-OF-WAY, SECTION 9, BLOCK "X", H.P. HILLIARD SURVEY, MIDLAND COUNTY, TEXAS; THE LICENSE TERM IS FOR TWENTY-FIVE (25) YEARS, COMMENCING WITH THE DATE OF THIS LICENSE AND SHALL AUTOMATICALLY RENEW AT THE END OF THE TERM FOR ONE ADDITIONAL TWENTY-FIVE (25) YEAR TERM UPON 90 DAYS WRITTEN REQUEST PRIOR TO EXPIRATION

It was noted this item was pulled for the Mayor to abstain on items 15 and 16.

Council Member Love moved to adopt Resolution No. 2013 - 144; seconded by Council Member Trost. The motion carried by the following vote: AYE: Love, Morales, Trost, Dufford, James, Sparks. NAY: None. ABSTAIN: Perry. ABSENT: None.

16. Consider a motion on a request by Landgraf, Crutcher & Associates for the Lost Mountain Addition - Section 3, to approve items requested for deferral in the amount of \$29,000, and to waive the associated public improvement guarantee. The subject property is located between Midkiff Road and Garfield Street along the extension of Greentree Boulevard. (ENGINEERING SERVICES)

City Engineer David Beard gave an overview of the item noting the property owner wants to split the land into three sections, that the use of a septic tank is okay, and that water will be extended to the property at the cost of the owner. The property owner has agreed to cover the cost of future improvements.

City Engineer Beard answered questions about the extension of Green Tree Boulevard noting it would circumvent this property.

Council Member Love moved to approve a motion on a request by Landgraf, Crutcher & Associates for the Lost Mountain Addition - Section 3, to approve items requested for deferral in the amount of \$29,000, and to waive the associated public improvement guarantee. The subject property is located between Midkiff Road and Garfield Street along the extension of Greentree Boulevard; seconded by Council Member Dufford. The motion carried by the following vote: AYE: Love, Morales, Trost, Dufford, James, Sparks. NAY: None. ABSTAIN: Perry. ABSENT: None.

SECOND READINGS

17. Consider an ordinance on second reading annexing and adopting a service plan for certain areas adjoining the present City limits, being a 104.50-acre tract of land out of Section 38, Block 40, T-1-S, T&P RR Co. Survey, Midland County, Texas, and being more specifically described by metes and bounds in Section One hereof (Generally located on the west side of the extension of Avalon Drive, south of SH 191). (DEVELOPMENT SERVICES) (First reading held April 23, 2013.)

ORDINANCE NO. 9141

AN ORDINANCE EXTENDING THE BOUNDARIES OF THE CITY OF MIDLAND,

TEXAS, BY ADDING THERETO CERTAIN AREAS ADJOINING THE PRESENT CITY LIMITS, BEING A 104.50-ACRE TRACT OF LAND OUT OF SECTION 38, BLOCK 40, T-1-S, T&P RR CO. SURVEY, MIDLAND COUNTY, TEXAS, AND BEING MORE SPECIFICALLY DESCRIBED BY METES AND BOUNDS IN SECTION ONE HEREOF (GENERALLY LOCATED ON THE WEST SIDE OF THE AVALON DRIVE EXTENSION, SOUTH OF STATE HIGHWAY 191); AND APPROVING A PUBLIC SERVICE PLAN

Deputy City Secretary Reyes read the caption of Ordinance No. 9141.

Council Member Love moved to approve the second and final reading of Ordinance No. 9141 in accordance with the Charter of the City of Midland; seconded by Council Member Morales. The motion carried by the following vote: AYE: Love, Morales, Trost, Dufford, James, Sparks. NAY: None. ABSTAIN: Perry. ABSENT: None.

18. Consider an ordinance on second reading on a request by D.R. Horton to establish the initial zoning of annexed land (Tract 1) as PD, Planned District for a Housing Development on a 104.5-acre tract of land out of Section 38, Block 40, T-1-S, T&P RR Co. Survey, Midland County, Texas. (Generally located at the south extension of Avalon Drive, approximately 960 feet south of Deauville Boulevard.) (DEVELOPMENT SERVICES) (First reading held April 23, 2013.)

ORDINANCE NO. 9138

AN ORDINANCE ESTABLISHING THE ZONING CLASSIFICATION OF THE AREA INDICATED AS BEING A 104.50-ACRE TRACT OF LAND OUT OF SECTION 38, BLOCK 40, T-1-S, T&P RR CO. SURVEY, MIDLAND COUNTY, TEXAS, AND BEING MORE SPECIFICALLY DESCRIBED BY METES AND BOUNDS IN SECTION ONE HEREOF, AS A PD, PLANNED DISTRICT FOR A HOUSING DEVELOPMENT; SAID TRACT IS GENERALLY LOCATED ON THE WEST SIDE OF THE AVALON DRIVE EXTENSION, SOUTH OF STATE HIGHWAY 191; CONTAINING A CUMULATIVE CLAUSE; CONTAINING A SAVINGS AND SEVERABILITY CLAUSE; PROVIDING FOR A MAXIMUM PENALTY OR FINE OF TWO THOUSAND DOLLARS (\$2,000.00); AND ORDERING PUBLICATION

Deputy City Secretary Reyes read the caption of Ordinance No. 9138.

Council Member Trost moved to approve the second and final reading of Ordinance No. 9138 in accordance with the Charter of the City of Midland; seconded by Council Member Dufford. The motion carried by the following vote: AYE: Love, Morales, Trost, Dufford, James, Sparks. NAY: None. ABSTAIN: Perry. ABSENT: None.

19. Consider an ordinance on second reading on a request by Arthur Zuniga for a zone change from FD, Future Development District to 1F-3, One-Family Dwelling District on a 38.60-acre tract of land out of Section 13, Block 40, T-1-S, T&P RR Co. Survey, Midland County, Texas. (Generally located on the southwest corner of the intersection of Sherwood Drive and Sandstone Drive, approximately 1,000 feet west of Holiday Hill Road.) (DEVELOPMENT SERVICES) (First reading held April 23, 2013.)

ORDINANCE NO. 9139

AN ORDINANCE CHANGING THE ZONING CLASSIFICATION BY AMENDING CHAPTER ONE, TITLE XI, OF THE CITY CODE OF MIDLAND, TEXAS, BY

PERMITTING A 38.60-ACRE TRACT OF LAND OUT OF SECTION 13, BLOCK 40, T-1-S, T&P RR CO. SURVEY, CITY AND COUNTY OF MIDLAND, TEXAS, WHICH IS PRESENTLY ZONED FD, FUTURE DEVELOPMENT DISTRICT, TO BE USED AS A 1F-3, ONE-FAMILY DWELLING DISTRICT (GENERALLY LOCATED ON THE CORNER OF SHERWOOD DRIVE AND SANDSTONE DRIVE, APPROXIMATELY 1,000 FEET WEST OF HOLIDAY HILL ROAD); CONTAINING A CUMULATIVE CLAUSE; CONTAINING A SAVINGS AND SEVERABILITY CLAUSE; PROVIDING FOR A MAXIMUM PENALTY OR FINE OF TWO THOUSAND DOLLARS (\$2,000.00); AND ORDERING PUBLICATION

Deputy City Secretary Reyes read the caption of Ordinance No. 9139.

Council Member Sparks moved to approve the second and final reading of Ordinance No. 9139 in accordance with the Charter of the City of Midland; seconded by Council Member Morales. The motion carried by the following vote: AYE: Love, Morales, Trost, Perry, Dufford, James, Sparks. NAY: None. ABSTAIN: None. ABSENT: None.

20. Consider an ordinance on second reading on a request for the vacation of a 0.632-acre right-of-way dedication contained within Lots 7-12, Block 93; Lots 1, 2, 5 and 6, the adjacent vacated 20 foot alley and the adjacent vacated right-of-way of West Kentucky Avenue, Block 109, all out of Original Town, City and County, Midland Texas. (Generally located on the north side of West Front Street between South Marienfeld Street and South Big Spring Street.) (DEVELOPMENT SERVICES) (First reading held April 23, 2013.)

ORDINANCE NO. 9140

AN ORDINANCE VACATING AND ABANDONING A 0.632-ACRE RIGHT-OF-WAY DEDICATION WITHIN LOTS 7-12, BLOCK 93, LOTS 1, 2, 5 AND 6, THE ADJACENT VACATED 20-FOOT ALLEY AND THE ADJACENT VACATED RIGHT-OF-WAY OF WEST KENTUCKY AVENUE, BLOCK 109, ALL OUT OF ORIGINAL TOWN, CITY AND COUNTY OF MIDLAND, TEXAS (GENERALLY LOCATED ON THE NORTH SIDE OF WEST FRONT STREET BETWEEN SOUTH MARIENFELD STREET AND SOUTH BIG SPRING STREET); ADOPTING THE APPRAISAL BY THE CITY MANAGER OF \$38,267.00; WAIVING THE FEE FOR THE COST OF THE RIGHT-OF-WAY; AND ORDERING RECORDATION BY THE CITY SECRETARY

Deputy City Secretary Reyes read the caption of Ordinance No. 9140.

Council Member Trost moved to approve the second and final reading of Ordinance No. 9140 in accordance with the Charter of the City of Midland; seconded by Council Member Sparks.

Susie Hitchcock-Hall of Susie's South Forty Confections reported her candy factory would be relocated to the downtown and that they would be open for tours.

The motion carried by the following vote: AYE: Love, Morales, Trost, Perry, Dufford, James, Sparks. NAY: None. ABSTAIN: None. ABSENT: None.

21. Consider an ordinance on second reading on a request by Richard Tatsch (Douglas Avenue) for a zone change from 1F-1, One-Family Dwelling District to PD, Planned District for Housing Development on Lots 1 through 6, Block 7, Langford-Weatherred

Addition, City and County of Midland, Texas. (Generally located on the southeast corner of the intersection of North "A" Street and Douglas Avenue.) (DEVELOPMENT SERVICES) (First reading held April 23, 2013.)

ORDINANCE NO. 9134

AN ORDINANCE CHANGING THE ZONING CLASSIFICATION BY AMENDING CHAPTER ONE, TITLE XI, OF THE CITY CODE OF MIDLAND, TEXAS, BY PERMITTING LOTS 1-6, BLOCK 7, LANGFORDWEATHERED ADDITION, CITY AND COUNTY OF MIDLAND, TEXAS, WHICH IS PRESENTLY ZONED 1F-1, ONE-FAMILY DWELLING DISTRICT, TO BE USED AS A PD, PLANNED DISTRICT FOR A HOUSING DEVELOPMENT (GENERALLY LOCATED ON THE SOUTHEAST CORNER OF NORTH "A" STREET AND DOUGLAS AVENUE); CONTAINING A CUMULATIVE CLAUSE; CONTAINING A SAVINGS AND SEVERABILITY CLAUSE; PROVIDING FOR A MAXIMUM PENALTY OR FINE OF TWO THOUSAND DOLLARS (\$2,000.00); AND ORDERING PUBLICATION

Deputy City Secretary Reyes read the caption of Ordinance No. 9134.

Council Member Dufford moved to approve the second and final reading of Ordinance No. 9134 in accordance with the Charter of the City of Midland; seconded by Council Member Sparks. The motion carried by the following vote: AYE: Love, Morales, Trost, Perry, Dufford, James, Sparks. NAY: None. ABSTAIN: None. ABSENT: None.

PUBLIC HEARINGS

22. At approximately 10:30 A.M. hold a public hearing and consider an ordinance on a request by Michael Postar for a zone change from LR-1, Local Retail District on Lot 1, Block 10 and from MF-1, Multiple Family Dwelling District on Lot 15, Block 11 and the vacated 0.23-acre alley right-of-way, to PD, Planned District for a Shopping Center, all out of Trueland Addition, Section 2, City and County of Midland, Texas. (Generally located on the southwest corner of the intersection of East Scharbauer Drive and North Fairgrounds Road.) (DEVELOPMENT SERVICES)

ORDINANCE NO. 9142

AN ORDINANCE CHANGING THE ZONING CLASSIFICATION BY AMENDING CHAPTER ONE, TITLE XI, OF THE CITY CODE OF MIDLAND, TEXAS, BY PERMITTING LOT 1, BLOCK 10, LOT 15, BLOCK 11, AND THE ADJACENT VACATED 0.23-ACRE ALLEY RIGHT-OF-WAY, ALL OUT OF TRUELAND ADDITION, SECTION 2, CITY AND COUNTY OF MIDLAND, TEXAS, WHICH IS PRESENTLY ZONED LR-1, LOCAL RETAIL DISTRICT, IN PART, AND MF-1, MULTIPLE-FAMILY DWELLING DISTRICT, IN PART, TO BE USED AS A PD, PLANNED DISTRICT FOR A SHOPPING CENTER (GENERALLY LOCATED ON THE SOUTHWEST CORNER OF THE INTERSECTION OF EAST SCHARBAUER DRIVE AND NORTH FAIRGROUNDS ROAD); PROVIDING FOR SUCH USE TO BE SUBJECT TO CERTAIN SPECIAL CONDITIONS AND RESTRICTIONS AS SET OUT HEREIN; CONTAINING A CUMULATIVE CLAUSE; CONTAINING A SAVINGS AND SEVERABILITY CLAUSE; PROVIDING FOR A MAXIMUM PENALTY OR FINE OF TWO THOUSAND DOLLARS (\$2,000.00); AND ORDERING PUBLICATION

Senior Planner Ken VanDyne gave an overview of the item noting the item was for a proposed mini storage facility and that no letters of objection had been received.

Mayor Perry opened the public hearing at 11:07 a.m.

Michael Postar, 3110 Kentucky, reported this was their third storage facility and it would include surveillance cameras and would be gated. He expected the monthly rates to be about \$80-\$120 a month.

Jim Prince, 6101 State Highway 349, reported there was a great need for storage space considering the current conditions in Midland. He noted that many GPS units guide drivers down Fairgrounds from I-20 and that this project would improve the view on Fairgrounds and be a good thing for Midland.

There being no one else wishing to speak, the public hearing was closed at 11:13 a.m.

Deputy City Secretary Reyes read the caption of Ordinance No. 9142.

Council Member Sparks moved approval of the first of two readings of Ordinance No. 9142 in accordance with the Charter of the City of Midland; seconded by Council Member Morales. The motion carried by the following vote: AYE: Love, Morales, Trost, Perry, Dufford, James, Sparks. NAY: None. ABSTAIN: None. ABSENT: None.

23. At approximately 10:33 A.M. hold a public hearing and consider a resolution on a request by Katherine and Clint Williamson for a variance for the required paving of an alley for rear entry access on the east 1/3 of Lot 9, all of Lot 10 and the west 2/5 of Lot 11, Block 14, North Park Hill Addition, City and County of Midland, Texas. (Generally located on the north side of Country Club Drive, approximately 270 feet west of North "G" Street.) (DEVELOPMENT SERVICES)

ORDINANCE NO. 2013 - 149

RESOLUTION GRANTING A VARIANCE FOR THE EAST 1/3 OF LOT 9, ALL OF LOT 10 AND THE WEST 2/5 OF LOT 11, BLOCK 14, NORTH PARK HILL ADDITION, CITY AND COUNTY OF MIDLAND, TEXAS (GENERALLY LOCATED ON THE NORTH SIDE OF COUNTRY CLUB DRIVE, APPROXIMATELY 270 FEET WEST OF NORTH "G" STREET), BY PERMITTING ACCESS TO SAID PROPERTY FROM AN UNPAVED ALLEY WHICH DOES NOT CONFORM TO CITY OF MIDLAND STANDARD SPECIFICATIONS

Senior Planner Ken VanDyne gave an overview of the item noting the applicant was looking for a variance to the subdivision code to not be required to pave the alley up to the garage he plans to construct. This item went before Planning & Zoning and was approved 5-4. Staff recommends against approval. He reviewed what other properties currently have garages in the alley.

Mayor Perry opened the public hearing at 11:20 a.m.

Clint Williamson, 1410 Country Club, stated he wanted to build the garage for a safety reason for his wife to load and unload their 3 and 5 year old children. He presented several letters of support from his neighbors. He indicated it would be cost prohibitive to pave the entire alley and still have enough money to build the garage.

There being no one else wishing to speak, the public hearing was closed at 11:26 a.m.

Council Member James moved to adopt Resolution No. 2013 - 149; seconded by Council Member Dufford.

Discussion ensued about the number of garages in the alley. It was determined that there were four garages; two were paved and two were unpaved.

When asked about putting up money for paving his portion in the future, Assistant City Manager Nichols noted they could use the existing deferral process.

The motion carried by the following vote: AYE: Love, Morales, Trost, Perry, Dufford, James, Sparks. NAY: None. ABSTAIN: None. ABSENT: None.

24. At approximately 10:36 A.M. hold a public hearing regarding a proposed Oil and Gas Permit to Petroplex Energy, Inc. (Operator) for a Permit to Drill an Oil & Gas Well within the City Limits, (Western T-8 #3) located 467 feet from north line and 2058 feet from west line, Section 8, Block 39, T-1-S, T&P RR Co. Survey, Midland County, Texas. (Generally located on the east side of extension of North Midland Drive, approximately 1 mile north of Green Tree Boulevard.) Public hearing only, no further action required. (DEVELOPMENT SERVICES)

Oil and Gas Compliance Officer Ron Jenkins gave an overview of the item noting that no letters of objection had been received.

Mayor Perry opened the public hearing at 11:39 a.m. There being no one present wishing to speak, the public hearing was immediately closed.

MISCELLANEOUS

26. Consider a resolution approving the issuance of a permit to Callon Petroleum Operating Co. (Operator) for a Permit to Drill an Oil & Gas Well within the City Limits, (Pecan Acres 22C #2) located 467 feet from east line and 467 feet from south line, Section 22, Block 40, T-1S, T&P RR Co. Survey, Midland County, Texas. (Generally located approximately 430 feet north of Briarwood Avenue, north of North County Road 1250.) (DEVELOPMENT SERVICES)

RESOLUTION NO. 2013 - 145

RESOLUTION APPROVING THE ISSUANCE OF A PERMIT TO CALLON PETROLEUM OPERATING COMPANY ("OPERATOR") TO DRILL AN OIL AND GAS WELL WITHIN THE CITY LIMITS LOCATED 467 FEET FROM THE EAST LINE AND 467 FEET FROM THE SOUTH LINE, SECTION 22, BLOCK 40, T-1-S, T&P RR CO. SURVEY, CITY AND COUNTY OF MIDLAND, TEXAS (GENERALLY LOCATED APPROXIMATELY 430 FEET NORTH OF BRIARWOOD AVENUE, NORTH OF NORTH COUNTY ROAD 1250); AND PROVIDING THAT SAID PERMIT DOES NOT REQUIRE A NEW ROAD REPAIR AGREEMENT BUT SHALL BE CONSOLIDATED UNDER AN EXISTING ROAD REPAIR AGREEMENT

Oil and Gas Compliance Officer Ron Jenkins gave an overview of the item noting that no letters of objection had been received and that the Oil & Gas Advisory Committee had recommended that no landscape variance be granted.

Council Member Morales moved to adopt Resolution No. 2013 - 145; seconded by Council Member Love.

Council Member Trost moved to amend the motion by requiring landscaping when the permit is issued; seconded by Council Member Morales. The motion to amend carried by the following vote: AYE: Love, Morales, Trost, Perry, Dufford, James. NAY: Sparks. ABSTAIN: None. ABSENT: None.

The motion, as amended, carried by the following vote: AYE: Love, Morales, Trost, Perry, Dufford, James, Sparks. NAY: None. ABSTAIN: None. ABSENT: None.

27. Consider a resolution approving the issuance of a permit to Vector Oil and Gas (Operator) for a Permit to Drill an Oil & Gas Well within the City Limits, (Barron #2) located 2050 feet from north line and 2071 feet from west line, Section 6, Block "X", H. P. Hilliard Survey, Midland County, Texas. (Generally located on the west side of the Oriole Drive, approximately ½ mile south of Mockingbird Lane.) (DEVELOPMENT SERVICES)

RESOLUTION NO. 2013 - 146

RESOLUTION APPROVING THE ISSUANCE OF A PERMIT TO VECTOR OIL & GAS LP ("OPERATOR") TO DRILL AN OIL AND GAS WELL WITHIN THE CITY LIMITS LOCATED 2,050 FEET FROM THE NORTH LINE AND 2,071 FEET FROM THE WEST LINE, SECTION 6, BLOCK "X", H.P. HILLIARD SURVEY, CITY AND COUNTY OF MIDLAND, TEXAS (GENERALLY LOCATED ON THE WEST SIDE OF ORIOLE DRIVE, APPROXIMATELY ½ MILE SOUTH OF MOCKINGBIRD LANE); AND PROVIDING THAT SAID PERMIT DOES NOT REQUIRE A NEW ROAD REPAIR AGREEMENT BUT SHALL BE CONSOLIDATED UNDER AN EXISTING ROAD REPAIR AGREEMENT

Oil and Gas Compliance Officer Ron Jenkins gave an overview of the item noting that one letter of objection had been received, no variances were being requested, and the Road Repair Agreement would be consolidated with the existing Road Repair Agreement.

Council Member Sparks moved to adopt Resolution No. 2013 - 146; seconded by Council Member Morales. The motion carried by the following vote: AYE: Love, Morales, Trost, Perry, Dufford, James, Sparks. NAY: None. ABSTAIN: None. ABSENT: None.

28. Consider a motion appealing the Building Official's denial of a sign permit application by Cinergy Cinemas. (Generally located on Lots 1A and 2A, Block 2, Gateway Plaza Addition, Section 3.) (DEVELOPMENT SERVICES)

Senior Planner Ken VanDyne gave an overview of the item and reviewed the proposed signs.

City Manager Sharp reported the City needed to take a look at its current sign ordinance.

Council Member Dufford moved to approve a motion appealing the Building Official's denial of a sign permit application by Cinergy Cinemas. (Generally located on Lots 1A

and 2A, Block 2, Gateway Plaza Addition, Section 3.); seconded by Council Member Love. The motion carried by the following vote: AYE: Love, Morales, Trost, Perry, Dufford, James, Sparks. NAY: None. ABSTAIN: None. ABSENT: None.

29. Consider an ordinance amending Title III, Chapter 1, Section 10 of the City Code. (SOLID WASTE)

ORDINANCE NO. 9144

AN ORDINANCE AMENDING TITLE III, "DEPARTMENTS," CHAPTER 1, "WATER DEPARTMENT," SECTION 10, "PERMITTED USES OF THE OPTIONAL LITTER ABATEMENT AND BEAUTIFICATION FEE," OF THE CITY CODE OF MIDLAND, TEXAS, SO AS TO REFLECT THE CURRENT ORDINANCE NO. 9065 WHICH MADE SAID FEE MANDATORY; CONTAINING A CUMULATIVE CLAUSE; CONTAINING A SAVINGS AND SEVERABILITY CLAUSE; AND ORDERING PUBLICATION

Solid Waste Director Morris Williams gave an overview of the item noting this change was to clarify in the Code that the litter abatement fee is mandatory.

Deputy City Secretary Reyes read the caption of Ordinance No. 9144.

Council Member Love moved approval of the first of two readings of Ordinance No. 9144 in accordance with the Charter of the City of Midland; seconded by Council Member Trost. The motion carried by the following vote: AYE: Love, Morales, Trost, Perry, Dufford, James, Sparks. NAY: None. ABSTAIN: None. ABSENT: None.

30. Consider an ordinance amending Title III, Chapter 1, Section 11 of the City Code. (SOLID WASTE)

ORDINANCE NO. 9145

AN ORDINANCE AMENDING TITLE III, "DEPARTMENTS," CHAPTER 1, "WATER DEPARTMENT," SECTION 11, "BILLING OF THE OPTIONAL LITTER ABATEMENT AND BEAUTIFICATION FEE," OF THE CITY CODE OF MIDLAND, TEXAS, SO AS TO REFLECT THE CURRENT ORDINANCE NO. 9065 WHICH MADE SAID FEE MANDATORY; CONTAINING A CUMULATIVE CLAUSE; CONTAINING A SAVINGS AND SEVERABILITY CLAUSE; AND ORDERING PUBLICATION

Deputy City Secretary Reyes read the caption of Ordinance No. 9145.

Council Member Love moved approval of the first of two readings of Ordinance No. 9145 in accordance with the Charter of the City of Midland; seconded by Council Member Morales. The motion carried by the following vote: AYE: Love, Morales, Trost, Perry, Dufford, James, Sparks. NAY: None. ABSTAIN: None. ABSENT: None.

31. Consider a motion making appointments to various Boards and Commissions.

No appointments were made.

32. Consider a resolution authorizing the employment of the law firm of Lloyd Gosselink Rochelle and Townsend to assist in representing the City of Midland for the Railroad Commission of Texas. (CITY ATTORNEY'S OFFICE)

RESOLUTION NO. 2013 - 147

RESOLUTION AUTHORIZING THE CITY ATTORNEY TO ENTER INTO A PROFESSIONAL SERVICES CONTRACT WITH JASON HILL OF THE LAW FIRM OF LLOYD GOSSELINK ROCHELLE AND TOWNSEND, P.C. OF AUSTIN, TEXAS IN CONNECTION WITH THE PROTEST OF A COMMERCIAL SALTWATER DISPOSAL WELL IN SECTION 7, BLOCK 74, PUBLIC SCHOOL LAND SURVEY, WINKLER COUNTY, TEXAS; AND ALLOCATING FUNDS; AND THE CITY ATTORNEY AND ATTORNEYS WITH THE LAW FIRM OF LLOYD GOSSELINK ROCHELLE AND TOWNSEND, P.C. ARE HEREBY AUTHORIZED TO EMPLOY NEEDED EXPERTS AND MAKE ALL APPEARANCES BEFORE THE RAILROAD COMMISSION OF TEXAS

Council Member Trost moved to adopt Resolution No. 2013 - 147; seconded by Council Member Morales. The motion carried by the following vote: AYE: Love, Morales, Trost, Perry, Dufford, James, Sparks. NAY: None. ABSTAIN: None. ABSENT: None.

33. Consider a resolution ratifying the action of the City of Midland's Oil and Gas Coordinator, sent to the Railroad Commission of Texas protesting the drilling of a commercial saltwater disposal well at the T-Bar Ranch. (CITY ATTORNEY'S OFFICE)

RESOLUTION NO. 2013 - 148

RESOLUTION RATIFYING THE ACTIONS OF THE CITY OF MIDLAND'S OIL AND GAS COORDINATOR IN RELATION TO PROTESTING THE APPLICATION OF HERITAGE GATHERING CORPORATION FOR THE DEVELOPMENT OF A COMMERCIAL SALTWATER DISPOSAL WELL IN SECTION 7, BLOCK 74, PUBLIC SCHOOL LAND SURVEY, WINKLER COUNTY, TEXAS; RATIFYING AND AFFIRMING ALL PRIOR ACTS OF THE MAYOR, CITY MANAGER, AND CITY ATTORNEY IN ANY WAY RELATED TO THE T-BAR RANCH WATER FIELD IN WINKLER AND LOVING COUNTY, TEXAS; AND AUTHORIZING THE CITY MANAGER TO PURCHASE WATER RIGHTS AND/OR THE SURFACE OF PROPERTY IN WINKLER AND LOVING COUNTY, TEXAS, IN THE VICINITY OF THE T-BAR WATER FIELD; AND APPROPRIATING FUNDS

Council Member Trost moved to adopt Resolution No. 2013 - 148; seconded by Council Member Love. The motion carried by the following vote: AYE: Love, Morales, Trost, Perry, Dufford, James, Sparks. NAY: None. ABSTAIN: None. ABSENT: None.

At 12:57 p.m. Mayor Perry recessed the meeting until 7:00 p.m. when Item number 25 would be considered.

EXECUTIVE SESSION

34. Mayor Perry announced that pursuant to Texas Government Code §551.101, the Council will hold an Executive Session which is closed to the public to discuss the following matters as permitted under the following Texas Government Code Sections:
- a. Section 551.071, Consultation with the City Attorney.
 - a.1. Discuss legal issues related to a hearing before the Railroad Commission of Texas regarding the application of Heritage Gathering Corporation for development of a commercial saltwater disposal well in Section 7, Block

74, Public School Land Survey, Winkler County, Texas.

- a.2. Discuss a matter in which the duty of the attorney to the governmental body under the Texas Disciplinary Rules of Professional Conduct of the State Bar of Texas clearly conflicts with Chapter 551 of the Texas Government Code.

Mayor Perry recessed the meeting to Executive Session at 12:06 p.m. The entire Council met in Executive Session until 12:35 p.m.

Mayor Perry reconvened the meeting to Regular Session at 12:55 p.m. to consider Agenda Items 32 and 33.

CDBG PUBLIC HEARING

Mayor Perry reconvened the meeting to regular session at 7:03 p.m. with the following Council Members present: Love, Morales, Trost, Perry and James.

25. At approximately 7:00 p.m. hold a public hearing on the 2013-2014 Community Development Block Grant Program. This is a public hearing only; no further action will be taken. (DEVELOPMENT SERVICES)

Community Development Manager Sylvester Cantu gave an overview of the item noting that the purpose for the public hearing was to allow for public input and to consider proposals for the coming year. He reviewed the list of proposals received and noted that the second public hearing would be held on June 11, 2013, and that final approval was scheduled for July 23, 2013.

Discussion ensued about the possibility of moving the funding of some programs to the General Fund and instead use CDBG funding for rental assistance. Mr. Cantu noted he would need to research the item. Discussion continued about different funding opportunities, the way HUD funds money, and the different target areas the City has addressed.

Mayor Perry opened the public hearing at 7:25 p.m.

Michael Wallace, 1210 E. Cuthbert stated he owns a 6-acre tract of land and would be willing to donate half of the land if the City would install infrastructure including a street that would be named "Brenda Myers Wallace Street."

David Diaz, 208 S. Marienfeld, and Alynda Best, 305 E. Texas spoke regarding the Sparks Park Target Area expressing concern that there were no more target areas left. Mr. Diaz also addressed that the State of Texas has a program for rental assistance called Tenant Based Rental Voucher (TBRV) that any non-profit can tap into as long as they are administered by a non-profit.

There being no one else present wishing to speak, the public hearing was closed at 7:37 p.m.

All of the business at hand having been completed, the meeting adjourned at 7:37 p.m.

PASSED AND APPROVED the 28th day of May, 2013.

W. Wesley Perry, Mayor

ATTEST:

Amy M. Turner, City Secretary



City Council Agenda

Approved for Agenda:
thudson
City Manager's Office

MEETING DATE: 5/28/2013

TO: City Council / City Manager

FROM: Regina Stephenson, Purchasing Manager

SUBJECT: Consider a resolution awarding a contract for the construction of Fire Station #10 and appropriating funds for the General Services Department.

Purpose:

Approval of a contract and appropriating funds for the construction of Fire Station #10 for the General Services Department.

Recommended City Council Action

☒ Approve ☐ Deny ☐ Directional / Informational

Fiscal Impact:

Permit Fees	10,840.00
Construction	3,582,274.00
Site Infrastructure	305,000.00
Furnishings	300,000.00
Contingency	209,905.00
Total Cost	<u>\$4,408,019.00</u>
2012 Certificate of Obligation and General Fund Unappropriated Fund Balance	

Discussion:

Five bids were received for the construction of Fire Station #10. We recommend awarding the contract for the base bid only to the low bidder, J. C. Roberts Construction Company, Inc.

Therefore, please consider approval of a resolution awarding a contract for the construction of Fire Station #10 to J. C. Roberts Construction Company, Inc. of Odessa, Texas for a total cost of \$3,582,274.00.

RESOLUTION NO.

**RESOLUTION AWARDING A CONTRACT FOR THE
CONSTRUCTION OF FIRE STATION #10 TO J.C.
ROBERTS CONSTRUCTION COMPANY,
INCORPORATED, OF ODESSA, TEXAS, AT A TOTAL
ESTIMATED COST OF \$3,582,274.00; AND
APPROPRIATING FUNDS IN THE AMOUNT OF
\$4,408,019.00**

WHEREAS, the City Manager advertised the construction of Fire Station #10 for competitive bids; and

WHEREAS, J.C. Roberts Construction Co., Inc., of Odessa, Texas, submitted the lowest and most responsible bid at \$3,582,274.00 as shown on the bid tabulation attached hereto as Exhibit "A" and incorporated herein for all legal purposes; and

WHEREAS, the City Council finds it to be in the public interest to execute a contract with J.C. Roberts Construction Co., Inc., of Odessa, Texas, for said project;

**NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE
CITY OF MIDLAND, TEXAS:**

SECTION ONE. That the Mayor and City Secretary are hereby authorized and directed to execute and attest, respectively, on behalf of the City of Midland, a contract with J.C. Roberts Construction Co., Inc., for said project at an estimated cost of \$3,582,274.00, said contract being on file in the office of the City Secretary, referenced by the date and number of this Resolution.

SECTION TWO. That the sum of \$4,408,019.00 is hereby appropriated from the from the following sources in the following amounts to the Fire Station #10 Project (9006): 2012 GPCO Fire Facilities Bond Fund (161) Unappropriated Fund Balance (5650) - \$3,743,989.00; General Fund (001) Unappropriated Fund Balance (5650) - \$664,030.00.

SECTION THREE. That the City Treasurer is hereby authorized and directed to pay J.C. Roberts Construction Co., Inc., pursuant to the terms of said contract from funds appropriated herein upon receipt of proper invoices or statements approved by the City Manager.

On motion of Council member _____, seconded by Council member _____, the above and foregoing resolution was adopted by the City Council of the City of Midland at a regular meeting on the _____ day of _____, A.D., 2013, by the following vote:

Council members voting "AYE":

Council members voting "NAY":

W. Wesley Perry, Mayor

ATTEST:

Amy M. Turner, City Secretary

RECOMMENDED AND APPROVED:

Courtney Sharp, City Manager

APPROVED AS TO CONTENT
AND COMPLETENESS:

Robert Patrick, General Services Director

APPROVED AS TO FORM:

Keith Stretcher, City Attorney

**City of Midland**

**City of Midland Fire Station No.10
300 N. Lorraine Midland, Texas 79701
May 8, 2013 at 11:00am**

03.8686.12

Contractor	Bid Bond	Addendum #1	Addendum #2	Addendum #3	Addendum #4	Addendum #4R	Base Proposal	Alternate 1 (Truck Bays)	Total Base Bid Plus Alternative
Mid-Tex 5206 West Wadley Midland, TX 79707	✓	✓	✓	✓	✓	✓	\$ 3,711,000.00	\$ 480,000.00	\$ 4,191,000.00
Journeyman Construction 7701 N Lamar Blvd Ste. 100 Austin, Texas 78752	✓	✓	✓	✓	✓	✓	\$ 4,131,247.00	\$ 477,800.00	\$ 4,609,047.00
Minnix Commercial Construction 12302 Slide Rd. Lubbock, TX 79424	✓	✓	✓	✓	✓	✓	\$ 3,988,000.00	\$ 491,000.00	\$ 4,479,000.00
JC Roberts PO Box 60631 Midland, TX 79711	✓	✓	✓	✓	✓	✓	\$ 3,582,274.00	\$ 492,329.00	\$ 4,074,603.00
Mega Contractors 911 N Sylvania Ave. Ste 160 Fort Worth, TX 76111	✓	✓	✓	✓	✓	✓	\$ 3,739,000.00	\$ 607,000.00	\$ 4,346,000.00

\\Data1\Projects\2012\8686.12\BID-PROPOSAL PHASE\Bid Tab.docm

May 16, 2013

The Honorable Wes Perry
Mayor
City of Midland
PO Box 1152
Midland, Texas 79702

Re: Recommendation for Award of Construction Contract
Midland Fire Station No. 2

Dear Mayor Perry:

We have reviewed the bids for the above referenced project received on May 8, 2013 and determined that all bids were submitted in accordance with guidelines established in the Bid Documents and those procedures adopted by the City of Midland. All bids have been determined to be tabulated properly and are consistent with those figures recorded during the bid opening. Completed bid tabulation forms are enclosed for your reference.

We recommend that the Construction Contract for the Midland Fire Station No. 10 be awarded to the low bidder, JC Roberts Construction Company, Inc., for the **Total Contract Amount of \$3,582,274.00 for the Base Bid only**. PSC has had extensive experience working with JC Roberts Construction Company, Inc. on projects very similar to yours. We feel that this company has the qualifications and capacity to complete the project to the satisfaction of the City of Midland and PSC.

Please contact me if you have questions or wish to discuss this matter further.

Sincerely,

PARKHILL, SMITH & COOPER, INC.

By 
Chris Upton
AIA, RAS

cc: Robert Patrick
Regina Stephenson

Project Manual



City of Midland

Fire Station No. 10

Midland, Texas

April 2013

PSC Project #03868612



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-
- 01650 Starting of Systems
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DIVISION 2 – SITE WORK

- 02225 Trenching
- 02230 Site Clearing
- 02231 Aggregate Base Course
- 02300 Excavation and Fill
- 02301 Earthwork for Buildings
- 02350 Excavating, Backfilling and Subgrade Preparation
- 02511 Asphaltic Concrete Surfacing
- 02513 Pavement Markings
- 02521 Concrete Curbs, Gutters and Sidewalks
- 02522 Structural Portland Cement Concrete for Site Work
- 02607 Manholes and Covers
- 02667 Site Water Lines
- 02675 Disinfection of Water Distribution System
- 02732 Site Sanitary Sewerage and Storm Sewerage System
- 02764 Pavement Joint Sealants
- 02810 Irrigation Systems
- 02930 Exterior Plants

DIVISION 3 – CONCRETE

- 03300 Cast-In-Place Concrete

DIVISION 4 - MASONRY

- 04200 Concrete Unit Masonry

DIVISION 5 – METAL

- 05120 Structural Steel for Building
- 05210 Steel Joists Framing
- 05310 Steel Decking
- 05410 Structural Metal Stud Framing

DIVISION 6 - WOOD AND PLASTICS

- 06050 TimberSIL® Glass Wood Products
- 06114 Wood Blocking and Curbing
- 06410 Custom Casework

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

- 07181 Water Repellents Coatings
- 07210 Building Insulation
- 07270 Firestopping
- 07272 Fluid-Applied Membrane Air Barriers



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07410 Metal Roof Panels
07600 Sheet Metal
07900 Joint Sealers

DIVISION 8 - DOORS AND WINDOWS

08110 Steel Doors and Frames
08211 Wood Doors
08352 Four-Fold Door Systems
08364 Steel Sectional Overhead Doors
08410 Aluminum Entrances and Storefronts
08520 Aluminum Windows
08800 Glazing

DIVISION 9 - FINISHES

09250 Gypsum Board Systems
09300 Tile
09510 Acoustical Ceilings
09650 Resilient Flooring and Base
09900 Painting

DIVISION 10 - SPECIALTIES

10170 Solid Color Reinforced Composite Toilet Partitions
10350 Flagpoles
10505 Metal Lockers
10800 Toilet and Bath Accessories

DIVISION 11 - EQUIPMENT

11452 Residential Appliances

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Not Used

DIVISION 15 – MECHANICAL

15000 General Provision for Mechanical and Electrical
15300 Piping Accessories
15350 Plumbing Systems
15370 Fire Protection Sprinkler System
15400 Air Distribution
15500 Hangers and Supports
15600 Insulation
15700 Equipment
15800 Testing, Adjusting and Balancing Mechanical Systems



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DIVISION 16 – ELECTRICAL

16010	Basic Electrical Requirements
16110	Raceways
16120	Wires and Cables
16130	Boxes
16140	Wiring Devices
16170	Grounding and Bonding
16195	Electrical Identification
16441	Safety Switches
16470	Panelboards
16510	Lighting
16811	Fire Protection and Detection System



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DESIGN PROFESSIONAL RESPONSIBILITY

The specification sections authenticated by my seal and signature are limited to the following:

DIVISION 2 – SITE WORK

02225	Trenching
02230	Site Clearing
02231	Aggregate Base Course
02301	Earthwork for Buildings
02350	Excavating, Backfilling and Subgrade Preparation
02511	Asphaltic Concrete Surfacing
02513	Pavement Markings
02521	Concrete Curbs, Gutters and Sidewalks
02522	Structural Portland Cement Concrete for Site Work
02607	Manholes and Covers
02667	Site Water Lines
02675	Disinfection of Water Distribution System
02732	Site Sanitary Sewerage and Storm Sewerage System
02764	Pavement Joint Sealants



René Franks

04/03/2013

DESIGN PROFESSIONAL RESPONSIBILITY

The specification sections authenticated by my seal and signature are limited to the following:

DIVISION 2 – SITE WORK

02300 Excavation and Fill

DIVISION 3 – CONCRETE

03300 Cast-in-Place Concrete

DIVISION 4 - MASONRY

04210 Concrete Unit Masonry

DIVISION 5 – METAL

05120 Structural Steel for Building
05210 Steel Joists Framing
05310 Steel Decking
05410 Structural Metal Stud Framing



DESIGN PROFESSIONAL RESPONSIBILITY

The specification sections authenticated by my seal and signature are limited to the following:

DIVISION 2 – SITE WORK

02810 Irrigation Systems
02930 Exterior Plants



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DESIGN PROFESSIONAL RESPONSIBILITY

The specification sections authenticated by my seal and signature are limited to the following:

DIVISION 15 - MECHANICAL

- 15000 General Provisions for Mechanical and Electrical
- 15300 Piping and Accessories
- 15350 Plumbing Systems
- 15370 Fire Protection Sprinkler System
- 15400 Air Distribution
- 15500 Hangers and Supports
- 15600 Insulation
- 15700 Equipment
- 15800 Testing, Adjusting and Balancing Mechanical Systems



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DIVISION 16 - ELECTRICAL

- 16010 Basic Electrical Requirements
- 16110 Raceways
- 16120 Wires and Cables
- 16130 Boxes
- 16140 Wiring Devices
- 16170 Grounding and Bonding
- 16195 Electrical Identification
- 16441 Safety Switches
- 16470 Panelboards
- 16477 Fuses
- 16510 Lighting
- 16811 Fire Protection and Detection System



04/03/13

Fanning, Fanning & Associates, Inc.
Texas Registered Engineering Firm F-00294
2555 74th Street
Lubbock, Texas 79423
Tel 806.745.2533 Fax 806.745.3596
www.fanningfanning.com

ADVERTISEMENT FOR BIDS

1.1 OWNER:

City of Midland, Texas

1.2 PROJECT:

Fire Station No. 10 COM #: 5681-13.

1.3 ARCHITECT:

Parkhill, Smith & Cooper, Inc.
Engineers ■ Architects ■ Planners
1700 W. Wall, Suite 100
Midland, Texas 79701
Phone: 432.697.1447

1.4 DESCRIPTION:

- A. City of Midland will receive sealed bids for the projects noted above. You are invited to submit a stipulated sum bid on the attached forms for furnishing of all labor, materials, services and equipment necessary for and incidental to the project as called for on the Drawings and in the Project Manual.
- B. A contract will be awarded based on the lowest total combined bid for the project, or any combination of Base Bid and Alternates.

1.5 BASIS OF BIDS

- A. Bids shall be made on a stipulated sum basis on the attached forms for furnishing of all labor, materials, services and equipment necessary for and incidental to the project as called for on the Drawings and in the Project Manual.

1.6 SUBMISSION OF BIDS

- A. Address to: Mr. Courtney Sharp, City Manager
City of Midland City Hall, Texas
Proposal for Fire Station No. 10 #5681-13.
- B. Location: City Secretary's Office
300 N. Loraine
Midland, TX 79701
- C. Date: May 8, 2013
- D. Time: 11:00 a.m.

1.7 BID DOCUMENTS

- A. General Contractors may secure copies of Bid Documents from Parkhill, Smith & Cooper, Inc., Engineers ■ Architects ■ Planners, 1700 W. Wall, Suite 100, Midland, Texas 79701 as follows:
 - 1. Download documents (.PDF file extension format) from PSC's Info Exchange web site after registering as a plan holder with issuing PSC office. There is no cost or deposit required for this option.
 - 2. Unlimited number of digital copies (.PDF file extension format) upon a non-refundable cost of \$18.48 per each CD, plus applicable sales tax.
- B. Subcontract Bidders may secure copies of the Bid Documents from Parkhill, Smith & Cooper, Inc., Engineers ■ Architects ■ Planners, 1700 W. Wall, Suite 100, Midland, Texas 79701 as follows:
 - 1. Download documents (.PDF file extension format) from PSC's Info Exchange web site after registering as a plan holder with issuing PSC office. There is no cost or deposit required for this option.
 - 2. Unlimited number of digital copies (.PDF file extension format) upon a non-refundable cost of \$18.48 per each CD, plus applicable sales tax.
- C. Deposit shall be Company check or cashier's check made payable to Parkhill, Smith & Cooper, Inc.
- D. No partial sets will be issued.
- E. Additional Bid Documents may be purchased by any Bidder upon payment (non-refundable) of the following:
 - 1. Complete set of digital Bid Documents: \$18.48 per each CD, plus applicable sales tax.

1.8 ADDENDA

- A. Addenda will be issued to document holders by one of the two following methods:
 - 1. E-mail notification to document holder with link to download addenda from PSC's Info Exchange web site.
 - 2. For document holders not having e-mail address, addenda may be picked up at the issuing PSC office, or mailed via the United States Postal Service (USPS).
- B. Addenda will not be faxed to document holders.

1.9 BID SECURITY

- A. Bid security in the sum of 5% of the total bid amount and in the form of a cashier's check, certified check or Surety Proposal Bond, shall accompany all bids as stipulated in the Instruction to Bidders.

1.10 OPENING OF BIDS

- A. Bids will be publicly opened and read aloud at the City of Midland City Hall immediately after closing of bid time on May 8th, 2013 at 11:00 a.m.

1.11 FORMALITIES

- A. The Owner reserves the right to waive irregularities and to reject all bids.

END OF SECTION

INSTRUCTIONS TO BIDDERS

IB-1. BID FORMS

Bid shall be submitted on the Proposal form in the bound specifications.

In addition to the completed Proposals, bid forms shall include Bid Security, Financial Statement, and other specified documents. Failure to submit a complete bid as specified will be considered as sufficient cause for rejection of the bid.

IB-2. PREPARATION OF PROPOSALS

All blanks in the forms shall be filled in or marked "N.A." (Not Applicable) and all required information shall be included with the Proposals. Bid prices shall be written in ink and shall be shown both in written words and figures. Receipt of all addenda issued shall be acknowledged in the space provided on the addendum. Each addendum received and the Bid Security shall be enclosed with the Proposal. The Proposal and accompanying documents shall be enclosed in a sealed envelope, addressed to Mr. Courtney Sharp, City Manager, City of Midland, Texas marked "Proposal for Fire Station No. 10 #5681-13 with the name and address of the Bidder also shown thereon.

IB-3. EXPERIENCE RECORD AND FINANCIAL STATEMENT

The Experience Record included herein, shall be filled in, showing completed jobs, of a similar nature to the one covered by the Proposal, and the work in progress with contract and bond amounts and percent complete.

A sworn statement of the current financial condition of the Bidder shall also be enclosed with the Proposal, in order to provide the Owner with information relative to the responsibility of bidders and their ability to finance and construct the work. This statement shall be enclosed with the Proposal in a separate envelope and will be returned to the Bidder upon return of his bid security.

IB-4. BID SECURITY

Each proposal must be accompanied by a Bid Bond, Certified Check, or cash in the amount of not less than five percent of the maximum bid submitted, payable without recourse to the City of Midland, Texas. If a Bid Bond is submitted as bid security, it shall be executed by an approved surety company authorized to do business in the State of Texas, and accepted according to the latest list of companies holding certificates of authority from the Secretary of the Treasury of the United States of America. Such bid security shall be so conditioned that if the Bidder is awarded the Contract and is unable or fails to furnish performance and payment bonds and execute the Contract within ten days after date of award, the security shall revert to the Owner as compensation for damages which the Owner suffers because of such failure by the Bidder.

IB-5. PERFORMANCE AND PAYMENT BONDS

With the execution and delivery of the contract documents, the Contractor shall furnish, on the forms provided herein, bonds, as required by the General Conditions, in the sum of 100% of the total contract price, executed by an approved surety company authorized to do business in the State of Texas, and accepted according to the latest list of companies holding certificates of authority from the Secretary of the Treasury of the United States of America. Performance and Payment Bonds submitted shall be in compliance with Chapter 2253 of the Texas Government Code.

IB-6. INTERPRETATION OF BIDS

No bid will be considered which fails to supply all information indicated, or which has any limitation or provisions placed upon it by the Bidder. In case of a difference between the written words and the figures in the Proposal, the amount stated in written words will be considered as the bid price, without recourse on the part of the Contractor. In case of ambiguity or lack of clearness in the Proposal, the Owner will adopt the most advantageous construction thereof or reject the bid. The Owner reserves the right to accept or reject

any or all bids, if it is deemed to be in the best interest of the public. Further, the Owner reserves the right to reject any bids because of irregularity or to waive such irregularity if such action is in the public interest.

IB-7. DISPOSITION OF BIDS

The Owner expects to make award of the contracts as soon as possible after the opening of bids, but specifically reserves the right to hold all Proposals for a period not to exceed ninety (90) days, before making an award. No Proposal, having been opened, may be withdrawn prior to expiration of this one hundred twenty day period. Bid security of all but the successful Bidder will be returned upon making an award.

The Owner and Bidder agree that, if the Contract is awarded, that it will be awarded to either the lowest responsible bidder/proposer, or to the bidder/proposer who provides goods or services at the best value for the city of Midland. In determining the best value for the City of Midland, the City of Midland may consider the criteria enumerated in Section 252.043 of the Texas Local Government Code.

Further, Owner reserves the all rights granted by Section 271.027 of the Texas Local Government Code. The Owner reserves the right to award the bid to the lowest responsible bidder.

IB-8. EXAMINATION OF SITE, PLANS AND SPECIFICATIONS

Prior to submission of a Proposal, each Bidder shall have made a thorough examination of the site of work and of the plans and specifications, and shall become informed as to the location and nature of the proposed construction, labor conditions and all other matters that may affect the cost and time of completion of the work upon which he bids. Bidders shall make such investigations of the nature of the project as they deem necessary and shall assume all responsibility for fully informing themselves of the character of materials which will be encountered. The submission of a Proposal shall be prima facie evidence that the Bidder has made such an examination.

IB-9. INTERPRETATION OF SPECIFICATIONS PRIOR TO BIDDING

Any questions arising during the advertising period as to the meaning or intent of the specifications will be answered by an addendum which will be sent to all who have placed a deposit and have been furnished plans and contract documents. The Engineer/Architect shall receive requests for clarifications to specifications and plans at least three (3) days prior to the date for receipt of bids.

The receipt of each addendum shall be acknowledged by the Bidder in the space provided and each addendum shall be enclosed with the Proposal when it is submitted. All addenda shall become a part of these contract documents.

IB-10. AVAILABILITY OF PLANS

A. For Bidders

It is intended that all parties with an interest in the type of work included in the project covered by these documents be given a reasonable opportunity to examine the documents and prepare a bid or subbid. Documents may be examined without charge as noted in the Advertisement for Bids. Complete sets of documents may be obtained from the Engineer upon request, accompanied by a refundable deposit of \$75.00 for a hard copy set of specifications and plans. Bidders may download documents (.PDF file extension format) from PSC's Info Exchange web site after registering as a plan holder with the issuing PSC office as noted in the Advertisement for Bids. There is no cost or deposit required for this option.

The deposit will be refunded to Bidders who submit a bona fide Bid and return all sets of the Bid Documents in good condition within ten days after receipt of Bids. The cost of replacement of missing or damaged documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the Bid Documents and the Bidder's deposit will be refunded.

Bidders shall use complete sets of Bidding Documents in preparing Bids; neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

In making copies of the Bidding Documents available on the above terms, the Owner and the Architect do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant permission for any other use of the Bidding Documents.

B. For the Contractor

The Contractor will be furnished five (5) sets of specifications and plans for his use during construction. This shall include all plans and specifications furnished to material suppliers and subcontractors but does not include the executed contract copies. Plans and specifications for use during construction will be furnished directly only to the Contractor. The Contractor shall then distribute copies of plans and specifications to suppliers, subcontractors, or others, as required for proper execution of the work.

IB-11. SPECIAL PROVISIONS

Attention of Bidders is directed to SPECIAL PROVISIONS included in these documents for requirements concerning scope of work, labor, wage schedule, insurance and similar subjects.

IB-12. PLANT LOCATION AND STORAGE AREA

Contractors bidding on the work included in this contract who desire to locate a material storage area or other similar facility on the property may secure such site, buildings or areas by direct negotiation with the _____, Midland, Texas. An area located adjacent to the project area will be identified as available for use by the Contractor for staging and material storage.

IB-13. WITHDRAWAL OF PROPOSALS

Any Bidder, upon his or his authorized representative's written request, will be given permission to withdraw his Proposal not later than the time set for opening thereof. At the time of opening of the Proposals, when such Proposal is reached, it will be returned to him unread.

IB-14. DISQUALIFICATION OF BIDDERS

Any one or more of the following causes may be considered as sufficient for the disqualification of bidder and the rejection of his bid or bids:

More than one Proposal for the same work from an individual firm, partnership, or corporation under the same or different name.

Evidence of collusion among bidders. Participants in such collusion may not receive recognition as Bidders for any future work.

Unbalanced Proposals in which the prices for some items are out of proportion to the prices for other items.

Failure to submit a unit price for each item of work for which a bid price is required by the Proposal.

Lack of competency as revealed by the financial statement submitted.

Lack of responsibility as shown by past work judged from the standpoint of workmanship and progress.

Uncompleted work which, in the judgment of the Owner, might hinder or prevent the prompt completion of additional work if awarded.

For being in arrears on existing contracts, in litigation with the Owner, or having defaulted on a previous contract.

IB-15. MATERIAL GUARANTY

Before any contract is awarded, the Bidder may be required to furnish a complete statement of the origin, composition, or manufacture of any or all materials proposed to be used in the construction of the work, together with samples, which may be subjected to the tests provided for in these specifications to determine their quality and fitness for the work.

IB-16. WAIVER

BY SUBMITTING A BID, EACH BIDDER AGREES TO AND DOES HEREBY WAIVE ANY CLAIM THE BIDDER HAS OR MAY HAVE AGAINST THE CITY OF MIDLAND, TEXAS, AND THE CITY'S EMPLOYEES, AGENTS AND OFFICERS ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE FOLLOWING:

1. THE ADMINISTRATION, EVALUATION OR RECOMMENDATION OF ANY BID;
2. WAIVER OR DELETION OF ANY OF THE REQUIREMENTS UNDER THE BID DOCUMENTS OR THE CONTRACT DOCUMENTS;
3. ACCEPTANCE OR REJECTION OF ANY BIDS; AND
4. AWARD OF THE CONTRACT

BY SUBMITTING A BID, THE BIDDER ACKNOWLEDGES THAT THE BIDDER UNDERSTANDS ALL TERMS OF THE BIDDING DOCUMENTS AND CONSENTS TO THE BIDDING PROCESS AND THE POSSIBILITY OF A NEGATIVE ASSESSMENT. BY SUBMITTING A BID, THE BIDDER ACKNOWLEDGES AND AGREES THAT THERE WAS AND IS NO DISPARITY OF BARGAINING POWER BETWEEN THE BIDDER AND THE CITY OF MIDLAND, TEXAS.

THE BIDDER AGREES THAT THIS IS THE INTENTIONAL RELINQUISHMENT OF THE ABOVE LISTED PRESENTLY EXISTING KNOWN RIGHTS.

IB-17. WAIVER OF ATTORNEY FEES

BY EXECUTING THIS CONTRACT, CONTRACTOR AGREES TO WAIVE AND DOES HEREBY KNOWINGLY, CONCLUSIVELY, VOLUNTARILY AND INTENTIONALLY WAIVE ANY CLAIM IT HAS OR MAY HAVE IN THE FUTURE AGAINST THE OWNER, REGARDING THE AWARD OF ATTORNEY'S FEES, WHICH ARE IN ANY WAY RELATED TO THE CONTRACT, OR THE CONSTRUCTION, INTERPRETATION OR BREACH OF THE CONTRACT. THE CONTRACTOR SPECIFICALLY AGREES THAT IF THE CONTRACTOR BRINGS OR COMMENCES ANY LEGAL ACTION OR PROCEEDING RELATED TO THIS CONTRACT, THE CONSTRUCTION, INTERPRETATION, VALIDITY OR BREACH OF THIS CONTRACT, INCLUDING BUT NOT LIMITED TO ANY ACTION PURSUANT TO THE PROVISIONS OF THE TEXAS UNIFORM DECLARATORY JUDGMENTS ACT (TEXAS CIVIL PRACTICE AND REMEDIES CODE SECTION 37.001, ET. SEQ., AS AMENDED), OR CHAPTER 271 OF THE TEXAS LOCAL GOVERNMENT CODE, THE CONTRACTOR AGREES TO ABANDON, WAIVE AND RELINQUISH ANY AND ALL RIGHTS TO THE RECOVERY OF ATTORNEY'S FEES TO WHICH CONTRACTOR MIGHT OTHERWISE BE ENTITLED.

CONTRACTOR AGREES THAT THIS IS THE VOLUNTARY AND INTENTIONAL RELINQUISHMENT AND ABANDONMENT OF A PRESENTLY EXISTING KNOWN RIGHT. THE CONTRACTOR ACKNOWLEDGES THAT IT UNDERSTANDS ALL TERMS AND

CONDITIONS OF THE CONTRACT. THE CONTRACTOR FURTHER ACKNOWLEDGES AND AGREES THAT THERE WAS AND IS NO DISPARITY OF BARGAINING POWER BETWEEN THE OWNER AND THE CONTRACTOR. THIS SECTION SHALL NOT BE CONSTRUED OR INTERPRETED AS A WAIVER OF SOVEREIGN IMMUNITY.

THE CONTRACTOR AND OWNER ARE RELYING ON THEIR OWN JUDGMENT. EACH PARTY HAD THE OPPORTUNITY TO DISCUSS THIS CONTRACT WITH COMPETENT LEGAL COUNSEL PRIOR TO ITS EXECUTION.

BID BOND

THE STATE OF TEXAS)

SURETY'S NO. _____

COUNTY OF MIDLAND)

KNOWN ALL MEN BY THESE PRESENTS, THAT _____

_____ (hereinafter called the
Principal), as Principal, and _____

_____ (hereinafter called the Surety), as Surety, are held and firmly bound unto
the City of Midland, a home rule municipal corporation of Midland County (hereinafter called the Obligee), in
the amount of _____

_____ DOLLARS (\$ ____), for the payment whereof the said Principal and Surety bind themselves, and
their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a Bid or Proposal to enter into a certain written contract with
the Obligee for Fire Station No. 10.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said
Principal shall faithfully, enter into such written Contract, then this obligation shall be void; otherwise to
remain in full force and effect.

IT IS EXPRESSLY UNDERSTOOD AND AGREED that if said Principal should withdraw its Bid
anytime after such Bid is opened and before official rejection of such Bid or, if successful in securing the
award thereof, said Principal should fail to enter into the Contract and furnish satisfactory Performance Bond
and Payment Bond, the Obligee, in either of such events, shall be entitled and is hereby given the right to
collect this Bid Bond as liquidated damages.

PROVIDED further that if any legal action be filed upon this Bond venue shall lie in Midland County,
Texas.

IN WITNESS WHEREOF, the said Principal and Surety do sign and seal this instrument, this ____ day
of _____, 20____.

Surety

By_____

Address_____

APPROVED AS TO FORM:

City Attorney

NOTE: Attach Power of Attorney

BID FORM

TO: Mr. Courtney Sharp
City Manager
City of Midland
Midland, Texas

Dear Mr. Sharp:

Pursuant to the foregoing Request for Bid, the undersigned Bidder hereby proposes to do all work and furnish all necessary superintendence, labor, machinery, equipment, tools, and materials, and whatever else may be necessary to complete all work upon which he bids, as provided by the attached specifications and shown on the plans, and binds himself on acceptance of this Bid to execute a Contract and Bonds according to the accompanying forms, for performing and completing the said work within the time stated, and furnishing all required guarantees, for the following sum:

FIRE STATION NO. 10
#5681-13

- A. BASE BID, Lump Sum: Three million five hundred
eight-thousand Dollars (\$ 5,582,274.00)
two hundred seventy-four
- B. ALTERNATE NO. 1 -TRUCK BAY, Lump Sum: Four hundred ninety
two thousand three Dollars (\$ 492,329.00)
hundred twenty-nine
- TOTAL (BASE BID PLUS ALTERNATE), Lump Sum: Four million seventy-four
thousand six hundred Dollars (\$ 4,074,603)
three

(Note: All amounts shall be shown in both written and figure form. In case of discrepancy between the written amount and the figure, the written amount will govern. For alternates, check whether it is an add, deduct or no change.)

If awarded the contract, the undersigned agrees to commence work under this contract on or before May 28, 2013 and to substantial complete the project on March 23, 2014 unless modified by change order.

We have included, in the Bid sum, all applicable contingency allowances described in Section 01200-PRICE AND PAYMENT.

It is understood that the Owner reserves the right to accept or reject any and all Bids and to waive all formalities in accordance with State law.

The Bidder shall be required to issue a resale certificate on materials in lieu of paying the sales tax on such materials at the time of purchase. The City will provide the successful Bidder with a sales tax exemption certificate for such materials.

The undersigned Bidder hereby declares that he has visited the site of the work and has carefully examined the Plans, Project Manual and Contract Documents pertaining to the work covered by the above bid, and that the prices bid herein are based on the minimum wage rates included in the specifications.

The bidder certifies, by submission of this Bid or acceptance of this contract, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency. It further agrees that by submitting this Bid that it will include this clause without modification in all lower tier transactions, solicitations, Bids, contracts, and subcontracts. Where the bidder or any lower tier participant is unable to certify to this statement, it shall attach an explanation to this Bid.

The contractor or subcontractor, by submission of an offer and/or execution of a contract, certifies that it:

- a. is not owned or controlled by one or more citizens or nationals of a foreign country included in the list of countries that discriminate against U.S. firms published by the Office of the United States Trade Representative (USTR);
- b. has not knowingly entered into any contract or subcontract for this project with a contractor that is a citizen or national of a foreign country on said list, or is owned or controlled directly or indirectly by one or more citizens or nationals of a foreign country on said list.
- c. has not procured any product nor subcontracted for the supply of any product for use on the project that is produced in a foreign country on said list.

Unless the restrictions of this clause are waived by the Secretary of Transportation in accordance with 49 CFR 30.17, no contract shall be awarded to a contractor or subcontractor who is unable to certify to the above. If the contractor knowingly procures or subcontracts for the supply of any product or service of a foreign country on said list for use on the project,

Further, the contractor agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification without modification in each contract and in all lower tier subcontracts. The contractor may rely upon the certification of a prospective subcontractor unless it has knowledge that the certification is erroneous.

The contractor shall provide immediate written notice to the sponsor if the contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances. The subcontractor agrees to provide immediate written notice to the contractor, if at any time it learns that its certification was erroneous by reason of changed circumstances.

This certification is a material representation of fact upon which reliance was placed when making the award. If it is later determined that the contractor or subcontractor knowingly rendered an erroneous certification.

Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by this provision. The knowledge and information of a contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

This certification concerns a matter within the jurisdiction of an agency of the United States of America and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code, Section 1001.

The Bidder hereby agrees to commence work under this contract within 10 days of a date to be specified in written "Notice to Proceed" and to complete the work within the framework noted in the Contract. Bidder further agrees to pay as liquidated damages the sum of \$750.00 for each consecutive calendar day beyond each phase of the days allowed; as hereinafter provided in Paragraph 32 of the General Conditions.

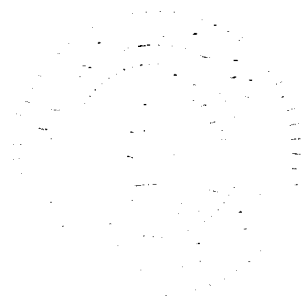
Bidder acknowledges receipt of the following addendum: One - April 24, 2013;

Two - May 1, 2013; Three - May 3, 2013; Four - May 6, 2013; FourR - May 7, 2013

Enclosed with this Bid is a Cashier's or Certified Check for _____ Dollars (\$_____)

or, a Bid Bond in the sum of 5% of Greatest Amount Bid Dollars (\$5% of Greatest Bid), which it is agreed shall be collected and retained by the Owner as liquidated damages in the event the Bid is accepted by the Owner within ninety (90) days after the date advertised for the reception of bids and the undersigned fails to execute the contract or required bonds with the Owner, under the conditions hereof, within ten (10) days after the date said Bid is accepted; otherwise, said check or bond shall be returned to the undersigned upon demand.

(Seal if Bidder is a
Corporation)



J. C. Roberts Construction Co., Inc.

Contractor

By

P. O. Box 60631, Midland, TX 79711

Address

CONTRACT

STATE OF TEXAS

COUNTY OF MIDLAND

THIS CONTRACT, made and entered into this 14 day of May
A.D. 2013, by and between the City of Midland, of the County of Midland and the State of Texas, acting
through W. Wesley Perry, Mayor
thereunto duly authorized so to do, Party of the First Part, hereinafter termed Owner, and
J. C. Roberts Construction Co., Inc.
of the City of Midland, County of Midland and State of Texas, Party of the Second
Part, herein-after termed Contractor.

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned,
to be made and performed by the Party of the First Part (Owner), and under the conditions expressed in the
bond bearing even date herewith, the said Party of the Second Part (Contractor) hereby agrees with said Party
of the First Part (Owner) to commence and complete the construction of items of work included in this project
which are described as follows: Construction of a new 12,000 square foot 3 bay fire station. The new
building includes office, multipurpose room, kitchen, exercise room, sleeping areas, restrooms, hose storage,
dry room, decontamination room, site improvements and other miscellaneous work as indicated on the drawings
and in the specifications.

The work will also include other miscellaneous materials, equipment, machinery, superintendence and
labor for constructing these improvements for the City of Midland, Texas.

These improvements are shown on the plans entitled "City of Midland, Fire Station No. 10" dated
March 2013 and the specifications attached hereto.

This contract shall include all extra work in connection, therewith, under the terms as stated in the
General Conditions of the Contract; and at his (or their) owner proper cost and expense to furnish all the
materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories and
services necessary to complete the said construction, in accordance with the conditions and prices stated in the
Proposal attached hereto, and in accordance with all the General Conditions of the Contract, and in accordance
with the plans, which includes all maps, plats, blueprints and other drawings and printed or written explanatory
matter thereof, and the Specifications therefor, as prepared by Parkhill, Smith & Cooper, Inc., herein entitled
the Architect, each of which has been identified by the endorsement of the Contractor and the Architect
thereon, together with the Contractor's written Proposal, and General Conditions of the Agreement, and the
Performance Bond and Payment Bond hereto attached; all of which are made a part hereof and collectively
evidence and constitute the entire contract.

Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an
amount in current funds equal to the sum of the amounts determined pursuant below:

	Amount	Awarded	Not Awarded
Fire Station No. 10	\$ <u>3,582,274.00</u>	<u>X</u>	
Alternate No. 1 – Alternate Truck Bay	\$ <u>492,329.00</u>		<u>X</u>
TOTAL AWARDED	\$ <u>3,582,274.00</u>		

The total contract sum awarded shall be Three Million Five Hundred Eighty Two Thousand Two Hundred Seventy Four and NO/100 (\$ 3,582,274.00), subject to additions and deductions as provided in the contract documents.

The Proposer hereby agrees to commence work under this contract within 10 days of a date to be specified in written "Notice to Proceed" and to complete the work under the Base Bid identified on the plans by March 23, 2014 including manufacture and delivery time.

Proposer further agrees to pay as liquidated damages the sum of \$750.00 for each consecutive calendar day beyond the days allowed as hereinafter provided in Paragraph 32 of the General Conditions.

The Owner agrees to pay the Contractor in current funds for the performance of the contract in accordance with the Proposal submitted therefor, subject to additions and deductions, as provided in the specifications, and to make payments on account thereof as provided therein.

ATTORNEY'S FEES -BY EXECUTING THIS CONTRACT, CONTRACTOR AGREES TO WAIVE AND DOES HEREBY KNOWINGLY, CONCLUSIVELY, VOLUNTARILY, AND INTENTIONALLY WAIVE ANY CLAIM IT HAS OR MAY HAVE IN THE FUTURE AGAINST THE OWNER, REGARDING THE AWARD OF ATTORNEY'S FEES, WHICH ARE IN ANY RELATED TO THE CONTRACTOR, OR THE CONSTRUCTION, INTERPRETATION OR BREACH OF THE CONTRACT, THE CONTRACTOR SPECIFICALLY AGREES THAT IF THE CONTRACTOR BRINGS OR COMMENCES ANY LEGAL ACTION OR PROCEEDING RELATED TO THIS CONTRACT, THE CONSTRUCTION, INTERPRETATION, VALIDITY OR BREACH OF THIS CONTRACT, INCLUDING BUT NOT LIMITED TO ANY ACTION PURSUANT TO THE PROVISIONS OF THE TEXAS UNIFORM DECLARATORY JUDGMENTS ACT (TEXAS CIVIL PRACTICE AND REMEDIES CODE SECTION 37.001, ET.SEQ., AS AMENDED), OR CHAPTER 271 OF THE TEXAS LOCAL GOVERNMENT CODE, THE CONTRACTOR AGREES TO ABANDON, WAIVE AND RELINQUISH ANY AND ALL RIGHTS TO THE RECOVERY OF ATTORNEY'S FEES TO WHICH CONTRACTOR MIGHT OTHERWISE BE ENTITLED.

CONTRACTOR AGREES THAT THIS IS VOLUNTARY AND INTENTIONAL RELINQUISHMENT AND ABANDONMENT OF A PRESENTLY EXISTING KNOW RIGHT. CONTRACTOR ACKNOWLEDGES THAT IF UNDERSTANDS ALL TERMS AND CONDITIONS OF THE CONTRACT. THE CONTRACTOR FURTHER ACKNOWLEDGES AND AGREES THAT THERE WAS AND IS NO DISPARITY OF BARGAINING POWER BETWEEN THE OWNER AND THE CONTRACTOR. THIS SECTION SHALL NOT BE CONSTRUED OR INTERPRETED AS A WAIVER OF SOVERIGN IMMUNITY.

THE CONTRACTOR AND OWNER ARE RELYING ON THEIR OWNER JUDGMENT. EACH PARTY HAD THE OPPORTUNITY TO DISCUSS THIS AGREEMENT WITH LEGAL COUNSEL PRIOR TO ITS EXECUTION.

IN WITNESS WHEREOF, the parties to these presents have executed this Agreement in the year and day first above written.

Party of the First Part (Owner)

ATTEST:

By _____
W. Wesley Perry, Mayor

By _____
Amy M. Turner, City Secretary

Party of the Second Part (Contractor)

ATTEST:

By_____

By_____

Complete Address:

J. C. Roberts Construction Co., Inc.

PO Box 60631

Midland, Texas 79711

STATE OF TEXAS

COUNTY OF Midland

Before me, a notary public, on this day personally appeared, _____ to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he executed the same for the purposes and consideration therein expressed.

Given under my hand and seal of office this _____ day of _____, 20____.

(Seal)

Notary Public's Signature

PERFORMANCE BOND
SUBMITTED IN COMPLIANCE WITH CHAPTER 2253
OF THE TEXAS GOVERNMENT CODE

STATE OF TEXAS §
 §
COUNTY OF MIDLAND §

KNOW ALL MEN BY THESE PRESENTS: That we, J. C. Roberts Construction Co., Inc.
of the City of Midland, County of Midland and State of Texas, as principal, and
_____ hereinafter called the Surety, are held
and firmly bound unto the City of Midland, Texas, a home rule municipal corporation of Midland County,
Texas, (hereinafter called the City-Obligee), in the penal sum of Three Million Five Hundred Eighty Two
Thousand Two Hundred Seventy Four and NO/100. DOLLARS, (\$ 3,582,274.00) lawful money
of the United States, well and
truly to be paid to the City of Midland, Texas, for the payment whereof the said Principal and Surety bind
themselves and their heirs, administrators, executors, successors, and assigns, jointly and severally, firmly
by these presents.

WHEREAS, the Principal has entered into a certain written contract with the Owner-Obligee, dated
the 14 day of May 2013, for project, Fire Station No. 10.
specifically including in the scope of this work and bond, the additional maintenance guaranty provisions set
forth in the contract conditions, which contract is hereby referred to and made a part hereof as fully and to the
same extent as if copied at length herein, as well as the Principal's primary obligation to perform according to
plans and specifications.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said
Principal shall faithfully perform the work in accordance with the plans, specifications, instructions to bidders,
general and special conditions and other contract documents, including any addendums thereto, then this
obligation shall be void; otherwise to remain in full force and effect.

PROVIDED further that if any legal action be filed upon this Bond venue shall lie in Midland County,
State of Texas.

PROVIDED further that this Performance Bond is submitted in compliance with Chapter 2253 of the
Texas Government Code.

Surety, for value received, stipulates and agrees that no change, extension of time, alteration or addition to
the terms of the contract, or to the work performed thereunder, or the plans, specifications or drawings
accompanying the same, or any assignment of the contract as may be provided for in the instructions to
bidders, shall in any way affect its obligation on this Bond, and it does waive notice of any such change,
extension of time, alteration or addition to the terms of the contract, assignment thereof, or to the work to be
performed thereunder.

IN WITNESS WHEREOF the said Principal and Surety have signed and sealed this instrument, this
_day of _____, 20_.

J. C. ROBERTS CONSTRUCTION CO., INC.

Contractor

Surety

By _____

By _____

(Title)

NOTE: If signed by an officer of the Surety Company, there must be on file a certified extract from the by-laws showing that this person has authority to sign such obligation. If signed by an Attorney in Fact, the Owner must be furnished with a copy of Power of Attorney for their files.

PAYMENT BOND
SUBMITTED IN COMPLIANCE WITH CHAPTER 2253
OF THE TEXAS GOVERNMENT CODE

STATE OF TEXAS §
 §
COUNTY OF MIDLAND §

KNOW ALL MEN BY THESE PRESENTS: That we, J. C. Roberts Construction Co, Inc.
of the City of Midland, County of Midland and State of Texas, as principal, and
_____ hereinafter called the Surety, are held and firmly bound unto the
City of Midland, Texas, a home rule municipal corporation of Midland County, Texas, (hereinafter called the
City- Obligee), in the penal sum of Three Million Five Hundred Eighty Two Thousand Two Hundred
Seventy Four and NO/100 DOLLARS, (\$ 3,582,274.00) lawful money of the United States, well and
truly to be paid to the City of Midland, for the payment whereof the said Principal and Surety bind
themselves and their heirs, administrators, executors, successors, and assigns, jointly and severally, firmly
by these presents.

WHEREAS, the Principal has entered into a certain written contract with the Owner-Obligee, dated
the 14 day of May 20 13, for Fire Station No. 10.
which contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at
length herein.

NOW, THEREFORE, the condition of this obligation is that if said Principal shall pay all claimants
supplying labor and material to him or a subcontractor in the prosecution of the work provided for in said
contract, then this obligation shall be null and void; otherwise to remain in full force and effect.

PROVIDED further that if any legal action be filed upon this Bond venue shall lie in Midland County,
State of Texas.

PROVIDE further that this Payment Bond is submitted in compliance with Chapter 2253 of the Texas
Government Code.

Surety, for value received, stipulates and agrees that no change, extension of time, alteration or
addition to the terms of this contract, or to the work performed thereunder, or the plans, specifications or
drawings accompanying the same, or any assignment of the contract as may be provided for in the instructions
to bidders, shall in any way affect its obligation on this Bond, and it does waive notice of any such change,
extension of time, alteration or addition to the terms of the contract, assignment thereof, or to the work to be
performed thereunder.

WITNESS our hands this the _____ day of _____, 20_.

J. C. ROBERTS CONSTRUCTION CO, INC.
Contractor

Surety

By _____

By _____
(Title)

NOTE: If signed by an officer of the Surety Company, there must be on file a certified extract from the by-laws showing that this person has authority to sign such obligation. If signed by an Attorney in Fact, the Owner must be furnished with a copy of Power of Attorney for their files.

CERTIFICATE OF INSURANCE

TO: CITY OF MIDLAND
FIRE STATION NO. 10
MIDLAND, TEXAS

Date _____

Type of
Project: Fire Station

THIS IS TO CERTIFY THAT _____
(Name of Insured)

is, at the date of this certificate, insured by this Company with respect to the business operations hereinafter described, for the types of Insurance and in accordance with the provisions of the standard policies used by this Company, and further hereinafter described. Exceptions to standard policy noted on reverse side hereof.

<u>Policy No.</u>	<u>Effective</u>	<u>TYPE OF INSURANCE</u>	<u>Expires</u>	<u>Limits of Liability</u>
Workmen's		<u>Compensation</u>		
		<u>Public</u>		
1 person \$ _____		<u>Liability</u>		
1 accident \$ _____		<u>Contingent</u>		
1 person \$ _____		<u>Liability</u>		
1 accident \$ _____		<u>Property</u>		
<u>Damage</u>				
Builder's		<u>Risk</u>		
		<u>Automobile</u>		
<u>Other</u>				
_____ The foregoing Policies (do) (do not) cover all sub-contractors.				

Locations Covered: _____

Description of Operations Covered: _____

The above policies either in the body thereof or by appropriate endorsement provide that they may not be changed or cancelled by the insurer in less than the legal time required after the insured has received written notice of such change or cancellation, or, in case there is no legal requirement, in less than five days after the insured has received such written notice.

FIVE COPIES OF THIS
CERTIFICATE MUST BE
SENT TO THE OWNER

(Name of Insurer)

By _____
Title _____
Phone _____

NOTE: THE CITY OF MIDLAND AND PARKHILL, SMITH & COOPER, INC. SHALL BE
NAMED AS ADDITIONAL INSURED ON REQUIRED INSURANCE POLICIES.

EXPERIENCE RECORD

List of Projects, similar to that covered by Proposal, which Bidder has successfully completed:

<u>Amount of</u>	<u>Date</u>	<u>Name and Address</u>
<u>Contract Award</u>	<u>Completed</u>	<u>of Owner</u>
<u>Type of Work</u>		

See attached list of Fire Station Projects Completed (highlighted red)

List of Projects Bidder is now engaged in completing:

<u>Amount of</u>	<u>Percent</u>	<u>Name and Address</u>
<u>Contract Award</u>	<u>Completed</u>	<u>of Owner</u>
<u>Type of Work</u>		

See attached list of Projects Under Construction (highlighted yellow)

Project	Owner	Architect	Contract	% Complete	Complete/Complete By
Gertrude Bruce Historical Cultural Center - Odessa	City of Odessa	Witherspoon Architecture	113,680	Complete	Nov 1997
Gonzales Elem. New Brick Veneer - Odessa	Ector County ISD	Jim Shelton Architect	33,790	Complete	Aug 1997
1997 OHS Renovations - Odessa	Ector County ISD	Dan Norris Architect	553,100	Complete	Aug 1997
1997 Austin Elem Restroom Additions - Odessa	Ector County ISD	Johnson Seefeldt Architects	165,100	Complete	Aug 1997
Comanche Trails Soccerplex - Odessa	City of Odessa	Hunter Corral / City of Odessa	94,793	Complete	Nov 1997
Crane High School Elevator Addition - Crane	Crane ISD	Hunter Corral Associates	78,677	Complete	Aug 1997
Water Lab Expansion - Odessa	City of Odessa	Johnson Seefeldt Architects	504,487	Complete	Mar 1998
Radio Tower Foundations - Odessa	City of Odessa	Parkhill, Smith and Cooper	14,743	Complete	Dec 1997
1997 Bonham Junior High Gym Addition - Odessa	Ector County ISD	Johnson Seefeldt Architects	742,400	Complete	Aug 1998
UTPB Park - Odessa	City of Odessa	Landgraf, Crutcher Associates	2,241,000	Complete	Dec 1998
Adolescent Treatment Center - Midland	Perm Bas Community Cntrs	Joe Mills Architect	129,277	Complete	June 1998
Baskin Robbins Renovation - Midland	Kent Distributors	Joe Mills Architect	132,341	Complete	June 1998
Ward County Courthouse - Monahans	Ward County	Witherspoon Architecture	1,083,000	Complete	Mar 2000
Ector Jr Hi Music Addition - Odessa	Ector County ISD	Johnson Seefeldt Architects	1,848,700	Complete	April 1999
TDCJ Prison Roof Replace - Ft. Stockton	Tx. Dept. of Criminal Justice	n/a	111,424	Complete	Sept 1998
WT State School - Pyote	Texas Youth Commission	Parkhill, Smith and Cooper	594,305	Complete	Oct 1999
City - Noel Plaza - Odessa	City of Odessa	City of Odessa	49,199	Complete	Dec 1999
City - UTPB Phase II - Odessa	City of Odessa	Landgraf, Crutcher Associates	282,742	Complete	Dec 1999
Phyllis Wheatley Day Nursey - Odessa	City of Odessa	n/a	9,030	Complete	Feb 2000
Animal Control Improvements - Odessa	City of Odessa	Parkhill, Smith and Cooper	298,600	Complete	Aug 2000
UTPB Park Phase II - Odessa	City of Odessa	Landgraf, Crutcher Associates	275,558	Complete	Aug 2000
Tx. Parks & Wildlife - Wamock Ctr - Lajitas	TP&W	TP&W	15,000	Complete	Nov 2000
Desert Energy - Odessa	Desert Energy	n/a	6,000	Complete	Nov 2000
Lawndale Park - Odessa	City of Odessa	KDC Landscape Design	79,083	Complete	Nov 2000
Time Machine - Odessa	City of Odessa	n/a	19,389	Complete	Jan 2001
Yoakum Co. Physicians Clinic - Denver City	Yoakum County	Joe D. McKay Architects	1,240,133	Complete	Aug 2001
MISD Warehouse - Midland	MISD	MISD	80,000	Complete	June 2001
Ector Co. Coliseum - Odessa	Ector County	n/a	8,636	Complete	Jan 2001
ECISD Roofing & Misc Renov - Odessa	Ector County ISD	Johnson Seefeldt Architects	883,600	Complete	Jan 2002
Eastside Park Improve - Odessa	City of Odessa	City of Odessa	105,330	Complete	Jan 2002
OHS Program Expansion - Odessa	Ector County ISD	Johnson Seefeldt Architects	240,585	Complete	Jan 2002
Durango Hanger Training Facility - Midland	City of Midland	Design Services	126,585	Complete	Jan 2002
Cogdell Memorial Hospital Renov - Snyder	Cogdell Mem Hosp District	Joe D. McKay Architects	2,019,816	Complete	May 2003
Ector County Library Renov - Odessa	Odessa	Johnson Seefeldt Architects	43,895	Complete	Mar 2002
Girl's Softball Complex - Odessa	City of Odessa	Johnson Seefeldt Architects	1,057,100	Complete	Dec 2002
MCH Building "L" Renovations - Odessa	Medical Center Hospital	Johnson Seefeldt Architects	390,889	Complete	July 2002
Ft. Davis HS M & E Renovations - Ft. Davis	Ft. Davis ISD	Johnson Seefeldt Architects	390,020	Complete	Aug 2002
ECISD CATE Greenhouse - Odessa	Ector County ISD	Howell Engineering	148,289	Complete	Oct 2002
ECISD Gale, Pond, Alamo Elem - Odessa	Ector County ISD	Johnson Seefeldt Architects	1,957,439	Complete	Aug 2003
Goodwill Industries - Odessa	Goodwill Industries	n/a	202,889	Complete	Feb 2003
Park Bleacher Covers - Odessa	City of Odessa	n/a	14,466	Complete	Feb 2003
Ector Co. Coliseum - Odessa	Ector County	n/a	10,620	Complete	Mar 2003
OHS Fieldhouse Renovation - Odessa	Ector County ISD	Johnson Seefeldt Architects	392,590	Complete	July 2003
Ratiff Stadium Turf Replacement - Odessa	Ector County ISD	Parkhill, Smith and Cooper	930,322	Complete	Oct 2003
TEC Center Renovations - Odessa	Ector County ISD	ECISD	38,743	Complete	Oct 2003
MMH Imaging Center Renovations - Midland	Midland Memorial Hospital	Rhotenberry Wellen Architects	489,690	Complete	Jan 2004
Cameron Elem. Additions and Renovations - Odessa	Ector County ISD	Norris, Witherspoon Architecture	2,371,175	Complete	Aug 2004
Buffalo Trails Scout Ranch - Toyahvale	Boy Scouts of America	James Rigger - Architecture	431,000	Complete	May 2004
Jr. Hi. Science Lab Renovations - Seminole	Seminole ISD	Joe Grimes, P.E.	194,776	Complete	Aug 2004
West Texas Training Center Phases V & IV - San Angelo	Texas State University System	DMS Architects	1,028,446	Complete	Dec 2004
West Texas State School Facility Improvements - Pyote	Texas Youth Commission	Parkhill, Smith and Cooper	921,002	Complete	Nov 2005
Permian High Swimming Pool & Stage Renov - Odessa	Ector County ISD	Hunter Corral Associates	184,180	Complete	Sep 2004
Health and Wellness Center - Odessa	City of Odessa	Johnson Seefeldt Architects	447,790	Complete	Mar 2005
Cosmetology Lab - Midland	Midland College	Parkhill, Smith and Cooper	177,777	Complete	Jan 2005
Odessa High School Phase I - Odessa	Ector County ISD	Johnson Seefeldt Architects	1,447,392	Complete	Aug 2005
UTPB Lab 3145 Renovation - Odessa	Univ of Texas of the Permian Bas	UTPB	21,650	Complete	Apr 2005
TxDot VTC Addition - Odessa	Texas Dept of Transportation	TxDot	109,377	Complete	May 2005
MCH Wheatley Stewart Build-Out "E"	Medical Center Hospital	Johnson Seefeldt Architects	381,820	Complete	July 2005
Midland College Cogdell Center - Midland	Midland College	Parkhill, Smith and Cooper	27,449	Complete	Sep 2005
City of Odessa Vehicle Maintenance Department - Odessa	City of Odessa	n/a	8,757	Complete	Jun 2005
Midland Memorial Hospital Endoscopy Suite - Midland	Midland Memorial Hospital	Rhotenberry Wellen Architects	576,000	Complete	Aug 2005
Odessa College Center for Teaching Excellence - Odessa	Odessa College	Johnson Seefeldt Architects	38,787	Complete	Sep 2005
ECISD Odessa High School Phase II Demolition - Odessa	Ector County ISD	Johnson Seefeldt Architects	67,690	Complete	July 2005
MCH Wheatley Stewart Build-Out "F" - Odessa	Medical Center Hospital	Johnson Seefeldt Architects	371,326	Complete	Nov 2005
Medical Community Credit Union - Odessa	Medical Community Credit Union	Norris Associates Architects	567,885	Complete	Mar 2006
Midland Memorial Hospital West Campus - Midland	Midland Memorial Hospital	n/a	23,250	Complete	Nov 2006
MCH Wheatley Stewart Build-Out "G" - Odessa	Medical Center Hospital	Johnson Seefeldt Architects	133,677	Complete	Feb 2006
UTPB Mesa Bldg Improv/Gym Renov-Odessa	Univ of Texas of the Permian Bas	Parkhill, Smith and Cooper	1,531,400	Complete	Aug 2006
ECISD Goliad Elementary Addition & Ren.-Odessa	Ector County ISD	Norris, Witherspoon Architecture	2,344,570	Complete	Mar 2007
Midland College Science Faculty Class-Midland	Midland College	Parkhill, Smith and Cooper	76,687	Complete	Feb 2006
Odessa College Concrete Walk Repl.-Odessa	Odessa College	Johnson Seefeldt Architects	52,616	Complete	Feb 2006
Midland Memorial Hospital Occupancy Separation-Midland	Midland Memorial Hospital	Rhotenberry Wellen Architects	797,497	Complete	June 2006
ECISD Ross Elementary School Renovations-Odessa	Ector County ISD	Johnson Seefeldt Architects	2,214,119	Complete	Mar 2007
Big Lake Waste Water Treatment Plant	City of Big Lake	Enprotec/Hibbs & Todd	2,133,734	Complete	May 2007
Monahans Waste Water Treatment Plant Repair	City of Monahans	Enprotec/Hibbs & Todd	20,702	Complete	Mar 2006
MCH 2006 Fire Sprinkler Project-Odessa	Medical Center Hospital	Johnson Seefeldt Architects	202,677	Complete	Aug 2006

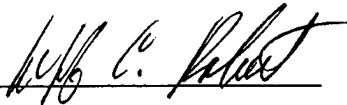
Project	Owner	Architect	Contract	% Complete	Complete/Complete By
MCH Data Center Expansion-Odessa	Medical Center Hospital	Johnson Seefeldt Architects	606,610	Complete	Mar 2007
UTPB Literacy Center Cubicles-Odessa	Univ of Texas of the Permian Bas	UTPB	23,877	Complete	Dec 2006
Midland Memorial Hospital Nurses Stations	Midland Memorial Hospital	MMH	19,277	Complete	Dec 2006
ECISD Burleson Elementary School-Odessa	Ector County ISD	Johnson Seefeldt Architects	3,298,179	Complete	Dec 2007
First Presbyterian Church Renovations-Midland	First Presbyterian	Parkhill, Smith and Cooper	123,683	Complete	Sept 2007
First Presbyterian Church Renovations - Midland	First Presbyterian Church	Rhotenberry Wellen Architects	123,683	Complete	June 2007
Odessa College Welding Training Center	Odessa College	Johnson Seefeldt Architects	196,677	Complete	Nov 2007
First Basin Credit Union - Odessa	First Basin Credit Union	Norris Associates Architects	759,500	Complete	Feb 2008
Midland Memorial Hospital Lab Renovations - Midland	Midland Memorial Hospital	Agnew & Associates Engineers	79,777	Complete	Aug 2007
Midland Fair Havens - Midland	Midland Fair Havens	Vandergriff Group	627,261	Complete	Aug 2008
City of Odessa Water Treatment Plant Filtration Rehab	City of Odessa	Alan Plummer Associates, Inc.	2,344,058	Complete	Nov 2008
Odessa College Welding Exhaust System	Odessa College	Bradshaw Engineering	174,177	Complete	Jan 2008
Ratliff Stadium Renovations - Odessa	Ector County ISD	Johnson Seefeldt Architects	2,302,164	Complete	April 2009
Midland Memorial Hospital HBO Renovations - Midland	Midland Memorial Hospital	Johnson Seefeldt Architects	477,377	Complete	Mar 2008
First Basin Credit Union - Midland	First Basin Credit Union	Norris Associates Architects	1,347,200	Complete	Jan 2009
MISD Greathouse Elementary School Additions - Midland	Midland ISD	Pate & Associates	2,284,245	Complete	Mar 2009
MCH Operating Rooms Renovations - Phase 2 - Odessa	Medical Center Hospital	Johnson Seefeldt Architects	6,192,137	Complete	May 2010
City of Rankin Lift Station - Rankin	City of Rankin	n/a	58,770	Complete	Mar 2010
MCH Annex Remodel - Odessa	Medical Center Hospital	n/a	23,777	Complete	Sept 2008
MCH New P.E.T. Suite - Odessa	Medical Center Hospital	Johnson Seefeldt Architects	547,577	Complete	Mar 2009
First Presbyterian Church Sidewalk Replace - Midland	First Presbyterian Church	n/a	11,989	Complete	Oct 2008
Big Lake Waste Water Treatment Plant Lift Station	City of Big Lake	n/a	33,777	Complete	Jan 2009
Santa Rita Elementary School Renovation - San Angelo	San Angelo ISD	Kinney Architects	2,043,024	Complete	Aug 2010
EZ Rider Bus Shelters and Sidewalks - Midland & Odessa	Mid - Od Urban Transit District	n/a	72,430	Complete	Aug 2009
Odessa College Welcome Center - Odessa	Odessa College	Johnson Seefeldt Architects	165,677	Complete	Aug 2009
Monahans Waste Water Treatment Plant Guidedrail Replace	City of Monahans	n/a	5,000	Complete	Mar 2009
Sibley Nature Center Additions & Renovation - Midland	City of Midland	Travis Durham Architect	920,927	Complete	May 2010
Midland College Cogdell Learning Center - Midland	Midland College	Vandergriff Group Architects	906,112	Complete	Mar 2010
20" RO Water Valve Repair - Ft. Stockton	City of Ft. Stockton	Parkhill, Smith and Cooper	5,000	Complete	Feb 2010
Midland College New Softball Field - Midland	Midland College	Parkhill, Smith and Cooper	486,723	Complete	May 2010
MMH Akin/Chandler Lease Space - Midland	Midland Memorial Hospital	Rhotenberry Wellen Architects	374,377	Complete	Aug 2010
Midland Senior Citizens Center Renovations - Midland	City of Midland	Vandergriff Group Architects	173,784	Complete	Sept 2010
MCH 3rd Street Demo & Site Work - Odessa	Medical Center Hospital	Johnson Seefeldt Architects	258,577	Complete	Sept 2010
Naidu Clinic ADA Accessibility Addition - Odessa	Naidu Clinic	Cawyer & Associates	26,748	Complete	Aug 2010
Odessa College Cosmetology Renovations - Odessa	Odessa College	Johnson Seefeldt Architects	68,857	Complete	Aug 2010
CRMWD Odessa Lift Stations Nos. 1 and 2 Upgrades	CRMWD	Freese & Nichols	1,345,600	Complete	March 2012
Miscellaneous Midland College Projects - Midland	Midland College	n/a	50,000	3,233,133	Jan 2011
MMH Interventional Radiology Phase 2 - Midland	Midland Memorial Hospital	Johnson Seefeldt Architects	405,016	Complete	April 2011
MMH Cath Room #1 Renovations - Midland	Midland Memorial Hospital	Johnson Seefeldt Architects	169,593	Complete	Mar 2011
MCH Hetzler Building Parking Lot - Odessa	Medical Center Hospital	Johnson Seefeldt Architects	184,447	Complete	Mar 2011
MCH OR Dehumidifier - Odessa	Medical Center Hospital	Johnson Seefeldt Architects	358,396	Complete	Aug 2011
Ector County Southside Senior Citizen Center - Odessa	Ector County ISD	Johnson Seefeldt Architects	61,854	Complete	May 2011
MCH Health & Wellness Center Lease A - Odessa	Medical Center Hospital	Johnson Seefeldt Architects	677,280	Complete	Aug 2011
St. Luke's Methodist Church Completion - Midland	St. Luke's Methodist Church	Parkhill, Smith and Cooper	957,797	Complete	Nov 2011
MCH Wheatley Stewart Parking Garage - Odessa	Medical Center Hospital	Johnson Seefeldt Architects	111,148	Complete	Aug 2011
Village Farms Site Utilities - Monahans	Village Farms	n/a	250,000	Complete	Oct 2011
Medical Office Building - Odessa	Dr. Gonzalez	Norris Associates Architects	1,125,000	Complete	Dec 2012
Sibley Nature Center Floor Repairs - Midland	City of Midland	Travis Durham Architect	25,000	Complete	Sept 2011
MMH X-Ray Room #2 Renovations - Midland	Midland Memorial Hospital	Johnson Seefeldt Architects	137,557	Complete	Nov 2011
MCH Center for Health & Wellness Suite 500 - Odessa	Medical Center Hospital	Johnson Seefeldt Architects	189,377	Complete	Nov 2011
I-20 Wildlife Preserve - Midland	City of Midland	Rhotenberry Wellen Architects	1,750,949	Complete	August 2012
KPBT Transmittal Building - Odessa	KPBT	n/a	134,757	Complete	Sept 2012
MCH Center for Health & Wellness Suite 110 - Odessa	Medical Center Hospital	Johnson Seefeldt Architects	222,427	Complete	Sept 2012
Vision 2015: Odessa College Athletic Fields - Odessa	Odessa College	Johnson Seefeldt Architects	1,994,589	Complete	March 2013
St. Mary's Catholic School - Odessa	St. Mary's Catholic Church	N/A	436,775	Complete	Sept 2012
Medical Center Hospital PM & R - Odessa	Medical Center Hospital	Johnson Seefeldt Architects	392,377	Complete	Feb 2013
Midland Memorial Hospital Dr. Gross Lease Space - Midland	Midland Memorial Hospital	Travis Durham Architect	363,201	Complete	Dec 2012
I-20 Wildlife Preserve Pavilion - Midland	City of Midland	Rhotenberry Wellen Architects	374,918	Complete	Feb 2013
City of Monahans WWTP Colonial Lift Station	City of Monahans	Burgess & Niple, Inc.	389,644	25%	June 2013
I-20 Wildlife Preserve Main Gate - Midland	City of Midland	Rhotenberry Wellen Architects	29,877	95%	May 2013
MCH 7-Central Med-Gas & Electrical Upgrades	Medical Center Hospital	Johnson Seefeldt Architects	144,677	80%	May 2013
City of Big Lake .525 WWTP Upgrades - Big Lake	City of Big Lake	Enprotec/Hibbs & Todd	889,993	10%	Oct 2013
Crane Memorial Hospital Physical Therapy & Apt. Bldg.	Crane Co. Hospital District	Vandergriff Group Architects	1,554,590	10%	Oct 2013

6 Projects Currently in Progress**\$ 6,970,189****146 Total Construction Projects****\$ 89,713,012**

List of Surety Bonds in force on the above uncompleted work:

<u>Amount of Contract Award</u>	<u>Amount of Bond</u>	<u>Name of Surety Company</u>
\$3,049,032	100%	North American Specialty Insurance Company
\$ 389,644	100%	North American Specialty Insurance Company
\$ 144,677	100%	North American Specialty Insurance Company
\$ 969,993	100%	North American Specialty Insurance Company

J. C. Roberts Construction Co., Inc.
Bidder

By 

P. O. Box 60631, Midland, TX 79711
Business Address

EQUIPMENT SCHEDULE

The Bidder should list the major equipment which is available and serviceable for use on this work.

1 Ton Trucks

3/4 Ton Trucks

Bobcat

Backhoe

Skid Steer

Telehandler/Forklift

Scissor Lift (2)

Welding Machines

Numerous Small Tools/Equipment

Numerous Dump/Utility Trailers

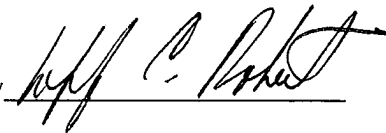
Portion of work bidder proposes to sublet, if any:

Site Work, Concrete, Masonry, Steel Decking, Metal Framing, Millwork, Thermal and Moisture Protection,

Doors/Windows, Acoustical Ceilings, Flooring, Painting, Mechanical/Plumbing, Electrical

Dated this 8th day of May, 20 13.

By



Title President

CONTRACT ASSURANCE

Contractor will ensure that the following clause is placed in every DOT-assisted contract and subcontract:

The contractor or subcontractor shall not discriminate on the basis of race, color, national origin or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract which may result in the termination of this contract or such other remedy as the recipient deems appropriate.

PROMPT PAYMENT

The prime contractor agrees to pay each subcontractor under this prime contract for satisfactory performance of its contract no later than 30 working days from the receipt of each payment the prime contractor receives from the City of Midland. The prime contractor agrees further to return retainage payments to each subcontractor within 30 working days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the City of Midland. The clause applies to both DBE and non-DBE subcontractors.

General Decision Number: TX130263 03/29/2013 TX263

Superseded General Decision Number: TX20120263

State: Texas

Construction Type: Building

County: Midland County in Texas.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Modification Number	Publication Date
0	01/04/2013
1	03/29/2013

BOIL0531-001 01/01/2012

	Rates	Fringes
Boilermaker.....	\$ 23.06	20.28

ENGI0178-004 12/01/2009

	Rates	Fringes
OPERATOR: Forklift.....	\$ 21.20	9.35

IRON0263-017 06/01/2012

	Rates	Fringes
Ironworker, reinforcing.....	\$ 21.85	5.40

PAIN0053-003 04/01/2008

	Rates	Fringes
Painter - Brush, Roller & Spray.....	\$ 15.81	4.56

* PLUM0404-022 09/24/2012

	Rates	Fringes
PLUMBER/PIPEFITTER.....	\$ 22.50	6.25

SUTX2009-169 06/03/2009

	Rates	Fringes
BRICKLAYER.....	\$ 18.00	0.00
CARPENTER, Includes Drywall Hanging, and Metal Stud Installation.....	\$ 15.17	0.00
CEMENT MASON/CONCRETE FINISHER...	\$ 13.89	0.00
ELECTRICIAN.....	\$ 13.63	1.25
IRONWORKER, STRUCTURAL.....	\$ 10.84	0.00
LABORER: Common or General.....	\$ 8.67	0.00
LABORER: Mason Tender - Brick...	\$ 9.13	0.00
OPERATOR: Backhoe/Excavator.....	\$ 13.81	0.00
OPERATOR: Grader/Blade.....	\$ 12.97	0.00
OPERATOR: Loader (Front End)....	\$ 12.23	0.00
ROOFER.....	\$ 12.06	0.00
TILE SETTER.....	\$ 8.50	0.00
TRUCK DRIVER.....	\$ 10.15	0.00

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.
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Unlisted classifications needed for work not included within
the scope of the classifications listed may be added after
award only as provided in the labor standards contract clauses
(29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification
and wage rates that have been found to be prevailing for the
cited type(s) of construction in the area covered by the wage
determination. The classifications are listed in alphabetical
order of "identifiers" that indicate whether the particular
rate is union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with
characters other than "SU" denotes that the union
classification and rate have found to be prevailing for that
classification. Example: PLUM0198-005 07/01/2011. The first
four letters, PLUM, indicate the international union and the
four-digit number, 0198, that follows indicates the local union
number or district council number where applicable, i.e.,
Plumbers Local 0198. The next number, 005 in the example, is
an internal number used in processing the wage determination.
The date, 07/01/2011, following these characters is the
effective date of the most current negotiated rate/collective
bargaining agreement which would be July 1, 2011 in the above
example.

Union prevailing wage rates will be updated to reflect any
changes in the collective bargaining agreements governing the
rates.

0000/9999: weighted union wage rates will be published annually
each January.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived
from survey data by computing average rates and are not union
rates; however, the data used in computing these rates may
include both union and non-union data. Example: SULA2004-007
5/13/2010. SU indicates the rates are not union majority rates,
LA indicates the State of Louisiana; 2004 is the year of the
survey; and 007 is an internal number used in producing the
wage determination. A 1993 or later date, 5/13/2010, indicates
the classifications and rates under that identifier were issued
as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change
until a new survey is conducted.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can
be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on
a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests

for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

SPECIAL PROVISIONS

SP-1 SCOPE OF WORK

The work to be accomplished under these specifications, including the plans, shall consist of the following:

The principal items of work are set forth in specific detail in the proposal section of these specifications; however, the work items may be generally described as:

The work will also include other miscellaneous materials, equipment, machinery, superintendence and labor for constructing these improvements for this project.

All labor, materials and equipment necessary to complete the work called for in these specifications and shown on the plans shall be furnished by the Contractor.

Payment for the various items of work will be made as specified under the various payment paragraphs of the technical sections.

SP-2 CONTRACT DOCUMENTS

All work covered by this contract shall be done in accordance with the Contract Documents described in the General Conditions. The drawings included in the documents consist of the plans entitled "Fire Station No. 10" dated March 2013.

All bidders shall be thoroughly familiar with all of the drawings and specifications. The Contractor shall be responsible for the satisfactory completion of all work shown on the drawings or specified.

The intent of the plans and specifications is to prescribe a complete work or improvement which the Contractor undertakes to do in full compliance with the plans, the specifications, the special provisions, proposal, and contract. The Contractor shall do all work including such additional, extra, and incidental work as may be considered necessary to complete the project in a satisfactory and acceptable manner, as provided in the plans, proposal, and contract. He shall furnish, unless otherwise provided in the specifications, special provisions, or contract, all materials, equipment, tools, labor and incidentals necessary to prosecute the completion of the work.

The Contract Documents are complementary, and what is called for by any one shall be as binding as if called for by all. In case of conflict between any of the Contract Documents, priority of interpretation shall be in the following order: Signed Contract, Special Provisions, Performance Bond, Special Bonds (if any), Proposal, Notice to Bidders, Instructions to Bidders, Technical Specifications, Plans and General Conditions of the Contract.

SP-3 TIME AND ORDER OF COMPLETION

The Contractor will be permitted to prosecute certain portions of the work in the order and manner of his own choosing to the best interest of the project. However, the work shall be conducted in such manner and with such materials, equipment and labor as may be required to insure completion in accordance with the plans and specifications within the time stated in the Proposal and in the Contract. The Contractor shall furnish the Architect with his proposed progress schedule and this schedule shall be approved by the Architect before work is commenced on the project.

The Contractor is reminded that approved material submittals are required prior to the incorporation of the materials into this project. To avoid any delays in the progress of the work, it is imperative that complete information be provided to the Architect as early as possible for review and approval.

The Contractor will be required to execute various portions of the project in phases to maintain usage of airport facilities as well as safety during the entire project. The Contractor will be allowed to develop his own phasing plan which will meet the intent of the phasing shown on the Plans. The Contractor's phasing plan will be subject to the Architect's approval.

Other contractors may be performing work for the Owner in the same general area as that covered under this contract. The Contractor shall be expected to coordinate his work with the work of other contractors as may be required to insure that all work can be carried out with the least possible interference with the operation of other contractors or the Owner. The Contractor's coordination with other contractors shall require the approval of the Architect. The Owner reserves the right to control and direct the sequence of operations in the areas where others will be working. Provision shall be made for other contractors to have suitable space to work and for storage of materials, as well as access to these areas.

The Contractor shall schedule his work well in advance of actual operations and shall keep the Architect advised of this schedule so that close coordination can be maintained with the City of Midland representative and with other contractors.

SP-4 LIMITATION OF OPERATION

Each item of work shall be completed without delay and in no instance shall the Contractor be permitted to transfer his forces from uncompleted work to new work without the permission of the Architect. The Contractor shall be required to submit a schedule of operations to the Architect for approval. The Contractor shall not commence new work to the prejudice of work already started.

The Contractor shall take all precautions necessary to insure the safety of facility employees as well as that of his own equipment and personnel. The Contractor shall make his own estimate of all difficulties to be encountered.

Nighttime construction activities will not be permitted without the prior approval of the Architect and the City of Midland representative.

The Contractor shall schedule his work well in advance of actual operations and shall keep the Architect advised of this schedule so that close coordination can be maintained with the Recreation Superintendent.

The Contractor shall provide an entrance gate for his employees and subcontractors. The Contractor shall be responsible for allowing only authorized personnel to enter the operational area of the job site through this gate. Entrance through the gate shall be controlled by the Contractor at all times. When not in use by the Contractor, the gate shall be securely locked to prevent entrance by unauthorized persons.

The Contractor shall maintain the pavement surfaces in a clean condition.

The Contractor shall be subject to a pre-construction conference to discuss phasing and project safety control after award of contract.

SP-5 DELETED

SP-6 AFFIDAVIT OF BILLS PAID

Prior to final acceptance of this project by the Owner, the Contractor shall execute an affidavit that all bills for labor, materials and incidentals incurred in the construction of these improvements, have been paid in full, including any retainage, and that there are no claims pending, of which he has been notified.

SP-7 CALENDAR DAY

Time for completion of the project and for liquidated damages shall be in accordance with the provisions of the General Conditions, Paragraph GC-32, TIME FOR COMPLETION AND LIQUIDATED DAMAGES. A calendar day is defined as every day shown on the calendar.

SP-8 PROTECTION OF PROPERTY

The Contractor shall exercise care to prevent damage to all structures, either above or below ground, including buildings, fences, pipelines, utilities, roads, etc., whether publicly or privately owned and including work performed by others. The Contractor shall be responsible for locating all underground facilities that might be damaged by the proposed construction.

The Contractor shall be responsible for all damage done to either public or private property during the course of construction except as specifically provided otherwise in these specifications.

Known existing underground utilities and structures are shown on the plans. Their locations are believed to be reasonably accurate but are not guaranteed.

The Contractor shall take all steps necessary to protect these existing facilities during construction.

SP-9 DELETED

SP-10 DELETED

SP-11 DELETED

SP-12 DELETED

SP-13 BARRICADES, SIGNS, AND HAZARD MARKINGS

The Contractor shall provide, erect, and maintain all necessary barricades, signs, danger signals, and lights for the protection of the work and the safety of the public for land traffic.

SP-14 DELETED

SP-15 PUBLIC CONVENIENCE AND SAFETY

Materials stored on the site shall be so placed and the work shall, at all times, be so conducted as to cause no greater obstruction to the air and ground traffic than is considered necessary by the Architect.

SP-16 FINAL CLEANING UP

As each intermediate phase of work is completed and prior to opening any portion of the job, the Contractor shall be responsible for cleaning the construction site and adjacent pavement as specified above.

Upon completion of the work and before acceptance and final payment will be made, the Contractor shall remove from the site all machinery, equipment, surplus, and discarded materials, rubbish and temporary structures. Material cleared from the site and deposited on property adjacent, will not be considered as being disposed of satisfactorily. The cost of the "Cleanup" shall be included as a part of the cost of the various items of work involved, and no direct compensation will be made for this work.

SP-17 INSURANCE

Contractor shall at all times during the term of this Contract maintain and keep in full force and effect insurance in the following types and minimum amounts with companies authorized to do business in the State of Texas:

Commercial General Liability (including Contractual Liability):

- Personal Injury: \$1,000,000.00 per person
\$1,000,000.00 per occurrence
- Property Damage \$500,000.00 per occurrence

Business Automobile Liability: \$250,000.00 combined single limit
Personal Injury and Property Damage

Worker's Compensation: Statutory Limits
Builders' Risk: \$1,000,000.00 per accident or occurrence
Employer's Liability: \$500,000.00 per accident or occurrence

The Commercial General Liability shall be on a per project aggregate, including completed operations, and shall be on an occurrence basis.

The Worker's Compensation coverage provided by Contractor shall inure to the benefit of employees injured during the course and scope of their employment by Contractor pursuant to this Contract.

The Business Automobile Liability insurance provided by Contractor shall cover any auto for bodily injury and property damage, including owned vehicles, hired and non-owner vehicles and employee non-ownership, and the amount of such policy shall be a minimum of \$250,000.00 covering any vehicle used for the execution of the work that is the subject of this Contract.

All insurance required pursuant to this Contract, except for Worker's Compensation Insurance shall name the Owner as an additional insured on claims occurred basis. All insurance required pursuant to this Contract, including Worker's Compensation Insurance, shall provide for a waiver of subrogation as to the Owner.

The parties agree that, prior to the execution of the Contract, Contractor shall provide one or more certificates of insurance specifically stating that these requirements have been met and subject to the approval of the City. The City shall not be required to provide any insurance whatsoever pursuant to this Contract.

The Contractor certifies that the certificate of insurance provided as required herein complies with the requirements of Senate Bill 425, passed during the 82nd regular session of the Texas Legislature, and effective January 1, 2012.

Owner shall be provided the notice by Contractor's insurance provider not later than thirty (30) days prior to any reduction or termination of such coverage. Owner shall not be required to provide any insurance whatsoever pursuant to this Contract.

Contractor shall contractually require all contractors, subcontractors, and sub-subcontractors that work on any portion of the work that is the subject of this Contract to obtain insurance coverage that meets or exceeds the policy requirements and minimum amounts specified herein. All Contractors, subcontractors, and sub-subcontractors shall obtain insurance policies that provide blanket waivers of subrogation in favor of the city of Midland and policies that name the city of Midland as an additional insured on a claims occurred basis (except worker's compensation).

The Contractor shall not begin work under this contract until he has obtained all insurance as required in the General Conditions of the Contract, has furnished proof of same to the Owner, and the Owner has approved the same. All insurance required for this project shall name the City of Midland and Parkhill, Smith & Cooper, Inc. as additional insureds.

The Contractor shall also obtain an Owner's Protective or Contingent Public Liability Insurance Policy naming the City of Midland, Texas and the Architect as additional insureds and the amount of the policy shall be as follows: \$1,000,000 for injuries, including accidental death, to one or more persons and subject to the above limit for each person, a total limit of \$1,000,000 for all damages arising out of bodily injuries to or death of two or more persons in any one accident, a limit of not less than \$1,000,000 for all damages arising out of injury to or destruction of property in any one accident, and subject to that limit per accident, a total (or aggregate) limit of \$2,000,000 for all damages arising out of injury to or destruction of property during the policy period. A copy of this policy shall be delivered to the Owner.

Before work on any contract or subcontract is started, each Contractor and Subcontractor shall submit to the Owner for approval seven (7) certificates covering each insurance policy carried and offered as evidence of compliance with the above requirements, signed by an authorized representative of the insurance company, setting forth:

-
1. Name and address of the insured.
 2. The location of the operations to which the insurance applied.
 3. The number of policy and the type or types of insurance in force thereunder on the date borne by such certificate.
 4. The expiration date of the policy and the limit or limits of liability thereunder on the date borne by such certificate.
 5. A statement that the insurance of the type afforded by the policy applied to all of the operations of whatever character, which are undertaken by the insured during the performance of this contract, provided such operations are required in the performance of the contract.
 6. A provision that the policy may be canceled only by mailing written notice to the named insured at the address shown in this policy stating when, not less than ten (10) days thereafter, cancellation of such policy shall be effective, with copy to the Owner of letter of intent.

These certificates will become a part of the Contract Documents and must be included with Contract Documents before execution by the City of Midland, Texas. Coverages specified herein apply to all operations of the Contractor in connection with this work, including automobile and other vehicles.

The Contractor's insurance shall cover himself and all subcontractors and sub-subcontractors. All other sublevels of contractors shall provide copies of proof of insurance if not covered by the general contractor.

The Contractor shall provide a Waiver of Subrogation in favor of the City of Midland and Parkhill, Smith & Cooper, Inc. on the Worker's Compensation and Employee Liability Insurance, Contractor's Public Liability and Property Damage Liability Insurance, and Automobile Insurance.

SP-18 REMOVAL AND DISPOSAL OF STRUCTURES, UTILITIES AND OBSTRUCTIONS

All materials and debris specified to be disposed of by the Contractor shall become the property of the Contractor and shall be properly disposed of off the airport property by the Contractor.

SP-19 CONFORMITY WITH PLANS AND ALLOWABLE DEVIATIONS

Finished surfaces shall conform to the lines, grades, cross sections and dimensions. Any deviation from the plans which may be required by the exigencies of construction shall be determined by the Architect and authorized by him in writing.

SP-20 REMOVAL OF DEFECTIVE AND UNAUTHORIZED WORK

All work which has been rejected or condemned shall be repaired or, if it cannot be satisfactorily repaired, removed and replaced at the Contractor's expense. Materials not conforming to the requirements of the specifications shall be removed immediately from the site of the work and replaced with satisfactory material by the Contractor at his expense.

Work done beyond that shown on the plans, or as given, except as herein provided, work done without proper inspection, or any extra or unclassified work done without written authority and prior contract in writing as to prices, will be done at the Contractor's risk and will be considered unauthorized and, at the

option of the Architect, may not be measured and paid for and may be ordered removed and replaced at the Contractor's expense.

Upon the failure of the Contractor to repair satisfactorily or to remove and replace, if so directed, rejected, unauthorized, or condemned work or materials immediately after receiving formal notice from the Architect, the Owner may recover for such defective work or materials on the Contractor's bond, or by action in a court having proper jurisdiction over such matters, or may employ labor and equipment and satisfactorily repair or remove and replace such work and charge the cost of the same to the Contractor, which cost will be deducted from any money due him.

SP-21 DISPUTED CLAIMS FOR EXTRA WORK

In case the Contractor deems extra compensation is due him for work on materials not clearly covered in the contract, or not ordered by the Architect as an extra, the Contractor shall notify the Architect in writing of his intention to make claim for such extra compensation before he begins the work on which he bases the claim and shall afford the Architect every facility for keeping actual cost of the work. Failure on the part of the Contractor to give such notification or to afford the Architect proper facilities for keeping strict account of actual costs shall constitute a waiver of the claim for such extra compensation. The filing of such notice by the contractor and the keeping of costs by the Architect shall not in any way be construed to prove validity of the claim. When the work has been completed, the Contractor shall within 10 days file his claim for extra compensation with the Architect, who will present it to the Owner for consideration.

SP-22 DELETED

SP-23 INDEMNIFICATION

THE CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS AND DEFEND THE OWNER, ARCHITECT, AND ALL OF THEIR OFFICERS, AGENTS AND EMPLOYEES FROM ALL SUITS, ACTIONS, CLAIMS, DAMAGES, PERSONAL INJURIES, LOSSES, PROPERTY DAMAGE AND EXPENSES OF ANY CHARACTER WHATSOEVER, INCLUDING REASONABLE ATTORNEY'S FEES, BROUGHT FOR OR ON ACCOUNT OF ANY INJURIES OR DAMAGES RECEIVED OR SUSTAINED BY ANY PERSON OR PERSONS OR PROPERTY, ON ACCOUNT OF ANY NEGLIGENT ACT OF THE CONTRACTOR, THEIR AGENTS OR EMPLOYEES, OR ANY SUBCONTRACTOR, IN THE EXECUTION, SUPERVISION AND OPERATIONS GROWING OUT OF OR IN ANY WAY CONNECTED WITH THE PERFORMANCE OF THIS CONTRACT, AND CONTRACTOR WILL BE REQUIRED TO PAY ANY JUDGMENT WITH COSTS WHICH MAY BE OBTAINED AGAINST THE OWNER, ARCHITECT OR ANY OF THEIR OFFICERS, AGENTS OR EMPLOYEES, INCLUDING REASONABLE ATTORNEY'S FEES.

THE CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS AND DEFEND THE OWNER AND ALL OF THE OWNER'S OFFICERS, AGENTS AND EMPLOYEES AND PARKHILL, SMITH & COOPER, INC. AND THE OFFICERS, AGENTS AND EMPLOYEES OF PARKHILL, SMITH & COOPER, INC. FROM ALL SUITS, ACTIONS, CLAIMS, DAMAGES, PERSONAL INJURIES, ACCIDENTAL DEATH, PROPERTY DAMAGE, LOSSES, AND EXPENSES OF ANY CHARACTER WHATSOEVER, INCLUDING ATTORNEY'S FEES, BROUGHT FOR OR ON ACCOUNT OF ANY INJURIES OR DAMAGES RECEIVED OR SUSTAINED BY ANY PERSON OR PERSONS OR PROPERTY, ON ACCOUNT OF ANY NEGLIGENT ACT OF THE OWNER, THE OWNER'S OFFICERS, AGENTS AND EMPLOYEES, OR ON ACCOUNT OF ANY NEGLIGENT ACT OF PARKHILL, SMITH & COOPER, INC., OR THE OFFICERS, AGENTS AND EMPLOYEES OF PARKHILL, SMITH & COOPER, INC. WHETHER SUCH NEGLIGENT ACTS WERE THE SOLE PROXIMATE CAUSE OF THE INJURY OR DAMAGE OR A PROXIMATE CAUSE JOINTLY AND CONCURRENTLY WITH THE CONTRACTOR OR THE CONTRACTOR'S EMPLOYEES, AGENTS OR SUBCONTRACTORS NEGLIGENCE, IN THE EXECUTION, SUPERVISION AND OPERATIONS GROWING OUT OF OR IN ANY WAY CONNECTED WITH THE PERFORMANCE OF THIS CONTRACT, AND CONTRACTOR WILL BE REQUIRED TO PAY ANY JUDGMENT WITH COSTS WHICH MAY BE OBTAINED AGAINST THE OWNER OR ANY OF ITS OFFICERS, AGENTS OR EMPLOYEES, INCLUDING REASONABLE ATTORNEY'S FEES.

THE CONTRACTOR AGREES THAT HE WILL INDEMNIFY AND SAVE THE OWNER AND PARKHILL, SMITH & COOPER, INC. HARMLESS FROM ALL CLAIMS GROWING OUT OF ANY DEMANDS OF SUBCONTRACTORS, LABORERS, WORKMEN, MECHANICS, MATERIALMEN, AND FURNISHERS OF MACHINERY AND PARTS THEREOF, EQUIPMENT, POWER TOOLS, ALL SUPPLIES, INCLUDING COMMISSARY INCURRED IN THE FURTHERANCE OF THE PERFORMANCE OF THIS CONTRACT. WHEN OWNER SO DESIRES, THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE THAT ALL OBLIGATIONS OF THE NATURE HEREINABOVE DESIGNATED HAVE BEEN PAID, DISCHARGED OR WAIVED.

THE CONTRACTOR HEREBY WAIVES ALL RIGHTS TO ANY ATTORNEY'S FEES AWARDED AS A RESULT OF ANY ACTION BROUGHT UNDER THE TEXAS UNIFORM DECLARATORY JUDGMENTS ACT RELATING TO THIS CONTRACT.

SP-24 CONTRACTOR'S RESPONSIBILITY FOR WORK

Until acceptance by the Architect of any part or all of the construction, as provided for in these specifications, it shall be under the charge and care of the Contractor, and he shall take every necessary precaution against injury or damage to any part of the work by the action of the elements or from any other cause whatsoever, whether arising from the execution or from the nonexecution of the work. The Contractor shall rebuild, repair, restore, and make good, at his own expense, all injuries or damage to any portion of the work occasioned by any of the above causes before its completion and acceptance.

SP-25 CORRECTION OF FAULTY WORK AFTER FINAL PAYMENT

The making of the final payment by the Owner to the Contractor shall not relieve the Contractor of responsibility for faulty materials or workmanship. The Contractor shall promptly replace any such defects discovered within one year from the date of written acceptance of the work.

The Performance Bond shall remain in effect until one year after the date of the written acceptance of the work to insure compliance by the Contractor with the requirements of this paragraph.

SP-26 TEXAS STATE SALES TAX

The work under this contract is for an entity which qualifies for exemption pursuant to the provisions of Article 151.309 of the Texas Tax Code.

The Contractor performing this contract may purchase, rent or lease all materials, supplies and equipment incorporated into the project by issuing to his supplier an exemption certificate in lieu of the tax, said exemption certificate complying with State Comptroller's rulings. However, equipment and parts for equipment purchased to be used on the project but not incorporated into the project do not qualify for said tax exemption.

The Contractor shall issue a resale certificate in lieu of paying such sales tax for all materials incorporated into this project. Further, the Contractor shall separate the charges for materials incorporated into the project from the charges for labor. Any such exemption certificate issued by the Contractor in lieu of the tax shall be subject to the provisions of the State Comptroller's rulings.

SP-27 SEPARATE CONTRACTS

The Owner reserves the right to let other contracts in connection with or in the vicinity of the project. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall coordinate his work and theirs. The Contractor's coordination with other contractors shall require the approval of the Architect. See Paragraph SP-3 for additional requirements concerning separate contracts.

SP-28 TRENCH SAFETY

The Contractor shall strictly comply with all requirements of the Occupational Safety and Health Administration (OSHA) Manual, Chapter XVII, Subpart P - EXCAVATION, TRENCHING AND SHORING for all trenching and excavation operations.

If depths of trenches are encountered which are over five (5) feet, the Contractor shall cut the trench walls to the angle of repose of the soils encountered, or shall submit alternate shoring details to the Architect for approval.

SP-29 LOAD RESTRICTIONS

The Contractor shall comply with all legal load restrictions in the hauling of materials on public roads beyond the limits of the work. A special permit will not relieve the Contractor of liability for damage which may result from the moving of material or equipment.

The operations of equipment of such weight or so loaded as to cause damage to structures or to any other type of construction will not be permitted. Hauling of materials over the base course will not be permitted. Hauling of materials over the base course or surface course under construction shall be limited as directed. No loads will be permitted on a concrete pavement, base or structure before the expiration of the curing period. The Contractor shall be responsible for all damage done by his/her hauling equipment and shall correct such damage at his/her own expense.

SP-30 NOTICE TO PROCEED

The notice to proceed shall state the date on which it is expected the Contractor will begin the construction and from which date contract time will be charged. The Contractor shall begin the work to be performed under the contract within 10 days of the date set by the Architect in the written Notice to Proceed, but in any event, the Contractor shall notify the Architect at least 24 hours in advance of the time actual construction operations will begin.

SP-31 PAYMENT FOR MATERIALS ON HAND

Partial payments may be made to the extent of the delivered cost of materials to be incorporated in the work, provided that such materials meet the requirements of the contract, plans and specifications and are delivered to acceptable sites on the airport property or at other sites in the vicinity that are acceptable to the Owner. Such delivered costs of stored or stockpiled materials may be included in the next partial payment after the following conditions are met:

- a. The material has been stored or stockpiled in a manner acceptable to the Architect at or on an approved site.
- b. The Contractor has furnished the Architect with acceptable evidence of the quantity and quality of such stored or stockpiled materials.
- c. The Contractor has furnished the Architect with satisfactory evidence that the material and transportation costs have been paid.
- d. The Contractor has furnished the owner legal title (free of liens or encumbrances of any kind) to the material so stored or stockpiled.
- e. The Contractor has furnished the Owner evidence that the material so stored or stockpiled is insured against loss by damage to or disappearance of such materials at any time prior to use in the work.

It is understood and agreed that the transfer of title and the Owner's payment for such stored or stockpiled materials shall in no way relieve the Contractor of his/her responsibility for furnishing and placing such materials in accordance with the requirements of the contract, plans and specifications.

In no case will the amount of partial payments for materials on hand exceed the contract price for such materials or the contract price for the contract item in which the material is intended to be used.

No partial payment will be made for stored or stockpiled living or perishable plant materials.

The Contractor shall bear all costs associated with the partial payment of stored or stockpiled materials in accordance with the provisions of this subsection. Partial payments shall be in accordance with GC-46, "Partial Payments."

SP-32 DELETED

SP-33 DELETED

The time allowed for completion of the entire project shall include the number of calendar days for anticipated delays due to normal weather conditions. No time extension for delays due to weather will be allowed until and unless such delays exceed the claims for extension of time because of abnormal inclement weather, such extension of time shall be granted only because such abnormal inclement weather prevented the execution of major items of work on normal working days. Weather conditions on a particular day may affect work on days following the normal weather day. This subsequent delay shall not be considered abnormal and no extension of time will be considered.

The following weather table reflects the meteorological data from the Midland-Odessa area, and will be used to determine contract time extensions due to abnormally inclement weather. For the purposes of this Contract, "abnormally inclement weather" will be interpreted as the number of days in excess of the normal number of days on which rainfall exceeds 0.01 inch, or snow/ice pellets exceed 1.0 inch. Extensions of time to complete the work will be based on calendar days, and will be granted by monthly account. No "rain days" unused for previous months may be carried over or accountable for future periods of time.

<u>WEATHER TABLE</u>		
<u>Month</u>	<u>Mean Number of Days of Rain (1)</u>	<u>Mean Number of Days of Snow/Ice Pellets (2)</u>
January	4	1
February	4	1
March	3	0
April	3	0
May	6	0
June	5	0
July	5	0
August	6	0
September	6	0
October	5	0
November	3	0
December	<u>4</u>	<u>1</u>
Annually	54	3

- (1) Mean number of days rainfall, 0.01" or more.
- (2) Mean number of days 1.0 inch or more.
- (*) Less than one-half inch.

This table is based on information reported from Midland International Airport, Midland, Texas. Latitude 31 degrees 56 minutes N. Longitude 102 degrees 12 minutes W., elevation (ground) 2,863 feet.

Means are based on records covering a period of 30 years.

SP-35 SUBSTANTIALLY COMPLETE

In various areas of the specifications the term "Substantially Complete" is used. The definition of this term shall be as follows:

Substantially complete shall occur at the time the work to be completed is complete as specified and Owner accepts and occupies the facility or improvement. All equipment shall have been completely installed, tested, ready for Owner acceptance and use and accepted by the Owner before work can be defined as substantially complete.

SP-36 SOVEREIGN IMMUNITY

By executing this contract the Owner is not waiving its right of sovereign immunity. The Owner is retaining its immunity from suit. The Owner is not granting consent to be sued by legislative resolution or action.

THERE IS NO WAIVER OF SOVEREIGN IMMUNITY.

SP-37 GOVERNING LAW AND VENUE

This Contract shall be governed by the laws of the State of Texas. All performance and payment made pursuant to this Contract shall be deemed to have occurred in Midland County, Texas. Exclusive venue for any claims, suits or any other action arising from or connected in any way to this Contract or the performance of this Contract shall be in Midland County, Texas. The obligations and undertakings of each of the parties to this Contract shall be deemed to have occurred in Midland County, Texas.

SP-38 THIRD-PARTY BENEFICIARY

The Owner's approval of this Contract does not create a third party beneficiary. There is no third party beneficiary to this Contract. No person or entity who is not a party to this Contract shall have any third party beneficiary or other rights hereunder.

SP-39 RELEASE

NOTWITHSTANDING ANY OTHER PROVISIONS, CONTRACTOR HEREBY RELEASES, ACQUITS, RELINQUISHES AND FOREVER DISCHARGES OWNER, OWNER'S EMPLOYEES AND OFFICERS, FROM ANY AND ALL DEMANDS, CLAIMS, DAMAGES OR CAUSES OF ACTION OF ANY KIND WHATSOEVER WHICH CONTRACTOR HAS OR MIGHT HAVE IN THE FUTURE, INCLUDING BUT NOT LIMITED TO BREACH OF CONTRACT, QUANTUM MERUIT, CLAIMS UNDER THE DUE PROCESS AND TAKINGS CLAUSES OF THE TEXAS AND UNITED STATES CONSTITUTIONS, TORT CLAIMS OR OWNER'S NEGLIGENCE.

SP-40 INDEPENDENT CONTRACTOR

It is expressly understood and agreed that Contractor shall perform all work and services described herein as an independent contractor and not as an officer, agent, servant or employee of the Owner; that the Contractor shall have exclusive control of and the exclusive right to control the details of the services and work performed hereunder, and all persons performing the same; and shall be solely responsible for the acts and omissions of its officers, agents, employees, contractors and subcontractors; that the doctrine of respondent superior shall not apply as between owner and Contractor, its officers, agents, employees, contractors and subcontractors; and that nothing herein shall be construed as creating a partnership or joint enterprise between

Owner and Contractor. No person performing any of the work and services described hereunder by Contractor shall be considered an officer, agent, servant or employee of the Owner. Further, it is specifically understood and agreed that nothing in this contract is intended or shall be construed as creating a "Community of Pecuniary Interest" or "An Equal Right of Control" which would give rise to vicarious liability. Contractor shall be an independent contractor under this contract and shall assume all of the rights, obligations and liabilities, applicable to it as such independent contractor. The Owner does not have the power to direct the order in which the work is done. The Owner shall not have the right to control the means, methods or details of the Contractor's work. The Contractor shall assume exclusive responsibility for the work. The Contractor is entirely free to do the work in its own way.

SP-41 NOTICE OF ALLEGED BREACH; STATUTORY PREREQUISITES

As a condition precedent to filing suit for alleged damages incurred by an alleged breach of an express or implied provision of this Contract, Contractor or his legal representative, shall give the City Manager, or any other reasonable official of the Owner, notice in writing (consisting of one original and seven copies of notice attached to a copy of this Contract) of such damages, duly verified, within one hundred-twenty (120) days after the same has been sustained. The discovery rule does not apply to the giving of this notice. The notice shall include when, where and how the damages occurred, the apparent extent thereof, the amount of damages sustained, the amount for which the contractor will settle, the physical and mailing addresses of Contractor at the time and date the claim was presented and the physical and mailing addresses of Contractor for the six months immediately preceding the occurrence of such damages, and the names and addresses of the witnesses upon whom the Contractor relies to establish its claim; and a failure to so notify the City Manager within the time and manner provided herein shall exonerate, excuse and except the Owner from any liability whatsoever. The Owner is under no obligation to provide notice to Contractor that Contractor's notice is insufficient. Owner reserves the right to request reasonable additional information regarding the claim. Said additional information shall be supplied within thirty (30) days after receipt of notice.

The statutory prerequisites outlined herein constitute jurisdictional requirements pursuant to Section 271.154 of the Texas Local Government Code and Section 311.034 of the Texas Government Code. Notwithstanding any other provision, Contractor's failure to comply with the requirements herein shall perpetually bar Contractor's claim for damages under Chapter 271 of the Texas Local Government Code and Section 311.034 of the Texas Government Code, regardless if Owner has actual or constructive notice or knowledge of said claim or alleged damages. Contractor agrees that the requirements of this entire Contract are reasonable.

SP-42 ASSIGNMENT

Contractor shall not, either directly or indirectly, assign all or any part of this contract or any interest, right or privilege herein, without the prior written consent of the owner. The issue on whether or not to grant consent to an assignment is in the sole discretion of the Owner.

SP-43 DAVIS BACON WAGE RATES

If applicable, the Davis-Bacon Act, 29 CFR 5.5, and any related acts or regulations are hereby incorporated by reference and made a part of this Contract, and all terms and requirements under said laws, by such incorporation, are made terms and requirements of this Contract, to which the parties to this Contract have agreed to be bound.

SP-44 PROMPT PAY ACT

The Owner and Contractor agree that Texas Government Code, Chapter 2251, Payment for Goods and Services (the “Prompt Pay Act”) does not waive government immunity.

GENERAL CONDITIONS OF THE CONTRACT

GC-01. OWNER

Whenever the word Owner, or the expression Party of the First Part, or First Party, is used in the contract documents, it shall be understood as referring to the Owner as described in the Contract.

GC-02. CONTRACTOR

Whenever the word Contractor, or the expression Party of the Second Part, or Second Party, is used, it shall be understood to mean the person, persons, co-partnership or corporation so defined in the contract and who has agreed to perform the work embraced in this contract, or to his or their legal representatives.

GC-03. ARCHITECT/ENGINEER

Whenever the word Architect/Engineer is used in this contract, it shall be understood as referring to Parkhill, Smith and Cooper, Inc., Consulting Engineers, Lubbock, Midland, El Paso and Amarillo Texas, Architect/Engineer of the Owner, or such other Architect/Engineer, supervisor or inspector as may be authorized by said Owner to act in any particular.

GC-04. CONTRACT DOCUMENTS

The Contract Documents shall consist of the Notice to Bidders (Advertisement), Instructions to Bidders, Proposal, signed Contract, Performance Bond, Payment Bond, General Conditions of the Contract, Special Provisions, Technical Specifications, Plans, and all modifications thereof incorporated in any of the documents before the execution of the contract.

The Contract Documents are complementary, and what is called for by any one shall be as binding as if called for by all. In case of conflict between any of the Contract Documents, priority of Interpretation shall be in the following order: Signed Contract, Performance Bond, Special Bonds (if any), Proposal, Special Provisions, Notice to Bidders, Instructions to Bidders, Technical Specifications, Plans and General Conditions of the Contract.

GC-05. SUB-CONTRACTOR

The term Sub-Contractor, as employed herein, includes only those having a direct contract with the Contractor, and it includes one who furnished material worked to a special design according to the plans or specifications of this work, but does not include one who merely furnished material not so worked.

GC-06. WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual or to a member of firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered mail to the last business address know to him who gives the notice.

GC-07. WORK

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and all water, light, power, fuel, transportation and other facilities necessary for the execution and completion of the work covered by the contract documents.

Unless otherwise specified, all materials shall be new and both workmanship and materials shall be of a good quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials. Materials or work described in words which so applied have a well known technical or trade meaning shall be held to refer to such recognized standards.

GC-08. DELETED

GC-09. DELETED

GC-10. LAYOUT OF WORK

Except as specifically provided herein, the Contractor shall be responsible for laying out all work and shall accomplish this work in a manner acceptable to the Architect/Engineer. The Architect/Engineer will check the Contractor's layout of all major structures and any other layout work done by the Contractor at the Contractor's request, but this check does not relieve the Contractor of the responsibility of correctly locating all work in accordance with the plans and specifications.

GC-11. ARCHITECT/ENGINEER'S AUTHORITY AND DUTY

Unless otherwise specified, it is mutually agreed between the parties to this Contract that the Architect/Engineer will observe the quality and progress of the work at various times. In order to prevent delays and disputes and to discourage litigation, it is further agreed that the Architect/Engineer shall in all cases determine the amounts and quantities of the several kinds of work which are to be paid for under this contract. He shall determine all questions in relation to said work and the construction thereof, and shall in all cases decide every question which may arise relative to the execution of this contract on the part of said Contractor. The Architect/Engineer's estimates and findings shall be the conditions precedent to the right of the parties hereto to any action of the contract, and to any rights of the Contractor to receive any money under this contract; provided, however, that should the Architect/Engineer render any decision or give any direction, which in the opinion of either party hereto, is not in accordance with the meaning and intent of this contract, either party may file with said Architect/Engineer within thirty (30) days his written objection to the decision or direction so rendered. It is the intent of this contract that there shall be no delay in the execution of the work, therefore, the written decision or directions of the Architect/Engineer as rendered shall be promptly carried out, and any claim arising therefrom shall be thereafter adjusted as hereinafter provided.

The Architect/Engineer shall, within a reasonable time, render and deliver to both the Owner and the Contractor a written decision on all claims of the parties hereto and on all questions which may arise relative to the execution of the work or the interpretation of the contract, specifications and plans. Should the Architect/Engineer fail to make such decision within a reasonable time, an appeal may be taken as if his decision had been rendered against the party appealing.

Whenever the words "directed", "required", "permitted", "designated", "considered necessary", "prescribed", or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation, or prescription, of the Architect/Engineer is intended; and similarly, the words "approval", "acceptable", "satisfactory", or words of like import shall mean approved by or acceptable or satisfactory to the Architect/Engineer.

Whenever in the specifications or drawings accompanying this contract, the terms of description of various qualities relative to finish, workmanship, or other qualities of similar kind which cannot, from their nature, be specifically and clearly described and specified, but are necessarily described in general terms, the fulfillment of which must depend on individual judgment, then in all such cases, any question of the fulfillment of said specifications shall be decided by the Architect/Engineer, and said work shall be done in accordance with his interpretations of the meaning of the words, terms or clauses defining the character of the work.

GC-12. SUPERINTENDENCE AND PROJECT REPRESENTATION

It is agreed by the Contractor that the Architect/Engineer shall be and is hereby authorized to appoint from time to time such subordinate engineers, supervisors or project representatives as the said Architect/Engineer may deem proper to inspect the material furnished and the work done under this contract, and to see that the said material is furnished, and said work is done in accordance with the specifications therefor. The Contractor shall furnish all reasonable aid and assistance required by the subordinate engineers, supervisors or project representatives for the proper inspection and examination of the work. The Contractor

shall regard and obey the directions and instructions of any subordinate engineers, supervisors or project representatives so appointed, when such directions and instructions are consistent with the obligations of this Contract and the accompanying plans and specifications, provided, however, should the Contractor object to any orders by any subordinate engineer, supervisor or project representative, the Contractor may within six (6) days make written appeal to the Architect/Engineer for his decision.

GC-13. CONTRACTOR'S DUTY AND SUPERINTENDENCE

The Contractor shall give personal attention to the faithful prosecution and completion of this contract and shall keep on the work, during its progress, a competent superintendent and any necessary assistants all satisfactory to the Architect/Engineer. The superintendent shall represent the Contractor in his absence and all directions given to him shall be as binding as if given to the Contractor. Adequate supervision by competent and responsible representatives of the Contractor is essential to proper performance of the work and lack of such supervision shall be grounds for suspending operations of the Contractor. Important directions shall be confirmed in writing to the Contractor. Other directions shall be so confirmed on written request in each case.

GC-14. CONTRACTOR'S UNDERSTANDING

It is understood and agreed that the Contractor has, by careful examination, satisfied himself as to the nature and location of the work, the confirmation of the ground, the character, quality and quantity of materials to be encountered, the character of equipment and facilities needed preliminary to and during the prosecution of the work, the general and local conditions, and all other matters which can in any way affect the work under this contract. No verbal contract or conversation with any officer, agent or employee of the Owner, either before or after the execution of this contract shall affect or modify any of the terms or obligations herein contained.

GC-15. CHARACTER OF WORKERS

The Contractor agrees to employ only orderly and competent employees, skillful in the performance of the type of work required under this contract, to do the work; and agrees that whenever the Architect/Engineer shall inform him in writing that any employee or employees on the work are, in his opinion, incompetent, unfaithful, or disorderly, such employee or employees shall be discharged from the work and shall not again be employed on the work without the Architect/Engineer's written consent.

GC-16. CONTRACTOR'S BUILDINGS

The building of structures for housing employees, or the erection of tents or other forms of protection, will be permitted only at such places as the Architect/Engineer shall direct, and the sanitary conditions of the grounds in or about such structures shall at all times be maintained in a manner satisfactory to the Architect/Engineer.

GC-17. SANITATION

Necessary sanitary conveniences for the use of laborers on work, properly secluded from public observation, shall be constructed and maintained by the Contractor in such manner and at such points as shall be approved by the Architect/Engineer, and their use shall be strictly enforced.

GC-18. SHOP DRAWINGS

The Contractor shall submit to the Architect/Engineer with such promptness as to cause no delay in his own work or in that of any other Contractor, shop and/or setting drawings and schedules required for the work of the various trades, and the Architect/Engineer shall pass upon them with reasonable promptness, making required corrections. The Architect/Engineer's approval of such drawings or schedules shall not relieve the Contractor from responsibility for deviations from drawings or specifications, unless he has in writing called the Architect/Engineer's attention to such deviations at the time of submission nor shall it relieve him from responsibility for errors of any sort in shop drawings or schedules.

GC-19. PRELIMINARY APPROVAL

The Architect/Engineer shall not have the power to waive the obligations of this contract for the furnishing by the Contractor of good material, and of his performing good work as herein described, and full accordance with the plans and specifications. No failure or omission of the Architect/Engineer to condemn any defective work or material shall relieve the Contractor from the obligations to at once tear out, remove and properly replace the same at any time prior to final acceptance upon the discovery of said defective work or material; provided, however, that the Architect/Engineer shall upon request of the Contractor, inspect and accept or reject any material furnished, and in event the material has been once accepted by the Architect/Engineer, such acceptance shall be binding on the owner, unless it can be clearly shown that such material furnished does not meet the specifications for this work. Any questioned work may be ordered taken up or removed for re-examination, by the Architect/Engineer, prior to final acceptance, and, if found not in accordance with the specifications for said work, all expense of removing, re-examination and replacement shall be borne by the Contractor, otherwise the expense thus incurred shall be allowed as Extra Work, and shall be paid for by the Owner, provided that, where inspection or approval is specifically required by the specifications prior to performance of certain work, should the Contractor proceed with such work without requesting prior inspection or approval, he shall bear all expense of taking up, removing and replacing his work if so directed by the Architect/Engineer.

GC-20. DEFECTS AND THEIR REMEDIES

It is further agreed that if the work or any part thereof, or any material brought on the site of the work for use in the work or selected for the same, shall be deemed by the Architect/Engineer as unsuitable or not in conformity with the specifications, the Contractor shall, after receipt of written notice thereof from the Architect/Engineer, forthwith remove such material and rebuild or otherwise remedy such work so that it shall be in full accordance with this contract.

GC-21. CHANGES AND ALTERATIONS

The Contractor further agrees that the Owner may make such changes and alterations as the Owner may see fit, in the line, grade, form, dimensions, plans or materials for the work herein contemplated, or any part thereof, either before or after the beginning of the construction without affecting the validity of this contract and the accompanying performance bond.

If such changes or alterations diminish the quantity of the work to be done, they shall not constitute the basis for a claim for damages, or anticipated profits on the work that may be dispensed with, except as provided for unit price items under "Estimated Quantities". If the amount of work is either increased or decreased, and the work can fairly be classified under the specifications, price adjustment for such increase or decrease shall be made according to the quantity actually done and at the unit price, if any, established for such work under this contract, except as provided for unit price items under "Estimated Quantities"; otherwise, price adjustment for such changed work shall be made as provided under Extra Work. In case the Owner shall make such changes or alterations as shall make useless any material already done or material already furnished or used then the Owner shall recompense the Contractor for any material or labor so used, and for any actual loss occasioned by such change, due to actual expense incurred in preparation as originally planned.

GC-22. RIGHT OF ARCHITECT/ENGINEER TO MODIFY METHODS AND EQUIPMENT

If at any time the methods or equipment used by the Contractor are found to be inadequate to secure the quality of work or the rate of progress required under this contract, the Architect/Engineer may order the Contractor in writing to increase their safety or improve their character and efficiency, and the Contractor shall comply with such order.

If, at any time the working force of the Contractor is inadequate for securing the progress herein specified, the Contractor shall, if so ordered in writing, increase his force or equipment, or both, to such an extent as to give reasonable assurance of compliance with the schedule of progress.

GC-23. KEEPING OF PLANS AND SPECIFICATIONS ACCESSIBLE

The Architect/Engineer shall furnish the Contractor with an adequate and reasonable number of copies of all specifications without expense to him, and the Contractor shall keep one copy of the same constantly accessible on the work, with the latest revisions noted thereon.

GC-24. OWNERSHIP OF DRAWINGS

All drawings, specifications and copies thereof furnished by the Architect/Engineer shall not be reused on other work, and with the exception of the signed contract sets, are to be returned to him on request, at the completion of the work. All models are the property of the Owner.

GC-25. ADEQUACY OF DESIGN

It is understood that the Owner believes it has employed competent engineers and designers. It is, therefore, agreed that the Owner shall be responsible for the adequacy of the design, sufficiency of the Contract Documents, the safety of the structure and the practicability of the operations of the completed project; provided the Contractor has complied with the requirements of the said Contract Documents, all approved modifications thereof, and additions and alterations thereto approved in writing by the Owner. The burden of proof of such compliance shall be upon the Contractor to show that he has complied with the said requirements of the Contract Documents, approved modifications thereof and all approved additions and alterations thereto.

GC-26. RIGHT OF ENTRY

The Owner reserves the right to enter the property or location on which the works herein contracted for are to be constructed or installed, by such agent or agents as he may elect, for the purpose of supervising and inspecting the work, or for the purpose of constructing or installing such collateral work as said Owner may desire.

GC-27. COLLATERAL CONTRACTS

The Owner agrees to provide by separate contract or otherwise, all labor and material essential to the completion of the work specifically excluded from this contract, in such manner as not to delay the progress of the work, or damage said Contractor, except where such delays are specifically mentioned elsewhere in the Contract Documents.

GC-28. DISCREPANCIES AND OMISSIONS

It is further agreed that it is the intent of this contract that all work must be done and all material must be furnished in accordance with the generally accepted practice, and in the event of any discrepancies between the separate contract documents, the priority of interpretation defined under "Contract Documents" shall govern. In the event that there is still any doubt as to the meaning and intent of any portion of the contract, specifications or drawings, the Architect/Engineer shall define which is intended to apply to the work.

GC-29. DELETED

GC-30. PROTECTION AGAINST ACCIDENT TO EMPLOYEES AND THE PUBLIC

The Contractor shall take out and procure a policy or policies of workmen's compensation insurance with an insurance company licensed to transact business in the State of Texas, which policy shall comply with the Workman's Compensation Law of the State of Texas. The Contractor shall at all times exercise reasonable precautions for the safety of employees and others on or near the work and shall comply with all applicable provisions of Federal, State and Municipal safety laws and building and construction codes.

All machinery and equipment and other physical hazards shall be guarded in accordance with the "Manual of Accident Prevention in Construction" of the Associated General Contractors of America except where incompatible with Federal, State or Municipal laws or regulations. The Contractor, his sureties and insurance

carriers shall defend, indemnify and save harmless the Owner and all its officers, agents, and employees and the Architect/Engineer and his agents and employees from all suits, actions or claims of any character, name and description brought for or on account of any injuries or damages received or sustained by any persons or property, on account of any negligent act or fault of the Contractor or any Subcontractor, their agents or employees, in the execution and supervision of said contract and project which is the subject matter of this contract or on account of the failure of the Contractor or any Subcontractor to provide necessary barricades, warning lights or signs, and will be required to pay any judgment with costs which may be obtained against the Owner or any of its officers, agents or employees, and/or the Architect/Engineer, his agents and employees.

The safety precautions taken shall be the sole responsibility of the Contractor, in his sole discretion as an independent contractor; the inclusion of this paragraph in the contract, as well as any notice which may be given by the Owner, the Architect/Engineer or their representatives concerning omissions under this paragraph as the work progresses, are intended only as reminders to the Contractor of his duty and shall not be construed as any assumption of duty to supervise safety precautions by either the Owner or the Architect/Engineer.

GC-31. DELETED

GC-32. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

It is hereby understood and mutually agreed, by and between the Contractor and the Owner, that the date of beginning and the time for completion as specified in the contract of the work to be done hereunder are ESSENTIAL CONDITIONS of this contract; and it is further mutually understood and agreed that the work embraced in this contract shall be commenced on a date to be specified in the "Notice to Proceed."

The Contractor agrees that said work shall be prosecuted regularly, diligently, and uninterruptedly at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the Owner, that the time for the completion of the work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

If the said Contractor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor does hereby agree, as a part consideration for the awarding of this contract, to pay to the Owner the amount specified in the contract, not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the contract for completing the work.

The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, and said amount is agreed to be the amount of damages which the Owner would sustain and said amount shall be retained from time to time by the Owner from current periodical estimates.

It is further agreed that time is of the essence of each and every portion of this contract and of the specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the contract an additional time is allowed for the completion of any work, the new time limit fixed by such extension shall be of the essence of this contract. Provided, that the Contractor shall not be charged with liquidated damages or any excess cost when the Owner determines that the Contractor is without fault and the Contractor's reasons for the time extension are acceptable to the Owner; Provided, further, that the Contractor shall not be charged with liquidated damages of any excess cost when the delay in completion of the work is due:

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- a. To any preference, priority or allocation order duly issued by the Government;
 - b. To unforeseeable cause beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, acts of God, or of the public enemy, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and severe weather; and
 - c. To any delays of Subcontractors or suppliers occasioned by any of the causes specified in subsection (a) and (b) of this article:

Provided, further, that the Contractor shall, within ten (10) days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the contract, notify the Owner, in writing, of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the Contractor within a reasonable time of its decision in the matter.

GC-33. PRICE FOR WORK

In consideration of the furnishing of all necessary labor, equipment and material and the completion of all work by the Contractor, and on the delivery of all material embraced in this contract in full conformity with the specifications and stipulations herein contained, the Owner agrees to pay the Contractor the prices set forth in the Proposal hereto attached, which has been made a part of this contract, and the Contractor hereby agrees to receive such prices in full for furnishing all material and all labor required for the aforesaid work, also for all expenses incurred by him, and for well and truly performing the same and the whole thereof in the manner and according to this Contract, the attached specifications, the drawings and the requirements of the Architect/Engineer.

GC-34. BONDS

It is further agreed by the parties to this contract that the Contractor will execute bonds in the sum of 100% of the total contract price, for the satisfactory performance of the work and payment of all labor, materials, and equipment in accordance with this contract on the forms provided for this purpose, executed by an approved surety company authorized to do business in the State of Texas, and it is agreed that this contract shall not be in effect until such bonds are furnished and approved by the Owner. Performance and Payment Bonds shall be in compliance with Chapter 2253 of the Texas Government Code.

GC-35. LOSSES FROM NATURAL CAUSES

Unless otherwise specified, all loss or damage to the Contractor arising out of the nature of the work to be done, or from the action of the elements, or from any unforeseen circumstances in the prosecution of the same, or from unusual obstructions or difficulties which may be encountered in the prosecution of the work, shall be sustained and borne by the Contractor at his own expense.

GC-36. PROTECTION OF ADJOINING PROPERTY

The said Contractor shall take proper means to protect the adjacent or adjoining property or properties, in any way encountered, which might be injured or seriously affected by any process of construction to be undertaken under this Contract, from any damage or injury by reason of said process of construction; and he shall be liable for any and all claims for such damage on account of his failure to fully protect all adjoining property. The Contractor agrees to indemnify, save and hold harmless the Owner against any claim or claims for damages due to any injury to any adjacent or adjoining property, arising or growing out of the performance of the contract, but any such indemnity shall not apply to any claim of any kind arising out of the existence or character of the work.

GC-37. PROTECTION AGAINST CLAIMS OF SUB-CONTRACTORS, LABORERS, MATERIALMEN AND FURNISHERS OF MACHINERY, EQUIPMENT AND SUPPLIES

The Contractor agrees that he will indemnify and save the Owner harmless from all claims growing out of the lawful demands of sub- contractors, laborers, workmen, mechanics, materialmen and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the furtherance of the performance of this contract. When so desired by the Owner, the Contractor shall furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid, discharged or waived. If the Contractor fails so to do, then the Owner may at the option of the Contractor either pay directly any unpaid bills, of which the Owner has written notice, or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to liquidate any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged, whereupon payments to the Contractor shall be resumed in full, in accordance with the terms of this contract, but in no event shall the provisions of this paragraph be construed to impose any obligations upon the Owner by either the Contractor or his surety.

GC-38. PROTECTION AGAINST ROYALTIES OR PATENTED INVENTION

The Contractor shall pay all royalties and license fees, and shall provide for the use of any design, device, material or process covered by letters patent or copyright by suitable legal contract with the patentee or owner. The Contractor shall defend all suits or claims for infringement of any patent or copyrights and shall indemnify and save the Owner harmless from any loss on account thereof, except that the Owner shall defend all such suits and claims and shall be responsible for all such loss when a particular design, device, material or process or the product of a particular manufacturer or manufacturers is specified or required by the Owner; provided, however, if choice of alternate design, device, material or process is allowed to the Contractor, then the Contractor shall indemnify and save Owner harmless from any loss on account of thereof. If the material or process specified or required by the Owner is an infringement, the Contractor shall be responsible for such loss unless he promptly gives such information to the Owner.

GC-39. LAWS AND ORDINANCES

The Contractor shall at all times observe and comply with all Federal, State and local laws, ordinances and regulations, which in any manner affect the contract or the work, and shall indemnify and save harmless the Owner against any claims arising from the violation of any such laws, ordinances, and regulations whether by the Contractor or his employees, except where such violations are called for by the provisions of the Contract Documents. If the Contractor observes that the plans and specifications are at variance therewith, he shall promptly notify the Architect/Engineer in writing, and any necessary changes shall be adjusted as provided in the contract for changes in the work. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Architect/Engineer, he shall bear all costs arising therefrom. In case the Owner is a body politic and corporate the law from which it derives its powers, insofar as the same regulates the objects for which, or in the manner in which, or the conditions under which the Owner may enter into contract, shall be controlling, and shall be considered as part of this contract, to the same effect as though embodied herein.

GC-40. ASSIGNMENT AND SUBLETTING

The Contractor further agrees that he will retain personal control and will give his personal attention to the fulfillment of this contract and that he will not assign by Power of Attorney, or otherwise, or sublet said contract without the written consent of the Owner, and that no part or feature of the work will be sublet to anyone objectionable to the Architect/Engineer or the Owner. The Contractor further agrees that the subletting of any portion or feature of the work, or materials required in the performance of this contract, shall not relieve the Contractor from his full obligations to the Owner, as provided by this Contract.

GC-41. TIME AND ORDER OF COMPLETION

It is the meaning and intent of this contract, unless otherwise herein specifically provided, that the Contractor shall be allowed to prosecute his work at such times and sessions, in such order of precedence, and in such manner as shall be most conducive to economy of construction; provided, however, that the order and the time of prosecution shall be such that the work shall be substantially completed as a whole or in part, in

accordance with this contract, the plans and specifications, and within the time of completion designated in the proposal; provided, also, that when the Owner is having other work done, either by contract or by his own force, the Architect/Engineer may direct the time and manner of constructing the work done under this contract so that conflict will be avoided and the construction of the various works being done for the Owner shall be harmonized.

The Contractor shall submit, at such times as may be reasonably be requested by the Architect/Engineer, schedules which shall show the order in which the Contractor proposes to carry on the work, with dates at which the Contractor will start the several parts of the work, and estimated dates of completion of the several parts.

GC-42. EXTENSION OF TIME

Should the Contractor be delayed in the completion of the work by any act or neglect of the Owner or Architect/Engineer or by any employee of either, or by other contractors employed by the Owner, or by changes ordered in the work, or by strikes, lockouts, fires and unusual delays by common carriers, or unavoidable cause or causes beyond the Contractor's control, or by any cause which the Architect/Engineer shall decide justifies the delay, then an extension of time shall be allowed for completing the work, sufficient to compensate for the delay, the amount of the extension to be determined by the Architect/Engineer, provided, however, that the Contractor shall give the Architect/Engineer prompt notice in writing of the cause of such delay.

GC-43. HINDRANCES AND DELAYS

No claims shall be made by the Contractor for damages resulting from hindrances or delays from any cause (except where the work is stopped by order of the Owner for his own convenience) during the progress of any portion of the work embraced in this contract. In case said work shall be stopped by the act of the Owner, then such expense as in the judgment of the Architect/Engineer is caused by such stoppage of said work shall be paid by the Owner to the Contractor.

GC-44. QUANTITIES AND MEASUREMENTS

No extra or customary measurements of any kind will be allowed, but the actual measured and/or computed length, area, solid contents, number and weight only shall be considered, unless otherwise specifically provided.

GC-45. ESTIMATED QUANTITIES

This Contract, including the specifications, plans and estimate, is intended to show clearly all work to be done and material to be furnished hereunder. Where the estimated quantities are shown for the various classes of work to be done and material to be furnished under this contract, they are approximate and are to be used only as a basis for estimating the probable cost of the work and for comparing the proposals offered for the work. It is understood and agreed that the actual amount of work to be done and material to be furnished under this contract may differ somewhat from these estimates, and that where the basis for payment under this contract is the unit price method, payment shall be for the actual amount of such work done and the material furnished.

Where payment is based on the unit price method, the Contractor agrees that he will make no claim for damages, anticipated profits, or otherwise on account of any differences which may be found between the quantities of work actually done, the material actually furnished under this contract and the estimated quantities contemplated and contained in the proposal; provided, however, that where the actual quantity of any major item in this contract is an estimated quantity and where the actual quantity of such "major item" varies more than twenty-five percent (25%) above or below the estimated quantity stated in this contract, an equitable adjustment in the contract price shall be made upon demand of either party. The equitable adjustment shall be based upon any increase or decrease in costs due solely to the variation above one hundred twenty-five percent (125%) or below seventy-five percent (75%) of the estimated quantity.

A "Major Item" shall be construed to be any individual bid item included in the proposal that has a total cost equal to or greater than ten (10) percent of the total contract cost, computed on the basis of the proposal quantities and the contract unit prices.

Any revised consideration is to be determined by contract between the parties, otherwise by the terms of this Contract, as provided under "Extra Work."

GC-46. PARTIAL PAYMENTS

On or before the 10th day of each month the Architect/Engineer shall prepare a statement showing as completely as practicable the total value of the work done by the Contractor up to and including the last day of the preceding month; said statement shall also include the value of all sound materials delivered on the site of the work that are to be fabricated into the work.

The Owner shall then pay the Contractor within three (3) working days after receipt of partial payment from the applicable governmental authority, the total amount of the Architect/Engineer's statement, less 5 percent of the amount thereof, which 5 percent shall be retained until final payment, and further less all previous payments and all further sums that may be retained by the Owner under the terms of this Contract. It is understood, however, that in case the whole work be near to completion and some unexpected and unusual delay occurs due to no fault or neglect on the part of the Contractor, the Owner may--upon written recommendation of the Architect/Engineer--pay a reasonable and equitable portion of the retained percentage to the Contractor; or the Contractor at the Owner's option, may be relieved of the obligation to fully complete the work, and thereupon, the Contractor shall receive payment of the balance due him under the contract subject only to the conditions stated under "Final Payment."

GC-47. USE OF COMPLETED PORTIONS

The Owner shall have the right to take possession of and use any completed or partially completed portions of the work, notwithstanding the time for completing the entire work or such portions may not have expired but such taking possession and use shall not be deemed an acceptance of any work not completed in accordance with the Contract Documents. If such prior use increases the cost of or delays the work, the Contractor shall be entitled to such extra compensation, or extension of time, or both, as the Architect/Engineer may determine.

GC-48. FINAL COMPLETION AND ACCEPTANCE

Within twenty (20) days after the Contractor has given the Architect/Engineer written notice that the work has been completed, the Architect/Engineer and the Owner shall inspect the work and within said time, if the work is found to be completed in accordance with the Contract Documents, the Architect/Engineer shall issue to the Owner and the Contractor his Certificate of Completion, and thereupon it shall be the duty of the Owner within ten (10) days to issue a Certificate of Acceptance of the work to the Contractor.

GC-49. FINAL PAYMENT

Upon the issuance of the Certificate of Completion, the Architect/Engineer shall proceed to make final measurements and prepare final statement of the value of all work performed and materials furnished under the terms of the Contract and shall certify same to the Owner, who shall pay to the Contractor on or before the 20th day after the date of the Certificate of Completion, or if governmental financial assistance is involved, within thirty (30) working days of receipt of final payment from the applicable governmental authority, the balance due the Contractor under the terms of this Contract, provided he has fully performed his contractual obligations under the terms of this contract; and said payment shall become due in any event upon said performance by the Contractor. Neither the Certificate of Acceptance nor the final payment, nor any provision in the Contract Documents, shall relieve the Contractor of the obligation for fulfillment of any warranty which may be required in the Special Provisions of the Specifications.

GC-50. PAYMENT WITHHELD

The Owner may, on account of subsequently discovered evidence, withhold or nullify the whole or part of any certificate to such extent as may be necessary to protect himself from loss on account of:

- a. Defective work not remedied.
- b. Claims filed or reasonable evidence indicating possible filing of claims.
- c. Failure of the Contractor to make payments properly to subcontractors or for material or labor.
- d. Damage to another contractor.

When the above grounds are removed, or the Contractor provides a Surety Bond satisfactory to the Owner, which will protect the Owner in the amount withheld, payment shall be made for amounts withheld because of them.

GC-51. DELAYED PAYMENTS

Should the Owner fail to make payment to the Contractor of the sum named in any partial or final statement, when payment is due, or should the Architect/Engineer fail to issue any statement on or before the date above provided, then the Owner shall pay to the Contractor, in addition to the sum shown as due by such statement, interest thereon at the rate of six (6) percent per annum, unless otherwise specified, from date due as provided under "Partial Payments" and "Final Payments", until fully paid, which shall fully liquidate any injury to the Contractor growing out of such delay in payment, but the right is expressly reserved to the Contractor in the event payments be not promptly made as provided under "Partial Payments", to at any time thereafter treat the contract as abandoned by the Owner and recover compensation, as provided under "Abandonment of Contract", unless such payments are withheld in accordance with the provisions of "Payments Withheld."

GC-52. EXTRA WORK

The term "Extra Work" as used in this contract shall be understood to mean and include all work that may be required by the Architect/Engineer or Owner to be done by the Contractor to accomplish any change, alteration or addition to the work shown upon the plans, or reasonably implied by the specifications, and not covered by the Contractor's Proposal, except as provided under "Changes and Alterations" herein.

It is agreed that the Contractor shall perform all Extra Work under the direction of the Architect/Engineer when presented with a written Extra Work Order signed by the Architect/Engineer, subject, however, to the right of the Contractor to require a written confirmation of such Extra Work Order by the Owner. It is also agreed that the compensation to be paid the Contractor for performing said Extra Work shall be determined by one or more of the following methods:

- Method A - By agreed unit prices; or
- Method B - By agreed lump sum; or
- Method C - If neither Method A nor Method B be agreed upon before the Extra Work is commenced, then the Contractor shall be paid the "actual field cost" of the work, plus fifteen (15) percent.

In the event said Extra Work be performed and paid for under Method C, then the provisions of this paragraph shall apply and the "actual field cost" is hereby defined to include the cost of all workmen, such as foremen, timekeepers, mechanics and laborers, and materials, supplies, teams, trucks, rentals on

machinery and equipment, for the time actually employed or used on such Extra Work, plus actual transportation charges necessarily incurred, together with all expenses incurred directly on account of such Extra Work, including Social Security, Old Age Benefits, Maintenance Bonds, Public Liability and Property Damage and Workmen's Compensation, and all other insurance as may be required by any law or ordinance, or directed by the Architect/Engineer or Owner, or by them agreed to. The Architect/Engineer may direct the form in which accounts of the "actual field cost" shall be kept and the records of these accounts shall be made available to the Architect/Engineer. The Architect/Engineer may also specify in writing, before the work commences, the method of doing the work and the type and kind of machinery and equipment to be used; otherwise these matters shall be determined by the Contractor. Unless otherwise agreed upon, the prices for the use of machinery and equipment shall be determined by using 100 percent, unless otherwise specified, of the latest schedule of Equipment Ownership Expense adopted by the Associated General Contractors of America. Where practicable, the terms and prices for the use of machinery and equipment shall be incorporated in the Written Extra Work Order. The fifteen (15%) of the "actual field cost" to be paid the Contractor shall cover and compensate him for his profit, overhead, general superintendence and field office expense, and all other elements of cost and expense not embraced within the "actual field cost" as herein defined, save that where the Contractor's Camp or Field Office must be maintained primarily on account of such Extra Work, then the cost to maintain and operate the same shall be included in the "actual field cost."

No claim for Extra Work of any kind will be allowed unless ordered in writing by the Architect/Engineer. In case any orders or instructions, either oral or written, appear to the Contractor to involve Extra Work for which he should receive compensation or an adjustment in the construction time, he shall make written request to the Architect/Engineer for written order authorizing such Extra Work. Should a difference of opinion arise as to what does or does not constitute Extra Work, or as to the payment therefor, and the Architect/Engineer insists upon its performance, the Contractor shall proceed with the work after making written request for written order and shall keep an accurate account of the "actual field cost" thereof, as provided under Method C. The Contractor will thereby preserve the right to submit the matter of payment by filing a claim as hereinbelow provided.

GC-53. TIME OF FILING CLAIMS

It is further agreed by both parties hereto that all questions of dispute or adjustment presented by the Contractor shall be in writing and filed with the Architect/Engineer within fifteen (15) days after the Architect/Engineer has given any directions, order or instruction to which the Contractor desires to take exception. The Architect/Engineer shall reply to such written exceptions by the Contractor and render his final decision in writing. In case the Contractor should appeal from the Architect/Engineer's decision, the appeal shall be filed with the Architect/Engineer and the Owner in writing within ten (10) days after the date of delivery to Contractor of the Architect/Engineer's final decision. It is further agreed that final acceptance of the work by the Owner and the acceptance by the Contractor of the final payment shall be a bar to any claim by either party, except where noted otherwise in the Contract Documents.

GC-54. DELETED

GC-55. ABANDONMENT BY CONTRACTOR

In case the Contractor should abandon and fail or refuse to resume work within ten (10) days after written notification from the Owner, or the Architect/Engineer, or if the Contractor fails to comply with the orders of the Architect/Engineer, when such orders are consistent with the Contract Documents, then, and in that case, where a performance bond exists, the Surety on the bond shall be notified in writing and directed to complete the work, and a copy of said notice shall be delivered to the Contractor.

After receiving said notice of abandonment, the Contractor shall not remove from the work any machinery, equipment, tools, materials or supplies then on the job, but the same, together with any materials and equipment under contract for the work, may be held for use on the work by the Owner or the Surety on the construction bond, or another contractor in completion of the work; and the Contractor shall not

receive any rental or credit therefor (except when used in connection with Extra Work, where credit shall be allowed as provided for under "Extra Work"), it being understood that the use of such equipment and materials will ultimately reduce the cost to complete the work and be reflected in the final settlement.

Where there is no performance bond provided or in case the Surety should fail to commence compliance with the notice for completion hereinbefore provided for, within ten (10) days after service of such notice, then the Owner may provide for completion of the work in either of the following elective manners:

- a. The Owner may thereupon employ such force of men and use such machinery, equipment, tools, materials and supplies as said Owner may deem necessary to complete the work and charge the expense of such labor, machinery, equipment, tools, materials and supplies to said Contractor, and expense so charged shall be deducted and paid by the Owner out of such moneys as may be due, or that may thereafter at any time become due to the Contractor under and by virtue of this Contract. In case such expense is less than the sum which would have been payable under this contract, if the same had been completed by the Contractor, then said Contractor shall receive the difference. In case such expense is greater than the sum which would have been payable under this contract, if the same had been completed by said Contractor, then the Contractor and/or his Surety shall pay the amount of such excess to the Owner; or
- b. The Owner under sealed bids, after five (5) days notice published one or more times in a newspaper having general circulation in the county of the location of the work, may let the contract for the completion of the work under substantially the same terms and conditions which are provided in this contract. In case of any increase in cost to the Owner under the new contract as compared to what would have been the cost under this contract, such increase shall be charged to the Contractor and the Surety shall be and remain bound therefor. However, should the cost to complete any such new contract prove to be less than what would have been the cost to complete under this contract, the Contractor and/or his Surety shall be credited therewith.

When the work shall have been substantially completed, the Contractor and his Surety shall be so notified and Certificates of Completion and Acceptance, as provided hereinabove shall be issued. A complete itemized statement of the contract accounts, certified to by the Architect/Engineer as being correct, shall then be prepared and delivered to the Contractor and his Surety, whereupon the Contractor and/or his Surety, or the Owner as the case may be, shall pay the balance due as reflected by said statement, within fifteen (15) days after the date of such Certificate of Completion.

In the event the statement of accounts shows that the cost to complete the work is less than that which would have been cost to the Owner, had the work been completed by the Contractor under the terms of this contract; or when the Contractor and/or his Surety shall pay the balance shown to be due by them to the Owner, then all machinery, equipment, tools, materials or supplies left on the site of the work shall be turned over to the Contractor and/or his Surety. Should the cost to complete the work exceed the contract price, and the Contractor and/or his Surety fail to pay the amount due the Owner within the time designated hereinabove, and there remains any machinery, equipment, tools, materials or supplies on the site of the work, notice thereof, together with an itemized list of such equipment and materials, shall be mailed to the Contractor and his Surety at the respective addresses designated in this contract provided, however, that actual written notice given in any manner will satisfy this condition. After mailing, or other giving of such notice, such property shall be held at the risk of the Contractor and his Surety subject only to the duty of the Owner to exercise ordinary care to protect such property. After fifteen (15) days from the date of said notice the Owner may sell such machinery, equipment, tools, materials or supplies and apply the net sum derived from such sale to the credit of the

Contractor and his Surety. Such sale may be made at either public or private sale, with or without notice, as the Owner may elect. The Owner shall release any machinery, equipment, tools, materials, or supplies, which remain on the work, and belong to persons other than the Contractor or his Surety, to their proper owners. The books on all operations provided herein shall be open to the Contractor and his Surety.

GC-56. ABANDONMENT BY OWNER

In case the Owner shall fail to comply with the terms of this contract, and should fail or refuse to comply with said terms within ten (10) days after written notification by the Contractor, then the Contractor may suspend or wholly abandon the work, and may remove therefrom all machinery, tools and equipment, and all materials on the site of work that have not been included in payments to the Contractor and have not been wrought into the work. And thereupon the Architect/Engineer shall make an estimate of the total amount earned by the Contractor, which estimate shall include the value of all work actually completed by said Contractor (at the prices stated in the attached proposal where unit prices are used), the value of all partially completed work at a fair and equitable price, and the amount of all Extra Work performed at the prices agreed upon, or provided for by the terms of this contract, and a reasonable sum to cover the cost of any provisions made by the Contractor to carry the whole work to completion and which cannot be utilized. The Architect/Engineer shall then make a final statement of the balance due the Contractor by deducting from the above estimates all previous payments by the Owner and all other sums that may be retained by the Owner under the terms of this Contract and shall certify same to the Owner who shall pay to the Contractor on or before thirty (30) days after the date of the notification by the Contractor the balance shown by said final statement as due the Contractor, under the terms of this Contract.

SECTION 01100

SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Work covered by Contract Documents.
- B. Work by Owner.
- C. Owner furnished products.
- D. Contractor use of site.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. Identification:
- B. Location:
- C. Verbal Summary: Without force or effect on requirements of the Contract Documents, a brief description of the Project is as follows:
 - 1. The Work consists of an approximately $\pm 12,000$ square foot new 3-bay fire station. The new building includes office, multipurpose room, kitchen, exercise room, sleeping areas, restrooms, hose storage, dry room, decontamination room, site improvements and other miscellaneous construction.
 - 2. The Work includes concrete masonry walls, architectural woodwork, structural standing seam roof, sheet metal, hollow metal doors and frames, aluminum windows, hardware, glazing, interior finishes, furnishings, plumbing, HVAC, electrical, lighting, site work, and other miscellaneous work as indicated on the drawings and in the specifications.

1.4 WORK BY OWNER

- A. Items noted 'NIC' (Not in Contract), moveable cabinets, furnishings, and minor equipment, will be furnished and installed by Owner before issuance of certificate of occupancy.

1.5 OWNER FURNISHED PRODUCTS

- A. Owner's Responsibilities:
 - 1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
 - 2. Arrange and pay for product delivery to site.
 - 3. On delivery, inspect products jointly with Contractor.
 - 4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
 - 5. Arrange for manufacturers' warranties, inspections and service.

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- B. Contractor's Responsibilities:
 - 1. Review Owner reviewed shop drawings, product data, and samples.
 - 2. Receive and unload products at site; inspect for completeness or damage, jointly with Owner.
 - 3. Handle, store, install and finish products.
 - 4. Repair or replace items damaged after receipt.

1.6 CONTRACTOR USE OF SITE

- A. Limit use of site to allow:
 - 1. Work by Others and/or work by Owner.
 - 2. Use of site by public.
- B. Construction Operations: Limited to areas noted on Drawings.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01200

PRICE AND PAYMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Material allowances.
- B. Contingency allowance.
- C. Inspection and testing allowances.
- D. Schedule of Values.
- E. Application for Payment.
- F. Change Procedures.
- G. Alternates.

1.3 RELATED SECTIONS

- A. Section 01330 – Submittal Procedures: Schedule of Values.
- B. Section 01600 – Product Requirements: Product substitutions.

1.4 CONTINGENCY ALLOWANCE

- A. Include the stipulated sum of \$150,000.00 for use upon Owner's instruction.
- B. Costs Included in Contingency Allowance: Contractor's costs for products, equipment, delivery, installation, labor, insurance, payroll, applicable taxes, and equipment rental; handling at the site, including unloading, uncrating, and storage; protection of products from elements and from damage; finishing costs.
- C. Costs Not Included in the Contingency Allowance, but included in Contract Sum/Price: Bonds, insurance, overhead, profit, and other expenses contemplated for stated allowance amounts.
- D. Funds will be drawn from Contingency Allowance only by Change Order.
- E. At closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order.
- F. Include the stipulated sum of \$50,000.00 for use of testing fees.

1.5 SCHEDULE OF VALUES

- A. Submit typed schedule on AIA Form G703 - Application and Certificate for Payment Continuation Sheet.
- B. Submit Schedule of Values in duplicate within 15 days after date established in Notice to Proceed.

-
- C. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the major specification Section, separating labor and material for each line item. Identify site mobilization, general conditions, testing, bonds and insurance as separate line items.
 - D. Include in each line item, the amount of Allowances specified in this Section.
 - E. Include within each line item, a directly proportional amount of Contractor's overhead and profit.
 - F. Revise schedule to list approved Change Orders, with each Application For Payment.

1.6 APPLICATIONS FOR PAYMENT

- A. Submit three notarized copies of each application on AIA Form G702 - Application and Certificate for Payment and AIA G703 - Continuation Sheet.
- B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.
- C. Payment Period: As defined in Owner-Contractor agreement.
- D. Include one copy of waiver of liens from each subcontractor.

1.7 CHANGE PROCEDURES

- A. The Architect will advise of minor changes in the Work not involving an adjustment to Contract Sum/Price or Contract Time as authorized by AIA A201, 1997 Edition, Paragraph 7.4 by issuing Architect's Supplemental Instructions on AIA Form G710.
- B. The Architect may issue a Construction Change Request which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications and a change in Contract Time for executing the change. Contractor will prepare and submit an estimate within 7 days.
- C. The Contractor may propose a change by submitting request for change to the Architect, describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, and the effect on the Contract Sum/Price and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01600.
- D. Stipulated Sum/Price Change Order: Based on Proposal Request and Contractor's fixed price quotation or Contractor's request for a Change Order as approved by Architect.
- E. Unit Price Change Order: For pre-determined unit prices and quantities, the Change Order will be executed on a fixed unit price basis. For unit costs or quantities of units of work which are not pre-determined, execute Work under a Construction Change Directive. Changes in Contract Sum/Price or Contract Time will be computed as specified for Time and Material Change Order.
- F. Construction Change Directive: Architect may issue a directive, on AIA Form G713 Construction Change Directive signed by the Owner, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute the change.
- G. Time and Material Change Order
 - 1. Submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.
 - 2. Architect will determine the change allowable in Contract Sum/Price and Contract Time as provided in the Contract Documents.
 - 3. Maintain detailed records of work done on Time and Material basis.

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- 4. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.
 - H. Change Order Forms: AIA G701 Change Order.
 - I. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
 - J. Change Order: Furnish an itemized breakdown, in form acceptable to Architect of all costs and supporting information including but not limited to quantities, material prices, tier subcontracted work is performed at, labor rates and employer payments and rental rates. The itemized breakdown detail shall be the same for any subcontractor work. Provide complete supporting information for profit and overhead or markups used when so requested. Consider the following items a part of overhead or Contractor's and sub-contractor's mark-up and do not include as a separate cost item: Labor for Superintendents, Assistant Superintendents, home office personnel, timekeepers and maintenance mechanics at any level of contracting; individual pieces of equipment, hand tools or instruments having a new value of \$500.00 or less, whether or not consumed by use; on site and main offices; modification to record contract documents nor guarantee period costs.

1.8 ALTERNATES

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at the Owner's option. Accepted Alternates will be identified in Owner-Contractor Agreement.
- B. Coordinate related work and modify surrounding work as required.
- C. Schedule of Alternates:
 - 1. Alternate No. 1: Alternate Truck Bay

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01300

ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Project Information Management.
- B. Coordination.
- C. Building Layout.
- D. Preconstruction meeting.
- E. Request for information.
- F. Progress meetings.
- G. Preinstallation meetings.
- H. Cutting and patching.

1.3 PROJECT INFORMATION MANAGEMENT

- A. Administration and exchange of project information will be accomplished through the use of the Architect's web-based Newforma® Info Exchange.
- B. Project information to be exchanged through Newforma® Info Exchange website includes, but is not limited to, the following:
 - 1. Product Submittals
 - 2. Requests for Information (RFI)
 - 3. Applications for Payment
 - 4. Schedules
 - 5. Construction Change Requests (CCRs)
 - 6. Close-out Documents
 - 7. Construction Document Files
 - a. Weather Days
 - b. Electronic File Requests
 - c. Correspondence
 - d. Test Reports
 - e. Meeting Minutes
 - f. Field Reports

1.4 COORDINATION

- A. Coordinate scheduling, submittals, and Work of the various Sections of the Project Manual to assure efficient and orderly sequence of installation of interdependent construction elements.

-
- B. Verify that utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
 - C. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
 - D. In finished areas, except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
 - E. Large Apparatus: Any large piece of apparatus which is to be installed in any space in the building, and which is too large to permit access through windows, doorways or shafts, shall be brought to the job by the Contractor involved and placed in the space before the enclosing structure is completed.
 - F. Items which require electrical connections shall be coordinated with Division 16 for:
 - 1. Voltage
 - 2. Phase
 - 3. Ampacity
 - 4. No. and size of wires
 - 5. Wiring diagrams
 - 6. Starter size, details and location
 - 7. Control devices and details
 - G. Coordinate completion and clean up of Work of separate Sections in preparation for Substantial Completion.
 - H. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.5 BUILDING LAYOUT

- A. Locate and protect survey control and reference points.
- B. Control datum for survey is that shown on Drawings.
- C. Verify set-backs and easements, confirm drawing dimensions and elevations.
- D. Provide field surveying services. Establish elevations, lines, and levels, utilizing recognized surveying practices.
- E. Submit a copy of registered site drawing and certificate signed by the Land Surveyor that the elevations and locations of the Work are in conformance with the Contract Documents.

1.6 PRECONSTRUCTION MEETING

- A. Architect will schedule a meeting after Notice to Proceed.
- B. Attendance Required: Owner, Architect, Contractor and major Subcontractors.
- C. Agenda:
 - 1. Submission of executed bonds and insurance certificates.
 - 2. Distribution of Contract Documents.
 - 3. Submission of list of Subcontractors, list of products, Schedule of Values, and progress schedule.
 - 4. Designation of personnel representing the parties in Contract and the Architect.
 - 5. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, Request for Information (RFI), and Contract closeout procedures.

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6. Review Notice to Proceed (NTP) and Substantial Completion Dates.
 7. Surface drainage requirements (SWPPP).
 8. Scheduling.
 - a. Use of premises by Owner and Contractor.
 - b. Owner's requirements.
 - c. Construction facilities and controls provided by Owner.
 - d. Temporary utilities provided by Owner.
 - e. Survey and building layout.
 - f. Security and housekeeping procedures.
 - g. Construction progress meetings.
 - h. Procedures for testing.
 - i. Procedures for maintaining record documents.
 - j. Requirements for start-up of equipment.
 - k. Inspection and acceptance of equipment put into service during construction period.
 9. Scheduling activities of Construction Material Testing (CMT) lab.
- D. Record minutes and distribute copies within three days after meeting to participants with two copies to Architect and those affected by decisions made.

1.7 REQUEST FOR INFORMATION

- A. Contractor shall use Architect's Newforma® Info Exchange website when submitting Requests For Information (RFI). Only Contractor can submit RFIs to Architect. RFI requests from subcontractors or material suppliers will not be considered.
- B. All information indicated on the RFI to be provided by Contractor shall be complete before a request can be uploaded to the Architect's Newforma® Info Exchange website. Requests with incomplete information will not be accepted. Submission of a complete RFI request by Contractor does not constitute an RFI until Architect makes the determination. If Architect determines that request cannot be answered with the information provided in the Contract Documents, Architect will then assign an RFI tracking number. Requests determined by Architect not to be an RFI will be returned to Contractor electronically and deleted from Architect's electronic tracking software without being assigned an RFI tracking number. A transmittal document returning the denied RFI request will be provided with a response indicating action to be taken by Contractor.
- C. RFIs may contain more than one item when the items are related issues. Otherwise, only one item shall be addressed on each RFI request.
- D. RFIs may contain more than one item when the items are related issues. Otherwise, only one item shall be addressed on each RFI request.
- E. Architect's response to the RFI will be in writing and issued to Contractor and Owner electronically via Architect's Newforma® Info Exchange website.
- F. Responses from Architect will not change any requirement of the Contract Documents. Should Contractor believe an RFI response to cause a change to the Contract, Contractor shall give written notice to Architect in accordance with the requirements in the Contract. Written notice shall include specific reasons and an order of magnitude of Cost and/or Time that Contractor deems appropriate based on the Architect's RFI response. Contractor's written notice does not constitute a Change Order, but provide a basis for further review and discussion with the Architect.

1.8 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at minimum bi-weekly intervals.
- B. Architect will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Architect, as appropriate to agenda topics for each meeting.
- D. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of Work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems which impede planned progress.
 - 5. Review of submittals schedule and status of submittals.
 - 6. Review of off-site fabrication and delivery schedules.
 - 7. Maintenance of progress schedule.
 - 8. Corrective measures to regain projected schedules.
 - 9. Planned progress during succeeding work period.
 - 10. Coordination of projected progress.
 - 11. Maintenance of quality and work standards.
 - 12. Effect of proposed changes on progress schedule and coordination.
 - 13. Other business relating to Work.
- E. Record minutes, and distribute copies within three days to Architect, participants, and those affected by decisions made.

1.9 PREINSTALLATION MEETING

- A. When required in individual specification Sections, convene a preinstallation meeting at work site prior to commencing work of the Section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific Section.
- C. Notify Architect four days in advance of meeting date.
- D. Prepare agenda and preside at meeting.
 - 1. Review conditions of installation, preparation and installation procedures.
 - 2. Review coordination with related work.
- E. Record minutes, and distribute copies within three days after meeting to participants, with three copies to Architect.

PART 2 - PRODUCTS

2.1 EQUIPMENT ELECTRICAL CHARACTERISTICS AND COMPONENTS

- A. Motors: Specific motor type is specified in individual specification sections.
- B. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Size terminal lugs to NFPA 70, include lugs for terminal box.
- C. Cord and Plug: Provide minimum 6 foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Examine and verify specific conditions described in individual specification sections.
- C. Verify that utility services are available, of the correct characteristics, and in the correct location.

3.2 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply any manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.3 CUTTING AND PATCHING

- A. Employ skilled and experienced installer to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements which affects:
 - 1. Structural integrity of element.
 - 2. Integrity of weather-exposed or moisture-resistant elements.
 - 3. Efficiency, maintenance, or safety of element.
 - 4. Visual qualities of sight-exposed elements.
 - 5. Work of Owner or separate contractor.
- C. Execute cutting, fitting, and patching to complete Work, and to:
 - 1. Fit the several parts together, to integrate with other Work.
 - 2. Uncover Work to install or correct ill-timed Work.
 - 3. Remove and replace defective and non-conforming Work.
 - 4. Remove samples of installed Work for testing.
 - 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- D. Execute work by methods which will avoid damage to other Work, and provide proper surfaces to receive patching and finishing.
- E. Cut rigid materials using masonry saw or core drill.
- F. Restore Work with new products in accordance with requirements of Contract Documents.
- G. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
- I. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.
- J. Identify any hazardous substance or condition exposed during the Work to the Architect for decision or remedy.

END OF SECTION

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Submittal procedures.
- B. Resubmittal requirements.
- C. Construction progress schedules.
- D. Proposed products list.
- E. Shop drawings.
- F. Product data.
- G. Samples.
- H. Design data.
- I. Test reports.
- J. Certificates.
- K. Manufacturers' instructions.
- L. Manufacturers' field reports.
- M. Erection drawings.
- N. Construction photographs.

1.3 RELATED SECTIONS

- A. Section 01200 - Price and Payment: Schedule of Values; Inspecting and Testing Allowances.
- B. Section 01400 - Quality Requirements: Manufacturers' field services and reports; Testing Laboratory Services.
- C. Section 01700 - Execution Requirements: Contract warranty, manufacturer's certificates and closeout submittals.

1.4 SUBMITTAL PROCEDURES

- A. Submit to Architect for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Produce copies and distribute in accordance with Submittal Procedures article and for record documents purposes described in Section 01700.
- C. Transmit each submittal separately with Contractor's standard transmittal letter including Contractor's name, address and phone number. Each submittal shall contain only one specification section.
- D. Sequentially number transmittal forms using Section number or Contractors other sequential numbering system.
- E. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing sheet and detail number(s), and specification Section number, appropriate to submittal.

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- F. Apply Contractor's stamp, signed or initialed certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.
 - G. Schedule submittals to expedite the Project, and deliver to Architect. Coordinate submission of related items.
 - H. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
 - I. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of completed Work.
 - J. Allow space on submittals for Contractor and Architect review stamps.
 - K. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.
 - L. Submittals not requested will not be recognized or processed.
 - M. Format
 - 1. Submit all submittals digitally using .PDF file extension. Each submittal shall be a single .PDF file including transmittal letter. Multiple files for the same submittal will not be accepted.
 - 2. Submittals in any other format, including .ZIP files, will be rejected.
 - 3. Hard copies will not be accepted.
 - 4. To ensure each page is legible, .PDF pages of drawings shall be the same size/scale as a hard copy. Where applicable, scale symbols should be provided to indicate scale. Illegible submittals will be rejected.
 - 5. Submittals will be uploaded to Architect's Info Exchange website.
 - N. The submittal procedures described in this Article applies to the Construction Progress Schedule, Products List, Shop Drawings, Product Data, Samples (actual samples and digital files of same), Design Data, Test Reports, Certificates, Manufacturer's Instructions and Field Reports, Erection Drawings and any other type of submittal submitted to Architect.

1.5 RESUBMITTAL REQUIREMENTS

- A. Revise and resubmit submittals, as required, and resubmit to meet requirements as specified and as noted on submittal reviews.
- B. Mark as RESUBMITTAL.
- C. Re-use original transmittal number and supplement with sequential alphabetical or numeric suffix for each re-submittal.

1.6 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit initial progress schedule for Architect's review within 15 days after date established in Notice to Proceed.
- B. Revise and resubmit as required.
- C. Submit revised schedule with each Application for Payment, identifying changes since previous version.
- D. Submit a horizontal bar chart with separate line for each section of Work, identifying first work day of each week.
- E. Indicate product/material manufacturer's lead-time for delivery to site. Include as a separate line for each product/material.
- F. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.

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- G. Indicate estimated percentage of completion for each item of Work at each submission.
 - H. Submit separate schedule of submittal dates for shop drawings, product data, and samples, including Owner furnished products and products identified under Allowances, and dates reviewed submittals will be required from Architect. Indicate decision dates for selection of finishes.
 - I. Indicate product/material manufacturer's lead-time for delivery to site. Include as a separate line for each product/material.
 - J. Indicate delivery dates for Owner furnished products and products identified under Allowances.
 - K. Revisions To Schedules:
 - 1. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
 - 2. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
 - 3. Prepare narrative report to define problem areas, anticipated delays, and impact on Schedule. Report corrective action taken, or proposed, and its effect.

1.7 SHOP DRAWINGS

- A. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- B. Printable Image Size: Minimum 8 ½ x 11 inches and maximum 30 x 42 inches.
- C. Draw details to a minimum scale of 1/2 inches equal to 1 foot.
- D. Draw site plans to same scale indicated on contract drawings.
- E. Draw all other plans to a minimum scale of 1/8 inch equal to 1 foot.
- F. Construction Documents (electronic or paper format) issued by the Architect cannot be used in any shape, form or fashion in the creation and development of shop drawings, except that electronic files containing floor plans or site plans which have been purchased from the Architect may be used as "backgrounds" for Contractor, subcontractors, sub-subcontractors and material suppliers in the Shop Drawing process.
- G. Electronic Files
 - 1. Electronic drawing files are available for purchase from the Architect upon request. Cost of the files are indicated below plus applicable taxes.

0 – 3 sheets	\$100.00 per sheet
4 – 6 sheets	\$400.00 flat fee
7 – 9 sheets	\$500.00 flat fee

Only the Contractor or his subcontractors and sub-subcontractors may purchase an electronic file. An electronic file will be provided in AUTOCAD format of the release currently used by the Architect. File will be provided via Architect's Info Exchange website.

- 2. Prior to delivery of the file, purchaser shall sign an Electronic File Transfer Release Form. Payment for an electronic file shall occur upon delivery of file to purchaser.
- 3. Electronic file shall be used only for the production of information required by this project and shall not be used in any other form (in whole or part).
- 4. In the creation and publication of Shop Drawings, under no circumstances shall the Design Professional's seal or title block of the drawing be reproduced. All shop drawings must be original works from the Contractor subcontractors, sub-subcontractors and material suppliers.

1.8 PRODUCT DATA

- A. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.
- B. Include recommendations for application and use, and reference to compliance with specified standards of trade associations and testing agencies.
- C. Include notation of special coordination requirements for interfacing with adjacent work and building utilities where applicable.
- D. After review, distribute in accordance with Article titled SUBMITTAL PROCEDURES above and provide copies for Record Documents described in Section 01700 – Execution Requirements.

1.9 SAMPLES

- A. Submit samples to illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Accompany physical sample with color digital image (photo or scanned PDF) of sample. Coordinate sample submittals for interfacing work.
- B. Unless otherwise specified, submit samples of finishes from manufacturers' full range of standard colors, textures, and patterns, for Architect's selection.
- C. Where variations in color, pattern or texture are inherent in the material or product, submit multiple samples to indicate the approximate range or variations.
- D. Include full Project information and identification of manufacturer, model number, type, style and color on each sample.
- E. Submit the number of samples specified in individual specification Sections; one of which will be retained by Architect.
- F. Reviewed samples which may remain as part of the Work are indicated in individual specification Sections.
- G. Samples will not be used for testing purposes unless specifically stated in individual specification section.

1.10 DESIGN DATA

- A. Submit for Architect's knowledge as contract administrator or for Owner.
- B. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.11 TEST REPORTS

- A. Submit for Architect's knowledge as contract administrator or for Owner.
- B. Submit test reports for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.12 CERTIFICATES

- A. When specified in individual specification sections, submit certification by manufacturer, installation/application subcontractor, or Contractor to Architect.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

1.13 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing.
- B. Identify conflicts between manufacturers' instructions and Contract Documents.
- C. Indicate special procedures, conditions requiring special attention and special environmental criteria required for application or installation.

1.14 MANUFACTURER'S FIELD REPORTS

- A. Submit reports for Architect's benefit as contract administrator or for Owner.
- B. Submit report within 30 days of observation to Architect for information.
- C. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.15 ERECTION DRAWINGS

- A. Submit drawings for Architect's benefit as contract administrator or for Owner.
- B. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.
- C. Data indicating inappropriate or unacceptable Work may be subject to action by Architect or Owner.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01400

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Quality control and control of installation.
- B. Tolerances.
- C. References.
- D. Mock-up requirements.
- E. Testing and Inspection services.
- F. Manufacturers' field services.
- G. Examination
- H. Preparation

1.3 RELATED SECTIONS

- A. Section 01330 - Submittal Procedures: Submission of Manufacturers' Instructions and Certificates.
- B. Section 01410 – Testing Laboratory Services.
- C. Section 01420 - Reference Standards.
- D. Section 01600 - Product Requirements: Requirements for material and product quality.
- E. Section 01700 - Execution Requirements: Starting of Systems.

1.4 QUALITY CONTROL AND CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Verify field measurements are as indicated on Shop Drawings or as instructed by manufacturer.
- G. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.5 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing in place.

1.6 REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date of Contract Documents, except where a specific date is established by Code.
- C. Obtain copy of standards when required by specification section.
- D. Neither contractual relationship, duties nor responsibilities of parties in Contract nor those of the Architect shall be altered from Contract Documents by mention or inference otherwise in any reference document.

1.7 MOCK-UP REQUIREMENTS

- A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.
- B. Assemble and erect specified items, with specified attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mock-ups shall be comparison standard for quality level for the Work.
- D. Where mock-up has been accepted by Architect and is specified in individual specification sections to be removed, remove mock-up and clear area.

1.8 TESTING AND INSPECTION SERVICES

- A. Owner will appoint and employ services of an independent firm to perform inspection and testing. Contractor shall pay for services from cash allowance(s) specified in Section 01200.
- B. The independent firm will perform inspections, tests, and other services specified in individual specification Sections and as required by the Architect, Engineer, or the Owner.
- C. Testing, inspections and source quality control may occur on or off project site. Perform off-site testing as required by Architect, Engineer, or Owner.
- D. Independent Testing Laboratory firm's reports will be submitted to the Architect, with a copy to the Contractor. Reports will indicate observations and results of tests and will indicate compliance or non-compliance with Contract Documents.
- E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, provide safe access to project site, and provide assistance by incidental labor as requested.
 - 1. Notify Architect and independent firm 48 hours prior to expected time for operations requiring services.
 - 2. Pay for additional samples and tests required for Contractor's use.

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- F. Employment of independent testing agency or laboratory does not relieve Contractor from performing Work to contract requirements.
 - G. Re-testing and/or re-inspection required because of non-conformance to specified requirements will be charged to the Contractor by deducting re-testing and/or re-inspection charges from the Contract Sum/Price.

1.9 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification Sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, and start-up of equipment, test, adjust, and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Architect 30 days in advance of required observations. Observer subject to approval of Architect.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- D. Refer to Section 01330 - Submittal Procedures: Manufacturers' Field Reports article.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Verify substrate is capable of structural support or attachment of new Work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Verify utility services are available, of correct characteristics, and in correct locations.

3.2 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

END OF SECTION

SECTION 01410

TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Selection and payment.
- B. Contractor submittals.
- C. Laboratory responsibilities.
- D. Laboratory reports.
- E. Limits on testing laboratory authority.
- F. Contractor responsibilities.
- G. Schedule of inspections and tests.

1.3 RELATED SECTIONS

- A. Section 01200 – Price and Payment: Allowance for payment of testing services.
- B. Section 01300 - Submittals: Manufacturer's certificates.
- C. Section 01650 - Starting of Systems and Division 15 Section: Testing, Adjusting, and Balancing.
- D. Section 01700 - Contract Closeout: Project Record Documents.
- E. Individual Specification Sections: Inspections and tests required, and standards for testing.

1.4 REFERENCES

- A. ANSI/ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- B. ANSI/ASTM E329 - Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.

1.5 SELECTION AND PAYMENT

- A. **Owner** shall employ and pay for services of an independent testing laboratory to perform specified inspection and testing.
- B. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.6 QUALITY ASSURANCE

- A. Comply with requirements of ANSI/ASTM E329 and ANSI/ASTM D3740R.
- B. Laboratory: Authorized to operate in State of Texas.
- C. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
- D. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards (NBS) standards or accepted values of natural physical constants.

1.7 CONTRACTOR SUBMITTALS

- 1. Prior to start of Work, submit testing laboratory name, address, and telephone number, and names of full time registered Engineer and responsible officer.
- 2. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent inspection, with memorandum of remedies of deficiencies reported by inspection.
- 3. Submit Testing Laboratory firm's reports to the Architect, in triplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
- 4. Testing and employment of testing agency or laboratory does not relieve Contractor from performing Work to contract requirements.
- 5. Perform re-testing and/or re-inspection required because of non-conformance to specified requirements using the same testing agency or laboratory. Payment for retesting will be the Contractor's responsibility.

1.8 LABORATORY RESPONSIBILITIES

- A. Test samples of mixes submitted by Contractor.
- B. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
- C. Perform specified inspection, sampling, and testing of Products in accordance with specified standards.
- D. Ascertain compliance of materials and mixes with requirements of Contract Documents.
- E. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or Products.
- F. Perform additional inspections and tests required by Architect.
- G. Attend preconstruction conferences and progress meetings.

1.9 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Architect, and to Contractor.
- B. Include:
 - 1. Date issued
 - 2. Project title and number
 - 3. Name of inspector
 - 4. Date and time of sampling or inspection
 - 5. Identification of product and Specifications Section
 - 6. Location in the Project
 - 7. Type of inspection or test

-
- 8. Date of test
 - 9. Results of tests
 - 10. Conformance with Contract Documents
 - C. When requested by Architect provide interpretation of test results.

1.10 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the Work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the Work.

1.11 CONTRACTOR RESPONSIBILITIES

- A. Deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.
- B. Cooperate with laboratory personnel, and provide access to the Work and to manufacturer's facilities.
- C. Provide incidental labor and facilities to provide access to Work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
- D. Notify Architect and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.
- E. Pay costs of testing laboratory services from Allowance specified in Section 01200 – Price and Payment on approval of invoices by Architect.
- F. Employ services of a separate qualified testing laboratory, arrange with laboratory and pay for additional samples and tests required by Contractor beyond specified requirements.

1.12 SCHEDULE OF INSPECTIONS AND TESTS

- A. Section 04200 - Unit Masonry System: Obtain four sample facebrick units and test for conformance to ASTM C67.
- B. At the time of final inspection and tests of the power and lighting system, all connections at panels, switches, circuit breakers, etc., and all splices shall be complete.
- C. Each power, lighting and control circuit shall be tested and proven free of breaks, short circuits or grounds. On all conductors rated at 600 volts, Megger shall be used to test circuits.
- D. As indicated in individual Specification Sections.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01420

REFERENCE STANDARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Quality assurance.
- B. Schedule of references.

1.3 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date of Contract Documents.
- C. Obtain copies of standards when required by Contract Documents.
- D. Maintain copy at jobsite during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
- F. The contractual relationship duties and responsibilities of the parties in Contract nor those of the Architect shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.4 SCHEDULE OF REFERENCES

AA	Aluminum Association 900 19th St., NW Washington, DC 20006 www.aluminum.org	(202) 862-5100
AABC	Associated Air Balance Council (202) 737-0202 1518 K St., NW Washington, DC 20005 www.aabchq.com	
AAMA	American Architectural Manufacturers Association 1827 Walden Office Sq., Suite 104 Schaumburg, IL 60173-4268 www.aamanet.org	(847) 303-5664

AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol Street, N.W., Suite 249 Washington, DC 20001 www.ashto.org	
AATCC	American Association of Textile Chemists and Colorists 1 Davis Dr, Research Triangle Park Durham, N.C. 27709 www.aatcc.org	919-549-8141
ABMA	American Boiler Manufacturers Association 950 N. Glebe Rd., Suite 160 Arlington, VA 22203-1824	
ACI	American Concrete Institute P.O. Box 9094 Farmington Hills, MI 48333-9094 www.aci-int.org	
ACI	ACI International P.O. Box 9094 Farmington Hills, MI 48333-9094	
ADC	Air Diffusion Council 104 So. Michigan Ave., No. 1500 Chicago, IL 60603	
ADSC	The International Association of Foundation Drilling 9696 Skillman Street, Suite 280 Dallas, TX 75243 www.adsc-iafd.com	(214) 681-5994
AF&PA	American Forest & Paper Association 1111 Nineteenth St. NW, Suite 800 Washington, DC 20036 www.afandpa.org	(202) 463-2700
AGA	American Gas Association P.O. Box 79230. Baltimore, MD 21279-0230	
AGC	Associated General Contractors of America 1957 E Street, N.W. Washington, DC 20006	

AHA	American Hardboard Association 1210 W. Northwest Hwy Palatine, IL 60067 www.hardboard.org	(847) 934-8800
AI	Asphalt Institute Research Park Drive P.O. Box 14052 Lexington, KY 40512-4052 www.asphaltinstitute.org	(606) 288-4960
AIA	American Institute of Architects 1735 New York Avenue, N.W. Washington, DC 20006	
AISC	American Institute of Steel Construction One East Wacker Dr., Suite 3100 Chicago, IL 60601-2001 www.aisc.org	(312) 670-2400
ISI	American Iron and Steel Institute 1101 17th St., NW, Suite 1300 Washington, DC 20036 www.steel.org	(202) 452-7100 (800) 277-3850
AITC	American Institute of Timber Construction 7012 S. Revere Pkwy, Suite 140 Englewood, CO 80112 www.aite-glulam.org	(303) 792-9559
AMCA	Air Movement and Control Association International, Inc. 30 W. University Dr. Arlington Heights, IL 60004-1893 www.amca.org	(847) 394-0150
ANSI	American National Standards Institute 1819 L. Street, N.W. Washington, DC 20036 www.ansi.org	(202) 293-8020
APA/EWA	APA-The Engineered Wood Association P.O. Box 11700 Tacoma, WA 98411-0700 www.apawood.org	(253) 565-6600
API	American Petroleum Institute 1220 L St., NW Washington, DC 20005-4070 www.api.org	(202) 682-8000

ARI	Air-Conditioning and Refrigeration Institute 4301 North Fairfax Dr., Suite 425 Arlington, VA 22203 www.ari.org	(703) 524-8800
ARRA	Asphalt Recycling and Reclaiming Association #3 Church Circle, PMB 250 Annapolis, MD 21401 www.arra.org	(410) 267-0023
ASCE	American Society of Civil Engineers World Headquarters 1801 Alexander Graham Bell Dr. Reston, VA 20191-4400 www.asce.org	(703) 295-6300 (800) 548-2723
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 1791 Tullie Circle, N.E. Atlanta, GA 30329 www.ashrae.org	(800) 527-4723 (404) 636-8400
ASME	American Society of Mechanical Engineers 3 Park Avenue New York, NY 10016-5990 www.asme.org	(800) 843-2763
ASPA	American Sod Producers Association 4415 West Harrison Street Hillside, IL 60162	
ASPE	American Society of Plumbing Engineers 15233 Ventura Blvd., Suite 811 Sherman Oaks, CA 91403	
ASTM	American Society for Testing and Materials 100 Barr Harbor Dr. West Conshohocken, PA 19428-2959 www.astm.org	(601) 832-9585
AWI	Architectural Woodwork Institute 1952 Isaac Newton Sq. West Reston, VA 20190 www.awinet.org	(703) 733-0600
AWPA	American Wood-Preservers' Association P.O. Box 5690 Grandbury, TX 76049-7979 www.awpa.com	(817) 326-6300

AWS	American Welding Society 550 LeJeune Road, N.W. Miami, FL 33126 www.amweld.org	(800) 443-9353 (305) 443-9353
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 www.awwa.org	(303) 794-7711
BHMA	Builders' Hardware Manufacturer Association 355 Lexington Avenue, 17 th floor New York, NY 10017 www.buildershardware.com	(212) 297-2122
BIA	The Brick Industry Association 11490 Commerce Park Drive Reston, VA 28191-1525 www.bia.org	(703) 620-0010
CDA	Copper Development Association 57th Floor, Chrysler Building 405 Lexington Avenue New York, NY 10174	
CFR	Code of Federal Regulations North Capitol Street between G & H Streets, NW Washington, DC 20402	
CLFMI	Chain Link Fence Manufacturers Institute 1101 Connecticut Avenue, N.W. Washington, DC 20036	
CPSC	Consumer Product Safety Commission 1111 Eighteenth Street, NW Washington, DC 20207	
CRSI	Concrete Reinforcing Steel Institute 933 Plum Grove Road Schaumburg, IL 60195	
DHI	Door and Hardware Institute 7711 Old Springhouse Road McLean, VA 22102	
DOT	Department of Transportation 400 Seventh Street, SW Washington, DC 20590	

EJCDC	Engineers' Joint Contract Documents Committee American Consulting Engineers Council 1015 15th Street, N.W. Washington, DC 20005	
EJMA	Expansion Joint Manufacturers Association 25 North Broadway Tarrytown, NY 10591	
EPA	Environmental Protection Agency 401 M Street, SW Washington, DC 20460	
FCC	Federal Communications Commission 1919 M Street, NW Washington, DC 20554	
FM	Factory Mutual System 1151 Boston-Providence Turnpike P.O. Box 688 Norwood, MA 02062	
FS	Federal Specification General Services Administration Specifications and Consumer Information Distribution Section (WFSIS) Washington Navy Yard, Bldg. 197 Washington, DC 20407	
GA	Gypsum Association 810 First St. NE, Suite 510 Washington, DC 20002	
GANA	Glass Association of North America 2945 SW Wanamaker Drive, Suite A Topeka, KS	(785) 271-0208
HPMA	Hardwood Plywood Manufacturers Association 1825 Michael Faraday Drive P.O. Box 2789	
HPW	H.P. White Laboratory 3114 Scarboro Road Street, MD 21154 Reston, VA 22090-2789	
ICBO	International Conference of Building Officials 5360 S. Workman Mill Road Whittier, CA 90601	

IEEE	Institute of Electrical and Electronics Engineers 345 East 47th Street New York, NY 10017	
IES	Illumination Engineering Society of North America 345 East 47th Street New York, NY 10017	
IMIAC	International Masonry Industry All-Weather Council International Masonry Institute 815 15th Street, N.W. Washington, DC 20005	
IMSA	International Municipal Signal Association 165 East Union Street P.O. Box 539 Newark, NY 14513	
ISWA	Insect Screen Weavers Association P.O. Box 1018 Ossining NY 10562	
MBMA	Metal Building Manufacturer's Association 1300 Sumner Avenue Cleveland, OH 44115-2851	
MFMA	Maple Flooring Manufacturers Association 60 Rivere Drive, Suite 500 Northbrook, IL 60062 mfma@maplefloor.com	(847) 480-9138
MIL	Military Specification Naval Publications and Forms Center 5801 Tabor Avenue Philadelphia, PA 19120	
ML/SFA	Metal Lath/Steel Framing Association 221 North LaSalle Street Chicago, IL 60601	
NAAMM	National Association of Architectural Metal Manufacturers 221 North LaSalle Street Chicago, IL 60601	
NBS	National Bureau of Standards (U.S. Department of Commerce) Gaithersburg, MD 20234	

NCMA	National Concrete Masonry Association P.O. Box 781 Herndon, VA 22070
NCRP	National Council on Radiation Protection and Measurement 7910 Woodmont Ave, Suite 800 Bethesda, MD 20814
NEBB	National Environmental Balancing Bureau 8224 Old Courthouse Road Vienna, VA 22180
NEC	National Electrical Code (by NFPA)
NECA	National Electrical Contractors Association 7315 Wisconsin Avenue Bethesda, MD 20814
NEMA	National Electrical Manufacturers' Association 2101 'L' Street, N.W. Washington, DC 20037
NFPA	National Fire Protection Association Battery March Park Quincy, MA 02269
NFoPA	National Forest Products Association 1619 Massachusetts Avenue, N.W. Washington, DC 20036
NHLA	National Hardwood Lumber Association P.O. Box 34518 Memphis, TN 38135
NPCA	National Paint and Coating Association 1500 Rhode Island Avenue N.W. Washington, D.C. 20005
NRCA	National Roofing Contractors Association 8600 Bryn Mawr Avenue Chicago, IL 60631
NSF	National Sanitation Foundation 3475 Plymouth Road P.O. Box 1468 Ann Arbor, MI 47106

NSWMA	National Solid Wastes Management Association 1730 Rhode Island Ave., N.W. Washington, DC 20036
NTMA	National Terrazzo and Mosaic Association 3166 Des Plaines Avenue Des Plaines, IL 60018
NWWDA	National Wood Window & Door Manufacturers Association 205 W. Touhy Avenue Park Ridge, IL 60068
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor) Government Printing Office Washington, D.C. 20402
PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077
PCI	Prestressed Concrete Institute 201 North Wells Street Chicago, IL 60606
PS	Product Standard U. S. Department of Commerce Washington, DC 20203
RILEM	International Union of Testing and Research Laboratories for Materials and Structures RILEM Secretariat General ENS-Pavillon des Jardins, 61 avenue du President Wilson F-94235 Cachan Cedex, France
RIS	Redwood Inspection Service One Lombard Street San Francisco, CA 94111
RCSHSB	Red Cedar Shingle and Handsplit Shake Bureau 515 116th Avenue Bellevue, WA 98004
RMA	Rubber Manufacturer's Association 1400 K Street, N.W. Washington, D.C. 20005

SDI	Steel Deck Institute P.O. Box 9506 Canton, OH 44711	
S.D.I.	Steel Door Institute 712 Lakewood Center North 14600 Detroit Avenue Cleveland, OH 44107	
SGCC	Safety Glazing Certification Council Route 11, Industrial Park Cortland, NY 13045	
SIGMA	Sealed Insulating Glass Manufacturers Association 401 North Michigan Avenue Chicago, IL 60611	(312) 644-6610
SJI	Steel Joist Institute 1205 48th Avenue North, Suite A Myrtle Beach, SC 29577	
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association 8224 Old Court House Road Vienna, VA 22180	
SPIB	Southern Pine Inspection Bureau 4709 Scenic Highway Pensacola, FL 32504-9094	
SSPC	Steel Structures Painting Council 4400 Fifth Avenue Pittsburgh, PA 15213	
TCA	Tile Council of America, Inc. Box 326 Princeton, NJ 08540	
UL	Underwriters' Laboratories, Inc. 333 Pfingston Road Northbrook, IL 60062	
WCLIB	West Coast Lumber Inspection Bureau 6980 S.W. Varns Road Box 23145 Portland, OR 97223	

WRI	Wire Reinforcement Institute 8361 A Greensboro Drive McLean, VA 22102
WWPA	Western Wood Products Association 1500 Yeon Building Portland, OR 97204
W.W.P.A.	Woven Wire Products Association 2515 N. Nordica Avenue Chicago, IL 60635

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES & CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 - General Requirements apply to Work of this Section.

1.2 SECTION INCLUDES

- A. Temporary Utilities: Electricity, lighting, heat, cooling, ventilation, communication services, water, and sanitary facilities.
- B. Temporary Controls: Barriers, enclosures fencing, protection of the Work, and water control.
- C. Construction Facilities: Field offices, parking, project identification.
- D. Removal of utilities, facilities, and controls.

1.3 RELATED SECTIONS

- A. Section 01700 - Execution Requirements: Final Cleaning

1.4 TEMPORARY ELECTRICITY

- A. Provide temporary electric feeder, in conduit, from existing electrical facilities at location as approved by Architect prior to installation. Contractor shall be responsible for maintaining continuous electrical service. All outages shall be conducted prior to occupancy of the building by the Owner. Any limited downtime shall be coordinated in advance with Owner 48 hours prior to disconnection. If downtime is greater than 24 hours, is not performed on a weekend or holiday, or will impede progress of the project, Contractor shall provide a generator so that work can continue. Contractor shall provide all necessary equipment and materials as required to maintain electrical service. All work shall be performed in accordance with the National Electrical Code and the utility company's recommendations and will be included as a part of this contract.
- B. **Owner shall pay cost of energy used.** Exercise measures to conserve energy.
- C. Power Service Characteristics Available: 120/208 volt, three phase, four wire.
- D. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required. Provide flexible power cords as required.
- E. Provide main service disconnect and over current protection at convenient location in conformance with the National Electrical Code.
- F. Permanent convenience receptacles may not be utilized during construction unless they are to be removed prior to completion of project.
- G. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.
 - 1. Provide 20 ampere duplex outlets, single phase circuits for power tools for every 2000 sq. ft of active work area and at specific locations as required.
 - 2. Provide 20 ampere, single phase branch circuits for lighting.

1.5 TEMPORARY COMMUNICATION SERVICES

- A. Provide, maintain and pay for telephone service to field office at time of project mobilization.
- B. Owner's communication systems shall not be used.
- C. As a minimum, provide cellular mobile telephone service for the on-site superintendent and home office telephone service.
- D. Provide field and home office with the following computer equipment and service:
 - 1. Hewlett Packard All-In-One or equivalent scanner, printer and facsimile.
 - 2. DSL or Cable Modem Service: Business DSL or Cable modem service with all required equipment (modems, filters, etc.). 1.5Mbps downstream/384Kbps upstream. Service shall utilize a DHCP IP address for the connection. Contractor shall pay all costs associated with this service including any ISP fees.

1.6 TEMPORARY WATER SERVICE

- A. Connect to existing water source for construction operations.
- B. **Owner shall pay cost of water used.** Exercise measures to conserve water.
- C. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.

1.7 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required portable facilities and enclosures. Privy pits shall not be used. Permanent building facilities shall not be used during construction operations.
- B. Coordinate location of portable facilities with Owner and Architect.
- C. Existing facilities may be used during construction operations. Maintain daily in clean and sanitary condition.
- D. At the end of construction, return facilities to same or better condition than originally found.

1.8 EMPLOYEE RESIDENTIAL OCCUPANCY

- A. Not allowed on Owner's property.

1.9 VEHICULAR ACCESS

- A. Use existing on-site roads for construction traffic.

1.10 PARKING

- A. When site space is not adequate, provide additional off-site parking.
- B. Use of existing on-site streets and driveways for construction traffic is permitted.
- C. Use of existing parking facilities by construction personnel is permitted.
- D. Do not allow heavy or tracked vehicles or construction equipment in parking areas.
- E. Maintenance:
 - 1. Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, mud, snow, and ice.
 - 2. Maintain existing and permanent paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

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- F. Removal, Repair:
 - 1. Remove temporary materials and construction when permanent paving is usable before Substantial Completion.
 - 2. Remove underground work and compacted materials to depth of 2 (TWO) feet; fill and grade site as specified.
 - 3. Repair existing facilities damaged by use, to original condition.
 - G. Mud from Site Vehicles: Provide means of removing mud from vehicle wheels before entering streets.

1.11 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Remove waste materials, debris, and rubbish from site and dispose off-site at intervals as required to maintain clean site.

1.12 PROJECT IDENTIFICATION

- A. Project Identification Sign
 - 1. Size: Provide (one) 8 ft. wide x 4 ft. high
 - 2. Materials: 3/4 inch thick exterior grade plywood and solid wood frame.
 - 3. Background Paint: Exterior quality, two coats; sign background of White color as selected.
 - 4. Lettering: Exterior paint of quality adequate to withstand weathering, fading, and chipping for duration of construction, contrasting colors with exhibit lettering by professional sign painter.
 - 5. Design: To Architect's design and colors.
 - 6. Content
 - a. Project title, as indicated on Contract Documents.
 - b. Owner's name and logo.
 - c. Names and titles of Architect and Consultants.
 - d. Name of Prime Contractor.
 - 7. Lettering: Series C of Standard Alphabet for Highway Signs, Public Roads Administration, Federal Works Agency.
- B. Project Informational Signs
 - 1. If required by other documents or sections of the Project Manual, provide weather protected signs for site safety procedures, wage rates, and storm water pollution prevention plan.
 - 2. Erect sign on or adjacent to the field office, if required.
- C. Design sign and structure to withstand 90 [Ninety] miles/hr wind velocity.
- D. Installation:
 - 1. Install project identification sign within 15 days after date fixed by Notice to Proceed.
 - 2. Erect at location of high public visibility adjacent to main entrance to site directed by Owner.
 - 3. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.

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- 4. Install sign surface plumb and level, with butt joints. Anchor securely.
 - 5. Paint exposed surfaces of sign supports and framing.
 - E. No other signs are allowed without Owner's permission except those required by law.
 - F. Maintenance: Maintain signs and supports clean, repair deterioration and damage.
 - G. Removal: Remove signs, framing, supports, and foundations at completion of Project and restore area.

1.13 TRAFFIC REGULATION

- A. Signs, Signals, And Devices:
 - 1. Traffic Cones and Drums, Flares and Lights: As approved by authority having jurisdiction.
 - 2. Flag person Equipment: As required by authority having jurisdiction.
- B. Flag Persons: Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.
- C. Flares and Lights: Use lights during hours of low visibility to delineate traffic lanes and to guide traffic.
- D. Haul Routes:
 - 1. Consult with authority having jurisdiction, establish public thoroughfares to be used for haul routes and site access.
 - 2. Confine construction traffic to designated haul routes.
 - 3. Provide traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.
- E. Traffic Signs And Signals:
 - 1. Provide signs at approaches to site and on site, at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
 - 2. Relocate as Work progresses, to maintain effective traffic control.
- F. Removal:
 - 1. Remove equipment and devices when no longer required.
 - 2. Repair damage caused by installation.
 - 3. Remove post settings to depth of [2] [Two] feet.

1.14 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas to allow for Owner's access of site, and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by authorities having jurisdiction for public rights-of-way.
- C. Provide protection for trees, shrubbery and lawns designated to remain. Replace damaged trees, shrubbery and lawns to original condition.
- D. Protect site improvements including but not limited to pavements, walkways and drainage structures from damage. Replace damaged site improvements to original condition.
- E. Protect non-owned vehicular traffic and stored materials from damage.

1.15 SECURITY

- A. Security Program:
 - 1. Protect Work existing premises from theft, vandalism, and unauthorized entry.

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- 2. Initiate program at project mobilization.
 - 3. Maintain program throughout construction period until Owner occupancy.
 - B. Restrictions:
 - 1. Do not allow cameras on site or photographs taken except by written approval of Owner.
 - 2. Do not work on Sundays.

1.16 WATER CONTROL

- A. Maintain excavations free of water.
- B. Provide, operate, and maintain pumping equipment.
- C. Protect site from puddling and running water from soil erosion.
- D. Provide water barriers as required to protect existing building from puddling, ponding or other water accumulation that may damage foundations or other sub-surface construction.

1.17 DUST CONTROL

- A. Execute Work by methods to minimize raising dust from construction operations.
- B. Provide positive means to prevent air-borne dust from dispersing into atmosphere.

1.18 EROSION AND SEDIMENT CONTROL

- A. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
- B. Minimize surface area of bare soil exposed at one time.
- C. Provide temporary measures including berms, dikes, and drains, and other devices to prevent water flow that would result in erosion.
- D. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
- E. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

1.19 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection where specified in individual specification Sections.
- B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to minimize damage.
- C. Provide protective coverings at openings in walls, roof, and soffits.
- D. Protect finished walkways, drives, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01600

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Products.
- B. Product delivery, storage and handling.
- C. Product options.
- D. Substitutions.

1.3 RELATED SECTIONS

- A. Section 01400 - Quality Requirements: Product quality monitoring. Testing Laboratory Services.

1.4 PRODUCTS

- A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work and does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.
- B. Provide interchangeable components of the same manufacturer, for similar components.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Delivery
 - 1. Deliver materials, products and equipment to the project site in manufacturer's original, unopened containers or packaging, with identifying labels intact and legible.
 - 2. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
 - 3. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
 - 4. Arrange deliveries in accordance with the construction schedule and in ample time to facilitate inspection prior to installation to avoid unnecessary delays in the construction process.
- B. Storage
 - 1. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible.
 - 2. Store sensitive products in weather-tight, climate controlled enclosures.
 - 3. For exterior storage of fabricated products, place on sloped supports, above ground.

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4. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation or potential degradation of Products.
 5. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
 6. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
 7. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.
 8. Materials, products and equipment may be stored off site in a bonded and insured warehouse approved by the Architect and Owner. Pay all costs incurred for off-site storage facilities. Products properly stored in off-site storage facilities may be included in progress pay requests with written approval of the Architect.
- C. Handling
1. Handle materials, products and equipment in a manner prescribed by manufacturer or specified to protect from damage during storage and installation.

1.6 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named in accordance with the following article.

1.7 SUBSTITUTIONS

- A. The materials, products and equipment described in the Contract Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution.
- B. No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least five days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other material, equipment or other portions of the Work including changes in the work of other contracts that incorporation of the proposed substitution would require shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final. Architect's approval is for manufacturer only and not specific material or equipment. Approved manufacturer's material or equipment is subject to additional review after award of contract and submitted for Architect's approval during Construction Administration submittal/shop drawing review.
- C. If the Architect approves a proposed substitution prior to receipt of Bids, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.
- D. A request for substitution constitutes a representation that the Bidder:
 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
 2. Will provide the same warranty for the Substitution as for the specified product.

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- 3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension which may subsequently become apparent.
 - 5. Will reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
 - E. After Contract award, Architect will not consider requests for substitutions.
 - F. Although substitutions may be considered when a product becomes unavailable through no fault of the Contractor.
 - G. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01650

STARTING OF SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Starting systems.
- B. Demonstration and instructions.
- C. Testing, adjusting, and balancing.

1.3 RELATED SECTIONS

- A. Section 01400 - Quality Requirements: Manufacturers field reports.
- B. Section 01700 – Execution Requirements: System operation and maintenance data and extra materials.
- C. Division 15 - Testing Adjusting and Balancing.

1.4 STARTING SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect seven days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions which may cause damage.
- D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of responsible manufacturer's representative and Contractors' personnel in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- H. Submit a written report in accordance with Section 01400 that equipment or system has been properly installed and is functioning correctly.

1.5 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of Products to Owner's personnel two weeks prior to date of final inspection.
- B. For equipment or systems requiring seasonal operation, perform demonstration for other season.
- C. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owners' personnel in detail to explain all aspects of operation and maintenance.

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- D. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed-upon times, at equipment location.
 - E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01700

EXECUTION REQUIREMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Closeout procedures.
- B. Final cleaning.
- C. Starting of systems.
- D. Demonstration and instructions.
- E. Testing, adjusting and balancing.
- F. Protecting installed construction.
- G. Hazardous materials affidavits.
- H. Project record documents.
- I. Operation and maintenance data.
- J. Manual for materials and finishes.
- K. Manual for equipment and systems.
- L. Spare parts and maintenance products.
- M. Product warranties and product bonds.
- N. Maintenance service.

1.3 CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Architect/Engineer's review.
- B. Provide submittals to Architect required by authorities having jurisdiction.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.4 FINAL CLEANING

- A. Execute final cleaning prior to final project assessment.
- B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- C. Clean equipment and fixtures to sanitary condition with cleaning materials appropriate to surface and material being cleaned.
- D. Clean or replace filters of operating equipment.
- E. Clean debris from roofs, gutters, downspouts, and drainage systems.
- F. Clean site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from site.

1.5 PROTECTING INSTALLED CONSTRUCTION

- A. Protect installed Work and provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.

1.6 HAZARDOUS MATERIALS AFFIDAVITS

- A. Contractor, each subcontractor, each sub-subcontractor, and each material/product supplier to provide a notarized affidavit declaring that hazardous materials were not incorporated into construction of or delivered to the Project.
- B. Hazardous materials include asbestos, lead polychlorinated biphenyl (PCB), prohibited termite eradication chemicals or any substance of any proportion determined or suspected by an agency of federal or state government to create a health hazard.
- C. Provide table of contents listing all affidavits in alphabetical order and assemble with metal prong binder in durable plastic presentation cover.
- D. Prepare binder cover with printed title "AFFIDAVITS OF NON-INCORPORATED HAZARDOUS MATERIALS", Title of Project, Project Address, Owner's Name, Address and Phone and date of Construction Completion.
- E. Provide one complete set of the aforementioned information in the prescribed format and on CD in PDF format.
- F. Submit prior to Application for Final Payment.

1.7 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed Shop Drawings, Product Data, and Samples.
 - 6. Complete set of MSDS sheets for all materials.
 - 7. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress, not less than weekly.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.

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3. Changes made by Addenda, Change Orders, RFI responses, and other modifications. For Addenda, Change Orders, and RFI responses, cut out and tape to pages in appropriate location, referencing source of change.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
1. Measured depths of foundations in relation to finish main floor datum.
 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 4. Field changes of dimension and detail.
 5. Details not on original Contract drawings.
 6. Changes made by Addenda, Change Order, RFI responses, and other modifications. For Addenda, Change Orders, and RFI responses, cut out and tape to pages in appropriate location, referencing source of change.
- G. Material Safety Data Sheets (MSDS)
1. Comply with the most current requirements of the Department of State Health Services, TEXAS VOLUNTARY INDOOR AIR QUALITY GUIDELINES FOR GOVERNMENT BUILDINGS, Publication #2-10 Section 297 of the Texas Health and Safety Code as outlined below.
 2. Submit MSDS on all products used in construction of Project.
 3. Submit MSDS in 8 ½ x 11 inch format text pages, bound in three D-ring binder with durable plastic covers.
 4. Prepare binder cover with printed title "MATERIAL SAFETY DATA SHEETS (MSDS)", Title of Project, Project Address, Owner's Name, Address and Phone, and Date of Construction Completion.
 5. Internally subdivide the binder contents with permanent page dividers, organized into the 16 Division CSI format, with tab title clearly printed under reinforced laminated plastic tabs.
 6. Prepare a table of contents, listing each of the 16 Divisions headings and listing each material/product under each heading by manufacturer and material/product name.
 7. Submit one complete set of the aforementioned information in the prescribed format and on CD in PDF format.
 8. Submit binder and CD with Application for Final Payment. Binder and CD shall include all MSDS for materials/products delivered or installed in Project.
 9. Failure to submit updated MSDS binders will cause Application for Final Payment to be held by Architect (not submitted to Owner for processing) until such time updated MSDS binder and CD are received and reviewed for compliance by Architect.
- H. Submit documents to Architect with claim for final Application for Payment.

1.8 OPERATION AND MAINTENANCE DATA

- A. Submit data bound in 8-1/2 x 11 inch (A4) text pages, three D side ring capacity expansion binders with durable plastic covers.
- B. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are required.
- C. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

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- D. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
 - E. Contents: Prepare Table of Contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:
 - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
 - 2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
 - 3. Part 3: Project documents and certificates, including the following:
 - a. Shop drawings and product data.
 - b. Air and water balance reports.
 - c. Certificates.
 - d. Originals/Photocopies of warranties and bonds.
 - 4. Submit one complete set of the aforementioned information in the prescribed format and on CD in PDF format.
 - 5. Provide CD with three separate titles as noted above (Part 1, Part 2 and Part 3)
 - 6. Submit binder and CD with Application for Final Payment.

1.9 MANUAL FOR MATERIALS AND FINISHES

- A. Submit one copy and CD in PDF format of preliminary draft or proposed formats and outlines of contents before start of Work. Architect/Engineer will review draft and return one copy with comments.
- B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.
- C. Submit one copy of completed volumes 15 days prior to final inspection. Draft copy be reviewed and returned after final inspection, with Architect comments. Revise content of document sets as required prior to final submission.
- D. Submit two sets of revised final volumes in final form within 10 days after final inspection.
- E. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. Include information for re-ordering custom manufactured products.
- F. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- G. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Include recommendations for inspections, maintenance, and repair.
- H. Additional Requirements: As specified in individual product specification sections.
- I. Include listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.10 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Submit one copy and CD in PDF format of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
- B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.
- C. Submit one copy of completed volume(s) 15 days prior to final inspection. Draft copy be reviewed and returned after final inspection, with Architect comments. Revise content of document sets as required prior to final submission.
- D. Submit one set and CD in PDF format of revised final volumes in final form within 10 days after final inspection.
- E. Each Item of Equipment and Each System: Include description of unit or system, and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.
- F. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
- G. Include color coded wiring diagrams as installed.
- H. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and special operating instructions.
- I. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- J. Include servicing and lubrication schedule, and list of lubricants required.
- K. Include manufacturer's printed operation and maintenance instructions.
- L. Include sequence of operation by controls manufacturer.
- M. Include original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- N. Include control diagrams by controls manufacturer as installed.
- O. Include Contractor's coordination drawings, with color coded piping diagrams as installed.
- P. Include charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- Q. Include list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- R. Include test and balancing reports as specified in Section 01400.
- S. Additional Requirements: As specified in individual product specification sections.
- T. Include listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.

1.11 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Furnish spare parts, maintenance, and extra products in quantities specified in individual specification sections.
- B. Deliver to Project site; obtain receipt prior to final payment.

1.12 PRODUCT WARRANTIES AND PRODUCT BONDS

- A. Obtain warranties and bonds executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
- B. Execute and assemble transferable warranty documents and bonds from subcontractors, suppliers, and manufacturers.
- C. Verify documents are in proper form, contain full information, and are notarized.
- D. Co-execute submittals when required.
- E. Include Table of Contents and assemble in separate three D side ring binder with durable plastic cover.
- F. Submit one complete set of the aforementioned information in the prescribed format and on CD in PDF format.
- G. Submit prior to Application for Final Payment.
- H. Time Of Submittals:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
 - 2. Make other submittals within ten days after Date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing date of acceptance as beginning of warranty or bond period.

1.13 MAINTENANCE SERVICE

- A. Furnish service and maintenance of components indicated in specification sections from date of Substantial Completion.
- B. Examine system components at frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- C. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by manufacturer of original component.
- D. Do not assign or transfer maintenance service to agent or Subcontractor without prior written consent of Owner.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 02225

TRENCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract Special Provisions and Division 1 - General Requirements apply to work of this section.

1.2 SECTION INCLUDES

- A. Excavating trenches for utilities from 5 feet outside building to municipal utilities.
- B. Compacted fill from top of utility bedding to subgrade elevations.
- C. Backfilling and compaction.

1.3 RELATED SECTIONS

- A. Document: Geotechnical report; bore hole locations and findings of subsurface materials.
- B. Section 02732 - Site Sanitary Sewerage and Storm Sewerage Systems: Storm sewer piping and bedding.

1.4 REFERENCES

- A. ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.
- B. ASTM D1556 - Test Method for Density of Soil in Place by the Sand-Cone Method.
- C. ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. Rammer and 18 inch Drop.
- D. ASTM D2167 - Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
- E. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- F. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.

1.5 DEFINITIONS

- A. Utility: Any buried pipe, duct, conduit, or cable.

1.6 FIELD MEASUREMENTS

- A. Verify that survey bench mark, control point, and intended elevations for the Work are as shown on drawings.

1.7 COORDINATION

- A. Verify work associated with lower elevation utilities is complete before placing higher elevation utilities.

PART 2 - PRODUCTS

2.1 FILL MATERIALS

- A. Trench backfill in areas for this project may be rock crusher fines or the most granular material from the excavated trench spoils. Only the material passing through the 2-inch screen size, and free of organic material shall be used.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.
- B. Protect plant life, lawns, and other features remaining as a portion of final landscaping.
- C. Protect bench marks, fences, paving, and curbs from excavating equipment and vehicular traffic.
- D. Maintain and protect above and below grade utilities which are to remain.
- E. Cut out soft areas of subgrade not capable of compaction in place. Backfill and compact to density equal to or greater than requirements for subsequent backfill material.

3.2 EXCAVATING

- A. Excavate subsoil required for utilities.
- B. Cut trenches sufficiently wide to enable installation and allow inspection. Remove water or materials that interfere with Work.
- C. Do not interfere with 45 degree bearing splay of foundations.
- D. Hand trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.
- E. Remove lumped subsoil, boulders, and rock.
- F. Correct areas over excavated in accordance with Paragraph 3.1.E. of this section.

3.3 BACKFILLING

- A. Backfill trenches to contours and elevations with unfrozen fill materials.
- B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- C. Place and compact materials in equal continuous layers not exceeding 8 inches compacted depth.
- D. Employ a placement method that does not disturb or damage existing or planned facilities.
- E. Maintain optimum moisture content of fill materials to attain required compaction density.
- F. Transport surplus fill materials off the project site for lawful disposal.

3.4 TOLERANCES

- A. Top Surface of Backfilling Under Paved Areas: Plus or minus 1/2 inch from required elevations.
- B. Top Surface of General Backfilling: Plus or minus 1 inch from required elevations.

3.5 FIELD QUALITY CONTROL

- A. Compaction testing will be performed in accordance with ASTM D1557, ASTM D2922, and ASTM D3017, and at the discretion of the Engineer the following: ASTM D1556, ASTM D2167
- B. Backfill loose lifts = 12-inch maximum. Density requirements: Top 4 ft. of trench below subgrade = 95% ASTM D1557. Trench levels below 4 ft. = 90% ASTM D1557.
- C. If tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest.
- D. Frequency of Tests: 1 test per 250 linear feet of trench, at lift level chosen by Engineer's Representative.

3.6 PROTECTION OF FINISHED WORK

- A. Protect finished Work.
- B. Reshape and re-compact fills subjected to vehicular traffic during construction.

END OF SECTION

SECTION 02230

SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract Special Provisions and Division 1 - General Requirements apply to work of this section.

1.2 SECTION INCLUDES

- A. Removing trees and other vegetation.
- B. Clearing and grubbing.
- C. Topsoil stripping.
- D. Removing above-grade site improvements.

1.3 RELATED SECTIONS

- A. Section 01500 – Temporary Facilities and Controls: Temporary utilities, temporary construction and support facilities, temporary security and protection facilities, and environmental protection measures during site operations.
- B. Section 02301 – Earthwork for Buildings: Soil materials, excavating, backfilling, and site grading.
- C. Section 02350 - Excavation, Backfilling and Subgrade Preparation: Soil materials, excavating, backfilling, and site grading.

1.4 DEFINITIONS

- A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 1 inch in diameter; and free of weeds, roots, and other deleterious materials.

1.5 MATERIALS OWNERSHIP

- A. Except for materials indicated to be stockpiled or to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from the site.

1.6 SUBMITTALS

- A. Record drawings according to Division 1 Section "Contract Closeout."
 - 1. Identify and accurately locate capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.7 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- B. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.
- C. Notify utility locator service for area where Project is located before site clearing.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Provide erosion-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 UTILITIES

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Architect not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Architect's written permission.

3.3 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots.
 - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 - 2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
 - 3. Completely remove stumps, roots, obstructions, and debris extending to a depth of 18 inches below exposed subgrade.
 - 4. Use only hand methods for grubbing within drip line of remaining trees.

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- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
 - 1. Place fill material in horizontal layers not exceeding 8-inch loose depth, and compact each layer to a density equal to adjacent original ground.

3.4 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.
 - 1. Strip surface soil of unsuitable topsoil, including trash, debris, weeds, roots, and other waste materials.
- C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Limit height of topsoil stockpiles to 72 inches.
 - 2. Do not stockpile topsoil within drip line of remaining trees.
 - 3. Stockpile surplus topsoil and allow for respreading deeper topsoil.

3.5 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
 - 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.

3.6 DISPOSAL

- A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off Owner's property.

END OF SECTION

SECTION 02231

AGGREGATE BASE COURSE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract Special Provisions and Division 1 - General Requirements apply to work of this section.

1.2 SECTION INCLUDES

- A. Subgrade.
- B. Aggregate Base Course.

1.3 RELATED SECTIONS

- A. Section 02225 - Trenching: Compacted backfill under base course.
- B. Section 02511 - Asphaltic Concrete Surfacing: Base Course finish for paving.
- C. Section 02522 - Structural Portland Cement Concrete for Site Work: Base course finish for paving.

1.4 REFERENCES

- A. AASHTO M147-65-Materials for Aggregate and Soil Aggregate.
- B. Texas Department of Transportation (TXDOT) - Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Test certificates from an approved commercial laboratory shall be furnished on materials covered by this section 30 days prior to construction.

1.6 QUALITY ASSURANCE

- A. Testing shall be by standard AASHTO methods.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Subgrade: Native material free of clay, organic or deleterious material.
- B. Base Course:
 - 1. Crusher Run Stone and Binding Material
 - a. Material shall be free of all soil, clay, and other objectionable materials.

-
- b. Conformance: TXDOT, Item 247, FLEXIBLE BASE COURSE, Paragraphs 247.2(2)(a) and 247.2(2)(d), Grade 3.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify Subgrade has been inspected, Gradients and elevations are correct and surface is dry.

3.2 PREPARATION

- A. Maintain and protect existing utilities remaining, which pass through work area.
- B. Protect bench marks, existing structures, fences, sidewalks, paving, and curbs from construction equipment and vehicular traffic.

3.3 INSTALLATION

- A. Subgrade
 1. Any clay encountered within 2 feet of the pavement surface grade shall be removed from the project site and replaced with suitable material.
 2. After the subgrade has been shaped and graded to the elevation shown on the plans, prepare the top 6 inches as a subgrade for the base course as specified herein. The top 6 inches shall be scarified, plowed or otherwise loosened; shall be wetted, shaped and rolled with approved rollers.
 3. When the required compaction is achieved, finish the subgrade to the line and grades as shown on the plans or as directed by the Architect.
 4. The subgrade shall be kept in good condition as required and shall be safe for traffic until such time as the base course is constructed. Periodically wetting of the subgrade will be required to maintain density and to keep down dust from traffic.
- B. Base Course: Construction methods shall be in accordance with TXDOT, Part II Construction Details, Division II, Subbase and Base Courses, Items 210, 216 and 247.

3.4 TOLERANCES

- A. Subgrade
 1. Scheduled compacted thickness: Within 1/4 inch.
 2. Variation from true elevation: Within 1/2 inch.
- B. Base Course
 1. Flatness: Maximum variation of 1/4 inch as measured with a 16 foot straight edge.
 2. Scheduled compacted thickness: Within 1/4 inch.
 3. Variation from true elevation: Within 1/2 inch.

3.5 FIELD QUALITY CONTROL

- A. Perform field density testing for subgrade and base course will be performed at a minimum of one density per 500 square yards.
- B. Work not meeting specified requirements shall be reworked and retested at no cost to the Owner.

-
- C. Engineer may request proof-rolling of base if Engineer suspects the presence of base not meeting compaction requirements.
 - 1. Proof roll base with a pneumatic-tired and loaded roller weighting not less than 25 tons with tire pressure being not less than 110 psi to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 - 2. Complete proof-roll subgrade in one direct, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.

3.6 SCHEDULE

- A. New Parking Areas:
 - 1. Subgrade: 6 inch, 95% density, ASTM D-1557.
 - 2. Base: 6 inch, 98% density, ASTM D-1557.

END OF SECTION

SECTION 02300

EXCAVATION AND FILL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Preparing of subgrade for building slabs.
 - 2. Excavating and backfilling of trenches within building lines.
 - 3. Excavating and backfilling for underground mechanical and electrical utilities and buried mechanical and electrical appurtenances.

1.3 DEFINITIONS

- A. Excavation consists of removal of material encountered to subgrade elevations indicated and subsequent disposal of materials removed.
- B. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be at Contractor's expense.
- C. Under footings or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position, when acceptable to Architect.
 - 1. In locations other than those above backfill compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by Architect.
- D. Additional Excavation: When excavation has reached required subgrade elevations, notify Architect, who will make an inspection of conditions. If Architect determines that bearing materials at required subgrade elevations are unsuitable, continue excavation until suitable bearing materials are encountered and replace excavated material as directed by Architect. The Contract Sum may be adjusted by an appropriate Contract Modification.
- E. Removal of unsuitable material and its replacement as directed will be paid on basis of Conditions of the Contract relative to changes in work.
- F. Subgrade: The undisturbed earth or the compacted soil layer immediately below granular subbase or topsoil materials.
- G. Building Pad: The building pad is defined by a line 5'-0" minimum beyond the exterior face of the continuous footing when measured at the bottom of the sub-excavation.
- H. Structure: Buildings, foundations, slabs, curbs, or other man-made stationary features occurring above or below ground surface.

1.4 QUALITY ASSURANCE

- A. Codes and Standards: Perform excavation work in compliance with applicable requirements of authorities having jurisdiction.
- B. Testing and Inspection Service: Owner will employ and pay for a qualified independent geotechnical testing and inspection laboratory to perform soil testing and inspection service during earthwork operations.

1.5 PROJECT CONDITIONS

- A. Site Information: Data in subsurface investigation reports was used for the basis of the design and are available to the Contractor for information only. Conditions are not intended as representations or warranties of accuracy or continuity between soil borings. The Owner will not be responsible for interpretations or conclusions drawn from this data by Contractor.
 - 1. Additional test borings and other exploratory operations may be performed by Contractor, at the Contractor's option; however, no change in the Contract Sum will be authorized for such additional exploration.
- B. Existing Utilities: Locate existing underground utilities in areas of excavation work. If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations.
 - 1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
 - 2. Do not interrupt existing utilities serving facilities occupied by Owner or others, during occupied hours, except when permitted in writing by Architect and then only after acceptable temporary utility services have been provided.
 - a) Provide minimum of 48-hour notice to Architect, and receive written notice to proceed before interrupting any utility.
 - 3. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shutoff of services if lines are active.
- C. Use of Explosives: Use of explosives is not permitted.
- D. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights.
 - 1. Operate warning lights as recommended by authorities having jurisdiction.
 - 2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
 - 3. Perform excavation by hand within dripline of large trees to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with moistened burlap.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. Satisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups GW, GP, GC, GM, GC-GM, GP-GM, GP-GC, SW, SP, SC, SM, SC-SM, SP-SM, SP-SC.
- B. Unsatisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups PT, OL, OH, ML, MH, CL, and CH where the plasticity index exceeds 18.
- C. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed slag, and natural or crushed sand.
- D. Backfill and Fill Materials: Satisfactory soil materials free of clay, rock or gravel larger than 4 inches in any dimension, debris, waste, frozen materials, vegetation and other deleterious matter.

PART 3 - EXECUTION

3.1 SITE PREPARATION

- A. General: Remove existing paving, debris and unsatisfactory materials from ground surface under the building pad. This material shall be removed and disposed of as here-in specified.
- B. Building Pad: The existing soils throughout the entire building pad shall be excavated to the elevation noted on the drawings. Excavated soils may be reused as fill material if they meet the requirements for satisfactory materials as here-in specified. The thus exposed subgrade shall be scarified and recompactd as here-in specified. The entire building pad shall be brought to grade using fill materials and procedures as here-in specified.

3.2 EXCAVATION

- A. Excavation is unclassified and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered.

3.3 STABILITY OF EXCAVATIONS

- A. General: Comply with local codes, ordinances, and requirements of agencies having jurisdiction.
- B. Slope sides of excavations to comply with local codes, ordinances, and requirements of agencies having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

3.4 DEWATERING

- A. Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area.

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1. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.
 2. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rain water and water removed from excavations to collecting or runoff areas. Do not use trench excavations as temporary drainage ditches.

3.5 STORAGE OF EXCAVATED MATERIALS

- A. Stockpile excavated materials acceptable for backfill and fill where directed. Place, grade, and shape stockpiles for proper drainage.
 1. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.
 2. Dispose of excess excavated soil material and materials not acceptable for use as backfill or fill.

3.6 EXCAVATION FOR STRUCTURES

- A. Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 foot, and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, and other construction and for inspection.
 1. Excavations for footings and foundations: Do not disturb bottom of excavation. Excavate by hand to final grade, trim bottoms to required lines and grades and prior to placement of the reinforcement and concrete, the base shall be compacted as herein specified.
 2. Excavation for Underground Mechanical or Electrical Structures: Conform to elevations and dimensions indicated within a tolerance of plus or minus 0.10 foot; plus a sufficient distance to permit placing and removal of concrete formwork, installation of services, and other construction and for inspection. Do not disturb bottom of excavations, intended for bearing surface.

3.7 TRENCH EXCAVATION FOR PIPES AND CONDUIT

- A. Excavate trenches to uniform width, sufficiently wide to provide ample working room and a minimum of 6 to 9 inches of clearance on both sides of pipe or conduit.
- B. Excavate trenches and conduit to depth indicated or required to establish indicated slope and invert elevations and to support bottom of pipe or conduit on undisturbed soil. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

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1. For pipes or conduit less than 6 inches in nominal size, and for flat-bottomed, multiple-duct conduit units, do not excavate beyond indicated depths. Hand-excavate bottom cut to accurate elevations and support pipe or conduit on undisturbed soil.
 2. For pipes and equipment 6 inches or larger in nominal size, shape bottom of trench to fit bottom of pipe for 90 degrees (bottom 1/4 of the circumference). Fill depressions with tamped sand backfill. At each pipe joint, dig bell holes to relieve pipe bell of loads ensure continuous bearing of pipe barrel on bearing surface.

3.8 COLD WEATHER PROTECTION

- A. Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F.

3.9 BACKFILL AND FILL

- A. General: Place soil material in layers to required subgrade elevations, for each area classification listed below, using materials specified in Part 2 of this Section.
 1. Under building slabs, use satisfactory excavated or borrow material.
 2. Under piping and conduit and equipment, use subbase materials where required correction of unauthorized excavation. Shape excavation bottom to fit bottom 90 degrees of cylinder.
 3. Backfill trenches with concrete where trench excavations pass within 18 inches of column or wall footings and that are carried below bottom of such footings or that pass under wall footings. Place concrete to level of bottom of adjacent footing.
 - a) Concrete is specified in Division 3.
 - b) Do not backfill trenches until tests and inspections have been made and backfilling is authorized by
 - c) Architect. Use care in backfilling to avoid damage or displacement of pipe systems.
 4. Provide 4-inch-thick concrete base slab support for piping or conduit less than 2'-6" below surface of roadways. After installation and testing of piping or conduit, provide minimum 4-inch-thick encasement (sides and top) of concrete prior to backfilling or placement of roadway subbase.
- B. Backfill excavations as promptly as work permits, but not until completion of the following:
 1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
 2. Inspection, testing, approval, and recording locations of underground utilities have been performed and recorded.
 3. Removal of concrete formwork.
 4. Removal of trash and debris from excavation.

3.10 PLACEMENT AND COMPACTION

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- A. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.
 - 1. When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum density.
 - B. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
 - C. Place backfill and fill materials evenly adjacent to structures, piping, or conduit to required elevations. Prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping, or conduit to approximately same elevation in each lift.
 - D. Control soil and fill compaction, providing minimum percentage of density specified for each area classification indicated below. Correct improperly compacted areas or lifts as directed by Architect if soil density tests indicate inadequate compaction.
 - 1. Percentage of Maximum Density Requirements: Compact soil to not less than the following percentages of maximum density, in accordance with ASTM D 1557:
 - a) Under structures, building slabs and steps, and pavements, compact top 12 inches of subgrade and each layer of backfill or fill material at 95 percent maximum density.
 - b) Under lawn or unpaved areas, compact top 6 inches of subgrade and each layer of backfill or fill material at 90 percent maximum density.
 - c) Under walkways, compact top 6 inches of subgrade and each layer of backfill or fill material at 95 percent maximum density.
 - 2. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or layer of soil material. Apply water in minimum quantity as necessary to prevent free water from appearing on surface during or subsequent to compaction operations.
 - a) Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
 - b) Stockpile or spread soil material that has been removed because it is too wet to permit compaction. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value..

3.11 GRADING

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- A. General: Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades.
 - B. Grading Surface of Fill Under Building Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 1/2 inch when tested with a 10-foot straightedge.
 - C. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or relative density for each area classification.

3.12 FIELD QUALITY CONTROL

- A. Quality Control Testing During Construction: Allow testing service to inspect and approve each subgrade and fill layer before further backfill or construction work is performed.
 - 1. Perform field density tests in accordance with ASTM D 1556 (sand cone method) or ASTM D 2167 (rubber balloon method), as applicable.
 - a) Field density tests may also be performed by the nuclear method in accordance with ASTM D 2922, providing that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. In conjunction with each density calibration check, check the calibration curves furnished with the moisture gages in accordance with ASTM D 3017.
 - b) If field tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the Architect.
 - 2. Footing Subgrade: For each strata of soil on which footings will be placed, perform at least one test to verify required density. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested strata when acceptable to Architect.
 - 3. Building Slab Subgrade: Perform at least one field density test of subgrade for every 2,000 sq. ft. of paved area or building slab, but in no case fewer than three tests. In each compacted fill layer, perform one field density test for every 2,000 sq. ft. of overlaying building slab or paved area, but in no case fewer than three tests.
 - 4. Foundation Wall Backfill: Perform at least two field density tests at locations and elevations as directed.
 - 5. If in opinion of Architect, based on testing service reports and inspection, subgrade or fills that have been placed are below specified density, perform additional compaction and testing until specified density is obtained.

3.13 EROSION CONTROL

- A. Provide erosion control methods in accordance with requirements of authorities having jurisdiction.

3.14 MAINTENANCE

- A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades in settled, eroded, and rutted areas to specified tolerances.
- C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.
- D. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn, or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.15 DISPOSAL OF EXCESS AND WASTE MATERIALS

- A. Remove excess excavated material, trash, debris, and waste materials and dispose of it off Owner's property.

END OF SECTION 02200

SECTION 02301

EARTHWORK FOR BUILDINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract Special Provisions and Division 1 - General Requirements apply to work of this section.

1.2 SECTION INCLUDES

- A. Preparing subgrades for slabs-on-grade.
- B. Excavating and backfilling for buildings and structures.
- C. Excavating and backfilling trenches for utilities and pits for buried utility structures.

1.3 DEFINITIONS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
 - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- C. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
- D. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
 - 1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
 - 2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.
- E. Fill: Soil materials used to raise existing grades.
- F. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 3/4 cu. yd. or more in volume that exceed a standard penetration resistance of 100 blows/2 inches when tested by a geotechnical testing agency, according to ASTM D 1586.
- G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- H. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- I. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 INFORMATIONAL SUBMITTALS

- A. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:
 - 1. Classification according to ASTM D 2487.
 - 2. Laboratory compaction curve according to ASTM D 698.

1.5 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.
 - 1. Do not proceed with work on adjoining property until directed by Architect.
- C. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth moving operations.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soil Classification Groups GC, SC, GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
 - 1. Liquid Limit: 25.
 - 2. Plasticity Index: 15 maximum
 - 3. Percent Retained on No. 4 Sieve: 25-50.
 - 4. Percent Retained on No. 40 Sieve: 50-85.
- C. Unsatisfactory Soils: Soil Classification Groups CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- E. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.
- F. Sand: ASTM C 33; fine aggregate.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth moving operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

- A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
 - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
 - 2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:
 - a. 24 inches outside of concrete forms other than at footings.
 - b. 12 inches outside of concrete forms at footings.
 - c. 6 inches outside of minimum required dimensions of concrete cast against grade.
 - d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
 - e. 6 inches beneath bottom of concrete slabs-on-grade.
 - f. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide.

3.5 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
 - 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
 - 2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

3.6 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.
 - 1. Clearance: 12 inches each side of pipe or conduit.
- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
 - 1. For pipes and conduit less than 6 inches in nominal diameter, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
 - 2. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe or conduit circumference. Fill depressions with tamped sand backfill.
 - 3. For flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support conduit on an undisturbed subgrade.
 - 4. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

3.7 SUBGRADE INSPECTION

- A. Notify Architect when excavations have reached required subgrade.
- B. If Architect determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll subgrade below the building slabs with a pneumatic-tired and loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 - 1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
 - 2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.
- D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.8 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings with engineered fill material. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Architect.
 - 1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

3.9 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.10 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
 - 2. Surveying locations of underground utilities for Record Documents.
 - 3. Testing and inspecting underground utilities.
 - 4. Removing concrete formwork.
 - 5. Removing trash and debris.
 - 6. Removing temporary shoring and bracing, and sheeting.
 - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.11 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- C. Trenches under Footings: Backfill trenches excavated under footings and within 18 inches of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Section 03300 - Cast-in-Place Concrete.
- D. Backfill voids with satisfactory soil while removing shoring and bracing.
- E. Place and compact initial backfill of satisfactory soil, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.
 - 1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- F. Place and compact final backfill of satisfactory soil to final subgrade elevation.

3.12 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
 - 1. Under building slabs, use satisfactory soils.
 - 2. Under footings and foundations, use satisfactory soils.
- C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.13 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.14 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
 - 1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.

3.15 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
- C. Grading Inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.16 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

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- C. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
 - 1. Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.
 - 2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet or less of wall length, but no fewer than two tests.
 - 3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length, but no fewer than two tests.
 - D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.17 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.
- B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.
 - 1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION

SECTION 02350

EXCAVATING, BACKFILLING AND SUBGRADE PREPARATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract Special Provisions and Division 1 - General Requirements apply to work of this section.

1.2 SECTION INCLUDES

- A. The work covered by this section includes the preparation of ground surfaces in areas of roadway surfacing and/or unpaved landscape areas. Refer to other spec sections for building pad construction. Preparation of the ground surfaces shall include all necessary grading excavating, filling, backfilling, borrowing and stockpiling of material, disposing of unacceptable or excess material, wetting, compacting, shaping and rolling.
- B. The Contractor shall furnish all materials, equipment, tools, labor, superintendence and incidentals required to perform the work as indicated on the drawings, as directed by the Engineer, and as specified herein.
- C. The work shall be performed to the dimensions, typical sections, and lines and grades indicated on the drawings or established by the Engineer and in accordance with these specifications.

1.3 RELATED SECTIONS

- A. Section 02301 - Earthwork for Buildings.

PART 2 - PRODUCTS

It shall be the responsibility of the Contractor to fully inform himself as to job site conditions and materials to be encountered prior to submitting his Proposal, and he shall include in that proposal all costs of such preliminary investigations, as well as all costs for performing the work covered by this section, including any necessary dewatering or rock excavation.

The use of explosives will not be permitted. There is no allowance for rock.

2.1 MATERIALS

- A. Fill and backfill material used for fill and backfilling under pavement(s) shall be free of any organic or deleterious substances. The fill material shall show low shrinkage or swelling when subjected to changes in moisture content, and its liquid limit shall be 35 or less.
 - 1. Maximum Aggregate Size: 3.0 inches
 - 2. Percent Retained on No. 4 Sieve: 25-50
 - 3. Percent Retained on No. 40 Sieve: 50-85
 - 4. Plasticity Index: 15 maximum.
- B. Suitability of potential fill material shall be determined by grain size analysis and tests for liquid limit, plastic limit, and shrinkage performed in accordance with applicable ASTM designations.

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- C. Under no circumstances shall rubble material or deposits of clay (defined as material have a PI greater than 18 be used to compromise any part of the fill or backfill. Undesirable materials encountered during excavation shall be wasted and disposed of at the Contractor's expense. All excess excavation which cannot be reused as backfill shall be disposed at the Contractors expense.
 - D. No frozen material shall be placed in fills or backfills, and no material shall be placed and compacted during periods when freshly placed material would become frozen.

PART 3 - EXECUTION

3.1 GRADING AND EXCAVATING:

- A. This work shall consist of removing all materials to the dimensions, typical sections, lines and grades shown on the drawings or established by the Engineer. The work shall include removal of all materials encountered, regardless of their nature; removal of materials which are unsuitable for use in subgrades, fills and backfills; stockpiling of suitable soils for use in fills or backfills; and the satisfactory disposal of unsuitable soil, vegetation, debris, or other deleterious materials encountered within areas of excavation.
- B. All areas involved in the construction shall be graded as shown on the drawings or as directed by the Engineer. These areas shall be shaped to drain away from the construction area and shall be maintained free of trash and debris until completion of the work.
- C. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific written direction of the Engineer. Unauthorized excavation, as well as remedial work directed by the Engineer, shall be at the expense of the Contractor.
- D. Prior to placement of fill or backfill, all excavations and potential fill materials shall be inspected and approved by the Engineer. The excavation shall be underlain by natural non-expansive soils and not by undesirable soil materials or clay soils.
- E. After excavation to the required elevation or prior to placement of fill, the upper 6 inches of the excavated area shall be scarified and shall be compacted to the density required herein or as indicated on the Contract Drawings.

3.2 BORROW

- A. If sufficient suitable material is not available from the excavated areas at the job site, the Contractor shall provide additional suitable materials as required to complete backfills and to construct all fills to the typical sections, lines and grades shown on the drawings or established by the Engineer. All costs of providing the borrow material, developing the source of borrow, and excavating and hauling the material shall be included in the most applicable bid item.

3.3 FILLING AND BACKFILLING

- A. Filling and backfilling shall be performed as necessary to complete the preparation of ground surfaces to the typical sections and the lines and grades shown on the drawings or established by the Engineer.

3.4 CONSTRUCTION METHODS

- A. The base of excavations shall be moistened and shall be compacted to a dry density which is not less than 95 percent of maximum as determined by ASTM D 1557. Fill material shall be

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- placed in lifts not to exceed eight (8) inches in depth and then compacted. The moisture content of the material shall be uniform and within, plus or minus, two (2) percent of optimum, as determined by ASTM D 3017 or as otherwise accepted by the Engineer. Water shall not be pooled or jetted onto the in-place fill, but should be distributed uniformly over its surface.
- B. Compaction of fill material shall be with approved types of pneumatic or tamping equipment. Heavy vibratory compaction equipment shall not be used adjacent to previously completed buildings, structures or foundations. Each lift of fill material shall be compacted to a dry density which is not less than 95 percent of maximum as determined by ASTM D 1557.
 - C. Control of filling operations shall consist of field inspection and testing, as determined by ASTM D 2922, to determine that each lift of fill has been compacted to the required density. Should any lift or portion of a lift not conform to density requirements, it shall be scarified and recompacted until the required density is obtained.

3.5 SUBGRADE

- A. After completion of excavation or filling and backfilling, the surfaces of the excavated or filled areas shall be prepared as subgrade for pavement base course or for the construction of concrete items. The subgrade shall be the thicknesses shown on the drawings.
- B. The subgrade shall be scarified, plowed or otherwise loosened; shall be wetted, shaped and rolled with approved rollers. The rolling shall be continued until a density of not less than 95 percent is obtained. The testing will be as outlined in ASTM D 1557; method to be selected by the Testing Laboratory and approved by the Engineer.
- C. When the required compaction is achieved the subgrade shall be finished to the line and grades as shown on the plans or as directed by the Engineer. The subgrade shall be kept in good condition as required and shall be safe for traffic until such time as the base course is constructed. Periodic wetting of the subgrade will be required to maintain density and to keep down dust from traffic.

3.6 SUBGRADE INSPECTION

- A. Notify Engineer when excavations have reached required subgrade.
- B. If Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll sub-grade below the building slabs with a pneumatic-tired and loaded roller weighting not less than 25 tons with tire pressure being not less than 110 psi to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 - 1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
 - 2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer, and replace with compacted backfill or fill as directed.
- D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer, without additional compensation.

END OF SECTION

SECTION 02511

ASPHALTIC CONCRETE SURFACING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract Special Provisions and Division 1 - General Requirements apply to work of this section.

1.2 RELATED SECTIONS

- A. Section 02231 - Aggregate Base Course.
- B. Section 02350 – Excavation, Backfilling and Subgrade preparation.

1.3 SCOPE

- A. This section covers the requirements for constructing an asphaltic concrete surface on a prepared base course in the locations and in conformity with the sections shown on the plans, as specified herein, or as directed by the Engineer. The Contractor shall furnish all materials, labor, superintendence and incidentals necessary to complete the work in accordance with the drawings and as specified herein.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Asphaltic Concrete
 - 1. Asphaltic concrete surfacing shall consist of a mixture composed of mineral aggregate and asphaltic material, mixed and applied while hot, placed on a previously completed base course. All methods employed in performing the work and all equipment, plant and machinery used for handling materials and executing a part of the work shall be subject to the approval of the Engineer before the work is started. Equipment, tools, machinery and plant shall be maintained in first class condition, and whenever found unsatisfactory shall be changed or improved as required.
 - 2. The surface course composed of mineral aggregate and bituminous material shall produce a mixture which, when designed and tested in accordance with these specifications and the most recent TxDOT standard test methods, shall have the following laboratory density as a percentage of the maximum theoretical density and stability:

Density %	Stability %
Min.- 96 Max. - 98 Optimum – 97	Not less than 35

- 3. The surface on which the asphaltic concrete pavement is placed must be dry and have a surface temperature of 50°F. or higher as measured with a handheld infrared thermometer. The asphaltic mixture shall not be placed when the air temperature is

below 45°F and falling, but it may be placed when the air temperature is above 40°F and rising. Materials shall be placed only when the weather conditions and the moisture conditions of the roadway surface are suitable, in the opinion of the Engineer. Weather limitations may be waived by the Engineer.

4. The paving mixture shall be composed of a uniform mixture of coarse aggregate, fine aggregate, mineral filler, and asphaltic cement. The material forming the mixture shall be proportioned by weight. The grading of each constituent shall be such as to produce, when proportioned, a mixture conforming to the limitations for grading of Type D surface or wearing course meeting Item 340 of the 2004 TxDOT Standard Specifications. Where multiple lifts are required, asphalt that will not be used for surface or wearing courses may be comprised of TxDOT Item 340 Type B or C material. In no case shall slag or LRA (Limestone Rock Asphalt) be permitted. The asphalt material content, as shown in the job mix formula, shall form approximately six percent (6%) of the mixture by weight. The thickness and type of the asphaltic concrete shall be as shown on the drawings and as stated in the Proposal.

B. Coarse Aggregate

1. Coarse aggregate shall be that part of the aggregate retained on a No. 8 mesh sieve and shall consist of clean, tough, durable fragments of stone or gravel conforming to TxDOT Item 302, Type A, of uniform quality throughout. It shall be free from dirt, organic or other injurious matter occurring either free or as a coating on the aggregate. The rock from which the aggregate is produced shall have a percentage wear of not more than forty percent (40%) when subjected to the Los Angeles Abrasion Test (Test Method TEX-410-A).
2. Crushed aggregate shall contain at least 75% by weight of crushed pieces having two or more fractured faces and at least 95% by weight of particles with one or more fractured faces. The area of each face shall be equal to at least 75% of the smallest midsectional area of the piece. When two fractures are contiguous, the angle between planes of fractures shall be at least 30 degrees to count as two fractured faces.

C. Fine Aggregate

1. The fine aggregate shall be that part of the aggregate passing the No. 8 mesh sieve and shall consist of sand or stone screenings or a combination thereof. Sand shall be composed of clean, sound, durable particles free from loam, coating or other deleterious substances. Screenings shall be of the same or similar materials as specified for coarse aggregate.
2. That portion of the fine aggregate including any blended filler, passing a No. 30 mesh sieve shall have a plasticity index of not more than 6 as determined by test method TEX-106-E, and a liquid limit of not more than 25 as determined by test method Tex-104-E.

D. Mineral Filler

1. The mineral filler shall consist of thoroughly dry stone dust, slate dust, Portland cement or other mineral dust approved by the Engineer. It shall be sufficiently dry, free-flowing, and free from injurious materials. Mineral filler shall meet the following grading requirements:

Passing a No. 30 100%
Passing a No. 200 mesh sieve 55-100%

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- E. Asphaltic Cement
 - 1. Asphaltic cement for the hot mix asphaltic concrete shall be homogenous, free of water and shall not foam when heated to 347°F. In addition, it shall meet the specifications of Performance Grade 64-22 or approved equal Asphaltic Cement as specified in Item 300 of the 2004 TxDOT Standard Specifications. The deviation from the final approved mix design for bitumen content will be limited to plus or minus 0.3 percent.
 - F. Additive
 - 1. Add a liquid anti-stripping agent that is in accordance with Item 301 of the 2004 TxDOT Standard Specifications to the hot mix asphaltic concrete. The additive shall be applied in accordance with the manufacturer's recommendations with a minimum of 0.5% required. The percentage of additive to be used shall be included in the job mix submitted to the Engineer for approval.
 - G. Prime Coat and Tack Coat
 - 1. The asphalts for the prime coat shall be cut back asphalt of the Medium Curing type, MC-30. The tack coat shall be cutback asphalt of the rapid curing type, RC-250. The asphalts used shall meet 2004 TxDOT Standard Specifications Item 300, Tables 4 and 5.
 - 2. Neither the prime coat nor the tack coat shall be applied when the air temperature is below 50°F. and falling, but may be applied when the air temperature is 40°F. and is rising. No prime coat or tack coat shall be applied when the general weather conditions, in the opinion of the Engineer, are not suitable.
 - H. Tests
 - 1. The Contractor shall furnish test certificates made by a competent commercial laboratory on each material source, as specified in this section, which he proposes to use before any such material is ordered or shipped. No material may be used until such test result certificates have been examined by the Engineer and the source and quality of the material approved. The asphaltic concrete mix design proposed for the project shall be approved by the Engineer before laying the asphalt concrete. The cost of all preconstruction tests shall be borne by the Contractor. Additional test certificates shall be furnished on the aggregate if the material source is changed.

2.2 EQUIPMENT

- A. All equipment used in the construction of the asphaltic concrete surfacing shall meet the approval of the Engineer and be maintained in first class condition throughout the period of construction.
- B. The asphalt distributor for prime and tack coat shall be an approved type, self-propelled pressure distributor, so constructed and operated as to distribute the material evenly and smoothly in the quantity specified or directed. Suitable means for heating, controlling the heat, determining the temperature of the contents of the tank, adjusting and controlling the rate of application and for measuring the volume of asphalt shall be provided. The distributor shall be calibrated prior to application of any material under these specifications or a certificate of calibration, satisfactory to the Engineer, shall be supplied by the Contractor.
- C. Trucks in which the material is hauled from the plant to the point of deposition, shall be tight to the material transported and so constructed that the entire load may be quickly dumped at the point of deposition. Trucks shall be clean of all foreign materials and maintained in a satisfactory condition.
- D. Equipment for rolling the surface shall minimally consist of a three-wheel roller weighing not less than ten (10) tons, a two axle tandem roller weighing not less than eight (8) tons

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- and a self-propelled pneumatic roller equipped with tires that will afford ground contact pressures of 90 pounds per square inch or more. Other small equipment such as shovels, hand tamps and smoothing irons shall be furnished and maintained in good condition.
- E. The spreading and finishing machine shall be of a type approved by the Engineer, shall be capable of producing a surface that will meet the requirements of the typical cross section and the surface test, when required, and when the mixture is dumped directly into the finishing machine shall have adequate power to propel the delivery vehicles in a satisfactory manner. The finishing machine shall be equipped with a flexible spring and/or hydraulic type hitch sufficient in design and capacity to maintain contact between the rear wheels of the hauling equipment and the pusher rollers of the finishing machine while the mixture is being unloaded. The paving machine shall be equipped with a heated compacting screed with an approved automatic dual longitudinal screed control system and an automatic transverse screed control system. The longitudinal controls shall be operated from a ski type grade reference using a ski of not less than 18 feet in length. Other types of grade reference may be used with the Engineer's approval. The selected grade reference equipment shall be maintained in good operating condition by personnel trained in the use of the specified type of equipment. The Contractor shall furnish all labor and equipment required for establishing and maintaining appropriate grade reference.

PART 3 - EXECUTION

3.1 APPLICATION OF PRIME AND TACK COATS

- A. A prime coat of asphalt shall be applied to the entire Flexible Base surface prior to placing the surface course.
- B. A tack coat of asphalt shall be applied to all surfaces which are to receive an asphaltic concrete surface course. The tack coat shall be applied immediately prior to placing the surface course. When the mixture will adhere to the surface on which it is to be placed without the use of a tack coat, the tack coat may be eliminated with the Engineer's approval.
- C. The prime coat shall be applied at least 24 hours in advance of placing the surface course. If required, the base course shall first be brought truly to the section and grade as established and shall be tested with a satisfactory 10-foot straightedge. Any deviation in excess of 1/4-inch from the straightedge or from true cross section shall be corrected by scarifying then adding or removing material, reshaping and compacting by sprinkling and rolling. No "scab" nor "featheredge" patches will be permitted. After correction of any defects in the base, it shall be cleaned of all foreign material and all dust and loose particles shall be swept from the surface with a rotary broom, or by another approved method, until the surface is in a condition to receive the prime coat.
- D. When the base is in proper condition, the prime coat shall be applied with an approved distributor at a rate of 0.20 - 0.30 gallon per square yard. The tack coat shall be applied at a rate of approximately 0.05 - 0.10 gallon per square yard. The asphalt shall be applied at the temperature recommended by the Asphalt Institute. Application by means of hose and spray attached to the distributor will be permitted upon approval by the Engineer, in areas inaccessible to the distributor. The prime coat shall not be applied during periods of inclement weather nor on a base which contains an excess of water. No traffic shall be permitted over the freshly applied prime coat, but, when it has penetrated and/or cured sufficiently that the wheels of vehicles do not track or pick up oil from the surface, the surface course may be placed thereon. If the prime coat is damaged before placing the surface course, such damage shall be repaired as directed and the surface shall be cleaned

of any dirt, dust, or other foreign material which may have accumulated thereon, immediately prior to placement of the surface course. The prime coat shall cure for not less than 24 hours after placing before any surface courses are applied to the base, or a longer period of time if the prime coat, in the opinion of the Engineer, has not properly cured. Prime coats shall not be applied more than 7 days in advance of placing the surface course. Areas that have been primed longer than the time specified above prior to placing the surface course shall be reprimed at the Contractor's expense.

3.2 ASPHALTIC CONCRETE LAYING

- A. After the tack coat has been applied and the areas to be paved have been put in proper condition to receive the surfacing, the asphaltic concrete mixture, heated and prepared as specified, shall be hauled to the point of placement and placed on the prepared surface. The mixture shall be so spread by the finishing machine in a uniform layer, that the finished thickness, as specified, is obtained over the entire area to be surfaced, after compaction. Laying shall be by means of the mechanical finishing machine wherever this is possible. Automatic screed controls will be required as previously noted in Section 2.2.E. of this specification. Each layer will be a minimum of 1" depth and a maximum of 2" depth unless shown otherwise on the plans or directed by the Engineer. Hand placing will be permitted where it is impracticable to operate the finishing machine. When hand placing is used, the material shall be dumped outside the area on which it is to be spread, and the entire load shall be spread and shaped so that the specified amount is placed on the base. Compaction shall be by means of lightly oiled, hot hand tamps. All contact surfaces of gutters and structures shall be painted with a thin, uniform coating of cut-back asphalt as required for the tack coat. The mixture when placed, shall be at a temperature of between 275°F. and 350°F unless recommended otherwise by the manufacturer. The dispatch of vehicles and placing of material, shall be done in a manner which will cause as little loss of heat as possible.

3.3 COMPACTION

- A. While still hot and as soon as it will bear the weight of the roller without undue displacement or hair cracking, the surface shall be rolled to the required density by any method, type and size of equipment which will give the required density. Pavement shall be rolled in a longitudinal direction, beginning at the side, and progressing toward the crown of the pavement. Each successive trip of the roller shall overlap the previous one by one-half (1/2) of the width of the roller wheel. Alternate trips shall be of slightly different length. The motion of the roller shall at all times be slow enough to avoid displacement of the hot mixture, and any displacement occurring shall immediately be corrected by the use of rakes and fresh mixture, if required. Rolling shall continue until the surface has been thoroughly compacted, is of a uniform texture, is true to grade and cross section, and all roller marks are eliminated. Adjacent to the gutters the surface shall be finished uniformly high so that when compacted it shall be slightly above the gutter lip. The rollers shall not be allowed to stand on pavement which has not cooled to normal atmospheric temperature. To prevent adhesion of the surfacing to the roller, the wheels shall be kept properly moistened with water but an excess of water will not be permitted. Necessary precautions shall be taken to prevent the dripping of gasoline, oil, grease or other foreign material on the pavement either when the rollers are in operation or when standing.
- B. Use tamps to thoroughly compact the edges of the pavement along curbs, headers, and similar structures and in locations that will not allow thorough compaction with the rollers.

The Engineer may require rolling with a trench roller on widened areas, in trenches, and in other limited areas.

3.4 JOINTS

- A. Joints between successive strips and between existing and new paving shall be carefully made in such a manner as to insure a thorough and continuous bond between the old and new surfaces. The roller shall pass over the unprotected end of the freshly laid mixture only when the laying of the mixture is discontinued for such a length of time as to permit the mixture to become chilled. In all cases, when the work is resumed, the material laid shall be cut back to its full depth so as to expose a fresh vertical surface, true to grade, cross section and properly compacted. All such surfaces, as well as the edge of a strip against which another strip is to be placed, shall be painted with tack coat prior to placement of fresh material against it. Joints with existing surfacing shall be constructed substantially as specified above in a manner which will produce a smooth continuous surface between the old and new sections.

3.5 THICKNESS TEST

- A. Thickness tests shall be done by lot with a lot being the amount of surface laid in one day. No lot shall exceed 10,000 square yards. If a day's laying exceeds 10,000 square yards, that day's laying shall be divided into two approximately equal lots.
- B. Thickness tests will be made by the Engineer for total depth of the completed asphaltic concrete pavement. Test specimens shall be 6-inch nominal core with a minimum diameter of 5-5/8" and shall be taken from the asphaltic concrete course at locations designated by the Engineer.
- C. For testing each lot shall be divided into four sublots of approximately equal size. The Engineer will locate one test location for each 1,000 square yards and/or fraction thereof in each sublot using random numbers in accordance with TxDOT Test Method Tex-225-F. If the test location falls within one foot of a longitudinal joint or lip of a gutter or within two feet of an unsupported edge or within 15 feet of the beginning or ending edge of a pass, the Engineer will relocate the test location using random numbers. Each specimen will be removed from the designated test location, marked and the pavement marked adjacent to the test location for future reference. The specimen will be measured for conformance with the specifications.
- D. If a lot contains less than 2,000 square yards, the Engineer may, at his option, divide the lot into two (2) equal sublots and proceed as above. The minimum number of tests for any lot shall be two (2).
- E. The thickness of a specimen shall be determined by averaging four (4) measurements obtained from opposite locations. Acceptability will be based on the mean of the thickness of each core in the lot. For determining the average specimen thickness, those specimens in excess of design thickness shall be considered at design thickness.
- F. The Contractor shall produce a pavement with the minimum thickness indicated. Should the mean of the core tests for a lot indicate a variance in thickness greater than 1/4" under the plan requirements, the lot shall be removed and replaced, or overlaid as indicated below.
- G. If the thickness of the asphaltic concrete proves to be less than required, the Contractor may replace or overlay the deficient areas as agreed by the Engineer. Overlays will be a thickness not less than 1 inch. Overlays will require the milling of asphalt adjacent to concrete curb and gutter to maintain the transverse profile.

3.6 COMPACTION TESTS

- A. Compaction tests will be made on the asphaltic surfacing on a lot basis using the cores obtained for thickness determination. The percent density for acceptance of a lot will be calculated using maximum theoretical specific gravity of the mixture. Asphaltic surfacing not meeting these specifications shall be removed and replaced.

<u>Average Percent Density of a Lot</u>	<u>Percent of Contract Unit Price to be Paid</u>
97.1 and Greater	0
92.0 - 97.0	100
91.0 - 91.9	90
90.0 - 90.9	75
Less than 90	Reject

3.7 SURFACE TESTS

- A. The surface of the pavement after compaction shall be true to the grades and cross sections as established. The Contractor shall provide a ten (10) foot straightedge. The maximum ordinate measured from the face of the straightedge shall not exceed one-eighth (1/8) inch at any point. Any humps or depressions exceeding the specified tolerance or which retain water on the surface shall be corrected by removing the defective work, replacing with new material and recompacting or milling the surface. In no case shall these corrective efforts be allowed to reduce the thickness of the asphaltic concrete surfacing below the minimums indicated. Irregularities shall be corrected as directed by the Engineer and shall meet his satisfaction, at the expense of the Contractor.

3.8 CLEANUP

- A. After completion of placement of the wearing course, all debris resulting from the construction shall be cleaned up and removed from the site of the work. Areas, which have been disturbed during the construction, shall be raked or graded as required and left in a clean and neat condition. Gutters shall be cleaned of all dirt, aggregate, or other material which would clog the gutter. The entire premises of the work shall be left in a clean condition satisfactory to the Engineer, and all costs of cleanup shall be borne by the Contractor.

END OF SECTION

SECTION 02513

PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract Special Provisions and Division 1 - General Requirements apply to work of this section.

1.2 DESCRIPTION

- A. This item shall consist of the painting of markings and stripes on the surface of pavements applied in accordance with these specifications and at the locations shown on the plans, or as directed by the Architect/Engineer.

PART 2 - PRODUCTS

2.1 MATERIALS

Paint shall meet the following specifications:

- A. Federal Test Method Standard No. 141, Methods 4121, 4184, 4281, 6121
- B. Fed. Spec. TT-P-85b
- C. Fed. Spec. TT-P-115A
- D. Fed. Spec. TT-14-16, Methods 408.1, 409.1, 409.2
- E. ASTM Designation D771-5S

PART 3 - EXECUTION

3.1 CONSTRUCTION METHODS

- A. Weather Limitations
 - 1. The painting shall be performed only when the surface is dry, when the atmospheric temperature is above 45°F (7°C), and when the weather is not foggy or windy.
- B. Equipment
 - 1. All equipment for the work shall be approved by the Architect/Engineer and shall include the apparatus necessary to properly clean the existing surface, a mechanical marking machine, and such auxiliary hand-painting equipment as may be necessary to satisfactorily complete the job.
 - 2. The mechanical marker shall be an atomizing spray-type marking machine suitable for application of traffic paint. It shall produce an even and uniform film thickness at the required coverage and shall be designed so as to apply markings of uniform cross sections and clear-cut edges without running or spattering.

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- C. Preparation of Surface
 - 1. Immediately before application of the paint, the surface shall be dry and free from dirt, grease, oil, laitance or other foreign material which would reduce the bond between the paint and the pavement. The area to be painted shall be cleaned by sweeping and blowing or by other methods as required to remove all dirt, laitance and loose materials.
 - 2. Paint shall not be applied to portland cement concrete pavement until the concrete in the areas to be painted is clean of curing material. Sandblasting or high pressure water shall be used to remove curing material from concrete surfaces.
 - D. Layout of Markings
 - 1. On those sections of pavement where no previously applied markings are available to serve as a guide, the proposed markings shall be laid out in advance of the paint application.
 - E. Application
 - 1. Markings shall be applied at the locations and to the dimensions and spacing shown on the plans. Paint shall not be applied until the layout and condition of the surface have been approved by the Architect/Engineer.
 - 2. The paint shall be mixed in accordance with the manufacturer's instructions and applied to the pavement with a marking machine at the rate of 100 to 110 square feet (9 to 10 square meters) per gallon (liter). The addition of thinner will not be permitted. A period of 15 days shall elapse between placement of a bituminous surface course or seal coat and application of the paint.
 - 3. The edges of the markings shall not vary from a straight line more than ½ inch (12mm) in 50 feet (15 m), and the dimensions shall be within a tolerance of plus or minus 5 percent. If indicated on the plans, glass spheres shall be distributed to the surface of the marked areas immediately after application of the paint. A dispenser shall be furnished which is properly designed for attachment to the marking machine and suitable for dispensing glass spheres. The spheres shall be applied at the rate of 10 pounds per gallon (1.2 kg per liter) of paint.
 - 4. The Contractor shall furnish certified test reports for the materials shipped to the project. The reports shall not be interpreted as a basis for final acceptance. The Contractor shall notify the Architect/Engineer upon arrival of a shipment of paint to the job site. All emptied containers shall be returned to the paint storage area for checking by the Architect/Engineer. The containers shall not be removed from the site or destroyed until authorized by the Engineer.
 - F. Protection
 - 1. After application of the paint all markings shall be protected from damage until the paint is dry. All surfaces shall be protected from disfiguration by spatter, splashes, spillage or drippings of paint.

END OF SECTION

SECTION 02521

CONCRETE CURBS, GUTTERS AND SIDEWALKS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract Special Provisions and Division 1 - General Requirements apply to work of this section.

1.2 SECTION INCLUDES

- A. Curb and gutter, concrete driveways, sidewalks, drainage aprons, and miscellaneous concrete paving work.

1.3 RELATED SECTIONS

- A. Section 02231 - Aggregate Base Course: Base preparation.
- B. Section 02511 - Asphaltic Concrete Surfacing Adjacent construction.
- C. Section 02522 – Structural Portland Cement Concrete for Site Work: Adjacent construction.
- D. Section 02764 – Pavement Joint Sealants: Joint sealants used in concrete sidewalks.

1.4 REFERENCES

- A. ASTM A185 – Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete
- B. ASTM A615 – Deformed Billet-Steel Bars for Concrete Reinforcement.
- C. ASTM C33 – Standard Specification for Concrete Aggregates
- D. ASTM C40 – Standard Test Method for Organic Impurities in Fine Aggregates for Concrete
- E. ASTM C94 – Standard Specification for Ready-Mixed Concrete.
- F. ASTM C150 – Standard Specification for Portland Cement
- G. ASTM C309 – Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- H. AASHTO T104 – Standard Method of Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
- I. AASHTO T96 – Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
- J. ACI Manual of Standard Practice
- K. ACI Detailing Manual
- L. ASTM D1557 – Laboratory Compaction Characteristics of Soil Using Modified Effort.
- M. ASTM D 1751 – Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

1.5 SUBMITTALS

- A. Certificates:
 - 1. The Contractor shall furnish results of tests made by a competent commercial laboratory on each material source he proposes to use before start of construction and material shall

not be shipped until such results have been examined by the Architect and the source of material approved. Laboratory mix designs and conformation cylinders will not be required for this project. However, the proposed mix for each class of concrete shall be submitted to the Architect for approval prior to placing any concrete. The cost of all pre-construction tests shall be borne by the Contractor. Additional test certificates shall be furnished on the aggregate if the material source is changed.

B. Curb and Gutter Cross-Section

1. Should the Contractor desire to use metal templates which differ slightly from the sections shown on the plans, such templates or drawings thereof shall be submitted for approval. Slight differences which will not affect the general appearances of the curb and gutter sections will be approved but no forms or templates shall be used which have not been approved by the Engineer.
2. Furnish, shall conform to provisions of Plant tests and certificates of conformity with specifications the with each carload of cement.

C. Reinforcing

1. Four (4) sets of Fabrication shop drawings shall be furnished the Architect and shall receive his approval before any reinforcing steel is fabricated.

D. Curing

1. The materials and method of application shall be approved by the Architect before concrete placement begins.

1.6 QUALITY CONTROL

- A. Concrete shall not be placed when the temperature is less than 40° F. and under no circumstances shall it be placed on frozen ground.
- B. All reinforcement shall be permanently marked with grade identification marks or shall, on delivery, be accompanied by a manufacturer's guarantee of grade and compliance with these specifications.
- C. Templates shall be maintained in good condition and warped or bent templates shall not be used.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Cement delivered in bags shall be marked plainly with the brand name of the manufacturer and a bag shall contain ninety-four (94) pounds of cement. Cement from different mills, though tested and approved, shall not be mixed. Cement shall be stored and handled in manner which will protect it from dampness and any cement which has become partially set or which contains hard lumps or cakes shall not be used.
- B. Reinforcement stored on the site shall be protected for accumulations of grease mud or other foreign matter and from rust producing conditions. Bars shall be free from rust, scale, oil, mud or structural defects when incorporated in the structures.

1.8 UNIT PRICES

- A. The cost of excavation, embankment, grading for curb, gutter, combined curb and gutter and other concrete structures or concrete work shall be included as a part of and paid for in the cost of each item bid.

PART 2 - MATERIALS

2.1 FORMS

- A. Curb and Gutter Forms:
 - 1. Straight Sections: Rigid metal forms, straight, free of warp and of a depth equal to depth of the concrete section formed. The forms shall consist of a back form and gutter form with steel templates.
 - 2. Radius Sections: Flexible steel forms.
 - 3. Templates: Steel templates shall have the shape of the cross-section of the curb and gutter except the bottom portion of the template shall be cut away to allow for a solid mass of concrete. An acceptable shape is shown on a detail sheet of the plans; however, other shapes may be used upon submission of a design and the approval of the Architect.
- B. Machine Laid Curb and Gutter
 - 1. The concrete curb and gutter sections may be formed with a curb and gutter laydown machine, provided the machine is capable of laying the curb and gutter to the proper grade, alignment and cross-section, and is equipped with adequate vibrators to produce a dense concrete free of honeycombs.
 - 2. Laydown machines that cannot meet the above requirements will not be acceptable for use.
- C. Sidewalk Forms

2.2 CONCRETE MATERIALS

- A. Cement: ASTM C-150, Type I or ASTM C-150, Type III, High Early Strength Cement with approval by the Engineer.
- B. Fine Aggregate: Natural sand or mixture of such sands, consisting of clean, hard, durable uncoated grains, free from lumps. Deleterious substances shall not exceed the following percentages by weight:

Material removed by decantation.....3.0%
Clay Lumps0.5%
Other deleterious substances such as coal,
shale coated grains and soft flaky particles3.0%

- 1. The aggregate shall be free from a harmful amount of salt or alkali and, when subjected to the color test for organic impurities shall not have a color darker than Fig. No. 2 (Test in accordance with A.S.T.M. Designation C-40).
- 2. Material which contains frozen lumps or wood, hay, burlap, paper, dirt or other foreign matter mixed with the aggregate in stock piles or in handling shall not be used
- 3. Fine aggregate shall be well graded from fine to coarse and shall meet the following requirements (ASTM C-33):

Passing 3/8" Sieve..... 100%
Passing No. 4 Sieve..... 95 - 100%
Passing No. 8 Sieve..... 80 - 100%
Passing No. 16 Sieve..... 50 - 85%
Passing No. 30 Sieve..... 25 - 60%
Passing No. 50 Sieve..... 10 - 30%
Passing No. 100 Sieve..... 2 - 10%

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- C. Coarse Aggregate: Crushed stone, gravel, or crushed gravel, or any combination of them, composed of hard, tough and durable particles free from adherent coating, free of salt, alkali, vegetable matter and soft, friable, thin or elongated particles and the substances listed below shall not be present in excess of the amounts indicated:

Soft Fragments 5% by weight
Clay Lumps 0.25% by weight
Removed by decantation * 1% by weight
(* ½ ? percent if consisting essentially of crusher dust)
The total deleterious substances shall not exceed 5% by weight

1. Grading of coarse aggregate shall conform to the following requirements (ASTM C-33 Size No. 57):

Maximum size - 1-inch sieve

Passing 1-inch sieve 95 - 100%
Passing 1/2-inch sieve 25 - 60%
Passing No. 4 sieve 0 - 10%

2. The coarse aggregate shall not show evidence of disintegration, nor show a total loss greater than eighteen (18) percent when subjected to five cycles of the sodium sulphate accelerated soundness test using AASHTO Designation T-104.
3. The percentage of wear shall not be more than 45 at 500 revolutions as determined by AASHTO Designation T-96.

- D. Water: Fresh, clean and free from injurious amounts of oil, acid, alkali or organic matter. The Contractor will provide at his expense the transportation of the water from the City mains to the places where it is to be used.

E. Reinforcing

1. Bar Reinforcement

- a. Deformed Bars: ASTM A615, Grade 60.
b. Plain Bars: ASTM A306, Grade 60.

2. Mesh Reinforcement: ASTM A185, spacing and wire gauge as shown on the drawings.
3. Fiber Reinforcing: "Fiber Mesh" or "Caprolan RC" or approved equal.

- F. Expansion joint material shall be an approved preformed bituminous impregnated non-extruding type jointing material, 1/2" thick (3/4" thick for machine laid curb and gutter), and shaped to the section of the curb and gutter, or concrete drainage apron.

G. Fabrication and Placing

1. Accurately fabricate to the dimensions and shapes shown on the drawings in accordance with ACI Manual of Standard Practice unless variations are specifically shown on the drawings.

2.3 PROPORTIONING

- A. The exact amounts of all material entering into the concrete shall be determined in the field in order to produce the desired durability, density, uniformity, workability and the specified strength. All materials shall be measured separately by methods, satisfactory to the Engineer, which will permit control of the concrete and production of a product of uniform quality. Particular care shall be used in measuring cement and water. One bag of cement will be

considered as ninety-four (94) pounds and one gallon of water as eight and thirty-three one-hundredths (8.33) pounds. Water contained in the aggregates shall be taken into account in calculating the amount of water to be added to the mixture. The percentage of fine aggregate to total aggregate shall be between 33% and 45%.

- B. Concrete for the designated uses shall conform to the following:

	Max. Water Content U.S. Gallons Per Sack of Cement	Min. Cement Content 94-lb. Sacks Per Cu. Yd.	Compressive Strength, Lbs. Per Sq. In.
Curb and Gutter, Gutter, Concrete Valley Gutters and Misc. Concrete Work	6.5	5.0	3000 at 28 days

2.4 MIXING

- A. Mix concrete in an approved batch type mixer equipped with a device for measuring the water which is accurate to within two percent (2%).
- B. Minimum time for mixing each batch after all ingredients are in the mixer: One and one-half (1 1/2) minutes.
- C. The speed of the mixer shall not exceed that recommended by the manufacturer.
- D. Excessive overmixing, requiring the addition of water to preserve the required consistency, will not be permitted.
- E. Discard concrete not in place within 45 minutes from the time of charging the drum, or which has developed initial hardening.
- F. Transit mixed concrete conforming to ACI 94 will be acceptable.
- G. Mix concrete for use in a curb and gutter laydown machine as specified above, and as required to form curb and gutter section with the laydown machine. Accurately control slump of concrete to prevent sagging or slumping of curb section behind laydown machine. Batches with excessive slump will be rejected.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before placing concrete, sprinkle subgrade or base surface so that it is in a thoroughly moistened condition (but not muddy).
- B. Complete preparation of curb and gutter subgrade at the time subgrade is constructed for adjacent street section.
- C. Oil forms with a light oil before each use and clean forms which are to be reused immediately after use.

3.2 EXCAVATION AND GRADING

- A. Conform to lines and grades shown on drawings or as established in field for excavation or embankment for curb, gutter, combined curb and gutter, and other miscellaneous concrete work.

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- B. Extend street subgrade six (6) inches beyond the back of curb and compact to 95% of maximum density as determined by ASTM D1557.
 - C. Where finished street subgrade is more than three (3) inches below bottom of proposed curb grade, fill with compacted caliche base to bring subgrade up to required bottom of curb elevation.
 - D. Where curb, gutter and combined curb and gutter pavement is on fill, place material – 8 in layers and compact, by appropriate methods, equal to that specified in Section -- 02230 - Aggregate Base Course.

3.3 FORMS

- A. Construct forms accurately to line and grade as established in the field and adequately brace so that they will not move during placing of the concrete.
- B. Leave forms in place at least twelve (12) hours after placing of concrete.
- C. Use flexible sheet steel forms for curb and gutter on curves with a radius of 130 feet or less.

3.4 JOINTS

- A. Expansion Joints: Provide an expansion joint at tangent point of each return at intersections, at intervals of not more than forty feet (40') between intersections (odd length sections as directed by Architect), and at end of each day's concrete pour.
- B. Construction or Contraction Joints
 1. Locate at 10-foot intervals, or at each template or as directed by Architect.
 2. Form construction or contraction joints for curb and gutter poured in metal forms using metal template plates accurately shaped to cross-section shown on drawings plans and so constructed that they can be removed during finishing operations.
- C. Place all joints perpendicular to surface of concrete and to axis of section.
- D. In machine laid curb and gutter make contraction joints at 10-foot intervals by cutting into the curb and gutter sections with a trowel a depth of approximately 2"; finish joints as specified under finishing. Place expansion joints at end returns, but not to exceed a maximum spacing of three hundred feet (300'), and at the end of each day's concrete pour.

3.5 REINFORCING

- A. Fiber reinforcing may be used in lieu of wire mesh for pedestrian sidewalks with material and rate of application approved by Architect.
- B. Hold bars rigidly in place with approved metal devices in accordance with the ACI Detailing Manual.
- C. Provide 1 2 inches of concrete cover for bars in slabs unless otherwise noted on the drawings.
- D. Where details on splices are not shown or where unanticipated splices are required, make in a region of minimum stress and of lap length as required by ACI Code.

3.6 CONCRETE

- A. Deposit in place in such a manner as to require minimum of re-handling and place in a manner which will produce a uniformly dense section, free of honeycomb or other voids, conforming to grade, thickness, and shapes shown on drawings.
- B. Thoroughly spade or vibrate concrete adjacent to forms or joints in order to eliminate honeycombing.

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- C. Accurately shape curb and gutter, gutter, concrete valley gutters, fillets, and other miscellaneous concrete work to cross section shown on drawings or approved by Architect.

3.7 FINISHING

- A. Finished to a surface of uniform texture by floating with a wood float and troweling.
- B. Finish both sides of all joints, lip of gutter, and back edge of curb with an approved edging tool before final brushing.
- C. Provide final finishing with a brush using a continuous stroke from back of curb to lip of gutter.
- D. Accurately shape and finish curves at top and bottom of curb sections to present a uniform appearance without "waves" in face of curb or "pockets" in gutters or slabs.
- E. Exercise particular care at valley gutters, both in setting forms and finishing, to insure that shape of gutter conforms to details of drawings and that no water pockets will be formed in gutter of pavement.
- F. At construction and contraction joints cut mortar full width of joint, and neatly finish with an approved edging or grooving tool of such design to groove the joint approximately 2" in depth.
- G. Neatly form and finish construction and contraction joints in machine laid curb and gutter with an approved edging or grooving tool of such design to groove the joint approximately 2" in depth.

3.8 PROTECTING AND CURING

- A. Burlap Method
 - 1. Cover all concrete work with burlap or other suitable material as soon as it has set sufficiently to prevent marking and keep wet continuously for at least four (4) days.
- B. Care shall be taken to prevent mechanical injury to concrete work during this period and until the work is accepted.
- C. All work damaged prior to acceptance shall be repaired to the satisfaction of the Engineer.
- D. Curing compound method
 - 1. In lieu of the above method of curing, the curb and gutter may be cured by applying a liquid membrane coating, conforming to ASTM C-309, to all exposed surfaces as soon as concrete has set sufficiently.
 - 2. Apply membrane to back and front of concrete curb and gutter as soon as forms have been removed.

3.9 PROTECTION

- A. Provide suitable means to prevent concrete from freezing for not less than 72 hours after placing. Remove and replace all concrete damaged by freezing. The addition of any admixture of chemicals to the concrete to prevent freezing shall not be allowed, unless specifically approved by the Architect.
- B. Provide suitable means to protect freshly poured concrete from rain damage. Keep such means readily accessible at all times during placement of concrete.
- C. Care shall be taken during the backfill and cleanup process not to scrape, chip, crack or otherwise damage the concrete including tire marks from equipment or trucks. All damaged concrete will be removed and replaced at the expense of the Contractor.

3.10 REMOVAL OF CONCRETE CURB, GUTTER, SIDEWALKS AND DRIVEWAYS

- A. The removal of all curbs, gutters, sidewalks and driveways that are required for the construction of the improvements as shown on the plans or as directed by the Architect shall be removed and disposed of by the Contractor and no separate payment will be made for this item of work.
- B. Remove sidewalks, driveways, curb and gutter to the limits as directed by the Engineer, and saw cut with a concrete saw unless the concrete is being removed to an existing construction joint.

3.11 DEFECTIVE WORK

- A. Removed and replace all defective work disclosed after forms have been removed.
- B. Defective work includes, but is not limited to deficient dimensions, section not constructed to the proper grade, concrete surface bulged, uneven, or shows honeycomb, which in the opinion of the Architect cannot be repaired satisfactorily.

3.12 BACKFILLING

- A. Backfill behind and adjacent to all concrete work including curb, gutter, sidewalks, drives, drainage structures and other miscellaneous concrete work using good quality topsoil free from organic material such as leaves, grass, roots and other unsuitable materials and free of rocks or stones.
- B. Provide a smooth, even slope between property line grade and top of curb or other concrete structure.
- C. Compact backfill behind curb and gutter to at least density of undisturbed natural ground in adjacent area.

3.13 ADJUSTING AND CLEANING

- A. Patch all honeycombed places in the back of the curb or face of gutter as directed by the Architect.

END OF SECTION

SECTION 02522

STRUCTURAL PORTLAND CEMENT CONCRETE FOR SITE WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract Special Provisions and Division 1 - General Requirements apply to work of this section.

1.2 SECTION INCLUDES

- A. This section of the specifications shall govern the materials and construction methods for concrete structures outside of the building. Any precast products utilized in the project shall be manufactured to meet or exceed these specifications.

1.3 CONCRETE MATERIALS TESTS

- A. Preconstruction Tests: The proposed concrete mix design shall be submitted to the Engineer for approval prior to placing any concrete. A laboratory design specific to this project will not be required provided the requirements of this section are met by the submitted design. The Engineer will require strength records of test cylinders from other projects using the proposed mix design. The costs of all preconstruction tests shall be borne by the Contractor. Additional test certificates shall be furnished on the aggregates if requested by the Engineer.
- B. Construction Tests: Test cylinders will be made in accordance with the Method of Making and Curing Concrete Compression and Flexure Test Specimens in the Field (ASTM Designation C 31). The specimens shall be cured under standard moisture and temperature conditions in accordance with the requirements of ASTM C 31. Strength tests shall be made, in general, for each day's run or for each 50 cubic yards of concrete if a day's run greatly exceeds the amount, but these tests may be made entirely at the discretion of the Engineer. The Contractor shall cooperate in securing and storing samples and shall furnish all materials required for sampling.

1.4 STRENGTH REQUIREMENTS

- A. Concrete mixes shall be designed to secure a dense, low-absorption concrete having a compressive strength of not less than 3,600 pounds per square inch at 28 days, as determined by making and breaking standard 6-inch by 12-inch cylinders in accordance with the provisions of ASTM Designations C 31 and C 39.
- B. The concrete mix shall have no less than 470 pounds of cement per cubic yard concrete mix. Percentage of cementitious materials other than Portland cement shall be limited to 20% by weight. Acceptance tests shall be determined at the 28 day mark. Methods such as ACI 301 coring shall be considered only at the Engineer's discretion.

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS

- A. Cement: Portland cement shall conform to the latest revision of Designation C 150, Type II, and shall be of an approved brand. An allowable alternate cement to ASTM C150, Type II, will be American Petroleum Institute (API) Type C cement of an approved brand. only one brand of cement will be permitted.
- B. Fine Aggregate: Fine aggregate shall comply with the requirements of ASTM Designation C 33. The fine aggregate will be required to meet the specified soundness test.
- C. Coarse Aggregate: Coarse aggregate shall comply with the requirements of ASTM Designation C 33. Gradation shall not be coarser than Size Number 467 (1-1/2 inch to No.4). The coarse aggregate will be required to meet the specified soundness and the percentage of wear shall not be more than 45 at 500 revolutions as determined by A.A.S.H.T.O. Designation T96.
- D. Water: Water shall be clear and free from injurious amounts of oil, alkali, organic matter or other deleterious substances.
- E. Admixtures
 - 1. Concrete may be supplied, with the approval of the Engineer, with the following admixtures:
 - a. Air Entrainment -ASTM C 260 equal to Siko-Air by Corporation.
 - b. Water Reducing Admixture -ASTM C 494, Type A equal to Pozzolith 344-N by Master Builders. Water reducing admixture is optional.
 - c. High-Range Water Reducing Admixture - ASTM C 494, Type F or G equal to Pozzolith 440-N by Master Builders. High-range, water reducing admixture is optional.
 - 2. Admixtures shall be used in strict compliance with manufacturer's instruction. Admixtures which contain calcium chloride shall not be used.

PART 3 - EXECUTION

3.1 REINFORCING

- A. Bar Reinforcing
 - 1. Except where plain bars are specifically shown on the plans all bar reinforcing shall be deformed bars. The deformed bar reinforcing shall conform to the requirements of ASTM Designation A 615, Grade 60.
 - 2. Any deformed bars delivered to the site of the work that are not marked in accordance with the requirements of ASTM Designation A 615 shall immediately be removed from the site.
- B. Epoxy Coating: All reinforcing steel to be epoxy coated will be designated on the plans. Epoxy coating and repair of coating shall be in accordance with 2004 Texas Department of Transportation (TxDOT) Item 440.2 Epoxy Coating.
- C. Storing Reinforcement: Reinforcement stored at the site shall be protected from the accumulation of grease, mud, or other foreign matter and from rust producing conditions. Bars shall be free from loose flaky rust, scale, oil, mud or structural defects where incorporated in the structure.
- D. Fabrication and Placing
 - 1. Reinforcement shall be accurately fabricated to the required dimensions and shapes in accordance with the ACI Manual of Standard Practice unless variations are

specifically shown on the plans. Four (4) sets of fabrication shop drawings shall be furnished the Engineer and shall receive his approval before any reinforcing steel is fabricated. Shop drawings shall be reviewed by the Contractor prior to submission to the Engineer.

2. Reinforcement shall be accurately placed and adequately supported by concrete, metal or other approved chairs, spacers, or ties and shall be secured against displacement.
3. The concrete cover for reinforcing shall be in accordance with the requirements of the ACI Building Code (ACI 318-05) or as noted on the drawings.
4. Splices shall be made as shown on the plans by lapping the bars the required amount and securely wiring them together. Where details of splices are not shown or where unanticipated splices are required, they shall be made in a location approved by the Engineer and the length of lap shall be as required by the ACI Building Code (ACI 318-05).

3.2 PROPORTIONS

A. General

1. Materials in the concrete shall be so proportioned that a workable mix, which will readily fill all form angles and properly embed the reinforcement without excessive manipulation, segregation or water gain, will result. High density and low water absorption shall be obtained with the mixes proposed and harsh mixes or those with which the required finishes cannot be obtained will not be approved. Concrete shall be provided with air entrainment of 4%, plus or minus 1%. Adjustments in the approved mixes shall be made during construction to compensate for variations in aggregates or whenever field tests indicate such adjustments are required. Changes in approved mixes required in order to bring the concrete into conformity with the specifications shall be made by the Contractor without additional compensation.
2. Measurements
 - a. Bulk cement- shall be measured by weight to within 1% of the required amounts. Cement in standard sacks will be considered as weighing 94 pounds and need not be weighed. Water shall be measured by either weight or volume to within 1-1/2% of the required amount.
 - b. Aggregates shall be measured by weight on a scale separate from that used for weighing cement. The individual aggregates, as weighed, shall be within 2% of the required amount and the total weight of the combined aggregates shall be within 1% of the required weight.
 - c. Water shall be measured by volume or by weight. The device for measurement of the water shall be readily adjusted and, under all operating conditions, shall have an accuracy within 1% of the required amount. The device shall be so arranged that the measurements will not be affected by variable pressures in the water supply line.
 - d. The complete plant assembly shall meet the approval of the Engineer, and facilities shall be provided for ready adjustment of aggregate weights for varying moisture content; accurate proportioning of water to cement; accurate control of all materials including positive shutoff where delivery to mixer is from bins; prompt removal of excess materials in hoppers; easy checking of weights of each separate aggregate; delivery of hopper of cement without waste; and for checking accuracy of measuring devices.

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- B. Proportions: The actual quantities of materials used in each batch shall be in accordance with the approved mix design for the class and slump of concrete being produced. The amount of moisture in the aggregates shall be considered in determining the amount of water to be added to each batch. The total content of any batch shall not exceed that of the approved mix design. Adequate means shall be furnished by the Contractor for determining and controlling the amount of water in the aggregate.
 - C. Control: The Engineer shall have free access to the plant at all times and the Contractor shall furnish materials for samples of all tests required to determine conformity with the specifications. Changes in the mix shall be made promptly whenever such tests indicate changes are required or whenever the quality of concrete produced fails to meet the requirements.

3.3 SLUMP

- A. Slump tests shall be made by the testing company. The number or frequency of such tests shall be entirely at the discretion of the Engineer. If the slump content falls outside the specified limits, a check test shall be made immediately on another portion of the same sample. In the event of a second failure, the concrete shall be considered as not meeting the requirements of these specifications.
- B. The slump of all concrete shall be between 3 inches and 5 inches (8" max after admixtures) with the conditions of placement governing the exact slump to be used. In all cases the Engineer shall specify the slump to be used. When a 3 inch slump is specified, the allowable tolerance shall be 1/2-inch. When the specified slump is greater than 3 inches, the allowable tolerance shall be 1-inch.

3.4 MIXING AND PLACING

- A. Mixing Equipment
 - 1. Mixers may be stationary mixers or truck mixers. Agitators may be truck mixers or truck agitators. Each mixer and agitator shall have attached thereto in a prominent place a metal plate or plates on which are plainly marked, for the various uses for which the equipment is designed, the capacity of the drum or container in terms of the volume of mixed concrete and the speed of rotation of the mixing drum, blades or paddles. Stationary mixers shall be equipped with an acceptable timing device that will not permit the batch to be discharged until the specified mixing time has elapsed. Truck mixers shall be equipped with means by which the number of revolutions of the drum blades or paddles may be readily verified.
 - 2. The mixer when loaded to capacity shall be capable of combining the ingredients of the concrete within the specified time into a thoroughly mixed and uniform mass and of discharging the concrete with a satisfactory degree of uniformity. No mixer or agitator shall be used if the results of slump tests of individual samples taken at approximately the one quarter, and the three quarter points of the load differ by more than 2 inches. Mixers and agitators shall be inspected frequently for changes in condition due to accumulations of hardened concrete or mortar or due to wear of blades. When any such change of condition is found, the slump tests described above shall be repeated.
 - 3. Truck mixers shall have adequate water supply and metering devices. No water shall be added to the concrete after the initial mixing water without the permission of the Engineer.

B. Mixing and Delivery

1. When a stationary mixer is used for the entire mixing of the concrete, the mixing time for one cubic yard of concrete shall be one minute with an increased mixing time of 15 seconds for each additional cubic yard or portion thereof.
2. When a stationary mixer is used for partial mixing, the mixing time shall be a minimum of 30 seconds. Mixing shall be completed by truck mixer at mixing speed.
3. Mixing time shall be measured from the time all cement and aggregates are in the drum. The batch shall be so charged into the mixer that some water will enter in advance of cement and aggregate, and all water shall be in the drum by the end of the first one fourth of the specified mixing time.
4. Mixing speed shall begin immediately after all ingredients are in the mixer. For complete mixing in the truck each batch shall be mixed not less than 70 nor more than 100 revolutions of the drum. For partial mixing in the truck each batch shall be mixed no less than 50 nor more than 100 revolutions of the drum. Mixing speed shall be as designated by the manufacturer. All revolutions after the prescribed mixing time shall be at agitating speed. The agitating speed shall be not less than one nor more than four revolutions per minute. The drum shall be kept in continuous motion from the time mixing is started until the discharge is completed.
5. The maximum time interval between the introduction of the water to the cement and aggregates, or the introduction of the cement to the aggregates, and the placing of the concrete in the forms shall not exceed the following:

Air or Concrete Temperature

<u>(Whichever is higher)</u>	<u>Maximum Time</u>
90° F or above	45 Minutes
75° F to 89° F	60 Minutes
35° F to 74° F	90 Minutes

6. Concrete shall not be placed when the ambient temperature is less than 40° F and falling but may be placed when the ambient temperature is not less than 35° F if the temperature is rising. The temperature of the concrete at the time of placement in the forms shall be not less than 50°F nor more than 90°F.

C. Transporting: Concrete shall be handled from the mixer to the place of final deposit in a manner which will prevent segregation and when practicable shall be deposited in its final position without rehandling or flowing. All equipment used in transporting concrete shall be maintained in a clean condition. Concrete shall not be delivered from joists by spout or trough, nor dumped into carts with a free fall of more than 4 feet. Every precaution shall be taken to prevent separation or loss of ingredients while transporting the concrete. Pumping and conveying of concrete shall be done only after approval by the Engineer and with equipment which will insure a continuous flow without segregation.

D. Placing:

1. Concrete shall not be placed until all reinforcement is securely and properly fastened in its correct position. Form ties shall be checked and retightened where necessary. Forms and reinforcement shall be inspected and approved by the Engineer before beginning placement of concrete. All embedded items shall be in place and anchored and the forms and reinforcement shall be cleaned and cleanout openings closed before such inspection. A representative of the Engineer will be on the job during placement of concrete and concrete shall not be placed unless the Engineer or his representative is present.
2. Concrete shall be placed in a manner which will prevent segregation, thoroughly embed all reinforcement and fixtures, fill all angles in the forms and prevent

formation of aggregate pockets or honeycomb. Placement in walls, columns or other deep forms shall be done through openings in the forms, spaced at frequent intervals, or through tremies so that the free fall shall not exceed 6 feet. Points of depositing the concrete shall be spaced so that the concrete surfaces can be kept level without flowing it into place.

3. Concrete shall be placed with the aid of approved mechanical vibrating equipment. Vibration shall be applied directly to the concrete and shall be of sufficient intensity and duration to cause flow or settlement of the concrete, thorough compaction and complete embedment of reinforcement and fixtures. Supplemental forking and spading by hand may be required to secure dense uniform surfaces and complete filling of corners and angles. Excessive spading or vibrating causing undue water gain or segregation will not be permitted. If moderate working causes excessive water gain, the mixture shall be adjusted. Excess water shall be removed when it appears and concrete shall not be deposited in such accumulations of water. A grill tamp shall be used on slabs. Completed sections shall conform to the details on the plans and the concrete shall be dense, uniform and free of aggregate pockets or honeycomb.

3.5 FORMS

- A. Material: Forms for all concrete work shall be of wood or approved metal forms. Wood sheeting, forming surfaces exposed to sight or weather shall be plywood or plywood lines of a quality to produce smooth even surfaces. Whatever material is used shall produce a slightly surface, free from excessive form marks and shall meet the approval of the Engineer before use. The same type of form shall be used for all exposed portions of the work unless specifically approved by the Engineer.
- B. Construction: Forms shall be constructed true to lines, grades and sections shown on the plans and shall be mortar-tight and sufficiently rigid to prevent displacement or sagging between supports. All exposed edges on all structures, included edges at all joints shall be chamfered 3/4-inch unless otherwise noted on the plans. Forms shall be set plumb and true and rigidly braced to maintain them in correct position and alignment.
- C. Wetting and Oiling: The inside surface of forms shall be coated with a non-staining mineral oil or other approved coating and shall be cleaned and oiled after each use. Forms which have dried out between uses shall be recoated just prior to placing of concrete. Excess oil or grease shall be wiped from the form surface. If forms have dried out so that the joints have opened, they shall be thoroughly soaked with water prior to placing of concrete.
- D. Removing Forms
 1. Forms may be removed only upon approval of such removal by the Engineer. In general, removal of forms will be permitted after 14 days or after concrete has attained design strength and if removal of forms and ties will not damage the concrete.
 2. It shall be the responsibility of the Contractor, in all form removal, to prevent structural damage or marring of the concrete surfaces.

3.6 PATCHING

- A. Concrete work obviously out of horizontal or vertical alignment or which shows serious surface defects shall be removed and replaced by the Contractor at his expense. Patching of minor defects will be permitted provided such patching removes the defect. Immediately after removing forms the concrete shall be inspected for defects. All defects permitted to be

patched and all form tie holes shall be patched before the concrete is thoroughly dry. Defective areas shall be chipped away to a depth of not less than one inch with edges perpendicular to the surface. This and the surrounding area shall be wetted prevent absorption of water from the patching mortar. The patching mortar shall be of the same materials and of the proportions as used for the concrete except that the coarse aggregate shall be omitted and the amount of water used shall be as little as is consistent for proper handling and placing. The mortar shall be re-tempered without the addition of water by allowing it to stand for one hour and mixing to prevent setting. The mortar shall be thoroughly compacted into place, screeded off slightly higher than the surrounding surface and left undisturbed for a period of one to two hours. Final finishing shall conform to the finish of the surrounding areas.

- B. Form tie holes shall be patched with this same mortar, the holes being completely filled and the mortar tightly packed into the hole. Holes passing entirely through the concrete shall be filled by forcing the mortar through from one side to the other. Mortar shall be struck off flush with burlap or canvas and the patch finally finished to conform to the surrounding surface.

3.7 FINISHING

A. Exposed Formed Surfaces

- 1. All exposed concrete surfaces shall be true, smooth, free from open or rough spaces, depressions, or projections. The concrete in horizontal plane surfaces shall be brought flush with the finished top surface at the proper elevation and shall be struck-off with a straightedge and floated. Mortar finishing shall not be permitted, nor shall dry cement or sand-cement mortar be spread over the concrete during the finishing of horizontal plane surfaces.
- 2. The surface finish of exposed concrete, which includes the wingwalls, the vertical edges of the sidewalks and the end of culvert walls, shall be a rubbed finish. The interior walls of the culvert barrels are not included as exposed concrete in the above. A carborundum stone shall be used to finish the surface. When approved, the finishing can be done with a rubbing machine.

- B. Unexposed Formed Surfaces: All surfaces which are not normally exposed to view shall require no finishing other than filling tie rod holes, removing fins and rough edges, and patching or removing of any defects.

- C. Slab Finishing: After screeding, consolidating and leveling of concrete slabs, surfaces shall not be worked until ready for floating. Floating shall begin when surface water has disappeared. Final troweling shall begin when the surface produces a ringing sound as the trowel is moved over the surface. The concrete surface shall be consolidated by the final hand-troweling operation, free of trowel marks, uniform in texture and appearance. Immediately after trowel finish, the concrete surface shall be slightly roughened by brooming with a fiber bristle broom.

3.8 CURING AND PROTECTING

A. Curing

- 1. The curing period for all concrete begins immediately after placing and/or finishing operations are completed. Delay in initiation of curing measures will not be tolerated. All concrete shall be protected from loss of moisture and large changes in temperature, for a period of seven (7) days after placement. Curing measures shall be as specified below, unless similar measures which are demonstrated to achieve the same or better results are approved by the Engineer in writing.

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2. Forms shall remain in place 24 hours, but shall be removed within 48 hours after placement of the concrete. Forms shall be kept wet at all times until they are removed.
 3. All required patching and repair of defects shall be accomplished immediately upon removal of forms. After completion of the patching, each section shall be coated with a membrane curing compound, Horncure 30D or equal, applied at a rate of not more than 200 square feet per gallon.
- B. Protecting
1. Concrete shall be protected against all adverse conditions including weather, and against mechanical damage, until completion of the project. Any such damage incurred shall be promptly repaired by the Contractor at his own expense, in a manner approved by the Engineer.
 2. Concrete shall be protected against low temperatures by maintaining a placement temperature not less than 50°F for five (5) days after placement. Concrete shall also be protected against extremes of high temperature, low humidity and wind movement by means of the curing methods specified herein or by other methods approved by the Engineer. It shall be the responsibility of the Contractor to anticipate, as nearly as possible, changes in weather conditions which would affect the placement and protection of the concrete. He shall be prepared at all times with proper materials, equipment and personnel, to protect freshly placed concrete when sudden changes in weather make such protection necessary. Failure to have available proper materials, equipment or personnel for expeditious placement and adequate preparation of the concrete will be grounds for postponement of placing of concrete.

3.9 EMBEDDED ITEMS

- A. All items required by the plans or these specifications to be embedded in the concrete shall be accurately set in place and securely maintained in such positions during placement of concrete.

END OF SECTION

SECTION 02607

MANHOLES AND COVERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract Special Provisions and Division 1 - General Requirements apply to work of this section.

1.2 SECTION INCLUDES

- A. Storm sewer lines may have modular precast concrete manhole sections with tongue-and-groove joints with transition to lid frame, covers, anchorage, and accessories, or these manholes may be fiberglass as described herein.
- B. Sanitary sewer lines shall be fiberglass manholes as described herein.

1.3 RELATED SECTIONS

- A. Section 02732 – Site Sanitary Sewerage and Storm Sewerage System

1.4 REFERENCES

- A. ASTM A48 - Gray Iron Castings.
- B. ASTM C478 - Precast Reinforced Concrete Manhole Sections.
- C. ASTM C923 - Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes.

1.5 SUBMITTALS FOR REVIEW

- A. Shop Drawings: Indicate manhole locations, elevations, piping, conduit, and sizes and elevations of penetrations.
- B. Product Data: Provide manhole covers, component construction, features, configuration, & dimensions.

PART 2 - PRODUCTS

2.1 CONCRETE MANHOLE MATERIALS

- A. Manhole Sections: Reinforced precast concrete 4,000 psi at 28 days in accordance with ASTM C478 with gaskets in accordance with ASTM C923.

2.2 CONCRETE MANHOLE COMPONENTS

- A. Lid and Frame: ASTM A48, Class 30B Cast iron construction, machined flat bearing surface, removable lid, lid molded with Sanitary Sewer name; V1420/V1430 Ring and Cover; manufactured by East Jordan Iron Works or approved equal. Lids on storm sewer manholes shall be slotted grates.
- B. Manhole Steps: None.

2.3 CONFIGURATION

- A. Shaft Construction: Concentric with concentric cone top section; lipped male/female joints; sleeved to receive pipe sections.
- B. Shape: Cylindrical.
- C. Clear Inside Dimensions: 48 inch diameter for pipes up to 36" diameter. Larger manhole diameter as required for pipes larger than 36" diameter.
- D. Design Depth: As indicated.
- E. Clear Lid Opening: 30 inches diameter.
- F. Pipe Entry: Provide openings as required.
- G. Steps: None.

2.4 FIBERGLASS MANHOLE MATERIALS AND COMPONENTS

- A. Resin - The resins used shall be a commercial grade unsaturated polyester resin or other suitable polyester or vinyl ester resin.
- B. Reinforcing Materials - The reinforcing materials shall be commercial Grade "E" type glass in the form of continuous roving, and chop roving, having a coupling agent that will provide a suitable bond between the glass reinforcement and the resin.
- C. Interior Surfacing Material - The inner surface exposed to the chemical environment shall be a resin-rich layer of 0.010 to 0.020 inch thick. The inner surface layer exposed to the corrosive environment shall be followed with a minimum of two passes of chopped roving of minimum length 0.5 inch (13mm) to maximum length of 2.0 inches (50.8mm) and shall be applied uniformly to an equivalent weight of 3 oz/ft². Each pass of chopped roving shall be well-rolled prior to the application of additional reinforcement. The combined thickness of the inner surface and interior layer shall not be less than 0.10 inch (2.5mm).
- D. Wall Construction Procedure - After inner layer has been applied the manhole wall shall be constructed with chop and continuous strand filament wound manufacturing process which insures continuous reinforcement and uniform strength and composition. The cone section, if produced separately, shall be affixed to the barrel section at the factory with resin-glass reinforced joint resulting in a one-piece unit. Seams shall be fiberglassed on the inside and the outside using the same glass-resin jointing procedure. Field joints shall not be acceptable by anyone except the manufacturer.
- E. Exterior Surface - For a UV inhibitor the resin on the exterior surface of the manhole shall have gray pigment added for a minimum thickness .125 inch.
- F. Stubouts and Connections - Stubouts shall be factory installed. Installation of SDR PVC sewer pipe shall be performed by sanding, priming and using resin fiber-reinforced hand layup. The resin and fiberglass shall be same type and grade as used in the fabrication of the fiberglass manhole. Inserta-Tee fittings or Kor-N-Seal boots may be installed by manhole manufacturer using fiberglass reinforced pipe stubout for Kor-N-Seal boot sealing surface.

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- G. Manhole Bottom – Fiber-reinforced bottoms are optional on fiberglass manholes. Bottom shall have a minimum of three 1-1/2" deep by 3-1/2" wide stiffening ribs completely enclosed with resin fiber-reinforcement and have a minimum 3 inch anti-flotation ring. Manhole bottom shall be a minimum of 5/16 inch thick. Concrete shall be used to form bench area and invert. Also concrete may be used on top of anti-flotation ring and around the reducer section as required for buoyancy. Manholes installed in existing lines shall utilize cast-in-place concrete bottoms in accordance with the plans and specifications.
 - H. Fillers and Additives - Fillers, when used, shall be inert to the environment and manhole construction. Sand shall not be accepted as an approved filler. Additives, such as thixotropic agents, catalysts, promoters, etc., may be added as required by the specific manufacturing process to be used to meet the requirements of this standard. The resulting reinforced-plastic material must meet the requirements of this specification.
 - I. Manufacture - Manhole cylinders, manway reducers, and connectors shall be produced from glass fiber-reinforced polyester resin using a combination of chop and continuous filament wound process. All manholes shall be designed so that a ladder or step system can be supported by the installed manhole. Manway reducers will be concentric with respect to the larger portion of the manhole diameters through 60 inches. Larger manholes may have concentric or eccentric manway reducer openings. The manhole shall provide an area from which a typical ring and cover plate can be supported without damage to the manhole.
 - J. Exterior Surface - The exterior surface shall be relatively smooth with no sharp projections. Hand-work finish is acceptable if enough resin is present to eliminate fiber show. The exterior surface shall be free of blisters larger than 0.5 inch in diameter, delamination or fiber show.
 - K. Interior Surface - The interior surface shall be resin rich with no exposed fibers. The surface shall be free of crazing, delamination, blisters larger than 0.5 inch in diameter and wrinkles of 0.1256 inch or greater in depth. Surface pits shall be permitted if they are less than 0.75 inch in diameter and less than 0.0625 inch deep. Voids that cannot be broken with finger pressure and that are entirely below the resin surface shall be permitted if they are less than 0.5 inch in diameter and less than 0.0625 inch thick. Any manhole repair is required to meet all requirements of this specification. Manhole lengths shall be in 6 inch increments ± 2 inches. Tolerance of inside diameter shall be $\pm 1\%$ of required manhole diameter.
 - L. Load Rating - The complete manhole shall have a minimum dynamic-load rating of 16,000 lbf. when tested in accordance with ASTM 3753 8.4 (Note 1). To establish this rating the complete manhole shall not leak, crack or suffer other damage when load tested to 40,000 lbf. and shall not deflect vertically downward more than 0.25 inch at the point of load application when loaded to 24,000 lb.
 - M. Stiffness - The manhole cylinder shall have the minimum pipe-stiffness values shown in the table below when tested in accordance with ASTM 3753 8.5 (Note 1).

<u>Manhole Length in Feet</u>	<u>PSI</u>
3 - 6.5	0.75
7 - 12.5	1.26
13 - 20.5	2.01
21 - 25.5	3.02
26 - 35	5.24

- N. Soundness - In order to determine soundness, apply an air or water pressure test to the manhole test sample. Test pressure shall not be less than 3 psig or greater than 5 psig. While holding at the established pressure, inspect the entire manhole for leaks. Any leakage through the laminate is cause for failure of the test. Refer to ASTM 3753 8.6.
- O. Chemical Resistance - When tested in accordance with ASTM 3753 8.7 the log of percent retention of each property after immersion testing when plotted against the log of immersion time, and extrapolated to 100,000 hours shall assure retention of at least 50% of initial properties.
- P. Physical Properties

	Hoop Direction (psi)	Axial Direction (psi)
1. Tensile Strength	18,000	5,000
2. Tensile Modules	0.6×10^6	0.7×10^6
3. Flexural Strength	26,000	4,500
4. Flexural Modules	1.4×10^6	0.7×10^6
5. Compressive (psi)	18,000	10,000

All tests shall be performed as specified in ASTM 3753, latest edition, Section 8. Test Method D-790 and Test Method D-695.

- Q. Quality Control - Each completed manhole shall be examined for dimensional requirements, hardness, and workmanship. All required ASTM 3753 testing shall be completed and records of all testing shall be kept and copies of test records shall be presented to the Engineer upon formal written request. The manufacturer shall provide an independent certification indicating that the manhole has been sampled, tested and inspected in accordance with the provisions of this specification and meets all requirements.
- R. Shipping and Handling - Do not drop or impact the fiberglass manhole. Fiberglass manhole may be lifted by inserting a 4"x4"x30" timber into the top of the manhole with cable attached or by a sling or "choker" connection around center of manhole, lift as required. Use of chains or cables in contact with the manhole surface is prohibited.
- S. Concrete Bottom - Lower manhole into wet concrete until it rests at the proper elevation, with a minimum of 4 inches of fiberglass manhole inserted into the wet concrete below flow line, then move manhole to plumb. The concrete shall extend a minimum of one foot from the outside wall of the manhole and a minimum of 6 inches above incoming lines. On the inside, concrete shall form the invert area and rise a minimum of 4 inches above incoming lines. If required by Engineer concrete may be used around reducer section buoyancy.
- T. Grade Adjustment Rings – All final grade adjustment of manhole metal cover and frame assemblies shall be performed utilizing injection molded High Density Polyethylene (HDPE) grade adjustment rings as manufactured by LADTECH, INC., Telephone no. (651) 415-1252, 1-877-ADJ-RING, or approved equal. They shall be used instead of concrete grade adjustment rings. Grade adjustment rings shall be manufactured from polyethylene plastic as identified in ASTM D1248 (Standard Specification for Polyethylene Plastic Molding and Extrusion Materials. Material properties shall be tested and qualified for usage per the ASTM Test Methods referred to in ASTM D1248. The grade adjustment rings shall be tested to assure compliance with impact and loading requirements per AASHTO Standard Specification for Highway Bridges. Complete installation of grade adjustment rings shall be performed as per manufacturer's recommendations. The space between the rings, fiberglass manhole, and metal cover frame shall be sealed utilizing an approved all weather preformed joint sealant made of

butyl rubber that can bond properly between HDPE grade adjustment rings, fiberglass manhole, and metal cover frame. All manholes in the proposed roadways shall have manhole frame and cover grade adjustment rings of a total height of 18 inches. In all other locations, manhole metal cover and frame will seat on HDPE grade adjustment rings as required based on site condition. In proposed roadway locations, top 6 inches height of grade adjustment rings shall be composed of individual grade adjustment rings of maximum 2 inch thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify items provided by other sections of Work are properly sized and located.
- B. Verify that built-in items are in proper location, and ready for roughing into Work.
- C. Verify excavation for manholes is correct.

3.2 PREPARATION

- A. Coordinate placement of inlet and outlet pipe or duct sleeves required by other sections.

3.3 PLACING MANHOLE SECTIONS

- A. Place base pad, trowel top surface level.
- B. Place manhole sections plumb and level, trim to correct elevations, anchor to base pad.
- C. Cut and fit for pipe.
- D. Grout base of shaft sections to achieve slope to exit piping. Trowel smooth. Contour as required.
- E. Set cover frames and covers level without tipping, to correct elevations.
- F. Coordinate with other sections of work to provide correct size, shape, and location.

END OF SECTION

SECTION 02667

SITE WATER LINES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract Special Provisions and Division 1 - General Requirements apply to work of this section.

1.2 SECTION INCLUDES

- A. Pipe and fittings for site water line including domestic water line and fire protection water line.
- B. Valves and fire hydrants.

1.3 RELATED SECTIONS

- A. Section 02225 - Trenching.
- B. Section 02675 - Disinfection of Water Distribution Systems: Disinfection of site service utility water piping.

1.4 REFERENCES

- A. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
- B. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
- C. ASTM B88 - Seamless Copper Water Tube.
- D. ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
- E. ASTM D1785 - Poly (VinylChloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
- F. ASTM D2241 - Poly (VinylChloride) (PVC) Plastic Pipe(SDR-PR).
- G. ASTM D2466 - Poly (VinylChloride) (PVC) Plastic Pipe Fittings, Schedule 40.
- H. ASTM D2855 - Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and fittings.
- I. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- J. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.
- K. ASTM D3139 - Joints for Plastic Pressure Pipes using Flexible Elastomeric Seals.
- L. ASTM D3035 - Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Outside Diameter.
- M. AWS A5.8 - Brazing Filler Metal.
- N. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
- O. AWWA C105 - Polyethylene Encasement for Ductile Iron Piping for Water and Other liquids.
- P. AWWA C111 - Rubber-Gasket Joints for Ductile Iron and Grey-Iron Pressure Pipe and Fittings.
- Q. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.
- R. AWWA C500 - Gate Valves, 3 through 48 in NPS, for Water and Sewage Systems.
- S. AWWA C502 - Dry Barrel Fire Hydrants.
- T. AWWA C504 - Rubber Seated Butterfly Valves.

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- U. AWWA C508 - Swing-Check Valves for Waterworks Service, 2 in through 24 in NPS.
 - V. AWWA C509 - Resilient Seated Gate Valves 3 in through 12 in NPS, for Water and Sewage Systems.
 - W. AWWA C600 - Installation of Ductile-Iron Water Mains and Appurtenances.
 - X. AWWA C606 - Grooved and Shouldered Type Joints.
 - Y. AWWA C900 - Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 inch through 12 inch, for Water.
 - Z. AWWA C901 - Polyethylene (PE) Pressure Pipe, Tubing, and Fittings, 2 inch through 3 inch, for Water
 - AA. UL 246 - Hydrants for Fire - Protection Service.

1.5 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on pipe materials, pipe fittings, valves and accessories.

1.6 SUBMITTALS AT PROJECT CLOSEOUT

- A. Record actual locations of piping mains, valves, connections, and invert elevations.
- B. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.7 QUALITY ASSURANCE

- A. Perform Work in accordance with standards of local governing authority.
- B. Valves: Manufacturer's name and pressure rating marked on valve body.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site in such a manner as to prevent damage.
- B. Deliver and store valves in shipping containers with labeling in place.

PART 2 - PRODUCTS

2.1 WATER PIPE

General water piping shall be ductile iron or C900 PVC in standard trenches. Piping in and near underground vaults shall be ductile iron as noted on the details.

- A. Pipe 6" to 12" diameter
 - 1. Ductile Iron Pipe: AWWA C151:
 - a. Fittings: Ductile iron, standard thickness.
 - b. Joints: AWWA C111, rubber gasket with rods.
 - c. Jackets: AWWA C105 polyethylene jacket.
 - 2. PVC Pipe: AWWA C900 Class 150:
 - a. Fittings: AWWA C111, cast iron.
 - b. Joints: ASTM C3139 compression gasket ring.
 - c. Trace Wire: Magnetic detectable conductor, brightly colored plastic covering, imprinted with "Water Line" in large letters.

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- B. Pipe 1" to 4" Diameter
 - 1. Copper Tubing: ASTM B88, Type K annealed:
 - a. Fittings: ASME B16.18, cast copper, or ASME B16.22, wrought copper.
 - b. Joints: Compression connection or AWS A5.8, BCuP silver braze.
 - 2. PVC Pipe: ASTM D2241, SDR-26 for 160 psig pressure rating:
 - a. Fittings: ASTM D2466, PVC.
 - b. Joints: ASTM D2855, solvent weld.
 - c. Trace Wire: Magnetic detectable conductor, brightly colored plastic covering, imprinted with "Water Line" in large letters.
 - 3. Polyethylene Pipe: ASTM D3035, for 160 psig:
 - a. Fittings: AWWA C901, molded or fabricated.
 - b. Joints: Compression.
 - c. Trace Wire: Magnetic detectable conductor, brightly colored plastic covering, imprinted with "Water Line" in large letters.
- 2.2 GATE VALVES - UP TO 3 INCHES
- A. Brass or Bronze body, non-rising stem, inside screw, single wedge or disc, extension box and valve key.
- 2.3 GATE VALVES - 3 INCHES TO 12 INCHES
- A. AWWA C509, Iron body, bronze trim, non-rising stem with square nut, single wedge, resilient seat, ends, control rod, post indicator where shown on plans, extension box and valve key.
- 2.4 BUTTERFLY VALVES - FROM 14 INCHES AND LARGER
- A. AWWA C504, iron body, bronze disc, resilient replaceable seat, water or lug ends, ten position lever handle.
- 2.5 SWING CHECK VALVES
- A. Manufacturers:
 - 1. Watts Series 709OSYRW
 - 2. Substitutions: Refer to Section 01630
 - B. AWWA C510-92, iron body, bronze trim, removable disk & seat, flanged ends.
- 2.6 HYDRANT
- A. Manufacturers:
 - 1. Mueller Centurion, or approved equal.
 - B. Hydrant: AWWA C502, UL 246, dry barrel type, inside dimension of 7 inches minimum, with minimum 5 inches diameter valve seat opening; minimum net water area of barrel not less than 190 percent of valve opening; 6 inch bell or mechanical joint inlet connection with accessories, gland bolts, and gaskets.
 - C. Hydrant Extensions: Fabricate in multiples of 6 inches with rod and coupling to increase barrel length. Extensions shall be incidental, and shall be installed to place the hydrant lower flange at the elevation noted on the Plans.

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- D. Hose and Streamer Connection: Match sizes with utility company, two hose nozzles, one pumper nozzle.
 - E. Finish: Primer and two coats of enamel.

2.7 BEDDING AND COVER MATERIALS

- A. Bedding: Crushed rock material in compliance with ASTM C-33, Grade No. 8 or approved equal.
- B. Cover: Per Section 02225 - Trenching.

2.8 FITTINGS

- A. Fittings: 4 to 12 inch diameter pipe – ductile iron mechanical joint AWWA C110, minimum pressure rating 250 psi. Pipe smaller than 3 inch diameter – suitable for use with the piping and at a pressure rating not less than the pipe.

2.9 TAPPING SLEEVES AND VALVES

- A. Tapping sleeves shall be designed for a working pressure of 150 psi, and shall be mechanical joint, or as required to make the connection. Tapping sleeves shall be Mueller, ductile iron, with duck-tipped gaskets or approved equal. All interior cast iron surfaces shall be epoxy coated in accordance with the appropriate paragraphs of this section. Tapping valves shall be resilient seat Mueller mechanical joint valves designed for a working pressure of 150 psi or approved equal.

2.10 VALVE BOXES AND EXTENSION STEMS AND POST INDICATORS

- A. Extension stems shall be furnished on buried valves where the top of the operating nut is more than 36-inches below finished grade. Top of the extension stem shall not be more than 9-inches below the top of the valve box. Buried valves shall be provided with cast iron valve boxes. The boxes shall be designed to fit over a section of 6-inch C900 PVC riser pipe which will be used as an extension from the top of the valve to within 8-inches of the ground surface. The box shall have a heavy cast iron cover. The box shall have a flange type base, with the base being approximately 4 inches larger in diameter than the outside diameter of the barrel of the box. The necessary length of 6-inch C900 PVC riser pipe required for the extension shall be considered as a part of the box.
- B. Post indicator extensions shall be compatible with the installed valve and shall be installed per manufacturer's instructions. Post indicators shall be Mueller adjustable type or approved equal.

2.11 ACCESSORIES

- A. Concrete for Thrust Restraints: 3,000 psi concrete.

2.12 CASING PIPE IN BORED HOLES

- A. New welded steel with min. yield strength of 35,000 psi, U.S. manufacturer.
- B. Wall thickness of 0.3125 inches, meeting ASTM 139, Grade B or ASTM A252, Grade 2.
- C. Exterior bituminous coating per AWWA C104.
- D. Joints shall be welded.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that building service connection and municipal utility water main size and location are as indicated.

3.2 PREPARATION

- A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare pipe connections to equipment with flanges or unions.

3.3 BEDDING

- A. Excavate pipe trench in accordance with Section 02225 for work of this Section. Hand trim excavation for accurate placement of pipe to elevations indicated.
- B. Form and place concrete for pipe thrust restraints at any change of pipe direction. Place concrete to permit full access to pipe and pipe accessories.
- C. Place bedding material at trench bottom, level fill materials in one continuous layer not exceeding 6 inches compacted depth.
- D. For non-metallic pipe, place bedding material around pipe sides and to 6" over top of pipe. Take care to position bedding material under the pipe haunches.
- E. For metallic pipe, backfill around sides and to top of pipe. Take care to position bedding material under the pipe haunches.
- F. Maintain optimum moisture content of cover material to attain required compaction density.

3.4 INSTALLATION - PIPE

- A. Maintain separation of water main from sewer piping in accordance with TNRCC code.
- B. Install ductile iron piping and fittings to AWWA C600.
- C. Route pipe in straight line.
- D. Install pipe to allow for expansion and contraction without stressing pipe or joints.
- E. Install access fittings to permit disinfection of water system performed under Section 02675.
- F. Slope water pipe and position drains at low points.
- G. Form and place concrete for thrust restraints at each elbow or change of direction of pipe main.
- H. Establish elevations of buried piping to ensure not less than 3.5 ft of final cover.
- I. For non-metallic pipe, install trace wire continuous buried 18 inches below finish grade, above pipe line; coordinate with Section 02225.
- J. Backfill trench in accordance with Section 02225.
- K. Pipe installed in casings:
 - 1. Attach 2 hardwood skids to pipe joint using stainless steel bands. Skid dimensions shall position the pipe bell above the casing by 2" minimum. Skid length shall be 2/3 pipe joint length minimum. Submit alternate skid designs for approval.
 - 2. Insert pipe joints into casings such that joint is always in compression.
 - 3. Seal spaces at ends of casing pipe between casing and carrier pipe with grout. Extend grout 12" min. into casing.

3.5 INSTALLATION - VALVES AND HYDRANTS

- A. Set valves on solid bearing.
- B. Center and plumb valve box over valve. Set box cover flush with finished grade.
- C. Set hydrants plumb; locate pumper nozzle perpendicular to and facing roadway.
- D. Set hydrants to elevation noted on the Plans, with nozzles at least 20 inches above ground.
- E. Provide a granular drainage sump as indicated on the plans. Encase elbow of hydrant in gravel to above drain opening. Do not connect drain opening to sewer.
- F. Paint hydrants Federal Safety Yellow.

3.6 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Flush and disinfect system in accordance with Section 02675.

3.7 SERVICE CONNECTIONS

- A. Provide water service to municipal requirements.

3.8 FIELD QUALITY CONTROL

- A. Compaction testing per Section 02225 - Trenching.
- B. Other testing per Section 02675 – Disinfection of Water Distribution System.

END OF SECTION

SECTION 02675

DISINFECTION OF WATER DISTRIBUTION SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract Special Provisions and Division 1 - General Requirements apply to work of this section.

1.2 SECTION INCLUDES

- A. Disinfection of potable water distribution system.
- B. Testing and reporting results.

1.3 REFERENCES

- A. AWWA B300 - Standard for Hypochlorites.
- B. AWWA B301 - Standard for Liquid Chlorine.
- C. AWWA B302 - Standard for Ammonium Sulfate.
- D. AWWA B303 - Standard for Sodium Chlorite.
- E. AWWA C651 - Standards for Disinfecting Water Mains.

1.4 SUBMITTALS FOR INFORMATION

- A. Test Reports: Indicate results comparative to specified requirements.
- B. Certificate: Certify that cleanliness of water distribution system meets or exceeds specified requirements.

1.5 PROJECT RECORD DOCUMENTS

- A. Submit test results to Engineer.
- B. Disinfection report:
 - 1. Type and form of disinfectant used.
 - 2. Date and time of disinfectant injection start and time of completion.
 - 3. Test locations.
 - 4. Initial and 24 hour disinfectant residuals (quantity in treated water) in ppm for each outlet tested.
 - 5. Date and time of flushing start and completion.
 - 6. Disinfectant residual after flushing in ppm for each outlet tested.
- C. Bacteriological report:
 - 1. Date issued, project name, and testing laboratory name, address, and telephone number.
 - 2. Time and date of water sample collection.
 - 3. Name of person collecting samples.
 - 4. Test locations.
 - 5. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.
 - 6. Coliform bacteria test results for each outlet tested.

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7. Certification that water conforms, or fails to conform, to bacterial standards of the local health department.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with AWWA C651.
- B. Water Treatment Firm: Company specializing in disinfecting potable water systems specified in this Section with minimum three years experience.
- C. Testing Firm: Company specializing in examining potable water systems, approved by the State of Texas.
- D. Submit bacteriologist's signature and authority associated with testing.

1.7 REGULATORY REQUIREMENTS

- A. Conform to applicable code or regulation for performing the work of this Section.
- B. Provide certificate of compliance from authority having jurisdiction indicating approval of water system.

PART 2 - PRODUCTS

2.1 DISINFECTION CHEMICALS

- A. Chemicals: AWWA B300, Hypochlorite, AWWA B301, Liquid Chlorine, AWWA B302, Ammonium Sulfate, and AWWA B303, Sodium Chlorite.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that piping system has been cleaned, inspected, and pressure tested.
- B. Perform scheduling and disinfecting activity with start-up, testing, adjusting and balancing, demonstration procedures, including coordination with related systems.

3.2 EXECUTION

- A. Provide and attach required equipment to perform the work of this Section.
- B. Introduce treatment into piping system.
- C. Maintain disinfectant in system for 24 hours.
- D. Flush, circulate, and clean until required cleanliness is achieved; use municipal domestic water.
- E. Replace permanent system devices removed for disinfection.
- F. Pressure test system to 150 psi. Repair leaks and re-test.

3.3 FIELD QUALITY CONTROL

- A. Test samples in accordance with AWWA C651.

END OF SECTION

SECTION 02732

SITE SANITARY SEWERAGE AND STORM SEWERAGE SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract Special Provisions and Division 1 - General Requirements apply to work of this section.

1.2 SECTION INCLUDES

- A. Sanitary sewerage drainage piping, fittings, accessories and bedding from 5' outside building to municipal utilities.
- B. Site storm sewers and culverts.

1.3 RELATED SECTIONS

- A. Sections 02225 - Trenching: Trenching subsoil for sewer system piping.

1.4 REFERENCES

- A. ANSI/ASTM A74 - Cast Iron Soil Pipe and Fittings.
- B. ANSI/ASTM C12 - Practice for Installing Vitrified Clay Pipe Lines.
- C. ANSI/ASTM C14 - Concrete Sewer, Storm Drain, and Culvert Pipe.
- D. ANSI/ASTM C76 - Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
- E. ANSI/ASTM C425 - Compression Joints for Vitrified Clay Pipe and Fittings.
- F. ANSI/ASTM C443 - Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
- G. ANSI/ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb Rammer and 12 inch Drop.
- H. ANSI/ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb Rammer and 18 inch Drop.
- I. ANSI/ASTM D2321 - Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.
- J. ANSI/ASTM D2729 - Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- K. ANSI/ASTM D2751 - Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings.
- L. ANSI/ASTM D3033 - Type PSP Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- M. ANSI/ASTM D3034 - Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- N. ASTM A746 - Ductile Iron Gravity Sewer Pipe.
- O. ASTM C564 - Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
- P. ASTM C700 - Vitriified Clay Pipe, Extra Strength, Standard Strength and Perforated.
- Q. ASTM D1785 - Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120.
- R. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- S. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.

1.5 DEFINITIONS

- A. Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations.

1.6 SUBMITTALS

- A. Product Data: Provide data indicating pipe, pipe accessories.

1.7 PROJECT RECORD DOCUMENTS

- A. Record location of pipe runs, connections, and invert elevations.
- B. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.8 FIELD MEASUREMENTS

- A. Verify that field measurements and elevations are as indicated.

1.9 COORDINATION

- A. Coordinate the Work with termination of sanitary sewer connection outside building, connection to off-site utility service and trenching.

PART 2 - PRODUCTS

2.1 SEWER AND STORM SEWER PIPE MATERIALS

- A. General: Pipe for sanitary sewers 15" in diameter and less shall be PVC.
- B. PVC Pipe: ANSI/ASTM D3034, Type PSM, Poly(Vinyl Chloride) (PVC) material; bell and spigot style joint end, with rubber gasket joints. Utilize SDR 35 (greater than 3 or less than 12 feet of cover) and SDR 26 (less than 3 or greater than or equal to 12 feet of cover).
- C. Polyethylene Storm Sewer Pipe: High Density Polyethylene (HDPE) pipe shall meet: ASTM F 405, Standard Specification for Corrugated Polyethylene Pipe and Fittings; ASTM F 667, Standard Specification for Large Diameter Corrugated Polyethylene Pipe and Fittings; AASHTO M 252, Standard Specification for Polyethylene Corrugated Drainage Pipe; and AASHTO M 294 Standard Specification for Corrugated Polyethylene Pipe, 12" to 36" diameter. Joint watertightness is required to inhibit groundwater infiltration and/or effluent exfiltration. Watertight joints shall be sealed with an elastomeric gasket that meets or exceeds the performance requirements of ASTM F477. Diameters 600 mm (24") and smaller shall meet ASTM D3212; larger pipe shall meet ASTM D3212, with the exception that the maximum pressure is 34 kPa (5 psi). The pipe shall be smooth interior Advanced Drainage Systems (ADS) N-12 for 12" to 36" diameters, and ADS N-12 HC for diameters larger than 36", or Hancor Products ASTM F794 Vylon Pipe, ETI Co Ultra-Rib or approved equal.
- D. Concrete Storm Sewer Pipe: Concrete culvert pipe, 12" diameter or larger, reinforced concrete Class III - Wall B, shall conform to the requirements of A.A.S.H.T.O. M170 or ASTM C76. The pipe shall be Gifford Hill Tongue and Groove C-76 or approved equal.
- E. PVC Force Main Pipe: ASTM D1784; AWWA C905. C905 PVC shall be made of compounds conforming to ASTM D1784 with a cell classification of 12454B. C905 shall meet all

dimensional, chemical and physical requirements as outlined in AWWA C905, SDR 21 (200 psi).

- F. Box Culverts: concrete box culverts may be either cast-in-place or precast. Cast-in-place items shall conform to spec Section 03300 Cast-in-Place Concrete. Precast boxes shall conform to ASTM C-850 for 0 to 2 feet of fill.

2.2 PIPE ACCESSORIES

- A. Storm sewer catch basins on pipes 12" or larger shall be Oldcastle/Brooks precast concrete, sized per application, or approved equal.
- B. Storm sewer catch basins on pipes smaller than 12" diameter shall be 1200 NGB Next Generation Catch Basins units manufactured by NDS Company (806) 726-1994, sized per application, or approved equal.
- C. Storm sewer junction boxes may be concrete or fiberglass per Section 02607 of these specifications.
- D. Trace Wire for Non-Metallic Conduits: Magnetic detectable conductor, brightly colored plastic covering, imprinted with "Sewer Line" in large letters.
- E. Sloping End Treatments: If part of the project, sloped concrete end treatments shall be constructed per TxDOT Standards. 6:1 typical slope.
- F. Cleanouts shall incorporate long sweep ells, and shall be constructed per the plan details.
- G. Concrete headwalls shall be TxDOT Std. headwalls adapted per number of pipes per installation.

2.3 BEDDING MATERIALS

- A. Bedding: Crushed rock material in compliance with ASTM C33. Grade No. 8 or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on drawings.

3.2 PREPARATION

- A. Hand trim excavations to required elevations. Correct over excavation with bedding aggregate.
- B. Remove large stones or other hard matter which could damage pipe or impede consistent backfilling or compaction.

3.3 BEDDING

- A. Excavate pipe trench in accordance with Section 02225 for work of this Section. Hand trim excavation for accurate placement of pipe to elevations indicated.
- B. Place bedding material at trench bottom, level materials in continuous layer not less than 6 inch depth.

3.4 INSTALLATION - PIPE

- A. Install pipe, fittings, and accessories in accordance with ASTM D2321 and manufacturer's instructions. Seal joints watertight.
- B. Lay pipe to slope gradients noted on drawings; with maximum variation from true slope of 1/8 inch in 10 feet.
- C. Place bedding material around pipe sides and to 6" over top of pipe. Take care to position bedding material under the pipe haunches.
- D. Refer to Section 02225 for trenching and backfill requirements. Do not displace or damage pipe when compacting.
- E. Install trace wire continuous over top of pipe, buried 18 inches below finish grade.
- F. For concrete pipe, 2-sack concrete shall be used as backfill up to the top of the pipe to provide joint water-tightness.

3.5 FIELD QUALITY CONTROL

- A. Request inspection prior to and immediately after placing bedding.
- B. Compaction testing per Section 02225 – Trenching.
- C. Pressure Test: Test in accordance with ASTM C828.
- D. Deflection Test: Test in accordance with 95% diameter mandrel.

3.6 PROTECTION

- A. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

END OF SECTION

SECTION 02764

PAVEMENT JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract Special Provisions and Division 1 - General Requirements apply to work of this section.

1.2 SECTION INCLUDES

- A. Expansion and contraction joints within Portland cement concrete pavement.
- B. Joints between Portland cement concrete and asphalt pavement.

1.3 RELATED SECTIONS

- A. Section 02521 – Concrete Curbs Gutters and Sidewalks.
- B. Section 02522 – Structural Portland Cement Concrete for Site Work.

1.4 REFERENCES

- A. ASTM C 1193 – Use of Joint Sealants
- B. ASTM D 5249 – Backer Material for Use With Cold-and-Hot-Applied Joint Sealants in Portland Cement Concrete and Asphalt Joints
- C. ASTM D 1751 – Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
- D. ASTM D 3405 – Joint Sealants, Hot Applied, for Concrete and Asphalt Pavements
- E. ASTM D 3406 – Joint Sealant, Hot Applied, Elastomeric Type, for Portland Cement Concrete Pavements
- F. ASTM C 920 – Elastomeric Joint Sealants

1.5 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Verification: For each type and color of joint sealant required. Install joint-sealant samples in 1/2-inch wide joints formed between two 6-inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- C. Product Certificates: Signed by manufacturers of joint sealants certifying that products furnished comply with requirements and are suitable for the use indicated.
- D. Compatibility and Adhesion Test Reports: From joint sealant manufacturer indicating the following:
 - 1. Materials forming joint substrates and joint-sealant backer materials have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- E. Product Test Reports: From a qualified testing agency indicating joint sealants comply with requirements, based on comprehensive testing of current product formulations.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.
- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- C. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency, based on testing current sealant formulations within a 36-month period.
 - 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
 - 2. Test joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.
- D. Preconstruction Compatibility and Adhesion Testing: Submit to joint sealant manufacturer, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Use manufacturer's standard test methods to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials to comply with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer.
 - 2. When joint substrates are wet.
 - 3. When blowing dust conditions exist.
- B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than that allowed by joint sealant manufacturer for application indicated.
- C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint sealant manufacturer based on testing and field experience.
- B. Bituminous pre-molded expansion joint shall conform to ASTM D 1751.
- C. Elastomeric sealant for contraction joints shall be, or shall be equivalent to, W.R. Meadows "SOF-SEAL" or "Gardox".
 - 1. Hot poured sealant for joints between portland cement concrete and bituminous concrete shall conform to ASTM D 3405.
 - 2. Hot poured sealant for all other joints in portland cement concrete pavement shall conform to ASTM D 3406.
 - 3. Cold poured joint sealant shall conform to ASTM C 920.
- D. Mix material in accordance with manufacturer recommendations.

2.2 JOINT-SEALANT BACKER MATERIALS

- A. General: Provide joint-sealant backer materials that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint sealant manufacturer based on field experience and laboratory testing.
- B. Round Backer Rod for Cold- and Hot-Applied Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depths and prevent bottom-side adhesion of sealant.
- C. Backer Strips for Cold- and Hot-Applied Sealants: ASTM D 5249; Type 2; of thickness and width required to control sealant depths, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.
- D. Round Backer Rods for Cold-Applied Sealants: ASTM D 5249, Type 3, of diameter and density required to control sealant depths and prevent bottom-side adhesion of sealant.

2.3 PRIMERS

- A. Primers: Product recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint- sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions.
- B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturer's written installation instructions applicable to products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of backer materials.
 - 2. Do not stretch, twist, puncture, or tear backer materials.
 - 3. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.
- D. Install sealants by proven techniques to comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses provided for each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealants from surfaces adjacent to joint.
 - 2. Use tooling agents that are approved in writing by joint sealant manufacturer and that do not discolor sealants or adjacent surfaces.
- F. Provide joint configuration to comply with joint sealant manufacturer's written instructions, unless otherwise indicated.
- G. Provide recessed joint configuration for silicone sealants of recess depth and at locations indicated.

3.4 CLEANING

- A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

END OF SECTION

SECTION 02810

IRRIGATION SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SUMMARY

- A. The work consists of installing a complete underground irrigation system as shown on the Drawings and as specified hereafter. The Contractor performing this work shall furnish all labor, equipment, materials and permits necessary for the completion of the system, except those specified to be furnished by others.
- B. Unless otherwise specified or indicated on the Drawings, the construction of the irrigation system shall include the furnishing, installing and testing of all pipe, fittings, valves, heads, controllers, wires, air release and vacuum valves, backflow prevention devices, inlet and discharge piping, automatic drain valves, manual drain valves, valve boxes, water meters, and all other components pertinent to the plans and specifications of this system.
- C. The Contractor shall perform all trenching, excavating, boring, backfilling, compacting, concrete pouring, electrical work, welding, and any other work necessary for the completion of the project.

1.3 SITE INVESTIGATION

- A. The Contractor shall examine related work and surfaces before starting the work of this section. The Contractor shall report to the Landscape Architect or his authorized representative, in writing, conditions which will prevent the proper execution of irrigation installation.
- B. Deviations from plans and specifications shall be executed only with the express permission of the Landscape Architect and at no cost to the Owner. If obvious inadequacies or inappropriate design are found on the drawings, they shall be promptly brought to the attention of the Landscape Architect in writing before proceeding with installation of the system.

1.4 CODES, RULES AND SAFETY ORDERS

- A. All work and materials shall be in full accordance with the latest local rules and regulations of safety.

1.5 PROTECTION

- A. The Contractor shall furnish and maintain all warning signs, shoring, barricades, red lanterns, etc., as required by the Safety Orders of the Division of Industrial Safety and local ordinances.

1.6 DEFINITIONS

- A. Lateral Piping: Downstream from control valves to sprinklers, specialties, and drain valves. Piping is under pressure during flow.
- B. Irrigation Main Piping: Downstream from point of connection to water distribution piping to, and including, control valves. Piping is under water-distribution-system pressure.
- C. The following are industry abbreviations for plastic materials:
 - 1. PVC: Polyvinyl chloride plastic.

1.7 PERFORMANCE REQUIREMENTS

- A. Maintain 100 percent water-coverage irrigation system for exterior plants indicated.
- B. Location of Sprinklers and Specialties: Design location is approximate. Make minor adjustments necessary to avoid plantings and obstructions such as signs and light standards. Maintain 100 percent water coverage of planting areas indicated.
- C. Minimum Working Pressures: The following are minimum pressure requirements for piping, valves, and specialties, unless otherwise indicated:
 - 1. Irrigation Main Piping: 200 psig.
 - 2. Lateral Piping: 200 psig.

1.8 SUBMITTALS

- A. Prepare and make five sets of submittals providing manufacturer's specifications and "cut sheets" on the following components:
 - 1. Controllers
 - 2. Manual and automatic valves
 - 3. 24 volt wire
 - 4. Piping
 - 5. Joint materials
 - 6. Filters
 - 7. Valve boxes
 - 8. Wire splicing materials
 - 9. PVC fittings
 - 10. Drip emitters
 - 11. Pipe fittings
 - 12. Heads
 - 13. Drainage aggregate
 - 14. Warning tape
- B. Provide irrigation system record drawings:
 - 1. Legibly mark drawings to record actual construction.
 - 2. Indicate horizontal and vertical locations, referenced to permanent surface improvements
 - 3. Identify field changes of dimension and detail any changes made by Change Order.
- C. The Contractor shall provide one controller chart showing the area covered by a controller for each automatic valve. The chart shall be a reduced drawing of the actual "Record Drawing" system. The size of the chart shall be the maximum size that the controller door will allow. If controller sequence is not legible when the drawing is reduced, drawing shall be enlarged to a size that is readable.
- D. Chart shall be a blackline print with a different color used to show area of coverage for each system. When completed and approved, the chart shall be hermetically sealed

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- between two pieces of plastic, each piece being a minimum 20 mils thick. Charts shall be completed and approved prior to final inspection and acceptance of the irrigation system.
- E. Field quality-control test reports.
 - F. Operation and Maintenance Data: For irrigation systems, to include in emergency, operation, and maintenance manuals. Include data for the following:
 - 1. Automatic-control valves.
 - 2. Irrigation heads.
 - 3. Controllers.

1.9 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with sections on general conditions. Quality control and Standard landscape practices.
- C. Installer's Qualifications: Minimum of 5 years experience installing irrigation systems of comparable size, and current Irrigator's License. Submit a copy of Irrigator's License to the Landscape Architect.
- D. Materials, equipment and methods of installation shall comply with the following codes and standards:
 - 1. Manufacturer's Instructions.
 - 2. National fire Protection Association (NFPA): national Electrical code.
 - 3. American society for testing Materials (ASTM).
 - 4. National Sanitation Foundation (NSF).
 - 5. The Irrigation Association (IA).
 - 6. Texas Commission on Environmental Quality (TCEQ).
- E. Excavation, backfilling and compaction operations: Contractor shall meet State and Local requirements.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver irrigation system components in manufacturer's original, undamaged and unopened containers with labels intact and legible.
- B. Deliver plastic piping in bundles, packaged to provide adequate protection of pipe ends, both threaded or plain.
- C. Store and handle materials to prevent damage and deterioration.
- D. Provide secure, locked storage for valves, sprinklers heads, and similar components that can not be immediately replaced, to prevent installation delays.
- E. Contractor to provide and honor all manufacturer warranties on all irrigation products.
- F. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- G. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.11 PROJECT CONDITIONS

- A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:
 - 1. Notify Landscape Architect and Owner no fewer than five days in advance of proposed interruption of water service.
 - 2. Do not proceed with interruption of water service without Owner's written permission.
- B. Known underground and surface utility lines are indicated within the drawing set. If utilities are not shown on plans, that does not mean there are no utilities in the construction limits.
- C. Protect existing trees, plants, lawns and other features designated to remain as part of the final landscape work.
- D. Promptly repair damage to adjacent facilities caused by irrigation system work. Cost of repairs at Contractor's expense.
- E. Promptly notify the Landscape Architect of unexpected subsurface conditions.
- F. Irrigation system layout is diagrammatic. Exact location of piping, sprinkler heads, valves and other components shall be established by Contractor in the field at the time of installation.
 - 1. Cut through concrete and masonry with core drills. Jackhammers are not permitted.
 - 2. Materials and finishes for patching shall match existing surface materials and finish. Exercise special care to provide patching at openings in exterior walls watertight.
 - 3. Methods and materials used for cutting and patching shall be acceptable too the Landscape Architect.

1.12 COORDINATION

- A. The Contractor shall coordinate and cooperate with other contractors on site to ensure rapid and efficient completion of all contracted work.

1.13 WARRANTY

- A. Irrigation system shall be guaranteed against defects in materials and workmanship for one (1) year after substantial completion. Work covered under the guarantee period will include, but not be limited to, emergency repairs. Repair settling backfilling trenches, and repair replacement of any malfunctioning equipment.
- B. Correct all defects and resulting damages within 24 hours after the Owner's notification. If no response to the notification is made within the 24 hour period, the Owner may proceed with repairs and charge the expense incurred with the work to the Contractor. The Owner may make emergency repairs as necessary without voiding the guarantee.
- C. Furnish all materials, labor and equipment for correction at no expense to the Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 PIPES, TUBES, AND FITTINGS

- A. Refer to Part 3 "Piping Applications" Article for applications of pipe, fitting, and joining materials.
- B. PVC Pipe: ASTM D 1785, PVC 1120 compound, Class 200 IPS
 - 1. PVC Socket Fittings, Schedule 40: ASTM D 2466.
- C. PVC Pipe: ASTM D 1785, PVC 1120 compound, Schedule 40.
 - 1. PVC Socket Fittings, Schedule 40: ASTM D 2466.
- D. PVC Pipe: ASTM D 1785, PVC 1120 compound, Schedule 80.
 - 1. PVC Socket Fittings, Schedule 80: ASTM D 2467.
 - 2. PVC Threaded Fittings: ASTM D 2464.

2.3 SWING JOINTS

- A. Swing joints shall be LASCO "o" ring swing joints as required to protect the head from breakage. Swing joints shall be the same size as the inlet opening.

2.4 JOINING MATERIALS

- A. Solvent Cement: ASTM F 656 primer and ASTM D 2564 solvent cement in color other than orange. Solder: ASTM B 32, Alloys Sn95 and E.
- B. Gaskets and Fasteners for Metal and Metal-to-Plastic Flanged Joints. ASME B16.21, nonmetallic, asbestos-free, flat 1/8 inch thickness gaskets and ASME B18.2.1, carbon steel bolts, nuts, and washer.
- C. Gaskets for Plastic Flanged Joints: Materials recommended by plastic pipe and fittings manufacturer.

2.5 SPECIALTY VALVES

- A. Medium and High Flow Control Zone Kit with Basket Filter:
 - 1. Control Zone Kit shall be Rain Bird's Commercial Control Zone Kit with Rain Bird's 1" or 1 1/2" PESB valve, Quick Check Basket Filter with 200-mesh (75 micron) screen and 40 psi Pressure Regulator.
 - 2. The 1" control zone kit shall have a 1" isolation ball valve.
 - 3. The filter shall be a 1" inline Quick Check Basket Filter body constructed of heavy-duty, glass-filled, UV resistant polypropylene capable of withstanding pressures of not less than 150 psi (10,3 bars). The design shall be a basket style body with jar-top cap. The cap shall incorporate an indicator that goes from green to red during operation when the filter element needs cleaning. The dimensions for the filter shall not exceed the following: Height: 6 1/2" (16,5 cm), Length: 6 1/2" (16,5 cm), Width: 3 1/2" (8,9 cm). The filter element shall be constructed of a durable stainless steel mesh attached to a propylene frame and shall be a standard 200-mesh (75 micron). The screen shall be serviceable for cleaning purposes by unscrewing the cap from the body and removing the filter element.
 - 4. The control zone kit shall have an inline pressure regulator. The pressure regulator shall be constructed of durable, UV resistant non-corrosive material able to accommodate an inlet pressure rating of not less than 150 psi (10,3 bar). The pressure regulating device is a normally open device that allows full flow with little pressure loss unless the inlet pressure is greater than the preset level. As the inlet pressure increases above the preset level it compresses a spring and begins to reduce

the flow and downstream pressure. The inline pressure regulator shall have a preset outlet pressure of approximately 40 psi (2,8 bar).

5. The control zone kit shall have a 1" or 1 1/2" Rain Bird PESB series automatic irrigation control valve. The valve pressure rating not to be less than 150 psi (10,3 bars). The valve body and bonnet shall be constructed of high-impact, weather-resistant plastic, stainless steel and other chemical/UV resistant materials. The valve shall have a diaphragm constructed of a durable Buna-N rubber material reinforced with nylon. The valve shall be fitted with a TBOS Potted Latching Solenoid.
6. Models:
 - a. Medium Flow Kit for 3.0 to 20.0 GPM (11 to 76 l/m). Includes a 1" PESB Valve, Basket Filter with 200 mesh (75 micron) screen, 40 psi Pressure Regulator and ball valve.
 - 1) XCZ-100-B-COM

2.6 CONTROL-VALVE BOXES

- A. Plastic Control-Valve Boxes: Box and cover, and box extensions with open bottom and openings for piping; designed for installing flush with grade. Include size as required for valves and service.
 1. Shape: Rectangular.
 2. Sidewall Material: PE. Injection molded of structural foam polyethylene.
 3. Cover Material: PE.
 - a. Lettering: IRRIGATION.
 4. Manufacturers:
 - a. Carson Industries LLC.
 - b. NDS.
 - c. Ametek.
 - d. Strongwell.
- B. Pro Series Rectangular Valve Box, Cover and Extensions as required.
- C. Drainage Backfill: 6" depth cleaned gravel or crushed stone, graded from 3/4 inch (19 mm) minimum to 2 inches (75 mm) maximum.

2.7 SPRINKLER SPECIALTIES

- A. Self-cleaning, pressure compensating dripperline: Netafim Techline CV
 1. Techline is a low volume dripperline with integral and evenly spaced pressure compensating drippers at specified intervals in three discharge rates (0.4, 0.6 & 0.9 gallons per hour [GPH]). Techline is available in 100', 250' and/or 1,000' coils. Techline Blank Tubing is available in 100', 250' and/or 1,000' coils.
 2. Techline shall consist of nominal sized one-half inch (1/2") inch low-density linear polyethylene tubing with internal pressure compensating, continuously self-cleaning, integral drippers at a specified spacing, (12", 18", or 24" centers) or blank tubing without drippers. The tubing shall be brown in color and conform to an outside diameter (O.D.) of 0.67 inches and an inside diameter (I.D.) of 0.57 inches. Individual pressure compensating drippers shall be welded to the inside wall of the tubing as an integral part of the tubing assembly. These drippers shall be constructed of plastic with a hard plastic diaphragm retainer and a self-flushing/cleaning elastomer diaphragm extending the full length of the dripper.
 3. The drippers shall have the ability to independently regulate discharge rates, with an inlet pressure of seven to seventy (7-70) pounds per square inch (PSI), at a constant

flow and with a manufacturer's coefficient of variability (Cv) of 0.03. Recommended operating pressure shall be between 15-45 PSI. The dripper discharge rate shall be 0.4, 0.6, or 0.9 gallons per hour (GPH) utilizing a combination turbulent flow/reduced pressure compensation cell mechanism and a diaphragm to maintain uniform discharge rates. The drippers shall continuously clean themselves while in operation. The dripperline shall be available in 12", 18" and 24" spacing between drippers unless otherwise specified. Techline pipe shall be installed beneath landscape mulch unless otherwise specified. Maximum system pressure shall be 45 PSI. Filtration shall be 120 mesh or finer. Bending radius shall be 7". For on-surface or under mulch installations, 6" metal wire staples (TLS6) shall be installed 3'-5' on center, and two staples installed at every change of direction. Techline shall be Netafim Model Number TLCV9-1210 or approved equal. The Techline Blank Tubing shall be Netafim Model Number TLCV0025 or approved equal.

2.8 AUTOMATIC-CONTROL SYSTEM

A. ESP Modular:ESP-SMT Series

1. The controller shall be of a hybrid type that combines electro-mechanical and microelectronic circuitry capable of fully automatic or manual operations. The controller shall be housed in a wall-mounted, weather resistant plastic cabinet with a key-locking cabinet door (outdoor models only) suitable for either indoor or outdoor installation.
2. The controller shall have a base unit with 4 stations as well as three expansion slots capable of receiving station modules of three stations each to create a controller of up to 13 stations. Station 13 shall be called an "auxiliary station" and shall have the capability of bypassing an active rain sensor or of functioning as a normal station output. Station timing shall be from 0 minutes to 6 hours. Run time resolution shall be in 1-minute increments from 0 to 59 minutes and 10 minutes from 1 to 6 hours. The LCD shall display "No Run Times" or equivalent icon for 230 VAC models if no run time has been entered for any station in any program.
3. The controller shall have three separate and independent programs which can have different start times, station timing and watering days. Each program shall have up to 4 start times available. The controller shall stack multiple start times in sequence to prevent hydraulic overload. The LCD shall display "No Start Times" or the equivalent icon for 230 VAC models if no start time has been entered for any program. The Controller shall be capable of operating two 24 VAC solenoid valves per station plus a master valve or remote pump start relay. The controller shall operate on 120 VAC $\pm$ 20% AT 60Hz (230 VAC $\pm$ 20% at 50 Hz for international models). The controller shall have an electronic, diagnostic circuit breaker that shall sense a station with an electrical overload or short circuit and shall bypass the station and continue operating all other stations.
4. The controller shall have a 365-day calendar with a permanent day off feature that allows a day(s) of the week to be turned OFF on any cycle (odd/even/1-31 day cycle). A day set to "Permanent Off" shall override the normal repeating schedule and shall display the words "Day Always Off/Day Off" in the LCD screen. The controller shall have a seasonal adjust feature adjustable from 0% to 200% in increments of 10%. Seasonal adjust shall effect all programs simultaneously. If seasonal adjust is set to 0% the LCD shall display "SEASONAL ADJ" (equivalent icon for 230 VAC models).

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5. The controller shall have a 12-hour AM/PM or 24 hour military (for 230 VAC models) clock with a midnight day change over. The controller shall have a sensor circuit for connection to a rain sensor or to an underground moisture sensor system that will interrupt a scheduled watering under “wet” or “moist” conditions. The controller shall have an indicator on the LCD screen and one LED light to indicate that a sensor is connected and active and that watering has been temporarily disabled.
 6. The controller shall have access to a variety of “hidden features” by turning the dial to a specific location on the dial and pushing the ON OFF buttons simultaneously. These features shall include:
 - a. Save a custom default program.
 - b. Retrieve a custom default program.
 - c. Bypass an active rain sensor on the Auxiliary Station.
 - d. Allow the Auxiliary Station to be interrupted by an active rain sensor.
 - e. Clear memory.
 - f. Set a day as “Permanently Off.”
 - g. Set master valve/pump start circuit by station.
 - h. Set programmable delay between station.
 7. The controller shall have the following manual operations and manual advances for semiautomatic control:
 - a. Run a single valve.
 - b. Run multiple manually stacked valves.
 - c. Run a semi-automatic program.
 - d. Run a test on all valves (all stations with any time assigned regardless of the program) from 1 to 10 minutes.
 8. The controller shall have a removable, battery programmable front panel (uses a 9 volt battery [not included]) for conveniently programming the controller away from the installation site or for teaching irrigation scheduling.
 9. The controller shall have a capacity for the program to be erased allowing the user to start programming with a blank controller. The controller shall have multiple knockouts, sizes and locations, including the back of the cabinet, to facilitate installation and provide a clean professional look. The controller shall have a factory default program that runs 10 minutes every day beginning 8 hours after power resumption.
 10. The controller shall have a reset button to reset the controller in the case of micro-controller “lock-up” due to power surges or frequent interruption to the power supply.
 11. The controller should include a weather sensor to be installed per manufacturer’s recommendations.
 12. The weather sensor includes a tipping rain bucket to measure effective rainfall.
 13. The controller shall be as manufactured by Rain Bird Corporation, Azusa, California.
 14. Electrical Specifications
 - a. Application: suitable for use with 24 VAC controllers (with or without pump start / master valve).
 - b. Electrical rating suitable for use with up to six 24VAC 7VA solenoids plus an additional master valve or pump start that does not exceed 53VA.
 - c. Controller Interface Wire: 30” length of #22 gauge UV resistant extension wire.
 - d. UL, cUL, CE, C-Tick, and WEEE certifications.

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- e. FCC approved spread spectrum 2 way radio transceivers with FCC Class B approvals.
 - f. Signal transmission distance of 700' Line of Sight.
 - g. Battery life: four or more years under normal operating conditions.
 - h. 6 KV surge / lighting protection.
 - 1) Mechanical Properties
 - i. Adjustable rainfall settings from 1/8" – 1/2".
 - j. Adjustable low temperature settings from 33°F – 41°F.
 - k. Three irrigation modes to select: Programmed, Suspend Irrigation for 72 hours, Override sensor for 72 hours.
 - l. "Quick Shut Off" suspends active irrigation cycle within approximately two minutes.
 - m. High-grade, UV resistant polymer units resist harmful environmental effects.

2.9 QUICK COUPLERS

- A. Description: Factory-fabricated, bronze or brass, two-piece assembly. Include coupler water seal valve; removable upper body with spring-loaded or weighted, rubber-covered cap; hose swivel with ASME B1.20.7, 3/4-11.5NH threads for garden hose on outlet; and operating key.
 - 1. Purple Locking-Top Option: Vandal-resistant locking feature. Include two matching keys.

PART 3 - EXECUTION

3.1 POINT OF CONNECTION

- A. All existing water main line locations shown on the Drawings are schematic. It shall be the Contractor's responsibility to pot hole and field check to determine actual locations as incidental requisite to the construction contract.
- B. The proposed controller location indicated on the plans is approximate. Actual location of the controller shall be determined by Owner's representative in the field.
- C. Where connections to existing stub-outs are required, the Contractor shall make necessary adjustments should stubs not be located exactly as shown, at no additional cost to the Owner.

3.2 STATIC PRESSURE TEST

- A. The design pressure of the irrigation system is shown on the Drawings. Prior to start of construction of the irrigation system, the Contractor shall provide a gauged test of available static pressure at the point of connection. In the event that the actual static pressure is less than the design static pressure, the Contractor shall not proceed with the work until receiving written direction from the Owner's Representative.

3.3 PREPARATION

- A. Examine final grades and installation conditions. Do not start irrigation system work until unsatisfactory conditions are corrected.
- B. Contractor will be responsible for gaining access under all existing paving by boring under the paving. Sleeves should be coordinated before all work begins.

3.4 EARTHWORK

A. Excavating and Trenching:

1. All excavation shall be considered unclassified excavation and include all materials encountered.
2. Install piping and wiring in sleeves under sidewalks, roadways, parking lots, and railroads.
3. The Contractor shall be responsible for locating all cables, conduits, piping, and any other utilities or structures that may be encountered either above or below ground. All necessary precautions must be taken by the Contractor to prevent any damage to these existing utilities and improvements. In the event that such damage should occur from his operations, the Contractor shall repair or replace damaged utilities to their original condition at no additional expense to the Owner
4. Excavation and trenching for pipe lines shall be a true and straight line with the trench banks as nearly vertical as practical. The width of the trenches shall not be greater than necessary to permit proper joining, tamping, backfilling, bedding or any other installation procedures that may be necessary. Trench widths shall also be wide enough so that there will be a minimum horizontal and vertical separation of 4" between pipes in the same trench.
5. In areas where trees are present, trench lines will be adjusted on the site to eliminate any damage to tree roots. In areas where avoidance of tree roots is not possible, trenches shall be hand dug. Roots greater than or equal to 1" in diameter shall not be cut.
6. Trench depths shall be sufficient to provide the specified pipe cover as described elsewhere in these specifications or as noted on the Drawings. In rocky areas the trenching depth shall be 6" below normal trench depth to allow for pipe bedding as described in other portions of these specifications.
7. Provide minimum cover over top of underground piping according to the following:
 - a. Irrigation Main Piping: Minimum depth of 18 inches below finished grade, or not less than 6 inches below average local frost depth, whichever is deeper.
 - b. Lateral Piping: 12 inches.
 - c. Sleeves: Same as line depth, 12" minimum.
8. If the Contractor encounters rock or other unfavorable trenching conditions, no additional compensation will be paid. When material from the excavation or trenching is unsuitable for use as backfill, additional backfill material suitable for this purpose shall be brought in at the expenses of the Contractor. It shall also be the Contractor's responsibility to remove and dispose of all unsuitable materials removed from the trench that cannot be used in the backfill operation.

B. Backfilling:

1. Upon completion of a particular section of the irrigation system, and after sufficient time has elapsed for the curing of solvent weld joints, partial backfilling shall begin, leaving all joints, risers and connections exposed for visual inspection during the hydrostatic testing. Only upon successful completion of the hydrostatic test shall the backfill operation be completed for any one particular section.
2. All backfill material shall be subject to approval by the Landscape Architect. Backfill material shall be free from rock, large stones, brush, sod, frozen material or other unsuitable substances that may damage pipe during the backfilling operations.
3. In the event that the material from the excavation or trenching is found to be unsuitable for use in backfill by the Owner's Representative, it shall be removed from the site and properly disposed of by the Contractor and at his own expense. The Contractor shall then, at no additional cost to the Owner, arrange for, purchase,

and furnish suitable backfill material consisting of earth, loam, sandy clay, sand or other approved materials free of large clods of earth or sharp stones and capable of attaining the same relative density of the surrounding ground.

4. In rocky areas, the trench depth shall be 6" below the normal trench depth to allow for 6" of suitable backfill as padding for the pipe. In like manner, there shall be at least 6" of padding on all sides of the pipe as a padding against the rock wall of the trench.
5. Install warning tape directly above pressure piping, 12 inches (300 mm) below finished grades, except 6 inches (150 mm) below subgrade under pavement and slabs.
6. Backfill shall be placed in horizontal layers not exceeding 6" in depth and shall be thoroughly tamped, or water compacted to near original density or so that no settling will result. Backfill shall be placed to the original ground level. If settlement of trenches occurs within one (1) year from date of completion, it shall be the Contractor's responsibility to refill trenches and re-seed or sod the repaired areas.
7. After all piping, risers, valves, thrust blocks, etc., have been installed and partially backfilled as specified in other parts of these specifications, the control valve shall be opened and a full head of water used to flush out the system. After the system is thoroughly flushed, risers shall be capped off and the system pressure tested in accordance with the testing section of these specifications. At the conclusion of the pressure test, the heads shall be installed and the backfill operation completed.

3.5 PIPING APPLICATIONS

- A. Install components having pressure rating equal to or greater than system operating pressure.
- B. Underground Irrigation Main Piping:
 1. Size 4" and smaller: Schedule 40, PVC pipe and socket fittings; and solvent-cemented joint.
 2. Size 6" and larger: Class 200, PVC pipe and socket fittings; and solvent-cemented joints.
- C. Lateral Piping:
 1. Class 200, PVC pipe and socket fittings; and solvent-cemented joints.
- D. Underground Branches and Offsets at Sprinklers and Devices: Class 200, PVC pipe; threaded PVC fittings; and threaded joints.
- E. Risers to Aboveground Sprinklers and Specialties: Class 200, PVC pipe and socket fittings; and solvent-cemented joints.
- F. Sleeves: Class 200, PVC pipe and socket fittings; and solvent-cemented joints.
 1. Irrigation piping and irrigation control wire shall not be installed in the same sleeve.
 2. Sleeve pipe shall be a minimum of two sizes larger than irrigation lines within sleeve.
 3. Sleeves for irrigation control wiring shall be sized as follows:

Maximum Number of Wires to be Installed in PVC Sleeve

Wire Size (AWG)	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
14	4	6	10	18	25	40	56	88
12	3	5	7	15	20	33	50	75

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- G. Transition Fittings: Use transition fittings for plastic-to-metal pipe connections according to the following:
 - 1. Couplings:
 - a. Underground Piping NPS 1-1/2 (DN 40) and Smaller: Manufactured fitting or coupling.
 - b. Underground Piping NPS 2 (DN 50) and Larger: AWWA transition coupling.
 - 2. Fittings:
 - a. Underground Piping: Union with plastic end of same material as plastic piping.

3.6 VALVE APPLICATIONS

- A. Where specific types are not indicated following requirements apply.
 - 1. Buried Valves 2" and Smaller: Wilkins 850 full port brass ball valve.
 - 2. Buried Valves 2" and Larger: Spears PVC utility ball valves.

3.7 PIPING INSTALLATION

- A. Install plastic pipe in accordance with manufacturer's installation instructions. Provide for thermal expansion and contraction.
- B. Saw cut plastic pipe. Use a square-in-saw vice to ensure a square cut. Remove burrs and shavings at ends prior to installation.
- C. Make plastic to plastic joints with solvent weld joints. Use only solvent recommended by the pipe manufacturer. Install plastic pipe fittings in accordance with pipe manufacturer's instructions. Contractor shall make arrangements with pipe manufacturer for all necessary field assistance.
- D. Make plastic to metal joints with plastic male adapters.
- E. Location and Arrangement: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are approved on Coordination Drawings.
- F. The minimum horizontal and vertical clearance between lines in the same trench shall be 4"
- G. Pipe shall not be laid when the temperature is 32 degrees F or below.

3.8 JOINT CONSTRUCTION

- A. Make solvent weld joints in accordance with manufacturer's recommendations.
 - 1. Pressure Main IPS Weld-on 711 (grey Heavy duty) for all Pressure Main and PVC pipe over 2".
 - 2. Lateral: IPS Weld-on 710 for all PVC pipe up to 2".
 - 3. Primer: IPS Weld-on, Purple P-68 or P-70
 - 4. Cleaner: IPS Weld-on
 - 5. Allow joints to set at least 24 hours before pressure is applied to the system.
 - 6. Maintain pipe interiors free of dirt and debris. Close open ends of pipe by acceptable methods when pipe installation is not in progress.
- B. Make gasket joints in accordance with manufacturer's recommendations.

3.9 VALVE INSTALLATION

- A. Underground Manual Valves: Install in valve box with top flush with grade.
 - 1. Install valve boxes on a minimum 4" depth base of pea gravel with landscape fabric beneath. Valve boxes shall be large enough to house the entire valve assembly and allow for maintenance.
 - 2. Provide valve box extension, if necessary, to ensure that entire valve assembly is enclosed in valve box and top of box or extension is flush with adjacent grade.
- B. Automatic Control Valve: Install in valve box with top flush with grade.
 - 1. Install valve boxes on a minimum 4" depth base of pea gravel with landscape fabric beneath. Valve boxes shall be rectangular and large enough to house the entire valve assembly and allow for maintenance.
 - 2. Provide valve box extension, if necessary, to ensure that entire valve assembly is enclosed in valve box and top of box or extension is flush with adjacent grade.
 - 3. Automatic control valves shall be of the type and size as indicated on the Drawings. Installation shall be according to these specifications, the Drawings and the manufacturer's specifications.
 - 4. Valve wire splices shall be waterproofed.
 - 5. Contractor shall provide a 36" wire expansion coil to facilitate raising splices to ground level without cutting wires.
 - 6. Seal threaded connections on pressure and non-pressure side of control valves with Teflon tape only.

3.10 SPRINKLER INSTALLATION

- A. Flush circuit piping with full head of water and install sprinklers after hydrostatic test is completed.
- B. Install sprinklers at manufacturer's recommended heights.
- C. Locate part-circle sprinklers to maintain a minimum distance of 4 inches (100 mm) from walls and 2 inches (50 mm) from other boundaries, unless otherwise indicated.
- D. Heads shall be installed in the vertical position and backfilled and compacted to near original density.
- E. Heads shall be of the type and make specified and shall be installed as shown on the Drawings.
- F. Head spacing shall not exceed the spacing shown and shall be in the location and configuration as shown on the Drawings. Contractor shall verify turf area dimension while staking head location. Heads shall be spaced to achieve uniform coverage.
- G. After all piping and risers are in place and connected and before installation of the heads, all control valves for a given section shall be fully opened and a full head of water shall be used to flush out the system.
- H. Install popup spray heads with LASCO swing joints.
- I. Install popup impact or gear driven sprinklers with an adjustable swing joint riser of at least 3 standard 90 degree elbows. Fabricate double swing joints risers of schedule 80 pvc nipples and schedule 40 PVC elbows.

3.11 AUTOMATIC-CONTROL SYSTEM INSTALLATION

- A. Controller shall be enclosed in a U.L., CE and C-Mark Listed rainproof plastic enclosure with optional key lock. The enclosure shall be rated for outdoor or indoor use. Enclosure shall be a wall mount model with removable knockouts on the lower side and back of the housing for choice of wiring location.

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- B. The operating panel shall be a totally enclosed module that is removable from the housing for programming at a separate location. A test post for 24V a.c. operation shall be accessible with or without the operating panel. Zone modules (SLM4 or SLM12) shall be self-contained modules that can be installed without turning off power to the unit and programming of new zones shall not be required. Module wiring connections shall be of the type that allows insertion of solid wires without any tool. Each module shall contain its own surge protection.
 - C. Controller shall be completely electric in operation. Controller shall be installed and wired in accordance with manufacturer's published instructions. Controller shall be capable of operating from an independent power supply. Primary shall be 115V a.c. 60hz or 230V, 50hz.
 - D. WARRANTY: Controller shall carry a conditional two (2) year exchange warranty.

3.12 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Ground equipment according to Division 16 Section "Grounding and Bonding."
- C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- D. Valve wire splices shall be waterproofed using 3M Scotchlok Connectors and the Contractor shall provide a 36" wire expansion coil to facilitate raising splices to ground level without cutting wires.

3.13 LABELING AND IDENTIFYING

- A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplates and signs on each automatic controller.
 - 1. Text: In addition to identifying unit, distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

3.14 FIELD QUALITY CONTROL

- A. Observation
 - 1. The following observations shall be the minimum required observations during the course of construction. Additional observations shall be made at any time at the discretion of the Owner or Landscape Architect. It shall be the responsibility of the Contractor to notify the Owner's Representative, in writing, 48 hours in advance of each required observation. The sequence of required observations shall not be changed from the sequence listed below. The Contractor shall not proceed with work of the next sequence without written approval of the work of the previous sequence. The Contractor shall attach a copy of the written observation approvals to all applications for payment.
 - a. Observe head placement, coverage and operating pressure prior to planting.
 - b. Observe at end of maintenance period.
- B. Testing
 - 1. Upon completion of the irrigation system's mainline, the entire mainline shall be tested for a one hour period at 100 psi, unless otherwise noted. Prior to testing, the mainline shall be partially backfilled, leaving all joints and connections exposed for visual inspection. All dirt shall be flushed from the system and the line filled with

water to remove air. The mainline shall be brought to static pressure. A pressure gauge and temporary valve shall be installed at the end of the mainline to permit air pressure to be applied to the main. A pressure of 100 psi must be retained for a one hour period. Any leaks resulting in the one hour pressure test shall be repaired and the system retested until the system passes the test.

2. Upon completion of the lateral piping sections, each lateral system shall be pressure tested. On systems using flex nipples, or swing joints, the lateral system shall be tested prior to installation of the flex nipples or swing joints. Prior to testing the lateral lines shall be partially backfilled leaving all joints and connections exposed for visual inspection. All air and dirt shall be flushed from the system and all open fittings shall be capped. The testing procedure shall be the same as used for the main line. If after one hour 100 psi pressure has been retained, the heads shall be installed, and the backfill operation completed. Any leaks resulting from the hydrostatic test shall be repaired and the system retested until the system passes the test.
3. The Contractor shall be responsible for payment of construction observations for retesting of any lines or system components that fail initial pressure or performance test. Costs shall include the time of the observer at the observer's standard rate, travel time and travel expenses.

3.15 STARTUP SERVICE

- A. Verify that controllers are installed and connected according to the Contract Documents.
- B. Verify that electrical wiring installation complies with manufacturer's submittal and installation requirements in Division 16 Sections.
- C. Complete startup checks according to manufacturer's written instructions.

3.16 ADJUSTING

- A. Contractor shall adjust all valves for the proper operating pressure and adjust all heads for uniform coverage and even flow.
- B. Contractor shall wire the Controller (valve/station) as directed by the Landscape Architect. The valve number shall be indicated on the Controller panel for each station.
- C. Contractor shall program Controller to provide optimum system performance.

3.17 CLEANING

- A. The Contractor shall continuously keep a neat and orderly area in which he is installing the system. Disposal of rubbish and waste material resulting from the installation shall be continual. Upon completion of the system, the Contractor shall remove from the Owner's property at his own expense, all temporary structures, rubbish waste material, tools and equipment resulting from or used in the installation of the system.
- B. The Contractor shall repair damage resulting from irrigation system installation.
- C. Flush dirt and debris from piping before installing sprinklers and other devices.

3.18 FINAL ACCEPTANCE

- A. When the Contractor is satisfied that the system is operating properly, that it is balanced and adjusted, that all work and clean-up is completed he shall issue notice of completion to the Owner's Representative requesting a final inspection. The Owner's Representative will respond to the notice of completion by the Contractor and shall appear with the Owner for an observation of the project. At that time the Contractor shall demonstrate the operation of each system in its entirety. In judging the work, no allowance for deviation from the original Drawings and Specifications will be made unless prior approval has been obtained.
- B. Any inconsistency to the Specifications or the Drawings shall be noted by the Owner's Representative and a written copy of required corrections shall be given to the Contractor.

3.19 DEMONSTRATION

- A. After the system has been tested and accepted, the Contractor shall instruct the Owner's Representative in the operation and maintenance of the system.
- B. The Contractor shall provide the Owner with two (2) keys for the following:
 - 1. Manual Gate Valves.
 - 2. Manual Drain Valves.
 - 3. Valve Boxes.
 - 4. Valve Markers.
 - 5. Controllers.
 - 6. Any locking assembly in need of key access.
- C. The Contractor shall provide the Owner with two copies of an Irrigation Maintenance Manual bound in a three ring binder. The maintenance manual shall include copies of the approved submittals, controller operations manuals and manufacturers warranties on all irrigation products.

3.20 SYSTEM MAINTENANCE AND GUARANTEE

- A. Maintenance of the irrigation system shall begin immediately following the installation of the system and shall continue until the entire project is accepted. Maintenance shall include repair of defects or damages, and adjustments and fine tuning of the system, and repairs of damages resulting from vandalism, erosion, weather, and the like.
- B. For a period of one (1) year from final acceptance of the system, the Contractor shall promptly furnish and install, without cost to Owner, any and all parts or materials which prove defective in material or workmanship. Damage due to irrigation system line breaks shall be repaired and brought to original condition by the Contractor at no expense to the Owner.
- C. In the fall, at the Owner's request, the Contractor shall drain the system, and otherwise prepare the system for winter. In the spring, at the Owner's request, the Contractor will reactivate the system, repair any defects or damage and adjust the system. As these services are performed, the Contractor shall instruct the Owner.

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- D. For a period of one (1) year from final acceptance of the system, the Contractor shall repair any settlement of trenches by one of the following methods as directed by the Owner's Representative.
1. Bring to grade by top-dressing (raking topsoil into the planting bed).
 2. Bring to grade with topsoil.
 3. Remove existing plant material, fill depression with topsoil, and replace with new plant material to match original plantings.
 4. Repair by any of the above methods shall result in a smooth, level area. Maintenance of repaired areas shall be the responsibility of the Owner.

END OF SECTION

SECTION 02930

EXTERIOR PLANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Trees.
- B. Shrubs.
- C. Ground cover.
- D. Plants.

1.3 RELATED SECTIONS

- A. Section 02301 - Earthwork for Buildings: Filling, and rough grading and for subsurface aggregate drainage and drainage backfill materials.

1.4 DEFINITIONS

- A. Balled and Burlapped Stock: Exterior plants dug with firm, natural balls of earth in which they are grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of tree or shrub required; wrapped, tied, rigidly supported, and drum-laced as recommended by ANSI Z60.1.
- B. Balled and Potted Stock: Exterior plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than diameter and depth recommended by ANSI Z60.1 for type and size of exterior plant required.
- C. Container-Grown Stock: Healthy, vigorous, well-rooted exterior plants grown in a container with well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for kind, type, and size of exterior plant required.
- D. Fabric Bag-Grown Stock: Healthy, vigorous, well-rooted exterior plants established and grown in-ground in a porous fabric bag with well-established root system reaching sides of fabric bag. Fabric bag size is not less than diameter, depth, and volume required by ANSI Z60.1 for type and size of exterior plant.
- E. Finish Grade: Elevation of finished surface of planting soil.
- F. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- G. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.
- H. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.

1.5 SUBMITTALS

- A. Samples for Verification: For each of the following:
 - 1. One bag chat material for Landscape Architect's approval.
- B. Product Certificates: For each type of manufactured product, signed by product manufacturer, and complying with the following:
 - 1. Manufacturer's certified analysis for standard products.
 - 2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.
- C. Qualification Data: For landscape Installer.
- D. Topsoil Analysis: For existing surface soil and imported topsoil. Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of topsoil.
 - 1. Report suitability of topsoil for plant growth. State recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce a satisfactory topsoil.
- E. Planting Schedule: Indicating anticipated planting dates for exterior plants.
- F. All plants for planting plan as located and selected by the Landscape Contractor at a nursery, place of supply, or site within a 30-mile radius of the existing project. Plants will be submitted to Landscape Architect for approval before delivering to project site.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape installer with three years previous experience of size and scope commensurate with this project and whose work has resulted in successful establishment of exterior plants.
 - 1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when exterior planting is in progress.
- B. Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.
- C. Provide quality, size, genus, species, and variety of exterior plants indicated, complying with applicable requirements in ANSI Z60.1, "American Standard for Nursery Stock" and any additional comments listed on the plans.
 - 1. Approval of exterior plants will be made by Landscape Architect, who will observe plants at their place of growth, supplier, or remote site before delivery to the project site.
- D. Tree and Shrub Measurements: Measure according to ANSI Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6 inches above ground for trees up to 4-inch caliper size, and 12 inches above ground for larger sizes. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip-to-tip.

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- E. Observation: Landscape Architect may observe trees and shrubs at place of growth, supplier, or remote site within 30 miles of the project site before planting for compliance with requirements for genus, species, variety, size, and quality. Landscape Architect retains right to observe trees and shrubs further for size and condition of balls and root systems, insects, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site and supply acceptable material at no additional cost.
 - 1. Notify Landscape Architect of sources of planting materials fourteen days in advance of delivery to site.
 - F. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver exterior plants to site in a healthy and stable condition with no damage or injuries.
- B. Do not prune trees and shrubs before delivery, except as approved by Landscape Architect. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior plants during delivery.
- C. Handle planting stock by root ball. Do not strap tree trunks for loading, unloading or planting.
- D. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants trees in shade, protect from weather and mechanical damage, and keep roots moist.
 - 1. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
 - 2. Do not remove container-grown stock from containers before time of planting.
 - 3. Water root systems of exterior plants stored on-site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.

1.8 COORDINATION

- A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.
 - 1. Spring Planting: February 1 to June 15.
 - 2. Fall Planting: September 1 to October 31.
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.
- C. Coordination with Lawns: Plant trees and shrubs after finish grades are established and before planting lawns, unless otherwise acceptable to Landscape Architect.
 - 1. When planting trees and shrubs after lawns, protect lawn areas and promptly repair damage caused by planting operations.

1.9 WARRANTY

- A. Special Warranty: Warrant the following exterior plants, for the warranty period indicated, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, or incidents that are beyond Contractor's control.
 - 1. Warranty Period for Trees and Shrubs: One year from date of Substantial Completion.
 - 2. Warranty Period for Ground Cover and Plants: One year from date of Substantial Completion.
 - 3. Remove dead exterior plants as directed by Landscape Architect. Replace immediately unless required to plant in the succeeding planting season.
 - 4. Replace exterior plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
 - 5. A limit of one replacement of each exterior plant will be required, except for losses or replacements due to failure to comply with requirements.

1.10 MAINTENANCE

- A. Trees and Shrubs
 - 1. Perform the following Maintenance tasks for the designated maintenance period:
 - a. Prune, cultivate, water, weed, and fertilize, as required to establish healthy, viable plants.
 - b. Restore planting saucers, tighten and repair stakes and guy supports.
 - c. Reset proper grades or vertical position, as required.
 - d. Spray as required to keep trees and shrubs free of insects and disease.
 - e. Restore or replace damaged tree wrappings.
 - f. Replenish mulch to specified depth when $\frac{1}{2}$ specified depth is lost.
 - 2. Maintenance period: 12 months from Date of Substantial Completion.
 - a. Remove all tree stakes from trees one year from Date of Substantial Completion.
- B. Ground Cover and Plants
 - 1. Perform the following Maintenance tasks for the designated maintenance period:
 - a. Water, fertilize, and perform any other operations as required to establish healthy, viable plants.
 - b. Spray as required to keep groundcovers and perennials free of insects and disease.
 - 2. Maintenance period: 12 months from Date of Substantial Completion.
- C. Annual Plantings
 - 1. Plant Seasonal Color plantings, as specified, at the onset of each season.
 - 2. Replace any dead or unhealthy plants throughout the season, as needed.
- D. Planting Beds
 - 1. Perform the following maintenance tasks for the designated maintenance period:
 - a. Cultivate, fertilize and add soil amendments as needed.
 - b. Eliminate undesirable weeds and/or grasses by hand weeding or spray. Take appropriate measure to protect desirable plants.
 - c. Replenish mulch to specified depth when $\frac{1}{2}$ specified depth is lost.
 - d. Reset proper grades as needed to retain design intent.
 - 2. Maintenance period: 12 months from Date of Substantial Completion.

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- E. Lawn Areas
 - 1. Perform the following maintenance tasks for the designated maintenance period:
 - a. Mow regularly to the height as recommended by turf grower.
 - b. Water and fertilize on a regular schedule as specified.
 - c. Weed, either by hand or spray, as required, to minimize undesirable weed and/or grass growth.
 - d. Edge lawn areas adjacent to curbs and hardscape elements.
 - F. Erosion Control
 - 1. If any erosion problems occur due to excessive run-off from surface drainage, or roof drains, propose and/or coordinate a solution to owner or Landscape Architect.
 - 2. When approved, incorporate the solution.
 - 3. Restore entire area disturbed by erosion to its original condition, by adding lost soil and/or mulch, as well as replanting any disturbed or lost plant materials.
 - G. Irrigation System Maintenance
 - 1. Make necessary vertical adjustments to heads and rotors so that they are flush with surrounding grades, when not operating.
 - 2. Adjust arc of spray on heads which are not covering, as designed, or are over-spraying adjacent hardscape elements.
 - 3. Repair any leaks or damage which might occur in the system.
 - 4. Replace damaged irrigation parts, as necessary.
 - 5. Log information about Irrigation Controller cycles, including time of operation, duration of operation, and precipitation rate for each zone in irrigation system. Include records in monthly report.
 - H. Record Keeping
 - 1. Maintenance Plan
 - a. Submit a Maintenance Plan which outlines the services and/or inspections to be performed and the frequency of services and/or inspections.
 - b. Submit Maintenance plan to Owner and landscape architect upon request for Substantial Completion.
 - c. The Maintenance Plan shall be approved by both Owner and Landscape Architect prior to the beginning of the Maintenance Period.
 - d. The Maintenance Plan should designate a Contact Person for maintenance services.
 - 2. Maintenance Log
 - a. During the designated Maintenance Period, keep a Log recording the date of service, the area of service, the task performed, and number of man-hours spent of performing each task.
 - b. Submit the Maintenance Report to the owner and Landscape Architect monthly.

PART 2 - PRODUCTS

2.1 TREE AND SHRUB MATERIAL

- A. General: Furnish nursery-grown trees and shrubs complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

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- B. Grade: Provide trees and shrubs of sizes and grades complying with ANSI Z60.1 for type of trees and shrubs required. Trees and shrubs of a larger size may be used if acceptable to Landscape Architect, with a proportionate increase in size of roots or balls.
 - C. Label each tree and shrub with securely attached, waterproof tag bearing legible designation of botanical and common name. Do not remove tags from plants until Substantial Completion.
 - D. Label at least one tree and one shrub of each variety and caliper with a securely attached, waterproof tag bearing legible designation of botanical and common name.
 - E. If formal arrangements or consecutive order of trees or shrubs is shown, select stock for uniform height and spread, and number label to assure symmetry in planting.

2.2 TREES

- A. Trees: Single-stem trees unless specified differently on plans, with straight trunk, well-balanced crown, and strong, central, intact leader, of height and caliper indicated, complying with ANSI Z60.1 for type of trees required.
 - 1. Provide balled and burlapped, balled and potted, container-grown or fabric bag-grown trees.
 - 2. Branching Height: One-third to one-half of tree height or as specified on drawings.

2.3 DECIDUOUS SHRUBS

- A. Form and Size: Deciduous shrubs with not less than the minimum number of canes required by and measured according to ANSI Z60.1 for type, shape, and height of shrub.
 - 1. Provide balled and burlapped, balled and potted, container-grown or fabric bag-grown deciduous shrubs.

2.4 CONIFEROUS EVERGREENS

- A. Form and Size: Normal-quality, well-balanced, coniferous evergreens, of type, height, spread, and shape required, complying with ANSI Z60.1.

2.5 BROADLEAF EVERGREENS

- A. Form and Size: Normal-quality, well-balanced, broadleaf evergreens, of type, height, spread, and shape required, complying with ANSI Z60.1.
 - 1. Provide balled and burlapped, balled and potted, container-grown or fabric bag-grown trees.

2.6 GROUND COVER PLANTS

- A. Ground Cover: Provide ground cover of species indicated, established and well rooted in pots or similar containers, and complying with ANSI Z60.1.

2.7 PLANTS

- A. Annuals: Provide healthy, disease-free plants of species and variety shown or listed. Provide only plants that are acclimated to outdoor conditions before delivery and that are in bud but not yet in bloom.
- B. Perennials: Provide healthy, field-grown plants from a commercial nursery, of species and variety shown or listed.

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- C. Fast-Growing Vines: Provide vines of species indicated complying with requirements in ANSI Z60.1 as follows:
 - 1. Two-year plants with heavy, well-branched tops, with not less than 3 runners 18 inches or more in length, and with a vigorous well-developed root system.
 - 2. Provide field-grown vines. Vines grown in pots or other containers of adequate size and acclimated to outside conditions will also be acceptable.

2.8 TOPSOIL

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 2 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.
 - 1. Topsoil Source: Amend existing in-place surface soil to produce topsoil. Verify suitability of surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
 - a. Surface soil may be supplemented with imported or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep; do not obtain from playa lake areas.

2.9 INORGANIC SOIL AMENDMENTS

- A. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, with a minimum 99 percent passing through No. 6 sieve and a maximum 10 percent passing through No. 40 sieve.
- B. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
- C. Aluminum Sulfate: Commercial grade, unadulterated.
- D. Perlite: Horticultural perlite, soil amendment grade.
- E. Agricultural Gypsum: Finely ground, containing a minimum of 90 percent calcium sulfate.
- F. Sand: Clean, washed, natural or manufactured, free of toxic materials.
- G. Diatomaceous Earth: Calcined, diatomaceous earth, 90 percent silica, with approximately 140 percent water absorption capacity by weight.
- H. Zeolites: Mineral clinoptilolite with at least 60 percent water absorption by weight.

2.10 ORGANIC SOIL AMENDMENTS

- A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
 - 1. Organic Matter Content: 50 to 60 percent of dry weight.
 - 2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.
- B. Peat: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having a water-absorbing capacity of 1100 to 2000 percent.

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- C. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture, free of chips, stones, sticks, soil, or toxic materials.
 - 1. In lieu of decomposed wood derivatives, mix partially decomposed wood derivatives with at least 0.15 lb of ammonium nitrate or 0.25 lb of ammonium sulfate per cubic foot of loose sawdust or ground bark.
 - D. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.11 FERTILIZER

- A. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
 - 1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

2.12 MULCHES

- A. Inorganic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:
 - 1. Type: Crushed stone.
 - 2. Size Range: Screenings.
 - 3. Color: Trail Mix.

2.13 STAKES AND GUYS

- A. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, redwood, or pressure-preservative-treated softwood, free of knots, holes, cross grain, and other defects, 3 by 3 inches minimum by length indicated, pointed at one end.
- B. Guy and Tie Wire: ASTM A 641/A 641M, Class 1, galvanized-steel wire, 2-strand, twisted, 0.106 inch in diameter.
- C. Guy Cable: 5-strand, 3/16-inch- diameter, galvanized-steel cable, with zinc-coated turnbuckles, a minimum of 3 inches long, with two 3/8-inch galvanized eyebolts.
- D. Chafing Guard: Camb guards recycled rubber belts with brass grommets, Model # 92-112. Install per manufacturer's specifications.
- E. Flags: Standard surveyor's plastic flagging tape, yellow, 6 inches long.

2.14 MISCELLANEOUS PRODUCTS

- A. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.
- B. Trunk-Wrap Tape: Two layers of crinkled paper cemented together with bituminous material, 4-inch- wide minimum, with stretch factor of 33 percent.

2.15 PLANTING SOIL MIX

- A. Planting Soil Mix: Mix topsoil with soil amendments and fertilizers in portions recommended by the topsoil analysis and as per instructions on the plans.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive exterior plants for compliance with requirements and conditions affecting installation and performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, and lawns and existing exterior plants from damage caused by planting operations.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Lay out individual tree and shrub locations and areas for multiple exterior plantings. Stake locations, outline areas, adjust locations when requested, and obtain Landscape Architect's acceptance of layout before planting. Make minor adjustments as required.
- D. Lay out exterior plants at locations directed by Landscape Architect. Stake locations of individual trees and shrubs and outline areas for multiple plantings.
- E. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks, branches, stems, twigs, and foliage to protect during digging, handling, and transportation.
 - 1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

3.3 PLANTING BED ESTABLISHMENT

- A. Loosen subgrade of planting beds to a minimum depth of 12 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
 - 1. Apply fertilizer directly to subgrade before loosening.
 - 2. Spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.
 - a. Delay mixing fertilizer with planting soil if planting will not proceed within five days.
 - 3. Spread planting soil mix to specified depths, but not less than required to meet finish grades after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
 - a. Spread approximately one-half the thickness of planting soil mix over loosened subgrade. Mix thoroughly into top 4 inches of subgrade. Spread remainder of planting soil mix.
- B. Finish Grading: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.
- C. Restore planting beds if eroded or otherwise disturbed after finish grading and before planting.

3.4 TREE AND SHRUB EXCAVATION

- A. Pits and Trenches: Excavate circular pits with sides sloped inward. Trim base leaving center area raised slightly to support root ball and assist in drainage. Do not further disturb base. Scarify sides of plant pit smeared or smoothed during excavation.
 - 1. Excavate approximately 1.5 times as wide as ball diameter for balled and burlapped, balled and potted, container-grown and fabric bag-grown stock.
- B. Subsoil removed from excavations may be used as backfill.
- C. Obstructions: Notify Landscape Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.
 - 1. Hardpan Layer: Drill 6-inch- diameter holes into free-draining strata or to a depth of 10 feet, whichever is less, and backfill with free-draining material.
- D. Drainage: Notify Landscape Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub pits.
- E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.5 TREE AND SHRUB PLANTING

- A. Set balled and burlapped stock plumb and in center of pit or trench with top of root ball 1 inch above adjacent finish grades.
 - 1. Remove burlap and wire baskets from tops of root balls and partially from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
 - 2. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.
- B. Set balled and potted and container-grown stock plumb and in center of pit or trench with top of root ball 1 inch above adjacent finish grades.
 - 1. Carefully remove root ball from container without damaging root ball or plant.
 - 2. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.
- C. Set fabric bag-grown stock plumb and in center of pit or trench with top of root ball 1 inch above adjacent finish grades.
 - 1. Carefully remove root ball from fabric bag without damaging root ball or plant. Do not use planting stock if root ball is cracked or broken before or during planting operation.
 - 2. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.
- D. Inorganic Mulching: Apply 4-inch average thickness of inorganic mulch extending 12 inches beyond edge of planting pit or trench. Do not place mulch within 6 inches of trunks or stems.

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- E. Wrap trees of 2-inch caliper and larger with trunk-wrap tape. Start at base of trunk and spiral cover trunk to height of first branches. Overlap wrap, exposing half the width, and securely attach without causing girdling. Inspect tree trunks for injury, improper pruning, and insect infestation; take corrective measures required before wrapping.

3.6 TREE AND SHRUB PRUNING

- A. Prune, thin, and shape trees and shrubs as directed by Landscape Architect.
- B. Prune, thin, and shape trees and shrubs according to standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise indicated by Landscape Architect, do not cut tree leaders; remove only injured or dead branches from flowering trees. Prune shrubs to retain natural character. Shrub sizes indicated are sizes after pruning.

3.7 GUYING AND STAKING

- A. Upright Staking and Tying: Stake trees of 1- through 5-inch caliper. Stake trees of less than 1-inch caliper only as required to prevent wind tip-out. Use a minimum of 2 stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation and to extend at least 72 inches above grade. Set vertical stakes and space to avoid penetrating root balls or root masses. Support trees with camb guards broad belt like material at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree. Use the number of stakes as follows:
 - 1. Use 2 stakes for trees up to 12 feet high and 2-1/2 inches or less in caliper; 3 stakes for trees less than 14 feet high and up to 5 inches in caliper. Space stakes equally around trees.

3.8 GROUND COVER AND PLANT PLANTING

- A. Set out and space ground cover and plants as indicated.
- B. Dig holes large enough to allow spreading of roots, and backfill with planting soil.
- C. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
- D. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
- E. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.9 PLANTING BED MULCHING

- A. Mulch backfilled surfaces of planting beds and other areas indicated.
 - 1. Inorganic Mulch: Apply 4-inch average thickness of organic mulch, and finish level with adjacent finish grades. Do not place mulch against plant stems.
 - 2. Compact mulch in 2 equal lifts with a mechanically operated vibratory plate compactor to a minimum 85% density.

3.10 CLEANUP AND PROTECTION

- A. During exterior planting, keep adjacent pavings and construction clean and work area in an orderly condition.
- B. Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged exterior planting.

3.11 DISPOSAL

- A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SUMMARY

- A. This Section specifies cast-in place concrete, including formwork, reinforcing, mix design, placement procedures, and finishes.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, curing compounds, and others as requested by Architect.
- C. Shop drawings for reinforcement, prepared by registered Professional Engineer for fabrication, bending, and placement of concrete reinforcement. Comply with ACI SP-66 (88), "ACI Detailing Manual," showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete structures.
- D. Laboratory test reports for concrete materials and mix design test.
- E. Materials certificates in lieu of materials laboratory test reports when permitted by Architect. Materials certificates shall be signed by manufacturer and Contractor, certifying that each material item complies with or exceeds specified requirements. Provide certification from admixture manufacturers that chloride content complies with specification requirements.

1.4 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following codes, specifications, and standards, except where more stringent requirements are shown or specified:
 - 1. ACI 318, "Building Code Requirements for Reinforced Concrete."
 - 2. Concrete Reinforcing Steel Institute (CRSI), "Manual of Standard Practice."
- B. Materials and installed work may require testing and retesting at any time during progress of work. Tests, including retesting of rejected materials for installed work, shall be done at Contractor's expense.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings.
- B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.
- C. Form Coatings: Provide commercial formulation form-coating compounds with a maximum VOC of 350 mg/l that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- D. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units that will leave no metal closer than 1-1/2 inches to exposed surface.
 - 1. Provide ties that, when removed, will leave holes not larger than 1-inch diameter in concrete surface.

2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
- B. Steel Wire: ASTM A 82, plain, cold-drawn steel.
- C. Welded Wire Fabric: ASTM A 185, welded steel wire fabric.
- D. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire-bar-type supports complying with CRSI specifications.
 - 1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
 - 2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs that are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).

2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I.
 - 1. Use one brand of cement throughout project unless otherwise acceptable to Architect.
- B. Fly Ash: ASTM C 618, Type C or Type F.
- C. Normal Weight Aggregates: ASTM C 33 and as herein specified. Provide aggregates from a single source for exposed concrete.
 - 1. For exterior exposed surfaces, do not use fine or coarse aggregates containing spalling-causing deleterious substances.
 - 2. Local aggregates not complying with ASTM C 33 but that special tests or actual service have shown to produce concrete of adequate strength and durability may be used when acceptable to Architect.
- D. Water: Drinkable.

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- E. Admixtures, General: Provide admixtures for concrete that contain not more than 0.1 percent chloride ions.
 - F. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a "Air-Tite," Cormix.
 - b "Air-Mix" or "Perma-Air," Euclid Chemical Co.
 - c "Darex AEA" or "Daravair," W.R. Grace & Co.
 - d "MB-VR" or "Micro-Air," Master Builders, Inc.
 - e "Sealtight AEA," W.R. Meadows, Inc.
 - f "Sika AER," Sika Corp.
 - G. Water-Reducing Admixture: ASTM C 494, Type A.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a "Chemtard," ChemMasters Corp.
 - b "PSI N," Cormix.
 - c "Eucon WR-75," Euclid Chemical Co.
 - d "WRDA," W.R. Grace & Co.
 - e "Pozzoloth Normal" or "Polyheed," Master Builders, Inc.
 - f "Prokrete-N," Prokrete Industries.
 - g "Plastocrete 161," Sika Corp.
 - H. High-Range Water-Reducing Admixture (Super Plasticizer): ASTM C 494, Type F or Type G.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a "Super P," Anti-Hydro Co., Inc.
 - b "PSI Super," Cormix.
 - c "Eucon 37," Euclid Chemical Co.
 - d "WRDA 19" or "Daracem," W.R. Grace & Co.
 - e "Rheobuild," Master Builders, Inc.
 - f "PSP," Prokrete Industries.
 - g "Sikament 300," Sika Corp.
 - I. Water-Reducing, Accelerating Admixture: ASTM C 494, Type E.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a "Q-Set," Conspec Marketing & Manufacturing Co.
 - b "Gilco Accelerator," Cormix.
 - c "Accelguard 80," Euclid Chemical Co.
 - d "Daraset," W.R. Grace & Co.
 - e "Pozzutec 20," Master Builders, Inc.
 - J. Water-Reducing, Retarding Admixture: ASTM C 494, Type D.

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1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a "PSI-R Plus," Cormix.
 - b "Eucon Retarder 75," Euclid Chemical Co.
 - c "Daratard-17," W.R. Grace & Co.
 - d "Pozzolith R," Master Builders, Inc.
 - e "Protard," Prokrete Industries.
 - f "Plastiment," Sika Corporation.

2.4 RELATED MATERIALS

- A. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.
- B. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.
 1. Waterproof paper.
 2. Polyethylene film.
 3. Polyethylene-coated burlap.
- C. Liquid Membrane-Forming Curing Compound: Liquid-type membrane forming curing compound complying with ASTM C 309, Type I, Class A. Moisture loss not more than 0.055 gr./sq. cm. when applied at 200 sq. ft./gal.
 1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a "A-H 3 Way Sealer," Anti-Hydro Co., Inc.
 - b "Spartan-Cote," The Burke Co.
 - c "Conspec #1," Conspec Marketing & Mfg. Co.
 - d "Hardtop," Cormix.
 - e "Day-Chem Cure and Seal," Dayton Superior Corp.
 - f "Eucocure," Euclid Chemical Co.
 - g "Horn Clear Seal," A.C. Horn, Inc.
 - h "L&M Cure," L & M Construction Chemicals, Inc.
 - i "Masterkure," Master Builders, Inc.
 - j "CS-309," W.R. Meadows, Inc.
 - k "LR-151," Prokrete Industries.
 - l "Kure-N-Seal," Sonneborn-Rexnord.
 - m "Stontop CS2," Stonhard, Inc.
- D. Water-Based Acrylic Membrane Curing Compound: ASTM C 309, Type I, Class B.
 1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a "Highseal," Conspec Marketing and Mfg. Co.
 - b "Safe Cure and Seal," Dayton Superior Corp.
 - c "Aqua-Cure," Euclid Chemical Co.
 - d "Dress & Seal #18WB," L&M Construction Chemicals, Inc.
 - e "Masterseal W," Master Builders, Inc.
 - f "Intex," W.R. Meadows, Inc.
 - g "Sika Membrane," Sika Corp.

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- E. Evaporation Control: Monomolecular film-forming compound applied to exposed concrete slab surfaces for temporary protection from rapid moisture loss.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a "Aquafilm," Ardex, Inc.
 - b "Eucobar," Euclid Chemical Co.
 - c "E-Con," L&M Construction Chemicals, Inc.
 - d "Confilm," Master Builders, Inc.

2.5 PROPORTIONING AND DESIGN OF MIXES

- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method used, use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing.
 - 1. Limit use of fly ash to not exceed 25 percent of cement content by weight.
- B. Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until proposed mix designs have been reviewed by Architect.
- C. Design mixes to provide normal weight concrete with the following properties, as indicated on drawings and schedules:
 - 1. 3000-psi, 28-day compressive strength; W/C ratio, 0.46 maximum
- D. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in work.

2.6 ADMIXTURES

- A. Use water-reducing admixture or high-range water-reducing admixture (Superplasticizer) in concrete as required for placement and workability.
- B. Use nonchloride accelerating admixture in concrete slabs placed at ambient temperatures below 50 deg F (10 deg C).
- C. Use high-range water-reducing admixture (HRWR) in pumped concrete, concrete for industrial slabs, architectural concrete, parking structure slabs, concrete required to be watertight, and concrete with water/cement ratios below 0.50.
- D. Use air-entraining admixture in all concrete. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus or minus 1-1/2 percent within following limits:
 - a percent 3/4-inch to 1-1/2-inch max. aggregate.

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- E. Use admixtures for water reduction and set control in strict compliance with manufacturer's directions.
 - F. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
 - 1. Ramps, slabs, and sloping surfaces: Not more than 3 inches.
 - 2. Reinforced foundation systems: Not less than 1 inch and not more than 3 inches.
 - 3. Concrete containing HRWR admixture (Superplasticizer): Not more than 8 inches after addition of HRWR to site-verified 2-inch to 3-inch slump concrete.
 - 4. Other concrete: Not more than 4 inches.

2.7 CONCRETE MIXING

- A. Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as specified.
 - 1. When air temperature is between 85 deg F (30 deg C) and 90 deg F (32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 GENERAL

- A. Coordinate the installation of joint materials with placement of forms and reinforcing steel.

3.2 FORMS

- A. General: Design, erect, support, brace, and maintain formwork to support vertical and lateral, static and dynamic loads that might be applied until concrete structure can support such loads. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances complying with ACI 347.
- B. Construct forms to sizes, shapes, lines, and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent leakage of cement paste.
- C. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.

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- D. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
 - E. Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
 - F. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.
 - G. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before concrete is placed. Retighten forms and bracing before concrete placement as required to prevent mortar leaks and maintain proper alignment.
 - H. Prefabricated Void Forms: Installation procedures and details will be in strict accordance with the recommendation of "Sure Void Products, Inc."

3.3 PLACING REINFORCEMENT

- 1. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports and as herein specified.
 - a. Avoiding cutting or puncturing vapor retarder during reinforcement placement and concreting operations.
- 2. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.
- 3. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as approved by Architect.
- 4. Place reinforcement to obtain at least minimum coverages for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- 5. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.4 JOINTS

- A. Construction Joints: Locate and install construction joints as indicated or, if not indicated, locate so as not to impair strength and appearance of the structure, as acceptable to Architect.

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- B. Provide keyways at least 1-1/2 inches deep in construction joints in walls and slabs and between walls and footings. Accepted bulkheads designed for this purpose may be used for slabs.
 - C. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints.

3.5 INSTALLATION OF EMBEDDED ITEMS

- A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached thereto.
- B. Forms for Slabs: Set edge forms, bulkheads, and intermediate screed strips for slabs to obtain required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting-type screeds.

3.6 PREPARATION OF FORM SURFACES

- A. General: Coat contact surfaces of forms with an approved, nonresidual, low-VOC, form-coating compound before reinforcement is placed.
- B. Do not allow excess form-coating material to accumulate in forms or to come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

3.7 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work.
- B. General: Comply with ACI 304, "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete," and as herein specified.
 - 1. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete that has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete to avoid segregation at its final location.
- C. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
 - 1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.
 - 2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not

insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.

- D. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
 - 1. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Bring slab surfaces to correct level with straightedge and strike off. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
 - 3. Maintain reinforcing in proper position during concrete placement.
- E. Cold-Weather Placing: Comply with provisions of ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
- F. When air temperature has fallen to or is expected to fall below 40 deg F (4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
 - 1. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 2. Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.
- G. Hot-Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.
 - 1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg F (32 deg C). Mixing water may be chilled, or chopped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.
 - 2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.
 - 3. Fog spray forms, reinforcing steel, and subgrade just before concrete is placed.
 - 4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, when acceptable to Architect.

3.8 FINISH OF FORMED SURFACES

- A. Rough Form Finish: For formed concrete surfaces not exposed to view in the finish work or concealed by other construction. This is the concrete surface having texture imparted by form-facing material used, with tie holes and

defective areas repaired and patched and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.

- B. Smooth Form Finish: For formed concrete surfaces exposed to view or to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, painting, or other similar system. This is an as-cast concrete surface obtained with selected form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch defective areas with fins and other projections completely removed and smoothed.
- C. Grout-Cleaned Finish: Provide grout-cleaned finish to scheduled concrete surfaces that have received smooth form finish treatment.
 - 1. Combine one part portland cement to 1-1/2 parts fine sand by volume, and a 50:50 mixture of acrylic or styrene butadiene- based bonding admixture and water to consistency of thick paint. Blend standard portland cement and white portland cement, amounts determined by trial patches, so that final color of dry grout will match adjacent surfaces.
 - 2. Thoroughly wet concrete surfaces, apply grout to coat surfaces, and fill small holes. Remove excess grout by scraping and rubbing with clean burlap. Keep damp by fog spray for at least 36 hours after rubbing.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.9 MONOLITHIC SLAB FINISHES

- A. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified; slab surfaces to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo; and as otherwise indicated.
 - 1. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating, using float blades or float shoes only, when surface water has disappeared, when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats or by hand-floating if area is small or inaccessible to power units. Check and level surface plane to tolerances of Ff 18 - Fl 15. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.
- B. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed to view and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or other thin film finish coating system.
 - 1. After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with surface leveled to tolerances of Ff 20 - Fl 17.

Grind smooth surface defects that would telegraph through applied floor covering system.

- C. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, apply trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming.
- D. Nonslip Broom Finish: Apply nonslip broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.
 - 1. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.10 CONCRETE CURING AND PROTECTION

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. In hot, dry, and windy weather, protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply in accordance with manufacturer's instructions after screeding and bull floating, but before power floating and troweling.
- B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.
- C. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing, and by combinations thereof, as herein specified.
- D. Provide moisture curing by following methods.
 - 1. Keep concrete surface continuously wet by covering with water.
 - 2. Use continuous water-fog spray.
 - 3. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4-inch lap over adjacent absorptive covers.
- E. Provide moisture-cover curing as follows:
 - 1. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
- F. Provide curing and sealing compound to exposed interior slabs and to exterior slabs, walks, and curbs as follows:
 - 1. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours and after surface water sheen has disappeared). Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - 2. Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete.

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- G. Curing Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces, by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.
 - H. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces, by application of appropriate curing method.
 - I. Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture-retaining cover, unless otherwise directed.

3.11 REMOVAL OF FORMS

- A. General: Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form-removal operations, and provided curing and protection operations are maintained.
- B. Formwork supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements, may not be removed in less than 14 days and until concrete has attained at least 75 percent of design minimum compressive strength at 28 days. Determine potential compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or members.
- C. Form-facing material may be removed 4 days after placement only if shores and other vertical supports have been arranged to permit removal of form-facing material without loosening or disturbing shores and supports.

3.12 REUSE OF FORMS

- A. Clean and repair surfaces of forms to be reused in work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-coating compound as specified for new formwork.
- B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces except as acceptable to Architect.

3.13 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.
- B. Reinforced Masonry: Provide concrete grout for reinforced masonry lintels and bond beams where indicated on drawings and as scheduled. Maintain accurate location of reinforcing steel during concrete placement.

3.14 CONCRETE SURFACE REPAIRS

- A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Architect.
 - 1. Cut out honeycomb, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts, down to solid concrete but in no case to a depth of less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with specified bonding agent. Place patching mortar before bonding compound has dried.
 - 2. For exposed-to-view surfaces, blend white portland cement and standard portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.
- B. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry-pack mortar, or precast cement cone plugs secured in place with bonding agent.
 - 1. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.
- C. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope and smoothness by using a template having required slope.
 - 1. Repair finished unformed surfaces that contain defects that affect durability of concrete. Surface defects, as such, include crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through nonreinforced sections regardless of width, spalling, popouts, honeycomb, rock pockets, and other objectionable conditions.
 - 2. Correct high areas in unformed surfaces by grinding after concrete has cured at least 14 days.
 - 3. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with patching compound. Finish repaired areas to blend into adjacent concrete. Proprietary underlayment compounds may be used when acceptable to Architect.
 - 4. Repair defective areas, except random cracks and single holes not exceeding 1 inch in diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place,

compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

- D. Repair isolated random cracks and single holes not over 1 inch in diameter by dry-pack method. Groove top of cracks and cut out holes to sound concrete and clean of dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry-pack before bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.
- E. Perform structural repairs with prior approval of Architect for method and procedure, using specified epoxy adhesive and mortar.
- F. Repair methods not specified above may be used, subject to acceptance of Architect.

3.15 QUALITY CONTROL TESTING DURING CONSTRUCTION

- A. General: The Owner will employ a testing laboratory to perform tests and to submit test reports.
- B. Sampling and testing for quality control during placement of concrete may include the following, as directed by Architect.
- C. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
 - 1. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
 - 2. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231 pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete.
 - 3. Concrete Temperature: Test hourly when air temperature is 40 deg F (4 deg C) and below, when 80 deg F (27 deg C) and above, and each time a set of compression test specimens is made.
 - 4. Compression Test Specimen: ASTM C 31; one set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cure test specimens are required.
 - 5. Compressive Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yds. plus additional sets for each 50 cu. yds. more than the first 25 cu. yds. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.
 - 6. When frequency of testing will provide fewer than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.
 - 7. When total quantity of a given class of concrete is less than 50 cu. yds., Architect may waive strength test if adequate evidence of satisfactory strength is provided.

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- 8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
 - 9. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi.
- D. Test results will be reported in writing to Architect, Structural Engineer, Ready-Mix Producer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day tests and 28-day tests.
 - E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.
 - F. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Architect. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed. Contractor shall pay for such tests when unacceptable concrete is verified.

END OF SECTION 03300

SECTION 04200

CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Concrete unit masonry.
- B. Clay unit masonry in the form of brick.

1.3 RELATED SECTIONS

- A. Section 07600 - Sheet Metal: For exposed sheet metal flashing installed in masonry.
- B. Products installed but not furnished under this Section include the following:
 - 1. Reglets in masonry joints for metal flashing are specified in Section 07600 - Flashing and Sheet Metal.
 - 2. Hollow metal frames in unit masonry openings are specified in Section 08110 - Steel Doors and Frames.

1.4 SYSTEM PERFORMANCE REQUIREMENTS

- A. Provide unit masonry that develops the following installed compressive strengths (f'm):
 - 1. For clay unit masonry: As follows:
 - a. f'm = 2500 psi.
 - 2. For concrete unit masonry: As follows:
 - a. f'm = 1500 psi.

1.5 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each different masonry unit, accessory, and other manufactured product indicated.
- C. Shop drawings for reinforcing detailing fabrication, bending, and placement of unit masonry reinforcing bars. Comply with ACI 315 "Details and Detailing of Concrete Reinforcing" showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of masonry reinforcement.
- D. Samples for initial selection purposes of the following:
 - 1. Unit masonry samples in small-scale form showing full extent of colors and textures available for each different exposed masonry unit required.
 - 2. Colored masonry mortar samples showing full extent of colors available.

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- E. Samples for verification purposes of the following:
 - 1. Full-size units for each different exposed masonry unit required showing full range of exposed color, texture, and dimensions to be expected in completed construction.
 - a. Include size variation data verifying that actual range of sizes for brick falls within ASTM C 216 dimension tolerances for brick where modular dimensioning is indicated.
 - 2. Colored masonry mortar samples for each color required showing the full range of colors expected in the finished construction. Label samples to indicate type and amount of colorant used.
 - 3. Accessories embedded in the masonry.
 - F. Material certificates for the following signed by manufacturer and Contractor certifying that each material complies with requirements.
 - 1. Each different cement product required for mortar and grout including name of manufacturer, brand, type, and weight slips at time of delivery.
 - 2. Each material and grade indicated for reinforcing bars.
 - 3. Each type and size of joint reinforcement.
 - 4. Each type and size of anchors, ties, and metal accessories.
 - G. Material test reports from a qualified independent testing laboratory employed and paid by Contractor indicating and interpreting test results relative to compliance of the following proposed masonry materials with requirements indicated:
 - 1. Grout mixes. Include description of type and proportions of grout ingredients.
 - 2. Masonry units.
 - H. Cold-weather construction procedures evidencing compliance with requirements specified in referenced unit masonry standard.
 - I. Hot-weather construction procedures evidencing compliance with requirements specified in referenced unit masonry standard.
 - J. Qualification data for firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, telephone numbers, names of Architects and Owners, and other information specified.
 - K. Results from tests and inspections performed by Owner's representatives will be reported promptly and in writing to Architect and Contractor.

1.6 QUALITY ASSURANCE

- A. Unit Masonry Standard: Comply with ACI 530.1/ASCE 6 "Specifications for Masonry Structures," except as otherwise indicated.
 - 1. Revise ACI 530.1/ASCE 6 to exclude Sections 1.4 and 1.7; Parts 2.1.2, 3.1.2, and 4.1.2; and Articles 1.5.1.2, 1.5.1.3, 2.1.1.1, 2.1.1.2, and 2.3.3.9 and to modify Article 2.1.1.4 by deleting requirement for installing vent pipes and conduits built into masonry.
- B. Preconstruction Testing: Owner will employ and pay a qualified independent testing laboratory to perform the following preconstruction testing indicated as well as other inspecting and testing services required by referenced unit masonry standard or indicated herein for source and field quality control:
 - 1. Clay unit masonry tests: For each different clay masonry unit indicated, units will be tested per ASTM C 67.
 - 2. Concrete Masonry Unit Tests: For each different concrete masonry unit indicated, units will be tested for strength, absorption, and moisture content per ASTM C 140.

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3. Mortar composition and properties will be evaluated per ASTM C 780.
 4. Grout compressive strength will be tested per ASTM C 1019.
- C. Single-Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.
 - D. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.
 - E. Field-Constructed Mock-Ups: Prior to installation of unit masonry, erect sample wall panels to further verify selections made under sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution. Build mock-ups to comply with the following requirements, using materials indicated for final unit of Work:
 1. Locate mock-ups on site in locations indicated or, if not indicated, as directed by Architect.
 2. Build mock-ups for the following types of masonry in sizes of approximately 4 feet long by 4 feet high by full thickness, including face and backup wythes as well as accessories.
 - a. Each type of exposed unit masonry construction.
 - b. Typical exterior face brick wall.
 3. Where masonry is to match existing, erect panels parallel to existing surface.
 4. Notify Architect one week in advance of the dates and times when mock-ups will be erected.
 5. Protect mock-ups from the elements with weather-resistant membrane.
 6. Retain and maintain mock-ups during construction in undisturbed condition as standard for judging completed unit masonry construction.
 - a. When directed, demolish and remove mock-ups from Project site.
 - F. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Section 01300 – Administrative Requirements.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver masonry materials to project in undamaged condition.
- B. Store and handle masonry units off the ground, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not place until units are in an air-dried condition.
- C. Store cementitious materials off the ground, under cover, and in dry location.
- D. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- E. Store masonry accessories including metal items to prevent corrosion and accumulation of dirt and oil.

1.8 PROJECT CONDITIONS

- A. Protection of Masonry: During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.

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- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.
 - C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Remove immediately any grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes from mortar droppings.
 - D. Cold-Weather Construction: Comply with referenced unit masonry standard for cold-weather construction and the following:
 - 1. Do not lay masonry units that are wet or frozen.
 - 2. Remove masonry damaged by freezing conditions.
 - E. Hot-Weather Construction: Comply with referenced unit masonry standard.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Comply with referenced unit masonry standard and other requirements specified in this Section applicable to each material indicated.

2.2 CLAY MASONRY UNITS

- A. General: Comply with the following requirements applicable to each form of brick required:
 - 1. Provide special molded shapes where indicated and as follows:
 - a. For applications requiring brick of form, color, texture, and size on exposed surfaces that cannot be produced by sawing standard brick sizes.
 - b. For applications where stretcher units cannot accommodate special conditions including those at corners, movement joints, bond beams, sashes, and lintels.
 - 2. Provide units without cores or frogs and with all exposed surfaces finished for ends of sills, caps, and similar applications that expose brick surfaces that otherwise would be concealed from view.
- B. Brick Units:
 - 1. Face Brick (Face Brick "A")
 - a. Conformance: ASTM C216, Type FBS, Grade SW.
 - b. Size and Shape: Nominal modular size of 2 1/4 x 4 x 8 inches.
 - c. Color: Onyx, velour cut.
 - d. Manufacturer: Acme Brick.
 - 2. Ceramic Glazed Face Brick (Face Brick "B")
 - a. Conformance: ASTM C126, Grade A-S Modular, Type I – Single Faced units.
 - b. Size and Shape: Nominal modular size of 2 1/4 x 4 x 8 inches.
 - c. Color: Classic Red #8800.
 - d. Manufacturer: Elgin Butler.
 - 3. Water Repellent: All exterior brick units shall contain integral water repellent known as "Dry Block System Admixture" as manufactured by Forrer Chemical Co.,

Milwaukee, Wisc. (or approved equal.). Use of water repellent shall be in strict accordance with manufacturers recommendations and written instructions.

2.3 CONCRETE MASONRY UNITS

- A. General: Comply with requirements indicated below applicable to each form of concrete masonry unit required.
 - 1. Provide special shapes where indicated and as follows:
 - a. For lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
 - 2. Size: Provide concrete masonry units complying with requirements indicated below for size that are manufactured to specified face dimensions within tolerances specified in the applicable referenced ASTM specification for concrete masonry units.
 - a. Concrete Masonry Units: Manufactured to specified dimensions of 3/8 inch less than nominal widths by nominal heights by nominal lengths indicated on drawings.
 - 3. Provide Type I, moisture-controlled units.
 - 4. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.
- B. Hollow Load-Bearing Concrete Masonry Units: ASTM C 90, Grade N and as follows:
 - 1. Unit Compressive Strength: Provide units with minimum average net area compressive strength indicated below:
 - a. 1900 psi.
 - 2. Weight Classification: Lightweight.
 - 3. Water Repellent: All exterior wall C.M.U. units including lintels and sills shall contain integral water repellent known as "Dry Block System Block Admixture" as manufactured by Forrer Chemical Co., Milwaukee, Wisc. (or approved equal). Use of the water repellent shall be in strict accordance with manufacturer recommendations and written instructions.

2.4 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce required mortar color.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Aggregate for Mortar: ASTM C 144, except for joints less than 1/4 inch use aggregate graded with 100 percent passing the No. 16 sieve.
 - 1. White Mortar Aggregates: Natural white sand or ground white stone.
 - 2. Colored Mortar Aggregates: Ground marble, granite, or other sound stone, as required to match Architect's sample.
- D. Aggregate for Grout: ASTM C 404.
- E. Colored Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with record of satisfactory performance in masonry mortars.
- F. Water: Clean and potable.
- G. Water Repellent: Dry block mortar admixture (or approved equal) as per manufacturer written recommendations.
- H. REINFORCING STEEL

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- I. General: Provide reinforcing steel complying with requirements of referenced unit masonry standard and this article.
 - J. Steel Reinforcing Bars: Material and grade as follows:
 - 1. Billet steel complying with ASTM A 615, Grade 60.

2.5 JOINT REINFORCEMENT

- A. General: Provide joint reinforcement complying with requirements of referenced unit masonry standard and this article, formed from the following:
 - 1. Galvanized carbon steel wire, coating class as required by referenced unit masonry standard for application indicated.
- B. Description: Welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet, with prefabricated corner and tee units, and complying with requirements indicated below:
 - 1. Wire Diameter for Side Rods: 0.1483 inch (9 gage).
 - 2. Wire Diameter for Cross Rods: 0.1483 inch (9 gage).
 - 3. For single-wythe masonry provide type as follows with single pair of side rods:
 - a. Truss design with continuous diagonal cross rods spaced not more than 16 inches o.c.
 - 4. For multiwythe masonry provide type as follows:
 - a. Truss design with diagonal cross rods spaced not more than 16 inches o.c. and number of side rods as follows:
 - b. Number of Side Rods for Multiwythe Concrete Masonry: One side rod for each face shell of hollow masonry units more than 4 inches in nominal width plus one side rod for each wythe of masonry 4 inches or less in nominal width.
 - 5. Available Manufacturers: Subject to compliance with requirements, manufacturers offering joint reinforcement that may be incorporated in the Work include, but are not limited to, the following:
 - a. AA Wire Products Co.
 - b. Dur-O-Wal, Inc.
 - c. Heckman Building Products, Inc.
 - d. Hohmann & Barnard, Inc.
 - e. Masonry Reinforcing Corp. of America.
 - f. National Wire Products Industries.
 - g. Southern Construction Products, Inc.

2.6 MISCELLANEOUS MASONRY ACCESSORIES

- A. Preformed Control Joint Gaskets: Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
 - 1. Styrene-Butadiene Rubber Compound: ASTM D 2000, Designation 2AA-805.
 - 2. Polyvinyl Chloride: ASTM D 2287, General Purpose Grade, Type PVC-65406.

2.7 INSULATION:

- A. Molded Polystyrene Unit Masonry Inserts: Insulation shall be Korfil or approved equal conforming to the requirements of ASTM C 578-85 with a density range of 1.0 to 1.3

lb/cu.ft. Inserts shall be approved by the American Society for Testing and Materials (ASTM) namely ASTM C 236-66, The Gummed Hot Box Test.

- B. Inserts are to be pre-installed at the block plant prior to delivery on the job site.

2.8 MASONRY CLEANERS

- A. Job-Mixed Detergent Solution: Solution of trisodium phosphate (1/2- cup dry measure) and laundry detergent (1/2-cup dry measure) dissolved in one gallon of water.
- B. Job-Mixed Muriatic Solution: Solution of 1 part muriatic acid and 10 parts clean water, mixed in a nonmetallic container with acid added to water.
- C. Proprietary Acidic Cleaner: Manufacturer's standard-strength, general-purpose cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry surfaces of type indicated below without discoloring or damaging masonry surfaces; expressly approved for intended use by manufacturer of masonry units being cleaned:
1. For masonry not subject to metallic oxidation stains, use formulation consisting of a concentrated blend of surface acting acids, chelating, and wetting agents.
 2. For dark colored masonry not subject to metallic oxidation stains, use formulation consisting of a liquid blend of surface acting acids and special inhibitors.
 3. For masonry subject to metallic oxidation stains, use formulation consisting of a liquid blend of organic and inorganic acids and special inhibitors.
 4. Available Products: Subject to compliance with requirements, a product that may be used to clean unit masonry surfaces includes, but is not limited to, the following:
 - a. "Sure Klean No. 600 Detergent," ProSoCo, Inc.
 - b. "Sure Klean No. 101 Lime Solvent," ProSoCo., Inc.
 - c. "Sure Klean Vana Trol," ProSoCo, Inc.

2.9 MORTAR AND GROUT MIXES

- A. General: Do not add admixtures including coloring pigments, air entraining agents, accelerators, retarders, water repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
1. Do not use calcium chloride in mortar or grout.
- B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification, for types of mortar indicated below:
1. Limit cementitious materials in mortar to portland cement- lime.
 2. For masonry below grade and in contact with earth, and where indicated, use type indicated below:
 - a. Type S.
 3. For reinforced masonry and where indicated, use type indicated below:
 - a. Type S.
- C. Colored Pigmented Mortar: Select and proportion pigments with other ingredients to produce color required.

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- D. Colored Aggregate Mortar: Produce mortar of color required by use of colored aggregates in combination with selected cementitious materials.
 - 1. Mix to match Architect's sample.
 - E. Grout for Unit Masonry: Comply with ASTM C 476 and referenced unit masonry standard.

2.10 SOURCE QUALITY CONTROL

- A. Brick Tests: For each type and grade of brick indicated, units will be tested by qualified independent testing laboratory per ASTM C 67 except 5 bricks will be selected at random for each 100,000 units or fraction thereof installed.
- B. Concrete Masonry Unit Tests: For each type, class, and grade of concrete masonry unit indicated, units will be tested by qualified independent testing laboratory for strength, absorption, and moisture content per ASTM C 140.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other specific conditions, and other conditions affecting performance of unit masonry.
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of unit masonry.
- B. Examine rough-in and built-in construction to verify actual locations of piping connections prior to installation.
- C. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Comply with referenced unit masonry standard and other requirements indicated applicable to each type of installation included in Project.
- B. Thickness: Build composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual thickness of the masonry units, using units of nominal thickness indicated.
- C. Build chases and recesses as shown or required to accommodate items specified in this and other Sections of the Specifications. Provide not less than 8 inches of masonry between chase or recess and jamb of openings and between adjacent chases and recesses.
- D. Leave openings for equipment to be installed before completion of masonry. After installation of equipment, complete masonry to match construction immediately adjacent to the opening.
- E. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting where possible.
- F. Matching Existing Masonry: Match coursing, bonding, color, and texture of new masonry with existing masonry.

3.3 CONSTRUCTION TOLERANCES

- A. Comply with construction tolerances of referenced unit masonry standard.

3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement-type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.
- B. Lay up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other construction.
- C. Bond Pattern for Exposed Masonry: Lay exposed masonry in the following bond pattern; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
 - 1. One-half running bond with vertical joint in each course centered on units in courses above and below.
- D. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- E. Stopping and Resuming Work: In each course, rack back 1/2-unit length for one-half running bond or 1/3-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly (if required), and remove loose masonry units and mortar prior to laying fresh masonry.
- F. Built-In Work: As construction progresses, build-in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.
 - 1. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.

3.5 MORTAR BEDDING AND JOINTING

- A. Lay hollow concrete masonry units as follows:
 - 1. With full mortar coverage on horizontal and vertical face shells.
 - 2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
 - 3. For starting course on footings where cells are not grouted, spread out full mortar bed including areas under cells.
- B. Cut joints flush for masonry walls to be concealed or to be covered by other materials, unless otherwise indicated.

3.6 STRUCTURAL BONDING OF MULTIWYTHE MASONRY

- A. Use continuous horizontal joint reinforcement installed in horizontal mortar joints for bond tie between wythes.
- B. Corners: Provide interlocking masonry unit bond in each course at corners, unless otherwise shown.
 - 1. Provide continuity with horizontal joint reinforcement at corners using prefabricated "L" units, in addition to masonry bonding.

3.7 HORIZONTAL JOINT REINFORCEMENT

- A. General: Provide continuous horizontal joint reinforcement as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcing a minimum of 6 inches.
- B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
- C. Provide continuity at corners by use of prefabricated "L" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.8 MOVEMENT (CONTROL AND EXPANSION) JOINTS

- A. General: Install control and expansion joints in unit masonry where indicated. Build in related items as the masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.
- B. Form control joints in concrete masonry as follows:
 - 1. Fit bond breaker strips into hollow contour in ends of block units on one side of control joint. Fill the resultant core with grout and rake joints in exposed faces.
 - 2. Install preformed control joint gaskets designed to fit standard sash block.
 - 3. Install special shapes designed for control joints. Install bond breaker strips at joint. Keep head joints free and clear of mortar or rake joint.
- C. Form expansion joints in brick made from clay or shale as follows:
 - 1. Form open joint of width indicated but not less than 3/8 inch for installation of sealant and backer rod specified in Section 07900 - Joint Sealers. Maintain joint free and clear of mortar.

3.9 LINTELS

- A. Install steel lintels where indicated.
- B. Provide masonry lintels where shown and wherever openings of more than 1'-0" for brick size units and 2'-0" for block size units are shown without structural steel or other supporting lintels. Provide precast or formed-in-place masonry lintels. Cure precast lintels before handling and installation. Temporarily support formed-in-place lintels.
 - 1. For hollow concrete masonry unit walls, use specially formed bond beam units with reinforcement bars placed as indicated and filled with coarse grout.
- C. Provide minimum bearing of 8 inches at each jamb, unless otherwise indicated.

3.10 WEEP HOLES

- A. General: Install weep holes in masonry where indicated.
- B. Install weep holes in the head joints in exterior wythes of the first course of masonry as follows:
 - 1. Form weep holes by keeping head joints free and clear of mortar.
 - 2. Space weep holes 24 inches o.c.

3.11 INSTALLATION OF REINFORCED UNIT MASONRY

- A. General: Install reinforced unit masonry to comply with requirements of referenced unit masonry standard.
- B. Temporary Formwork: Construct formwork and shores to support reinforced masonry elements during construction.
 - 1. Construct formwork to conform to shape, line, and dimensions shown. Make sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
- C. Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.
- D. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

3.12 FIELD QUALITY CONTROL

- A. Testing Frequency: Tests and evaluations listed in this article will be performed during construction for each 5000 sq. ft. of wall area or portion thereof.
 - 1. Mortar composition and properties will be evaluated per ASTM C 780.
 - 2. Grout compressive strength will be sampled and tested per ASTM C 1019.
- B. Prism Test Method: For each type of wall construction indicated, masonry prisms will be tested per ASTM E 447, Method B, and as follows:
 - 1. Prepare one set of prisms for testing at 7 days and one set for testing at 28 days.
- C. Evaluation of Quality Control Tests: In absence of other indications of noncompliance with requirements, masonry will be considered satisfactory if results from construction quality control tests comply with minimum requirements indicated.

3.13 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units and in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints including corners, openings, and adjacent construction to provide a neat, uniform appearance, prepared for application of sealants.
- C. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample wall panel; leave 1/2 panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 - 3. Protect adjacent nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
 - 4. Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.

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5. Clean brick by means of bucket and brush hand-cleaning method described in BIA "Technical Note No. 20 Revised" using the following masonry cleaner:
 - a. Job-mixed detergent solution.
 - b. Job-mixed acidic solution.
 - c. Proprietary acidic cleaner; apply in compliance with directions of acidic cleaner manufacturer.
 6. Clean concrete masonry by means of cleaning method indicated in NCMA TEK 45 applicable to type of stain present on exposed surfaces.
- D. Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure unit masonry is without damage and deterioration at time of Substantial Completion.

END OF SECTION

SECTION 05120

STRUCTURAL STEEL FOR BUILDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SUMMARY

- A. This Section includes fabrication and erection of structural steel work, as shown on drawings including schedules, notes, and details showing size and location of members, typical connections, and types of steel required.
 - 1. Structural steel is that work defined in American Institute of Steel Construction (AISC) "Code of Standard Practice" and as otherwise shown on drawings.
 - 2. Miscellaneous Metal Fabrications are specified elsewhere in Division 5.
 - 3. Refer to Division 3 for anchor bolt installation in concrete, Division 4 for anchor bolt installation in masonry.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data or manufacturer's specifications and installation instructions for following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).
 - 1. Structural steel (each type), including certified copies of mill reports covering chemical and physical properties.
 - 2. High-strength bolts (each type), including nuts and washers.
 - 3. Shrinkage-resistant grout.
- C. Shop drawings prepared under supervision of a licensed Structural Engineer, including complete details and schedules for fabrication and assembly of structural steel members, procedures, and diagrams.
 - 1. Include details of cuts, connections, camber, holes, and other pertinent data. Indicate welds by standard AWS symbols and show size, length, and type of each weld.
 - 2. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed as work of other sections.

1.4 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following, except as otherwise indicated:
- B. American Institute of Steel Construction (AISC) "Code of Standard Practice for Steel Buildings and Bridges."
 - 1. Paragraph 4.2.1 of the above code is hereby modified by deletion of the following sentence:
 - a "This approval constitutes the owner's acceptance of all responsibility for the design adequacy of any detail configuration of connections developed by the fabricator as a part of his preparation of these shop drawings."
- C. AISC "Specifications for Structural Steel Buildings," including "Commentary."
- D. "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts" approved by the Research Council on Structural Connections.
- E. American Welding Society (AWS) D1.1 "Structural Welding Code - Steel."
- F. ASTM A 6 "General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use."
- G. Qualifications for Welding Work: Qualify welding procedures and welding operators in accordance with AWS "Qualification" requirements.
- H. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests.
- I. If recertification of welders is required, retesting will be Contractor's responsibility.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to site at such intervals to ensure uninterrupted progress of work.
- B. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete or masonry, in ample time to not to delay work.
- C. Store materials to permit easy access for inspection and identification. Keep steel members off ground by using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration. If bolts and nuts become dry or rusty, clean and relubricate before use.
- D. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Metal Surfaces, General: For fabrication of work that will be exposed to view, use only materials that are smooth and free of surface blemishes including pitting, rust and scale seam marks, roller marks, rolled trade names, and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating, and applying surface finishes.
- B. Structural Steel Shapes, Plates, and Bars: ASTM A 36.

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- C. Cold Formed Steel Tubing: ASTM 1 501
 - D. Hot Formed Steel Tubing: ASTM A 500, Grade B.
 - E. Steel Pipe: ASTM A 53, Type E or S, Grade B; or ASTM A 501.
 - 1. Finish: Black, except where indicated to be galvanized.
 - F. Anchor Bolts: ASTM A 307, nonheaded type unless otherwise indicated.
 - G. Unfinished Threaded Fasteners: ASTM A 307, Grade A, regular low- carbon steel bolts and nuts.
 - 1. Provide hexagonal heads and nuts for all connections.
 - H. High-Strength Threaded Fasteners: Heavy hexagon structural bolts, heavy hexagon nuts, and hardened washers, as follows:
 - 1. Quenched and tempered medium-carbon steel bolts, nuts, and washers, complying with ASTM A 325.
 - I. Electrodes for Welding: Comply with AWS Code.
 - J. Nonmetallic Shrinkage-Resistant Grout: Premixed, nonmetallic, noncorrosive, nonstaining product containing selected silica sands, Portland cement, shrinkage compensating agents, plasticizing and water-reducing agents, complying with CE-CRD- C621.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
 - a Non-Shrink Grout (Non-Metallic); Conspec, Inc.
 - b Supreme Grout; Cormix, Inc.
 - c Sure Grip Grout; Dayton Superior.
 - d Euco N.S.; Euclid Chemical Co.
 - e Crystex; L & M Construction Chemicals, Inc.
 - f Masterflow 713; Master Builders.
 - g Sealtight 588 Grout; W. R. Meadows.
 - h Propak; Protex Industries, Inc.
 - i Set Non-Shrink; Set Products, Inc.
 - j Five Star Grout; U.S. Grout Corp.

2.2 FABRICATION

- A. Shop Fabrication and Assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings. Provide camber in structural members where indicated.
 - 1. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence that will expedite erection and minimize field handling of materials.
 - 2. Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.
- B. Connections: Weld or bolt shop connections, as indicated.
- C. Bolt field connections, except where welded connections or other connections are indicated.
 - 1. Provide high-strength threaded fasteners for all bolted connections.

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- D. High-Strength Bolted Construction: Install high-strength threaded fasteners in accordance with AISC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts."
 - E. Welded Construction: Comply with AWS Code for procedures, appearance and quality of welds, and methods used in correcting welding work.
 - F. Holes for Other Work: Provide holes required for securing other work to structural steel framing and for passage of other work through steel framing members, as shown on final shop drawings.
 - G. Provide threaded nuts welded to framing and other specialty items as indicated to receive other work.
 - H. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame-cut holes or enlarge holes by burning. Drill holes in bearing plates.
 - I. Painting: Provide a one-coat, shop-applied paint system complying with Steel Structures Painting Council (SSPC) Paint System Guide No. 7.00.

2.3 SOURCE QUALITY CONTROL

- A. General: Materials and fabrication procedures are subject to inspection and tests in mill, shop, and field, conducted by a qualified inspection agency. Such inspections and tests will not relieve Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements.
 - 1. Promptly remove and replace materials or fabricated components that do not comply.
- B. Design of Members and Connections: Details shown are typical; similar details apply to similar conditions, unless otherwise indicated. Verify dimensions at site whenever possible without causing delay in the work.
 - 1. Promptly notify Architect whenever design of members and connections for any portion of structure are not clearly indicated.

PART 3 - EXECUTION

3.1 ERECTION

- A. Temporary Shoring and Bracing: Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds.
- B. Temporary Planking: Provide temporary planking and working platforms as necessary to effectively complete work.
- C. Setting Bearing Plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of bearing plates.
 - 1. Set loose and attached base plates and bearing plates for structural members on wedges or other adjusting devices.
 - 2. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.
 - 3. Pack grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure.

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4. For proprietary grout materials, comply with manufacturer's instructions.
- D. Field Assembly: Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming part of complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces that will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 1. Level and plumb individual members of structure within specified AISC tolerances.
 2. Splice members only where indicated and accepted on shop drawings.
 - E. Erection Bolts: On exposed welded construction, remove erection bolts, fill holes with plug welds, and grind smooth at exposed surfaces.
 1. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
 2. Do not enlarge unfair holes in members by burning or by using drift pins, except in secondary bracing members. Ream holes that must be enlarged to admit bolts.
 - F. Gas Cutting: Do not use gas cutting torches in field for correcting fabrication errors in primary structural framing. Cutting will be permitted only on secondary members that are not under stress, as acceptable to Architect. Finish gas-cut sections equal to a sheared appearance when permitted.

3.2 QUALITY CONTROL

- A. Owner will engage an independent testing and inspection agency to inspect high-strength bolted connections and welded connections and to perform tests and prepare test reports.
 1. Testing agency shall conduct and interpret tests, state in each report whether test specimens comply with requirements, and specifically state any deviations therefrom.
 2. Provide access for testing agency to places where structural steel work is being fabricated or produced so that required inspection and testing can be accomplished.
 3. Testing agency may inspect structural steel at plant before shipment.
- B. Correct deficiencies in structural steel work that inspections and laboratory test reports have indicated to be not in compliance with requirements. Perform additional tests, at Contractor's expense, as necessary to reconfirm any noncompliance of original work and to show compliance of corrected work.

END OF SECTION 05120

SECTION 05210

STEEL JOISTS FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SUMMARY

- A. This Section includes steel joists for roof framing. Types of joists required include the following:
 - 1. K-Series Open Web Steel Joists.
 - 2. LH-Series Open Web Steel Joists
 - 3. DLH Series Open Web Steel Joists

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data and installation instructions for each type of joist and accessories.
 - 1. Include manufacturer's certification that joists comply with SJI "Specifications."
- C. Shop drawings showing layout of joist members, special connections, joining and accessories. Include mark, number, type, location and spacing of joists and bridging.

1.4 QUALITY ASSURANCE

- A. General: Provide joists fabricated in compliance with Steel Joist Institute (SJI) "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."
- B. Qualification of Field Welding: Qualify welding processes and welding operators in accordance with American Welding Society (AWS) "Structural Welding Code - Steel," AWS D1.1.
- C. Inspection: Inspect joists in accordance with SJI "Specifications."

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle steel joists as recommended in SJI "Specifications." Handle and store joists in a manner to avoid deforming members and to avoid excessive stresses.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Steel: Comply with SJI "Specifications" for chord and web sections.
- B. Steel Bearing Plates: ASTM A 36.
- C. Unfinished Threaded Fasteners: ASTM A 307, Grade A, regular hexagon type, low carbon steel.
- D. Steel Prime Paint: Manufacturer's standard.

2.2 FABRICATION

- A. General: Fabricate steel joists in accordance with SJI "Specification."
- B. Holes in Chord Members: Provide holes in chord members where shown for securing other work to steel joists; however, deduct area of holes from the area of chord when calculating strength of member.
- C. Extended End: Provide extended ends on joists where indicated, complying with SJI "Specifications" and load tables.
- D. Bridging: Provide horizontal or diagonal type bridging for joists, complying with SJI "Specifications."
 - 1. Provide bridging anchors for ends of bridging lines terminating at walls or beams.
- E. Supply ceiling extensions, either extended bottom chord elements or a separate extension unit of sufficient strength to support ceiling construction, where indicated. Extend ends to within ½" of finished wall surface, unless otherwise indicated.
- F. End Anchorage: Provide end anchorages, including steel bearing plates, to secure joists to adjacent construction, complying with SJI "Specifications."
- G. Shop Painting: Remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories before application of shop paint.
- H. Apply one shop coat of steel prime paint to joists and accessories, by spraying, dipping, or other method to provide a continuous dry paint film thickness of not less than 0.50 mil.

PART 3 - EXECUTION

3.1 ERECTION

- A. Place and secure steel joists in accordance with SJI "Specifications," final shop drawings, and as herein specified.
- B. Anchors: Furnish steel bearing plates and other devices to be built into concrete and masonry construction.
- C. Placing Joists: Do not start placement of steel joists until supporting work is in place and secured. Place joists on supporting work, adjust and align in accurate locations and spacing before permanently fastening.
- D. Provide temporary bridging, connections, and anchors to ensure lateral stability during construction.

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- 1. Where "open-web" joist lengths are 40 feet and longer, install a center row of bolted bridging to provide lateral stability before slackening of hoisting lines.
 - E. Bridging: Install bridging simultaneously with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords where terminating at walls or beams.
 - F. Fastening Joists: Comply with the following:
 - 1. Field weld joists to supporting steel framework and steel bearing plates where indicated in accordance with SJI "Specifications" for type of joists used. Coordinate welding sequence and procedure with placing of joists.
 - G. Touch-Up Painting: After joist installation, wire brush welded areas, abraded or rusty surfaces, and clean with solvent. Paint field-applied bolt heads and nuts and prepared surfaces on joists and steel supporting members. Use same type of paint as used for shop painting.

END OF SECTION 05220

SECTION 05310

STEEL DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Non-Acoustical Steel roof deck
 - 2. Non-composite steel form deck

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data including manufacturer's specifications and installation instructions for decking and accessories.
- C. Shop drawings showing layout and types of deck units, anchorage details, cut openings, special jointing, ridge and valley plates and other accessories.

1.4 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of the following codes and standards, except as otherwise indicated:
 - 1. American Iron and Steel Institute (AISI), "Specification for the Design of Cold-Formed Steel Structural Members."
 - 2. Steel Deck Institute (SDI), "Design Manual for Composite Decks, Form Decks and Roof Decks."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include but are not limited to the following:
 - a Bowman Metal Deck Div., Cyclops Corp.
 - b Consolidated Systems, Inc.
 - c Epic Metals Corp.
 - d Marlyn Steel Products, Inc.
 - e H. Robertson Co.
 - f Roll Form Products, Inc.
 - g Roof Deck, Inc.
 - h United Steel Deck, Inc.

2.2 MATERIALS

- A. Steel for Painted Metal Deck Units: ASTM A 611, grade as required to comply with SDI specifications.
- B. Steel for Galvanized Metal Deck Units: ASTM A 446 grade as required to comply with SDI specifications.
- C. Miscellaneous Steel Shapes: ASTM A 36.
- D. Sheet Metal Accessories: ASTM A 526, commercial quality, galvanized.
- E. Galvanizing: ASTM A 525, G60.
- F. Galvanizing Repair: Where galvanized surfaces are damaged, prepare surfaces and repair in accordance with procedures specified in ASTM A 780.
- G. Paint: Manufacturer's baked-on, rust-inhibitive paint, for application to metal surfaces that have been chemically cleaned and phosphate chemical treated.

2.3 FABRICATION

- A. General: Form deck units in lengths to span three or more supports, with flush, telescoped, or nested 2-inch laps at ends and interlocking or nested side laps, of metal thickness, depth, and width as indicated.
- B. Roof Deck Units: Provide deck configurations that comply with SDI "Specifications and Commentary for Steel Roof Deck", of metal thickness, depth and section properties as shown.
- C. Non-composite Steel Form Deck: Provide fluted sections of galvanized metal deck as permanent forms for concrete slabs with metal thickness, depth and section properties as shown.
- D. Ridge and Valley Plates: Fabricate from single piece of 0.036 inch minimum (20 gage) galvanized sheet steel. Minimum width of plate shall be 12 inches.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install deck units and accessories in accordance with manufacturer's recommendations, shop drawings, and as specified herein.
- B. Place deck units on supporting steel framework and adjust to final position with ends accurately aligned and bearing on supporting members before being permanently fastened. Do not stretch or contract side lap interlocks.
- C. Place deck units flat and square, secured to adjacent framing without warp or deflection.
- D. Coordinate and cooperate with structural steel erector in locating decking bundles to prevent overloading of structural members.
- E. Do not use floor deck units for storage or working platforms until permanently secured.
- F. Fastening Deck Units:

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1. Fasten roof and non-composite form deck units to steel supporting members as noted and detailed on the drawings.
 2. Mechanically fasten side laps of adjacent deck units between supports as noted on the drawings.
- G. Cutting and Fitting: Cut an neatly fit deck unit and accessories around other work projecting through or adjacent to the decking, as shown.
- H. Reinforcement at Openings: Provide additional metal reinforcement and closure pieces as required for strength, continuity of decking, and support of other work shown.
- I. Touch-Up Painting: After decking installation, wire brush, clean, and paint scarred areas, welds, and rust spots on top and bottom surfaces of decking units and supporting steel members.
- J. Touch-up painted surfaces with same type of shop paint used on adjacent surfaces.
- K. In areas where shop-painted surfaces are to be exposed, apply touch-up paint to blend into adjacent surfaces.

END OF SECTION 05310

SECTION 05410

STRUCTURAL METAL STUD FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SUMMARY

- A. Types of cold-formed metal framing units include the following:
 - 1. C-shaped steel studs.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data and installation instructions for each item of cold- formed metal framing and accessories.
- C. Shop drawings for special components and installations not fully dimensioned or detailed in manufacturer's product data.
- D. Include placing drawings for framing members showing size and gage designations, number, type, location, and spacing. Indicate supplemental strapping, bracing, splices, bridging, accessories, and details required for proper installation.

1.4 QUALITY ASSURANCE

- A. Component Design: Calculate structural properties of studs in accordance with American Iron and Steel Institute (AISI) "Specification for Design of Cold-Formed Steel Structural Members."
- B. Welding: Use qualified welders and comply with American Welding Society (AWS) D1.3, "Structural Welding Code - Sheet Steel."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include but are not limited to the following:
 - 1. Alabama Metal Industries Corp.
 - 2. Dale Industries, Inc.
 - 3. Dietrich Industries, Inc.
 - 4. Marino Industries, Inc.
 - 5. Superior Steel Studs, Inc.

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6. USG Industries
 7. United States Steel
 8. Wheeling Corrugating Co.

2.2 METAL FRAMING

- A. System Components: Manufacturers' standard galvanized steel studs of type, size, shape, and gage as indicated. With each type of metal framing required, provide manufacturer's standard steel runners (tracks), blocking, lintels, clip angles, shoes, reinforcements, fasteners, and accessories for applications indicated, as needed to provide a complete metal framing system.
- B. Materials and Finishes:
 1. For 18-gage and lighter units, fabricate metal framing components of commercial quality steel sheet with a minimum yield point of 33,000 psi; ASTM A 446, A 570, or A 611.
 2. Provide galvanized finish to metal framing components complying with ASTM A 525 for minimum G 60 coating.
 3. Finish of installation accessories to match that of main framing components, unless otherwise indicated.
 4. Fasteners: Provide nuts, bolts, washers, screws, and other fasteners with corrosion-resistant plated finish.
 5. Electrodes for Welding: Comply with AWS Code and as recommended by stud manufacturer.
 6. Galvanizing Repair: Where galvanized surfaces are damaged, prepare surfaces and repair in accordance with procedures specified in ASTM A 780.

2.3 FABRICATION

- A. General: Framing components may be prefabricated into assemblies before erection. Fabricate panels plumb, square, true to line, and braced against racking with joints welded. Perform lifting of prefabricated units to prevent damage or distortion.
- B. Fabricate units in jig templates to hold members in proper alignment and position and to assure consistent component placement.
- C. Fastenings: Attach similar components by welding. Attach dissimilar components by welding, bolting, or screw fasteners, as standard with manufacturer.
- D. Wire tying of framing components is not permitted.
- E. Fabrication Tolerances: Fabricate units to a maximum allowable tolerance variation from plumb, level, and true to line of 1/8 inch in 10 feet.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install metal framing systems in accordance with manufacturer's printed or written instructions and recommendations.
- B. Runner Tracks: Install continuous tracks sized to match studs. Align tracks accurately to layout at base and tops of studs. Unless noted otherwise, secure tracks as recommended by stud manufacturer for type of construction involved, except do not exceed 24 inches o.c. spacing for nail or power-driven fasteners or 16 inches o.c. for other types of attachment. Provide fasteners at corners and ends of tracks.
- C. Installation of Wall Studs: Secure studs to top and bottom runner tracks by either welding or screw fastening at both inside and outside flanges.
- D. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- E. Install supplementary framing, blocking, and bracing in metal framing system wherever walls or partitions are indicated to support fixtures, equipment, services, casework, heavy trim and furnishings, and similar work requiring attachment to the wall or partition. Where type of supplementary support is not otherwise indicated, comply with stud manufacturer's recommendations and industry standards in each case, considering weight or loading resulting from item supported.
- F. Frame wall openings larger than 2 feet square with double stud at each jamb of frame except where more than two are either shown or indicated in manufacturer's instructions. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with stud shoes or by welding, and space jack studs same as full-height studs of wall. Secure stud system wall opening frame in manner indicated.
- G. Install horizontal stiffeners in stud system, spaced (vertical distance) at not more than 54 inches o.c, unless otherwise noted. Weld at each intersection.
- H. Erection Tolerances: Bolt or weld panels (at both horizontal and vertical junctures) to produce flush, even, true- to-line joints.
- I. Maximum variation in plane and true position between prefabricated assemblies should not exceed 1/16 inch.
- J. Field Painting: Touch-up damaged shop-applied protective coatings. Use galvanizing repair system for galvanized surfaces.

END OF SECTION 05410

SECTION 06050

TIMBERSIL® GLASS WOOD PRODUCTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. TimberSIL® Glass Wood Products - Strengthened, Stabilized, And Protected By Millions Of Non-Toxic Glass Barriers
- B. Hardware.
- C. Finishes.

1.3 RELATED SECTIONS

- A. Section 08520 – Aluminum Windows.
- B. Section 07900 – Joint Sealers.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide TimberSIL® Glass Wood products strengthened, stabilized, and protected by millions of layers of non-toxic, amorphous glass.
- B. EPA Exempt, Non-toxic Product: determined by EPA under 40 CFR Part 152.10, May 14, 2008. Only such determination achieved in EPA history.
- C. Superior Strength:
 - 1. Modulus of Rupture, per ASTM D4761, ASTM D143: 30,250 psi; F_b: 5,005 psi.
 - 2. Modulus of Elasticity at L/360, per ASTM D143: E: 2,870,000 psi.
 - 3. Compression Parallel to Grain, per ASTM D143: 7,120 psi; F_c: 1,875 psi.
 - 4. Compression Perpendicular to Grain, per ASTM D143: 2,700 psi; F_{CP}: 920 psi.
- D. Ignition Resistant Material, Class A Fire Retardant: Class A rating when tested with accelerated, weathered samples according to ASTM 4898, in accordance with 30 minute extended ASTM E 84 method.
 - 1. TimberSIL® Flame-Spread Index: Test result 8.6 (Class A rating is 25 or less).
 - 2. TimberSIL® Smoke-Developed Index: Test result 119 (Class A rating is 450 or less).
- E. Corrosion of Fasteners, per AWWA E12-94: Below allowable loss level of 25 mils/year.
- F. Fungus Resistance (White & Brown Rot), per ASTM D1413: No decay.
- G. Termite Resistance, per AWWA E1-72: 10 (Sound, no decay).
- H. Insolubility of glass in situ, per molybdate assay: insoluble.
- I. Microscopic Evaluation with electron microscopy; TimberSIL® Glass Wood versus raw wood control: TimberSIL® cellular structures straight, intact vs. raw wood macerated.
- J. Toxic Chemical Content and Known Carcinogens: None. Per X-ray diffraction, glass portion is non-toxic amorphous glass.
- K. Accelerated weathering of TimberSIL® wood without coatings, per ASTM G151: meets or exceeds standards.

1.5 SUBMITTALS

- A. Product Data: Include manufacturer's printed data indicating the usage of TimberSIL® Glass Wood Products, and instructions for installation and finishing.
- B. Shop Drawings: Indicate materials and details of construction, methods of fastening, erection, and installation.
- C. Samples: For each type of field finishing indicated, provide samples not less than 12 inches long, showing the typical range in color and texture.
- D. Material Certificates: TimberSIL® Glass Wood is stamped by manufacturer and by wood certifier.
- E. TimberSIL® Span Tables, "Maximum Spans for TimberSIL® Joists & Rafters and Columns & Studs." These tables describe increased span distances due to the increased strength of TimberSIL® Products.
- F. Summaries of Third Party Data on TimberSIL® Properties, including strength, fire retardance, durability, and insolubility.
- G. Maintenance Data: For TimberSIL® glass wood fusion products, to include in maintenance manuals.
- H. Warranties: Special warranties specified in this Section.

1.6 QUALITY ASSURANCE

- A. Sources of TimberSIL® Glass Wood: TimberSIL® Products are available through authorized dealers and distributors of manufacturer. List of authorized dealers and distributors: <http://www.timbersilwood.com/authorized-dealers.html>.
- B. Identify each piece or each bundle of TimberSIL® Glass Wood, by the grade mark and manufacturer's end tag.
- C. Mockups: Build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution.
 - 1. Build mockup of indicated TimberSIL® Glass Wood assemblies as directed by Architect.
 - 2. Approval of mockups is for material and construction qualities specifically approved by Architect in writing.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.
 - 4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Follow separate TimberSIL® Guidelines for delivery, storage and handling. In general, protect against dampness from weather or adjacent surfaces, before, during, and after delivery, and comply with manufacturers storage and handling instructions. Deliver materials to job site in an undamaged condition. Store materials under cover or in a well-ventilated enclosure; keep wrapped and banded until TimberSIL® Products are installed. Boards or lumber that are left unused should be restacked evenly and re-banded if sufficient overage is being kept stored for more than several days.

1.8 WARRANTY

- A. Warranty: Manufacturer's transferable warranty agrees to replace TimberSIL® Glass Wood boards exhibiting structural failure due to termites, rot or decay within the specified

warranty period, not including incorrect installation, cracking, or splitting, provided that terms and conditions of the warranty have been met.

1. Warranted failures: structural failure due to termites, rot or decay.
2. Warranty Period: Forty years from date of purchase for residential uses.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. TimberSIL® Products; 4 Augusta Arbor Way, Greenville, SC 29605 v: 864-277-7007; f: 864-277-0455; www.timbersilwood.com; info@timbersilwood.com.

2.2 TIMBERSIL® GLASS WOOD PRODUCTS – STRENGTHENED, STABILIZED, AND PROTECTED BY MILLIONS OF LAYERS OF NON-TOXIC, AMORPHOUS GLASS

- A. Provide TimberSIL® glass strengthened, glass stabilized and glass protected wood products. TimberSIL® non-toxic, amorphous glass surrounds the vertical and horizontal structure of wood, inside and outside fibers, as a pattern to provide unusual strength and stability! TimberSIL® non-toxic, amorphous silicon dioxide (glass) is intimately commingled with intact wood fibers and cell walls. TimberSIL® glass strengthened and glass stabilized wood products provide superior improvements in strength, resilience, dimensional stability, resistance to fire, biological inertness, sustainability, and permanent carbon sequestration in comparison to raw wood or treated wood products.

The improvements in strength make it feasible for significantly less wood to be used in building projects, achieving the lowest project cost of all wood projects, while also increasing strength, and lifespan of completed projects.

TimberSIL® products contain harmless, EPA determined non-toxic, non-carcinogenic, non-corrosive, insoluble, non-leaching amorphous glass. TimberSIL® Products are stainable, paintable products that retain their natural wood appearance (follow TimberSIL® recommendations in “Installation of TimberSIL® Glass Wood Boards, Decking, and Lumber,” provided separately). Products contain no arsenic, chromium, copper, volatile organic compounds, or pesticides. The TimberSIL® process makes the TimberSIL® Glass Wood Materials unavailable as a food source to insects and decay.

TimberSIL® is manufactured using kiln-dried Southern Yellow Pine, inspected by SPIB or TPI.

- B. Unless otherwise noted:
 1. Provide TimberSIL® Glass Wood products where improved strength, increased spacing, and reductions in cost are indicated in residential or commercial buildings.
 2. Provide TimberSIL® Glass Wood products where non-toxic, extra strong, replacements for treated wood are indicated, or where fencing and related structural elements are indicated.

2.3 HARDWARE

- A. Provide sizes, and types of Fasteners. Extra protection for corrosive wood is not required or recommended. High grade fasteners, used for corrosive treated lumber, are not required for TimberSIL® Glass Wood. Self tapping screws are recommended, but not required.
- B. TimberSIL® Products recommends using stronger levers and wrenches to make it easier to maneuver extra strong TimberSIL® Products into place for fastening. TimberSIL® Products are often at least twice as strong and many times harder than wet treated wood, and the best approach is to build using techniques that are similar to tropical hardwoods.
- C. Recommend one level upgrade of saw blades and cutting tools; and recommend operating pneumatic pressure increases of 10-15%. Following these recommendations, no reports of accelerated wear of saw blades or other cutting tools has been reported.

2.4 FINISHES, GENERAL

- A. Appearance of Finished Work: Variations in appearance of materials are acceptable if they are within the range of overall color of natural unfinished southern yellow pine, or slightly darker.
- B. Field Finishing: Natural clear waterproofer No. 7214 by Seal-Once; New Image Coatings, LLC. 150 Dow Street, Manchester, NH 03101. Tel. (603) 669-8786.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, supports, and other conditions affecting performance of work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates to be clean and dry, and free of projections and detrimental substances.

3.3 INSTALLATION, GENERAL

- A. General: Install TimberSIL® Glass Wood to comply with manufacturer's written instructions and as indicated in drawings.
- B. Install TimberSIL® Glass Wood in sizes, types, and configurations indicated. Place members to keep warranty end tags in inconspicuous locations. Where both ends are exposed, relocate end tags to underside of other unexposed surface. Apply any coating to sanded surface before installing.
- C. Construct tight joints, following standard constriction practices.
- D. Install TimberSIL® decking with one quarter inch (1/4") spacing between boards, except in cases where boards have been allowed to expand with moisture.

3.4 FINISH WORK

- A. To prepare TimberSIL[®] Glass Wood surfaces for the application of a coating, machine sand the surfaces with medium grit sand paper, making sure to completely sand all surface that are to be coated.
- B. Wire brush or sand to remove occasional chalky deposits.
- C. Newly available silicate-based coatings do not require sanding or other surface preparation; contact TimberSIL[®] Products for more information.

3.5 CLEANING AND PROTECTION (MAINTENANCE)

- A. Protect finished work from other trades.
- B. Depending upon environmental conditions of the site, horizontal surfaces may require seasonal cleaning with a mild detergent and removal of debris.

END OF SECTION

SECTION 06114

WOOD BLOCKING AND CURBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Carpentry work not specified as part of other sections and which generally is not exposed, except as otherwise indicated.
- B. Nailers.
- C. Blocking in wall and roof openings.
- D. Wood furring and grounds.
- E. Concealed wood blocking for support of toilet and bath accessories, wall cabinets, wood trim, toilet partitions, handrails, TV brackets and all other wall mounted equipment and accessories requiring support or other sections referencing this section.
- F. Telephone and electrical panel back boards.
- G. Preservative treatment of wood.

1.3 RELATED SECTIONS

- A. Section 04200 - Unit Masonry: Masonry openings to receive wood blocking.
- B. Section 05120 - Structural Steel for Building: Prefabricated steel structural supports.
- C. Section 07600 - Sheet Metal: Nailers under coping.
- D. Section 08410 - Aluminum Entrances and Storefronts: Opening to receive wood blocking.
- E. Section 08520 - Aluminum Windows: Window openings to receive wood blocking.
- F. Section 09250 - Gypsum Board Systems: Gypsum board systems.

1.4 REFERENCES

- A. ALSC (American Lumber Standards Committee) - Softwood Lumber Standards.
- B. ANSI A208.1 - Mat-Formed Wood Particleboard.
- C. APA/EWA (APA/The Engineered Wood Association) - Certification.
- D. ASTM A153 - Zinc Coating (Hot Dip) of Iron and Steel Hardware.
- E. ASTM A563 Carbon and Alloy Steel Nuts.
- F. ASTM F568 Carbon and Alloy Steel Externally Threaded Fasteners.
- G. AWPA C1 (American Wood Preservers Association) - All Timber Products - Preservative Treatment by Pressure Process.
- H. AWPA C9 Plywood, Pressure Treatment.
- I. AWPA C20 (American Wood Preservers Association) - Structural Lumber Fire Retardant Treatment by Pressure Process.
- J. AWPA C27 Plywood, Fire-Retardant Pressure Treatment.
- K. FS FF-N-105B Nails, Brads, Staples and Spikes: Wire, Cut and Wrought.
- L. SPIB (Southern Pine Inspection Bureau) - Lumber Grading Rules.

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- M. WCLIB (West Coast Lumber Inspection Bureau) - Lumber Grading Rules.
 - N. NLGA (National Lumber Rules Authority)
 - O. WWPAA (Western Wood Products Association).

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with the following agencies:
 - 1. Lumber Grading Agency: Certified by ALSC.
 - 2. Wood Structural Panel Grading Agency: Certified by APA/EWA - The Engineered Wood Association.
 - 3. Lumber Grading Rules: WWPAA.
- B. Factory grade stamp each piece of lumber and each wood structural panel. In lieu of grade stamping, submit manufacturer's certificate certifying that products meet or exceed specified requirements.
- C. Mark each treated item with the Quality Mark Requirements of an inspection agency approved by ALSC's Board of Review.

1.6 SUBMITTALS

- A. Submit following in accordance with Section 01300:
 - 1. Product Data
 - a. Provide technical data on wood preservative materials and application instructions.
- B. Manufacturer's Certificate: Certify that products conform to specified requirements.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section 01600 – Product Requirements: Product storage and handling requirements.
- B. Protect all wood materials from warping or other distortion by stacking in vertical position, braced to resist movement.
- C. Keep all wood materials covered and dry. Provide air circulation within and around stacks.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General
 - 1. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
 - 2. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Nailers and Miscellaneous Framing: Yellow Pine species, No. 2 and better grade, 19 percent maximum moisture content, pressure preservative treat.
- C. Plywood: APA, Grade C-D; Exposure Durability 1; unsanded.

2.2 ACCESSORIES

- A. Fasteners and Anchors:
 - 1. Fasteners: ASTM F568 and FS FF-N-105B, Hot dipped or Electro galvanized steel.

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2. Decking Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing cadmium plated or zinc coated.
 3. Anchors:
 - a. At Metal Studs: Flat or oval head sheet metal screws as required by project conditions.
 - b. At Face Brick: Self tapping masonry anchors equal to Hilti Kwik-Con.
 - c. At Mortar Joints: Expansion type anchors equal to Rawl wedge anchors.
 - d. At Hollow Masonry: Resin injected screen anchors equal to Hilti HIT C20.
 - e. At Grout Filled Masonry and Concrete: Expansion bolts or self-tapping masonry anchors as required by project conditions.
 - f. At Drywall: Equal to Hilti Toggler.
 - B. Structural Framing Connectors: Hot dipped galvanized steel, sized to suit framing conditions.

2.3 FACTORY WOOD TREATMENT

- A. Shop pressure treat and deliver to site ready for installation, wood materials requiring pressure impregnated preservatives.
- B. Wood Preservative (Pressure Treatment): AWPAC Treatment C1 using water borne preservative with 0.25 percent retainage.
- C. Brush apply two coats of preservative treatment on wood in contact with cementitious materials, roofing and related metal flashings and other exterior locations.
- D. Apply preservative treatment in accordance with manufacturer's recommendations. Ensure site-sawn ends are similarly treated.
- E. Allow preservative to cure prior to erecting members.

PART 3 - EXECUTION

3.1 SITE APPLIED WOOD TREATMENT

- A. Brush apply two coats of preservative treatment on wood in contact with cementitious materials, roofing and related metal flashings and all other exterior locations.
- B. Apply preservative treatment in accordance with manufacturer's instructions.
- C. Treat site-sawn ends.
- D. Allow preservative to cure prior to erecting members.

3.2 INSTALLATION

- A. Set members level and plumb, in correct position.
- B. Place horizontal members, crown side up.
- C. Curbs
 1. Curb all roof openings except where prefabricated curbs are provided.
 2. Form corners by lapping side members alternatively.
 3. Construct curb members of single pieces.
- D. Install telephone and electrical panel back boards with plywood sheathing material where required. Size the back board by 12 inches beyond size of electrical panel.

3.3 SCHEDULES

- A. Roof Blocking: S/P/F species, 19 percent maximum moisture content, pressure preservative treatment.
- B. Telephone and Electrical Panel Boards: 3/4 inch thick, square edges, site brush applied preservative treated.

END OF SECTION

SECTION 06410

CUSTOM CASEWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Cabinet units.
- B. Countertops.
- C. Cabinet hardware.
- D. Prefinished exposed surfaces.
- E. Preparation for site finishing concealed surfaces.
- F. Preparation for installing utilities.

1.3 RELATED SECTIONS

- A. Section 01400 – Quality Requirements: Testing laboratory services.
- B. Section 06114 - Wood Blocking and Curbing: Grounds and support framing.
- C. Section 07900 - Joint Sealers: Seals at adjoining construction.
- D. Division 15 - Mechanical: Plumbing fixtures.
- E. Division 16 - Electrical: Power, signal, and data wiring.

1.4 REFERENCES

- A. ANSI A135.4 - Basic Hardboard.
- B. ANSI A161.1 - Countertops.
- C. ANSI A208.1 - Mat Formed Wood Particleboard.
- D. ANSI A208.2 – Medium Density Fiberboard.
- E. ASTM D1037 – Evaluating Properties of Wood-Base Fiber and Particle Panel Materials.
- F. AWI - Quality Standards, Eighth Edition
- G. BHMA A156.9 - Cabinet Hardware.
- H. BHMA A156.11 - Cabinet Locks.
- I. CID A-A 1936A - Adhesive, Contact.
- J. HPMA HP - American Standard for Hardwood and Decorative Plywood.
- K. ISSFA – Definition and Performance Standard for Solid Surface Materials.
- L. NEMA LD3 - High Pressure Decorative Laminates.
- M. NHLA - Rules for the Measurement and Inspection of Hardwood & Cypress
- N. PS 1 - Construction and Industrial Plywood.
- O. PS 20 - American Softwood Lumber Standard.

1.5 SUBMITTALS

- A. Shop Drawing and Product Data
 - 1. Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location and schedule of finishes.
 - 2. For shop drawings submitted in phases, number phases in sequential order and provide master cross reference indicating room number in numerical sequence, millwork elevation and shop drawing sheet where detailed.
 - 3. Product Data: Provide data for hardware accessories.
- B. Samples
 - 1. Submit one cabinet door and one cabinet drawer samples of each color selected, illustrating cabinet finish.

1.6 QUALITY ASSURANCE

- A. Perform cabinet construction in accordance with AWI custom quality standards and as specified.
- B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.7 DELIVERY, STORAGE, AND PROTECTION

- A. Transport, handle, store, and protect products to site under provisions of Section 01600.
- B. Protect units from moisture damage.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. During and after installation of work of this section, maintain the same temperature and humidity conditions in building spaces as will occur after occupancy.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Softwood Lumber: PS 20; graded in accordance with AWI custom grade, average moisture content of 8 percent.
- B. Hardwood Lumber: NHLA; graded in accordance with AWI premium grade; average moisture content of 8 percent.
- C. Softwood Plywood: PS-1; graded in accordance with AWI, core materials of veneer, lumber or particleboard, type of glue recommended for application; face veneer and cuts
- D. Hardwood Plywood: HPMA; graded in accordance with AWI, core materials of hardwood veneer, lumber or particleboard; type of glue recommended for application.
- E. Particleboard: ANSI A208.1; Grade M-2 or M-3, composed of wood chips, medium density, with sanded faces.
- F. Water Resistant Particleboard
 - 1. ANSI A161.2 and A208.1, Grade M-2 or M-3, with a 24 hour thickness swell factor of 5 percent or less and a 24 hour water absorption factor of 10 percent or less as tested in conformance with ASTM D1037.
 - 2. Acceptable Product: Willamette Industries Duraflake WR.

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- G. Fiberboard: ANSI A208.2, Grade MD.
 - H. Water Resistant Fiberboard
 - 1. ANSI A161.2 and A208.2, Grade MD with a 24 hour thickness swell factor of 5 percent or less and a 24 hour water absorption factor of 10 percent or less as tested in conformance with ASTM D1037.
 - 2. Acceptable Product: Sierra Pine Medex.
 - I. Thermoset Decorative Overlay Covered Particleboard: ANSI A208.1; Grade M-2 or M-3, composed of wood chips, medium density; surfaced with thermofused melamine.
 - J. Hardboard: ANSI A135.4; Pressed wood fiber with resin binder, tempered grade, 1/4 inch thick, smooth one side.
 - K. Thermoset Decorative Overlay Covered Hardboard: ANSI A135.4; Pressed wood fiber with resin binder, tempered grade, 1/4 inch thick, smooth one side; surfaced with thermofused melamine.
 - L. Solid Surfacing Material (SSM)
 - 1. Conformance to ISSFA-2-01.
 - 2. Classification: Veneer type.
 - 3. Thickness: 1/8 inch thick.
 - 4. Color and Pattern: Refer to Finish Legend in specification.
 - M. Plastic Laminate
 - 1. Conformance: NEMA LD 3.
 - 2. Grade
 - a. Horizontal Exposed Surfaces: GP-50, 0.50 inch thick.
 - b. Vertical Exposed Surfaces: GP-28, 0.28 inch thick.
 - c. Backing Sheet: BK20, 0.20 inch thick backing grade, undecorated plastic laminate.
 - d. Color, Pattern, and Surface Texture: Refer to Finish Legend in specification.
 - N. Adhesive: FS MMM-A-130 contact adhesive. Type recommended by laminate manufacturer to suit application.
 - O. Fasteners: Size and type to suit application.
 - P. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; Cadmium finish.
 - Q. Concealed Joint Fasteners: Threaded steel.
 - R. Grommets: Two piece plastic, with spring loaded access port equal to Hafele model no. 429.99, color as selected by Architect from manufacturer's standard.
 - S. Manufactured Supports
 - 1. Counter Support and Bench Seat Support
 - a. 6063 T-6 "T" shaped extruded aluminum with 5/16 inch diameter mounting/attaching holes, mill finish and 7/8 inch hole with rubber grommet for wiring.
 - b. Acceptable Product: Rakks Model no.
 - 1) EH – 1824-G at counter tops.
 - 2) EH – 1824 at lavatories.
 - 3) EH-1212 at benches less than 18" deep.
 - 4) EH-1218 at benches over 18" deep.
 - T. Provide hardware and accessories indicated and as required for a complete installation.
 - U. Concealed, Cabinet Hinges: Totally concealed style, opening 95 degrees equal to Grass 3000 Hinge Series.
 - V. Butt Hinges: BHMA 156.1, A8133.
 - W. Pulls: Standard wire style, centers by 5/16-inch diameter, no escutcheons; BHMA 02011.

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- X. Drawer Slides: BHMA 156.9, Type B05051, Slide-mounted, 75-pound capacity, full extension, with nylon ball-bearing rollers; positive pull-out stop, self-closing, lift-out feature.
 - Y. Locks: BHMA A 156.11, E07261, 5-pin tumbler, sized for door thickness.
 - Z. Shelf Supports: BHMA A 156.9, B04013, brass or nickel plated steel, no plastics allowed.
 - AA. Closet Rod: BHMA A 156.16, Type L03131, 7/8" diameter stainless steel.
 - BB. Coat Hooks: BHMA A 156.16, Type L03111, stainless steel or solid brass.
 - CC. Silencers: BHMA A 156.16, Type L03021.
 - DD. Lever Extension Flush Bolts: BHMA A 156.16, Type L04091.
 - EE. Finishes on Exposed Hardware: Comply with BHMA A 156.18 as follows:
 - 1. Exposed Hardware: 630, satin stainless steel.
 - 2. Concealed hardware: Manufacturer's standard non-corroding plated finish, complying with applicable requirements of BHMA A 156.9.
 - FF. Magnetic Catches: BHMA A 156.16, Type BO 3162.
 - GG. Manufactured Support:
 - 1. Counter Support
 - a. 6063 'T' shaped extruded aluminum with 5/16 inch diameter mounting/attaching holes, mill finish and 7/8 inch hole with rubber grommet for wiring.
 - b. Acceptable Product: RAKKS Model No. EH1824-FM.
 - c. Privacy Curtain Rod:
 - 1) 1 1/2 inch diameter brushed nickel plated rod.
 - 2) 1 1/2 inch diameter brushed nickel plated bracket.
 - 3) 1 1/4 inch diameter thin round metal curtain rings, brushed nickel plated, set of seven for each curtain rod.
 - 4) Acceptable Product: Modern balance rod.
 - 5) Size: Rod length 2" longer than opening.

2.2 FINISHING MATERIALS

- A. Finishing: Site finish of casework scheduled to receive opaque and transparent finishes specified in Section 09900 and in Finish Legend in specification.

2.3 FABRICATION

- A. General
 - 1. Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.
 - 2. Fit shelves, doors, drawer fronts and other exposed and semi-exposed edges with veneer matching face finish as scheduled. Use one piece for full length only.
 - 3. Cap exposed plastic laminate finish edges with material of same finish and pattern.
 - 4. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
 - 5. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes.
 - 6. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises.
 - 7. Apply laminate backing sheet to reverse side of plastic wood laminate finished surfaces.
 - 8. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes, and fixtures and fittings. Verify locations of cutouts from on-site dimensions. Seal cut edges.
 - 9. If veneer core plywood drawer sides, backs, and subfronts are used, assemble using dovetail or French dovetail construction.

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10. Fabricate drawers with bottoms set into sides, back, and front 1/4 inch.
 11. Construct cabinet bases of lumber products. Panel products such as plywood, particle board and MDF are not acceptable.
- B. Laminated Plastic-Covered Casework
1. Fabricate in accordance with AWI Section 400, flush inset with face frame style, using the following materials:
 - a. Body Members: Melamine covered particleboard.
 - b. Stiles and Rails: Poplar, Alder or medium density particleboard.
 - c. Shelves: Medium density particleboard.
 - d. Backs: Tempered hardboard.
 - e. Drawer Sides, Backs and Subfronts: Poplar, Alder or other solid wood.
 - f. Drawer Bottoms: Tempered hardboard or thermoset decorative overlay covered hardboard.
 - g. Drawer Fronts: Medium density particleboard or fiberboard.
 - h. Doors: Medium density particleboard or fiberboard.
- C. Transparent Finish Casework
1. Fabricate in accordance with AWI Section 400A, flush inset with face frame style, using the following materials:
 - a. Body Members
 - 1) Exposed: Rift cut red oak veneer on plywood core.
 - 2) Semi-exposed: Particleboard.
 - b. Stiles and Rails: Rift cut red oak.
 - c. Shelves
 - 1) Exposed: Rift cut red oak veneer on plywood core.
 - 2) Semi-exposed: Rift cut red oak veneer on plywood core.
 - d. Backs
 - 1) Exposed: Rift cut red oak veneer on plywood core.
 - 2) Semi-exposed: Rift cut tempered hardboard.
 - e. Drawer Sides, Backs and Subfronts: Poplar, Alder or 7 ply veneer core plywood.
 - f. Drawer Bottoms: Tempered hardboard.
 - g. Drawer Fronts: Rift cut red oak veneer on plywood core.
 - h. Doors: Rift cut red oak veneer on plywood core.
 - i. Door, Drawer and Shelf Edging: Lumber banding to match door and drawer faces.
- D. Plastic Laminate Covered Countertops
1. Conformance: Fabricate in accordance with AWI Section 400C.
 2. Exposed Finish: GP-50 high pressure decorative laminate.
 3. Core
 - a. Countertops Without Sinks: Particleboard or fiberboard.
 4. Backing Sheet: BK-20.
 5. Mechanically fasten back splash to countertops.
 6. Provide grommet at each knee space. Coordinate location with utilities.

2.4 FINISHING

- A. Sand work smooth and set exposed nails and screws.
- B. Finish for items scheduled to receive transparent or opaque finishes, specified in Section 09900 – Painting and in Finish Legend in specification.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify adequacy of backing and support framing.
- C. Verify location and sizes of utility rough-in associated with work of this section.

3.2 INSTALLATION

- A. Install casework and associated trim in accordance with AWI Section 1700.
- B. Set and secure casework in place; rigid, plumb, and level.
- C. Use fixture attachments in concealed locations for wall mounted components.
- D. Use concealed joint fasteners to align and secure adjoining cabinet units and counter tops.
- E. Seal splashes and returns to countertop and wall with type sealant specified in Section 07900 - Joint Sealants.
- F. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
- G. Secure cabinet and counter bases to floor using appropriate angles and anchorages.
- H. Secure countertop brackets to masonry surface with expansion type anchors and to drywall construction with fasteners installed to solid wood blocking secured to metal stud framing.
 - 1. Ease all edges and corners of brackets by filing to a radius edge.
- I. Anchorage Devices
 - 1. General: Use concealed anchorage devices at all locations except where otherwise approved by Architect.
 - 2. Transparent or Opaque Finish Casework
 - a. At exposed fixed locations, countersink and putty or countersink and conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.
 - b. At exposed locations requiring removable panels, provide brass screws and countersunk finishing washers.
 - 3. Laminated Plastic-Covered Casework
 - a. At exposed fixed locations, provide cadmium coated screws with countersunk finishing washers.
 - b. At exposed locations requiring removable panels, provide brass screws and countersunk finishing washers.

3.3 ADJUSTING

- A. Adjust installed work in accordance with Section 01700 - Contract Closeout.
- B. Test installed work for rigidity and ability to support loads.
- C. Adjust moving or operating parts to function smoothly and correctly.

3.4 CLEANING

- A. Clean installed work in accordance with Section 01700 - Contract Closeout.
- B. Clean casework, counters, shelves, hardware, fittings, and fixtures.

3.5 **HARDWARE SCHEDULE**

**A. FLUSH INSET WITH FACE FRAMES
EACH TO HAVE:**

- 1 CONTINUOUS, SEMI CONSEALED HINGE
- 1 PULL
- 1 LOCK WHERE INDICATED ON DRAWINGS
- 1 SILENCER

**EACH DRAWER TO HAVE:
PAIR OF DRAWER SLIDERS**

- 1 PULL
- 1 LOCK WHERE INDICATED ON DRAWINGS
- 2 SILENCERS

**B. WARDROBE CABINETS/CLOSETS
SINGLE DOOR CABINETS TO HAVE:**

- 1 ½ PAIR BUTTS; REFER TO 08700 HARDWARE
- 1 DEAD BOLT; REFER TO 08700 HARDWARE
- 1 PULL
- 3 SILENCERS
- 1 CLOTHES ROD
- 2 COAT HOOKS
- 1 MAGNETIC CATCH

DOUBLE DOOR CABINET TO HAVE:

- 3 PAIR BUTTS; REFER TO 08700 HARDWARE
- 1 DEAD BOLT; REFER TO 08700 HARDWARE
- 1 SET FLUSH BOLT; REFER TO 08700 HARDWARE
- 2 PULLS
- 2 SILENCERS
- 1 CLOTHES ROD
- 4 COAT HOOKS
- 1 MAGNETIC CATCH

END OF SECTION

SECTION 07181

WATER REPELLENT COATINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Water repellent coating applied to exterior masonry, surfaces.

1.3 RELATED SECTIONS

- A. Section 03300 - Cast-in-Place Concrete: Concrete surfaces.
- B. Section 04200 - Unit Masonry: Masonry surfaces.
- C. Section 07900 - Joint Sealers.

1.4 REFERENCES

- A. ASTM C67 - Sampling and Testing Brick and Structural Clay Tile.
- B. ASTM C140 - Sampling and Testing Concrete Masonry Units.
- C. ASTM C642 - Specific Gravity, Absorption and Voids in Hardened Concrete.
- D. ASTM D5095 - Determination of the Non-volatile Content in Silanes, Siloxanes and Silane-Siloxane Blends Used in Masonry Water Repellent Treatment.
- E. ASTM E514 - Water Penetration and Leakage through Masonry.
- F. RILEM 25 - PEM Method II.4

1.5 PERFORMANCE REQUIREMENTS

- A. Perform a laboratory test on each substrate to be treated, to determine absorption rate of treated and untreated specimens in accordance with the following standards:
 - 1. Brick: ASTM C 67, cold water absorption only.
 - 2. Concrete Unit Masonry: ASTM C140.
 - 3. Hardened Concrete: ASTM C642.
 - 4. Water Penetration and Leakage through Masonry: ASTM E514, using a test pressure of 20 lbf/ft².
- B. Treatment of Specimens: Treat specimens using same application rates and methods as recommended by water repellent manufacturer for field application.
- C. Water Absorption Reduction: Minimum 90 percent after 24 hours.

1.6 SUBMITTALS

- A. Product Data: Provide details of product description, tests performed, limitations to coating, cautionary procedures required during application, and chemical properties including percentage of solids.

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- B. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.
 - C. Test Reports
 - 1. Provide copy of laboratory test indicating compliance with specified requirements.
 - 2. Provide written results to Architect prior to beginning field application of water repellents.
 - D. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.
- C. Mockup
 - 1. Provide test on mock-up comprising typical water repellent installation, using specified methods and materials.
 - 2. Visually examine test area for color change of substrate and water repellency.
 - 3. Unacceptable Installation: Extensive darkening of substrate or absorption of water above specified limits.
 - 4. Acceptable Installation: Maintain for duration of project as representative standard for remainder of installation.
 - 5. Do not apply water replants to project surfaces without Architects written approval of water repellent mock-up.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01600.
- B. Protect coating liquid from freezing.

1.9 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply coating when ambient temperature is lower than 50 degrees F or higher than 100 degrees F.
- B. Keep surfaces being treated dry until completion of treatment , including curing period.

1.10 WARRANTY

- A. Provide manufacturer's standard 5 year warranty, signed by Contractor and applicator, warranting water repellent material against failure of material and workmanship.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Siloxane
 - 1. Chemprobe Technologies, Inc.
 - 2. The Euclid Chemical Company.
 - 3. L & M Construction Chemicals, Inc.

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- 4. Pecora Corporation.
 - 5. ProSoCo, Inc.
 - 6. Stonhard, Inc.
 - B. Substitutions: Under provisions of Section 01600.

2.2 MATERIALS

- A. Siloxanes: Colorless penetrating water repellent, 5 percent solids, alkylalkoxysiloxanes that are oligomeric with alcohol, ethanol, mineral spirits, water, or other proprietary solvent carrier.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify joint sealants are installed and cured.
- B. Verify surfaces to be coated are dry, clean and free of efflorescence, oil, or other matter detrimental to application of coating.

3.2 PREPARATION

- A. Cure masonry and mortar substrate a minimum of 21 days prior to application of water repellents.
- B. Remove loose particles and foreign matter.
- C. Remove oil or foreign substance with a chemical solvent which will not affect coating.
- D. Scrub and rinse surfaces with water and let dry.
- E. Test for pH level according to repellent manufacturer's instructions to ensure chemical bond to silicate minerals.
- F. Protect all glass, aluminum, painted surfaces and other substrates not specified to receive water repellent coating from contact with water repellent coating.

3.3 APPLICATION

- A. Apply coating in accordance with manufacturer's written instructions and at recommended rate.
- B. Apply in minimum two continuous, uniform coats.

3.4 FIELD QUALITY CONTROL

- A. Perform field test on non-water repellent treated and water repellent treated area for each substrate scheduled to be treated. Perform separate test for masonry and mortar joints.
 - 1. Perform test using the RILEM 25 PEM method II.4 for a period of one hour.
 - 2. Perform minimum of 5 separate tests for each substrate scheduled to receive water repellent treatment using specified methods and materials.
 - 3. Acceptable Application: Minimum 90 percent reduction in water absorption between treated and untreated areas.
 - 4. Provide additional coatings until required reduction in absorption is achieved.

3.5 PROTECTION TO FINISHED AND ADJACENT WORK

- A. Protect adjacent surfaces not scheduled to receive coating.
- B. Mask sealant bond surfaces to prevent water repellent from migrating onto joint surfaces.
- C. Protect landscaping, property, and vehicles.
- D. If applied to unscheduled surfaces, remove immediately by a method instructed by coating manufacturer.

3.6 SCHEDULE

- A. Exterior Decorative Concrete and Brick Masonry: Siloxane or blend; minimum two coats.

END OF SECTION

SECTION 07210

BUILDING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Rigid insulation in exterior wall construction.
- B. Flexible acoustical batt insulation in interior wall construction.

1.3 RELATED SECTIONS

- A. Section 04200 - Unit Masonry: Insulation fill in masonry units.
- B. Section 07270 - Firestopping: Sealing fire rated partitions
- C. Section 09250 - Gypsum Board Systems: Vapor barrier and acoustical sealant. Supporting construction
- D. Section 09510 - Acoustical Ceilings: Supporting construction.

1.4 REFERENCES

- A. ASTM C208 - Cellulosic Fiber Insulating Board.
- B. ASTM C240 - Testing Cellular Glass Insulation Block.
- C. ASTM C552 - Cellular Glass Thermal Insulation.
- D. ASTM C578 - Preformed, Cellular Polystyrene Thermal Insulation.
- E. ASTM C612 - Mineral Fiber Block and Board Thermal Insulation Board.
- F. ASTM C665 - Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
- G. ASTM C1289 - Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
- H. ASTM D2842 - Test Method for Water Absorption of Rigid Cellular Plastics.
- I. ASTM E 84-87 Test Method for Surface Burning Characteristics of Building Materials.
- J. ASTM E 90-87 Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
- K. ASTM E96 - Test Methods for Water Vapor Transmission of Materials.
- L. ASTM E 119-83 Fire Tests of Building Construction and Materials.
- M. ASTM E 413-87 Determination of Sound Transmission Class.
- N. NFPA 255 - Test of Surface Burning Characteristics of Building Materials.
- O. UL 723 - Tests for Surface Burning Characteristics of Building Materials.

1.5 QUALITY ASSURANCE

- A. Insulation k Values
 - 1. k values indicated are based on 75 deg. F.
 - 2. Where scheduled, provide insulations with conditioned k values complying with RIC/TIMA 281-1 Conditioning Procedure.

1.6 REGULATORY REQUIREMENTS

- A. Conform to applicable code as indicated on drawings for combustibility and smoke development requirements for materials as follows:
 - 1. Flame Spread: 25 or less.
 - 2. Smoke Developed: 450 or less.
- B. Identify insulation with appropriate markings of applicable testing and inspecting organization.

1.7 SUBMITTALS

- A. Product Data
 - 1. Provide data on product characteristics, performance criteria, limitations.
- B. Manufacturer's Certificate
 - 1. Certify that products meet or exceed specified requirements.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Do not install adhesives when temperature or weather conditions are detrimental to successful installation.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Protect insulations from physical damage and from becoming wet or soiled. Comply with manufacturer's recommendations for handling, storage and protection.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Flexible Insulation
 - 1. Owens/Corning Corporation
 - 2. CertainTeed
 - 3. Manville Corp.
 - 4. Substitutions: Under provisions of Section 01600
- B. Board Insulation
 - 1. Polystyrene Insulation
 - a. AFM - Molded Polystyrene Insulation.
 - b. EPS - Molded Polystyrene Insulation.
 - c. W.R. Grace Construction Products
 - d. DiversiFoam Products.
 - e. Dow Chemical.
 - f. Tenneco Foam Products.

2.2 MATERIALS

- A. Flexible Acoustical Insulation
 - 1. Conformance: ASTM C 665, Type I, glass or mineral fiber batt.
 - 2. Thermal Resistance: R8.
 - 3. Surface Burning Characteristics when tested in accordance with ASTM E 84
 - a. Maximum flame spread: 10
 - b. Maximum smoke developed: 10
 - 4. Noise Reduction Coefficient: .85.
 - 5. Size: To fit framing spacing.
- B. Thermal Board Insulation
 - 1. Molded Polystyrene Insulation: ASTM C578 Type IV, polystyrene board, with the following characteristics:
 - a. Board Density: 1.6 lb/cu ft.
 - b. Board Size: 16 inch wide x maximum length available.
 - c. Board Thickness: 2 inches.
 - d. Thermal Resistance: R of 10.
 - e. Water Absorption: In accordance with ASTM D2842 4 percent by volume maximum.
 - f. Compressive Strength: Minimum 60 psi.
 - g. Board Edges: Tongue and groove edges.
 - h. Flame/Smoke Properties: In accordance with ASTM E84.

2.3 ACCESSORIES

- A. Tape: Bright aluminum self-adhering type, mesh reinforced, 2 inch wide.
- B. Wire Mesh: Galvanized steel, hexagonal wire mesh.
- C. Adhesive: Type recommended by insulation manufacturer for application.
- D. Impaling Clips: Galvanized steel with washer retainer and clips, to be mechanically fastened to surface to receive board insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that substrate and adjacent materials are dry and ready to receive insulation.
- B. Verify insulation is dry.
- C. Verify substrate surface is flat, free of honeycomb, fins, irregularities, and materials or substances that may impede adhesive bond.

3.2 INSTALLATION

- A. General
 - 1. Install insulation in accordance with insulation manufacturer's instructions.
 - 2. Install insulation without gaps or voids.

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3. Place insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.
 4. Trim insulation neatly to fit spaces.
- B. Flexible Acoustical Insulation
1. Place between and tight to framing members.
 2. Tape in place.
- C. Thermal Board Insulation
1. Exterior Walls
 - a. Adhere a 2 inch wide strip of polyethylene sheet over joint with double beads of adhesive each side of joint.
 - 1) Tape seal joints between sheets.
 - 2) Extend sheet full height of joint.
 - b. Apply adhesive in three continuous beads per board length to full bed 1/8 inch thick. Daub adhesive tight to protrusions.
 - c. Install boards on wall surface, horizontally. Place membrane surface of insulation against adhesive.
 - d. Place boards in a method to maximize contact bedding. Stagger end joints. Butt edges and ends tight to adjacent board and to protrusions.
 - e. Tape insulation board joints.

END OF SECTION

SECTION 07270

FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Fireproof firestopping systems and firesafing materials and accessories.
- B. Fire wall/partition identification.

1.3 RELATED SECTIONS

- A. Section 04200 - Unit Masonry: Wall penetrations.
- B. Section 09250 - Gypsum Board Systems: Wall penetrations.
- C. Division 15 - Mechanical: Mechanical work requiring firestopping.
- D. Division 16 - Electrical: Electrical work requiring firestopping.

1.4 REFERENCES

- A. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
- B. ASTM E119 - Method for Fire Tests of Building Construction and Materials.
- C. ASTM E814 - Test Method of Fire Tests of Through Penetration Firestops.
- D. UL-05 - Fire Resistance Directory.
- E. UL 263 - Fire Tests of Building Construction and Materials.
- F. UL 723 - Test for Surface Burning Characteristics of Building Materials.
- G. UL 1479 - Fire Tests of Through-Penetration Firestops.
- H. WH (Warnock Hersey) - Certification Listings.

1.5 DEFINITION

- A. Firestopping: A certified sealing or stuffing material or assembly placed in spaces between building materials to arrest the movement of smoke, heat, gases, or fire through wall or floor openings and to maintain the integrity of fire resistance rated walls, partitions, floors, and ceiling-floor assemblies and construction joints. Through -penetrations include the annular space around pipes, tubes, conduit, wires, cables and vents.

1.6 SYSTEM DESCRIPTION

- A. Surface Burning: ASTM E84 or UL 723 with a flame spread / smoke developed rating of 0-25/0-450.
- B. Firestop all interruptions to fire rated assemblies, materials, and components.

1.7 SUBMITTALS

- A. Shop Drawings
 - 1. Provide detail drawing of each type firestop and location drawing referencing each type application.
- B. Product Data: Provide descriptive data on product characteristics, performance and limitation criteria and fire test data.
- C. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
- D. Manufacturer's Certificate
 - 1. Submit certificates attesting that firestopping material complies with specified requirements.
 - 2. Label or listing of Underwriters Laboratories will be acceptable evidence.
 - 3. In lieu of label or listing, a written certificate may be submitted from an approved, nationally recognized testing agency equipped to perform such services, stating that items submitted have been tested and conform to specified requirements and testing methods.

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Applicator: Company specializing in performing the work of this section with minimum three years documented experience.

1.9 REGULATORY REQUIREMENTS

- A. Conform to UL or WH for fire resistance ratings and surface burning characteristics.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Delivery, store and handle products to project site in accordance with requirements of Section 01600.

1.11 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when temperature of substrate material and ambient air is below 60 degrees F.
- B. Maintain this minimum temperature before, during, and for 3 days after installation of materials.
- C. Provide ventilation in areas to receive solvent cured materials.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Commercially manufactured, non-toxic products as listed in UL 05.
- B. Provide "F" and "T" fire resistance ratings for through-penetrations, as described in paragraph 1.5 DEFINITIONS in accordance with ASTM E 814 or UL 1479, except that T Ratings are not

required for penetrations smaller than or equal to a 4-inch nominal pipe or 16 square inches in overall cross sectional area.

2.2 ACCESSORIES

- A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces.
- B. Dam Material: Permanent:
 - 1. Mineral fiberboard or sheet metal.
- C. Installation Accessories: Clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify site conditions under provisions of Section 01300.
- B. Verify openings are ready to receive work of this section.

3.2 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter which may affect bond of firestopping material.
- B. Remove incompatible materials which may affect bond.
- C. Install backing and/or damming materials to arrest liquid material leakage.

3.3 APPLICATION

- A. General: Install firestopping system at all fire rated partitions and tunnel enclosures.
- B. Install material at walls or partition openings which contain penetrating sleeves, piping, ductwork, conduit and other items, requiring firestopping.
- C. Completely fill void spaces regardless of geometric configuration, subject to tolerance established by manufacturer.
- D. Apply primer and materials in accordance with manufacturer's instructions.
- E. Apply firestopping material in sufficient thickness to achieve rating and to uniform density and texture.
- F. Compress fibered material to achieve a density of 40 percent of its uncompressed density.
- G. Place sealant to completely seal junctions with adjacent dissimilar materials.
- H. Remove dam material after firestopping material has cured.

3.4 CLEANING

- A. Clean Work under provisions of Section 01700.
- B. Clean adjacent surfaces of firestopping materials.

3.5 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Section 01500.
- B. Protect adjacent surfaces from damage by material installation.

3.6 PERMANENT IDENTIFICATION OF RATED WALLS

- A. Mark each fire barrier wall above lay-in ceilings with words identifying it as a fire barrier at intervals required by authorities having jurisdiction, but not more than 20 feet on center on each side of the wall.

END OF SECTION

SECTION 07272

FLUID-APPLIED MEMBRANE AIR BARRIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Fluid-applied, vapor-permeable membrane air barriers.
- B. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air
- C. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.
- D. Air-Barrier Assembly: The collection of air-barrier materials and accessory material applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

1.3 RELATED SECTIONS

- A. Section 01400 - Quality Requirements: Coordination with Owner's independent testing and inspection agency.
- B. Section 01500 - Temporary Facilities and Controls: Requirement to schedule work to prevent sunlight and weather exposure of materials beyond limits established by manufacturer; requirement to protect materials from damage after installation and prior to installation of enclosing work.
- C. Section 03300 – Cast-In-Place Concrete: Requirement that backup concrete be free of fins, protrusions and large holes.
- D. Section 04200 – Unit Masonry: Requirement that backup masonry joints are flush and completely filled with mortar, and that excess mortar on brick ties will be removed; requirement for gap at deflection joints and fillers; coordination with sequencing of through-wall flashing.
- E. Section 06114 – Wood Blocking and Curbing: Covering preservative-treated materials with self-adhering membranes.
- F. Section 07900 – Joint Sealers.
- G. Section 09250 – Gypsum Board Systems: Requirement that backup gypsum sheathing has been installed with damaged corners repaired, joints filled and surface flush with compatible material as acceptable to the fluid-applied air and vapor barrier manufacturer; requirement for gap at deflection joints and fillers.

1.4 REFERENCES

- A. ASTM E 2357: Standard Test Method for Determining Air Leakage of Air Barrier Systems (Full Scale Wall Testing of the Air Barrier System). Ensure tests were conducted on steel stud frame walls with penetrations (Specimen 2) as some air barrier systems are not tested in that critical mode.
- B. ASTM E96: Water Vapor Transmission of Materials, Procedure B

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- C. ASTM E 2178-01: Standard Test for Determining the Air Permeability of Building Materials.
 - D. ASTM E283-91: Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - E. ASTM E330-90: Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 - F. AATCC 127: Water Resistance.
 - G. ICC-ES AC212: Freeze Thaw, Crack Bridging.
 - H. ASTM D 1970: Self Sealability.
 - I. ABAA: Air Barrier Association of America.

1.5 SUBMITTALS

- A. Submit in accordance with Division 1 requirements.
- B. Product Data: Submit manufacturer's product data, installation instructions, and manufacturer's printed instructions for evaluating, preparing, and treating substrate, temperature and other limitations of installation conditions, technical data, and tested physical and performance properties.
 - 1. Submit letter from primary materials manufacturer indicating approval of products not manufactured by primary manufacturer.
 - 2. Include statement that materials are compatible with adjacent materials proposed for use.
 - 3. Submit reports indicating that field peel-adhesion test on all materials to which sealants are adhered have been performed and the changes made, if required, to other approved materials, in order to achieve successful adhesion.
- C. Samples: Submit clearly labeled samples, 3 by 4 inch minimum size of each material specified.
- D. Shop Drawings: Submit shop drawings showing locations and extent of air and vapor barrier assemblies and details of all typical conditions, intersections with other envelope assemblies and materials, membrane counter-flashings, and details showing how gaps in the construction will be bridged, how inside and outside corners are negotiated, how materials that cover the air and vapor barrier are secured with air-tight condition maintained, and how miscellaneous penetrations such as conduits, pipes, electric boxes and similar items are sealed.
 - 1. Include VOC content of each material, and applicable legal limit in the jurisdiction of the project.
 - 2. Include statement that materials are compatible with adjacent materials proposed for use.
 - 3. Include recommended values for field adhesion test on each substrate.
- E. Product Certificates: Submit letter from manufacturer stating that materials proposed for use are permanently chemically compatible and adhesively compatible with adjacent materials proposed for use. Submit letter from manufacturer stating that cleaning materials used during installation are chemically compatible with each of the adjacent materials proposed for use.
- F. Qualification Data: For installer.
- G. Product test reports. For each air-barrier assembly, for tests performed by qualified testing agency.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Air Barrier Installer Qualifications: Currently accredited by the Air Barrier Association of America (ABAA) whose applicators are certified in accordance with the ABAA Quality Assurance Program.
- C. Manufacturer: Obtain primary materials from a single manufacturer regularly engaged in manufacturing air and vapor barrier membranes. Obtain secondary materials from a source acceptable to the primary materials manufacturer.
- D. VOC Regulations: Provide products which comply with applicable regulations controlling the use of volatile organic compounds for the specific authority having jurisdiction.
- E. Preconstruction Meeting: Convene a minimum of two weeks prior to commencing Work of this Section. Agenda shall include, at a minimum, construction and testing of mock-up, sequence of construction, coordination with substrate preparation, materials approved for use, compatibility of materials, coordination with installation of adjacent and covering materials, and details of construction. Attendance is required by representatives of related trades including covering materials, substrate materials and adjacent materials.
- F. Field Quality Assurance: Implement the ABAA Quality Assurance Program requirements. Cooperate with (ABAA) inspectors and independent testing and inspection agencies engaged by the Owner. Do not cover air and vapor barrier until it has been inspected, tested and accepted.

1.7 MOCK-UP

- A. Construct mock up in accordance with Section 01400 – Quality Requirements: Requirements for a mock-up.
- B. Mock-Ups: Build mock-up to set quality standards for materials and execution and for preconstruction testing.
 - 1. Build integrated mock-up of exterior wall assembly approximately 8 feet long by 8 feet high, incorporating backup wall construction, external cladding, window, storefront, door frame and sill, insulation, ties and other penetrations, and flashing to demonstrate surface preparation, crack and joint treatment, application of air barriers, and sealing of gaps, terminations, and penetrations of air- barriers assembly.
 - a. Coordinate construction of mock-ups to permit inspection by Owner's testing agency of air barrier before external insulation and cladding are installed.
 - b. Include junction with roofing membrane, building corner condition and foundation wall intersection.
 - c. If Architect determines mock-ups do not comply with requirements, reconstruct mock-ups and apply air barrier until mock-ups are approved.
- C. Approval of mock-ups does not constitute approval of deviations from the Contract Documents contained in mock-ups unless Architect specifically approves such deviations in writing.
- D. Subject to compliance with requirements, approved mock-ups may not remain as part of the completed work if undisturbed at time of substantial completion.

1.8 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Services: Owner will engage a qualified testing agency to perform preconstruction testing on field mock-ups.

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- B. Mock-Up Tests for Air and Water Infiltration: Test mock-up for air and water infiltration in accordance with ASTM E 1186 (air leakage location) or ASTM E 783 (air leakage quantification), and ASTM E 1105 (water penetration). Use smoke tracer to locate sources of air leakage. If deficiencies are found, repair or modify mock-up and retest until satisfactory results are obtained. Deficiencies include air leakage beyond values specified, uncontrolled water leakage, unsatisfactory workmanship.
 - 1. Perform the air leakage tests and water penetration test of mock-up prior to installation of cladding and trim but after installation of all fasteners for cladding and trim and after installation of other penetrating elements. For fasteners which would normally only be installed with cladding, install representative fasteners without cladding; intent is to perform testing with all types of penetrations in place.
 - C. Mock-Up Tests for Adhesion: Test mock-up of fluid-applied and sheet applied materials for adhesion in accordance with ASTM D 4541 using a Type 1 pull tester except that the disk used shall be 100mm in diameter and the membrane shall be cut through to separate the material attached to the disk from the surrounding material. Perform test after curing period recommended by the manufacturer. Record mode of failure and area which failed in accordance with ASTM D 4541. When the air barrier material manufacturer has established a minimum adhesion level for the product on the particular substrate, the inspection report shall indicate whether this requirement has been met. Where the manufacturer has not declared a minimum adhesion value for their product/substrate combination, then the inspector shall simply record the value.

1.9 PRE-INSTALLATION CONFERENCE

- A. Conduct conference at Project site, two weeks prior to commencing work of this section, under provisions of Section 01300 – Administrative Requirements: Pre-Installation Meeting. Attendance by the manufacturer's representative along with the installer is mandatory.
- B. **DO NOT PROCEED WITH THE INSTALLATION OF THE AIR BARRIER MEMBRANE AND THE THROUGH WALL FLASHING MEMBRANE PRIOR TO THE PRE-INSTALLATION CONFERENCE.**

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original packages with seals unbroken, labeled with manufacturer's name, product, and date of manufacture, and directions for storage.
- B. Store materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by air and vapor barrier membrane manufacturer. Protect stored materials from direct sunlight.
- C. Handle materials in accordance with manufacturer's recommendations.

1.11 PROJECT CONDITIONS

- A. Temperature: Install air and vapor barrier within range of ambient and substrate temperatures recommended by air and vapor barrier manufacturer.
- B. Field Conditions: Do not install air and vapor barrier in snow, rain, fog, or mist without temporary protection and supplemental heat as required. Do not install air and vapor barrier when the temperature of substrate surfaces and surrounding air temperatures are below those recommended by the manufacturer. Apply membrane to a surface dry substrate, or in accordance with manufacturer's recommendations.

1.12 WARRANTY

- A. Material Warranty: Provide manufacturer's standard product warranty, for a minimum 3 years from date of Substantial Completion.
- B. Installation Warranty: Provide air barrier subcontractor's 2 years warranty from date of Substantial Completion, including all components of the air and vapor barrier assembly, against failures including loss of air tight seal, loss of watertight seal, loss of adhesion, loss of cohesion, failure to cure properly.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.
- B. VOC Content: 250g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and complying with VOC content limits of authorities having jurisdiction.
- C. Low-Emitting Materials: Air barriers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.2 PERFORMANCE REQUIREMENTS

- A. General: Air barrier shall be capable of performing as a continuous vapor-permeable air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

2.3 VAPOR-PERMEABLE MEMBRANE AIR-BARRIER

- A. Fluid-Applied, Vapor-Permeable Membrane Air Barrier: Elastomeric, modified bituminous membrane.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Synthetic polymer membrane:
 - 1) BASF; Senergy Senersshield-R.
 - 2) Carlisle Coating & Waterproofing, Inc; Barritech VP.
 - 3) Grace Construction Products; Perm-A-Barrier VP.
 - 4) Henry Company; Air-Bloc 31MR.
 - 5) Hohmann & Barnard, Inc.; Textroflash Liquid VP.
 - 6) Meadows, W. R., Inc.; Air-Shield LMP.
 - 7) Polywall; Poly-Wall AIRLOK Flex VP.
 - 8) Rubber Polymer Corp.; Rub-R-Wall Airtight VP.
 - 9) STS Coatings; Wall Guardian FW-100A.
 - 10) Tremco Incorporated, an RPM company; ExoAir 220.

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2. Physical and Performance Properties:
 - a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E 2178.
 - b. Vapor Permeance: Minimum 10-20 perms; ASTM E 96/E 96M.
 - c. Ultimate Elongation: Minimum 200 percent; ASTM D 412, Die C.
 - d. Assembly Performance; ASTM E 2357

2.4 ACCESSORY MATERIALS

- A. General: Accessory materials recommended by air-barrier manufacturer to produce a complete air-barrier assembly and compatible with primary air-barrier material.
- B. Primer: Liquid (waterborne)(solvent-borne) primer recommended for substrate by air barrier material manufacturer.
- C. Butyl Strip: Vapor retarding, 30 to 40 (0.76 to 1.0mm) thick, self-adhering; polyethylene-film-reinforced top surface laminated to layer of butyl adhesive with release liner backing.
- D. Joint Reinforcing Fabric: Air-barrier manufacturer's nonwoven reinforcement fabric.
- E. Joint Reinforcing Strip: Air-barrier manufacturer's self-adhering glass-fiber-mesh tape.
- F. Substrate-Patching Membrane: Manufacturer's stand trowel-grade substrate filler.
- G. Adhesive and Tape: Air-barrier manufacturer's standard adhesive and pressure-sensitive adhesive tape.
- H. Stainless-Steel Sheet: ASTM A 240/A240 M, Type 304, 0.0187 inch thick, and Series 300 stainless-steel fasteners.
- I. Sprayed Polyurethane Foam Sealant: One- or two-component, foamed-in-place, polyurethane foam sealant, 1.5- to 2.0-lb/cu. ft density; flame-spread index of 25 or less according to ASTM E 162; with primer and noncorrosive substrate cleaner recommended by foam sealant manufacturer.
- J. Modified Bituminous Transition Strip: Vapor retarding, 40 mils thick, smooth surfaced, self-adhering; consisting of 36 mils of rubberize asphalt laminated to a 4-mil thick polyethylene film with release liner backing.
- K. Elastomeric Flashing Sheet: ASTM D 2000, minimum 50 to 65 mils thick, cured sheet neoprene with manufacturer-recommended contact adhesives and lap sealant with stainless-steel termination bars and fasteners.
- L. Preformed Silicone-Sealant Extrusion: Manufacturer's standard system consisting of cured low-modulus silicone extrusion, sized to fit opening widths, with single-component, neutral-curing, Class 100/50 (low-modulus) silicone sealant for bonding extrusions to substrates.
- M. Joint Sealant: ASTM C920, single-component, neutral-curing silicone; Class 100/50 (low modulus), grade NS, Use NT related to exposure, and as applicable to joint substrates indicated, Use O. Comply with Section 07900 - Joint Sealants.
- N. Termination Mastic: Air-barrier manufacturer's standard cold fluid-applied elastomeric liquid; trowel grade.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions under which air and vapor barrier assemblies will be applied, with Installer present, for compliance with requirements.
 1. Verify that surfaces and conditions are suitable prior to commencing work of this section. Do not proceed with installation until unsatisfactory conditions have been corrected.

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2. Do not proceed with installation until after minimum concrete curing period recommended by air and vapor barrier manufacturer.
 3. Ensure that the following conditions are met:
 - a. Surfaces are sound, dry, even, and free of oil, grease, dirt, excess mortar or other contaminants
 - b. Concrete surfaces are cured and dry, smooth without large voids, spalled areas or sharp protrusions.
 - c. Masonry joints are flush and completely filled with mortar, and all excess mortar sitting on masonry ties has been removed.
 - d. All joints between gypsum sheathing, roof board, masonry and concrete and other substrates wider than 1/4" shall be sealed as recommended by manufacturer.
 4. Verify substrate is surface dry. Test for capillary moisture by plastic sheet method according to ASTM D 4263 and take suitable measures until substrate passes moisture test. Surface dry is an acceptable substrate condition if acceptable to the manufacturer.
 5. Verify sealants used in sheathing are compatible with membrane proposed for use. Perform field peel-adhesion test on materials to which sealants are adhered.

3.2 SURFACE PREPARATION

- A. Clean, prepare, and treat substrate according to manufacturer's written instructions. Provide clean, dust-free and dry substrate for air and vapor barrier application.
- B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- C. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching membrane.
- D. Remove excess mortar from masonry ties, shelf angles, and other obstructions.
- E. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.
- F. Prime substrate for application of fluid-applied air and vapor barrier recommended by manufacturer.

3.3 INSTALLATION

- A. General: Install fluid-applied membrane air-barrier and accessory materials according to air-barrier manufacturer's written instructions to form a seal with adjacent construction and maintain a continuous air barrier.
 1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
 2. Install air-barrier assembly on roofing membrane or base flashing so that a minimum of 3 inches of coverage is achieved over each substrate.
- B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by fluid air-barrier material on same day. Reprime areas exposed for more than 24 hours.
 1. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.
 2. Prime masonry, concrete substrate with conditioning primer.
 3. Prime wood, metal and painted substrates with primer.
 4. Prepare, treat and seal vertical and horizontal surfaces at terminations and penetrations through air and vapor barrier and at protrusions.

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- C. Connect and seal exterior wall air-barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
 - D. At end of each working day, seal top edge of air barrier to substrate with flexible termination mastic.
 - E. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transitions and flashing so that a minimum of 3 inches of coverage is achieved over each substrate. Maintain 3 inches of full contact over firm bearing to perimeter frames with not less than 1 inch of full contact.
 - F. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air-barrier material with foam sealant.
 - G. Seal air-barrier assembly around masonry reinforcing or ties and penetrations with termination mastic.
 - H. Seal top of through-wall flashings to air barrier. Provide 6 inch minimum wide strip of manufacturer's recommended membrane counter-flashing to seal top of through-wall flashing to membrane or as recommended by manufacturer.
 - I. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counter-flashings or ending in reglets with termination mastic.
 - J. Repair punctures, voids, and deficient lapped seams. Slit and flatten fishmouths and blisters. Extend patches 6 inches beyond repaired areas.
 - K. Fluid-Applied Membrane Material: Apply a continuous unbroken air-barrier membrane to substrates according to the following thickness. Apply air-barrier membrane in full contact around protrusions such as masonry ties.
 - 1. Vapor-Permeable Membrane Air Barrier: Total dry film thickness as recommended in writing by manufacturer to meet performance requirements, but not less than 40-mil dry film thickness, applied in one or more equal coats.
 - L. Do not cover air barrier until it has been tested and inspected by Owner's testing agency.
 - M. Inspect installation prior to enclosing assembly and correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.4 FIELD QUALITY CONTROL

- A. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements.
- B. Air barriers will be considered defective if they do not pass tests and inspections.
 - 1. Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.
 - 2. Remove and replace deficient air-barrier components for retesting as specified above.
- C. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.
- D. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
 - 1. Protect air barrier from exposure to UV light and harmful weather exposure as required by manufacturer. If exposed to these conditions for more than the manufacturer's recommended exposure period, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed membrane according to air-barrier manufacturer's written instructions.

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- 2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.
 - E. Remove masking materials after installation.

END OF SECTION

SECTION 07410

METAL ROOF PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract for Construction, Supplementary Conditions (if any) and Division 1 - General Requirements apply to Work of this Section.

1.2 SECTION INCLUDES

- A. Factory-formed, double-lock, standing-seam, zinc-alloy, metal roof panels for warm roof assemblies limited to slopes $\geq 1:12$.

1.3 RELATED SECTIONS

- A. Section 05310 – Steel Decking.
- B. Section 05410 – Structural Metal Stud Framing.
- C. Section 07600 – Sheet Metal.
- D. Section 07900 – Joint Sealers.

1.4 REFERENCES

- A. ASTM B 32 – Standard Specification for Solder Metal.
- B. ASTM C 165 – Standard Test Method for Measuring Compressive Properties of Thermal Insulations.
- C. ASTM C 1248 – Standard Test Method for Staining of Porous Substrate by Joint Sealants.
- D. ASTM D 968 – Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive.
- E. ASTM D 1970 – Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
- F. ASTM E 96 – Standard Test Methods for Water Vapor Transmission of Materials.
- G. IBC – International Building Code.
- H. UL 1897 – Standard for Uplift Tests for Roof Covering Systems.

1.5 SYSTEM DESCRIPTION

- A. Provide complete Double Lock Standing Seam metal panel system as indicated, including:
 - 1. Factory-formed, zinc-alloy, metal panels.
 - 2. Attachment components.
 - 3. Weather-resistive barrier materials.

1.6 SUBMITTALS

- A. Comply with Section 01330 – Submittal Procedures.
- B. Product Data: Submit panel manufacturer's product data, including details of construction relative to materials, dimensions of individual components and profiles, finishes, and panel manufacturer's written and published installation instructions and installation guides.

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- C. Shop Drawings: Submit installer's shop drawings as verified by panel manufacturer, including roof plans, elevations, sections, and details, indicating installation layout of metal roof panels with keyed references to termination points.
 - D. Samples for Verification: Submit panel manufacturer's samples for each type of exposed component required, including:
 - 1. Metal Panel: Minimum 36 inches long by standard panel width, including finished seams. Include fasteners and clips & transverse cleat.
 - 2. Trim and Closures: 24" long sample of each type of trim and closure, including fasteners and components.
 - 3. Accessories: Cleats: 24" long sample of each type of accessory.
 - E. Qualification Data: Submit qualification data for manufacturer and installer to demonstrate capabilities and experience. Refer to AIA A305 Qualification Form as a guide for submittal.
 - F. Warranties: Submit warranties from:
 - 1. Manufacturer.
 - 2. Installer.

1.7 QUALITY ASSURANCE

- A. Panel Manufacturer's Qualifications: Manufactured a minimum of 250,000 square feet of metal roof panels of similar type to that specified.
- B. Installer's Qualifications:
 - 1. Engage an experienced installer who has completed metal roof panel installation similar in material, design, forming method, and extent to that indicated for this Project and with a record of successful in-service performance.
 - 2. Provide evidence of installer's personnel participation in panel manufacturer's training course.
- C. Metal Roof Panel Standard: Comply with manufacturer's written and published instructions.
- D. Mock-ups:
 - 1. Before installing metal roof panels, construct mock-ups. Verify selection made under sample submittals and demonstrate aesthetic effects and qualities of materials and execution as required by Architect.
 - 2. Build mock-ups to comply with the following requirements:
 - a. Construct mock-ups in location and of size (minimum 6'x4') as directed by Architect.
 - b. Receive approval of mock-ups by Architect in writing.
 - c. Approval of mock-ups does not constitute approval of deviations from the Contract Documents contained in mock-ups, unless such deviations are specifically approved by Architect in writing.
 - d. Approved mock-ups may become part of the completed Work, if undisturbed at time of Substantial Completion and approved by Architect in writing.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Delivery:
 - 1. Inspect delivered materials within 5 days from date of delivery. Report damaged materials to panel manufacturer within 5 days.
 - 2. Deliver materials to site in panel manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and panel manufacturer.
 - 3. Deliver materials so as not to be damaged or deformed.

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4. Package metal panels for protection during transportation and handling.
 5. Leave strippable protective UV-resistant film on metal panels, trims and accessories.
- B. Storage and Handling:
1. Store materials in clean areas in accordance with manufacturer's written and published instructions and installation guides.
 2. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

1.9 PROJECT CONDITIONS

- A. Weather Limitations: Install metal roof panels only when weather conditions permit installation in accordance with manufacturer's written and published instructions and installation guides.

1.10 WARRANTY

- A. Warranty Period:
1. Materials: 20 years from date of Substantial Completion. (Provided by the Panel Manufacturer)
 2. Installation: 2 years from date of Substantial Completion. (Provided by the Installer)

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Metal Panel System Manufacturer: Umicore Building Products USA, Inc., 3120 Highwoods Blvd., Suite 104, Raleigh, North Carolina 27604. Phone (919) 874-7173. Fax (919) 874-7140. Website www.vmzinc-us.com. E-mail info@vmzinc-us.com.
- B. Rheinzink, 96F Commerce Way, Woburn, MA 01801. Phone (781) 729-0812. Email info@rheinzink.com

2.2 METAL ROOF PANELS

- A. Metal: "VM ZINC Double Lock Standing Seam" factory-formed, zinc-alloy, metal roof panel (or equal).
1. Zinc Alloy: 99.995 percent electrolytic high-grade zinc with alloy additives of copper (0.08 percent to 0.20 percent), titanium (0.07 percent to 0.12 percent), and aluminum (0.015 percent).
 2. Thickness: 0.027 inch.
 3. Surface Aspect:
 - a. Preweathered Zinc: "QUARTZ ZINC". Dark gray zinc with luminance Y between 21 and 26 on exposed side or architect approved equal color management system.
 4. Dimensional Tolerances:
 - a. Coverage: Plus or minus 1/8 inch.
 - b. Flatness at Maximum Deflection: 1/4 inch on 36 inches.
 - c. Curvature: 1/4 inch on 10 feet.

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- B. Metal Roof Panels:
 - 1. Factory formed rectangular shaped standing seam, concealed fastener, wall panel system.
 - 2. Panels are overall, 16 7/8" x specified length. Panels are secured with concealed fastener and clip system.
 - 3. Standing seam height is 1 inch.
 - 4. Backside Coating:
 - a. Protective coating on backside of metal roof panels.
 - b. Material: Polymerized polyurethane.
 - c. Minimum Thickness: 60 microns.
 - d. Abrasion Resistance, ASTM D 968, Method A: 140 liters.

2.3 WEATHER-RESISTIVE BARRIER MATERIALS

- A. Available Products: Subject to compliance with requirements, weather-resistive barrier materials that may be incorporated into the Work include, but are not limited to, the materials specified.
- B. Hydrophobic Weather-Resistive Barrier:
 - 1. Fabric Underlayment:
 - a. Type: High-permeability, spun-bonded, non-woven, polypropylene fabric.
 - b. Weight: 6.103 oz/sq. yd.
 - c. Thickness: 0.023 inch.
 - d. Water Vapor Transmission, ASTM E 96, Method A: 212 perms.
 - 2. Acceptable Products:
 - a. VM Zinc Plus Underlay by Umicore Building Products.
 - b. Fabric underlayment approved by the panel manufacturer.
- C. Flashing Membrane: Self-adhering, high-temperature sheet:
 - 1. Slip-resisting, polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied.
 - 2. Minimum Thickness: 30 to 40 mils.
 - 3. Provide primer when recommended by flashing membrane manufacturer.
 - 4. Thermal Stability, ASTM D 1970, 240 degrees F: Stable.
 - 5. Low Temperature Flexibility, ASTM D 1970, Minus 20 degrees F: Passes.
 - 6. Available Products:
 - a. Carlisle Coatings & Waterproofing, Div. of Carlisle Companies Inc.; CCW WIP 403HR High Performance Underlayment.
 - b. Grace, W. R. & Co.; "Vycor Ultra HT".

2.4 THERMAL INSULATION

- A. High Compressive Strength Rock Wool Insulation - Minimum Compressive Strength, ASTM C 165. Over:
- B. Rigid Insulation:
 - 1. Minimum 25 PSI Extruded Polystyrene mechanically attached with plates and screws.
 - 2. Stager end joints of adjacent lengths of roof board.
 - 3. Butt edges and ends so that they form a smooth transition with no more than 1/16" of change in plane.

2.5 CLIPS AND FASTENERS FOR METAL ROOF PANELS

- A. 1" Fixed Clips:
 - 1. 300 series stainless steel.
 - 2. Pre-punched for attachment into substrate.
 - 3. Counter-sunk hole for fastener.
 - 4. Thickness: 0.015".
 - 5. Designed to withstand negative load requirements.
- B. VM ZINC® Insulation Pressure Plate with Integral Sliding Clips:
 - 1. 300 Series Stainless Steel Pressure Plate.
 - 2. Thickness: 0.024" fixed base with 0.015" thick sliding part.
 - 3. Clip is pre-punched with counter-sunk holes for attachment.
 - 4. Designed to withstand negative design load requirements.
- C. Clip and Plate Fasteners:
 - 1. Oval head, Self-Drilling screws.
 - 2. 300 series stainless steel.
 - 3. All fasteners to seat in pre-punched countersunk holes of VM ZINC® Clips in order to eliminate potential for contact and abrasion between fastener head and panel.
 - 4. Fastener head profile shall eliminate telegraphing through metal panel.
 - 5. Fasteners shall be selected to resist all negative design load requirements.
- D. Exposed Fasteners:
 - 1. Self-drilling.
 - 2. Material: 316 stainless steel fastener by SFS Stadler 80, 120, 160 & 190 mm with 4, 8 mm diameter.
 - 3. Heads: Oval Head.

2.6 ACCESSORIES

- A. Flashing and Trim:
 - 1. Shop or Field-fabricated from zinc-alloy sheets.
 - 2. Minimum Thickness: 0.031 inch.
 - 3. Seal against weather.
 - 4. Provide finished appearance.
 - 5. Provide pull-out resistance and flatness.
 - 6. Match surface aspect of adjacent metal roof panels.
 - 7. Flashing Backside Coating:
 - a. Coating Thickness: 60 microns.
 - b. Abrasion Resistance, ASTM D 968, Method D: 140 liters.
 - 8. Backer plates: Provide metal backing plates at panel edges, terminations, openings, splices, and where recommended by manufacturer, consisting of Zinc Plus material or stainless steel sheet goods formed in configuration and thickness recommended by manufacturer.
 - 9. Cleats: Continuous G90 galvanized cleats, formed in configuration, and thickness as recommended by the manufacturer, minimum 0.0239"
 - 10. Ventilation screen: 51% open perforated zinc, 0.039" thickness, by metal panel manufacturer where required.
- B. Exposed Fasteners:
 - 1. Self tapping screws, bolts, self locking rivets and other suitable fasteners designed to withstand design loads.
 - 2. Material: 300 series stainless steel.
 - 3. Heads: Factory applied coating to match color of metal.

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- C. Solder and Stripping for Accessories:
 - 1. Solder for Zinc-Alloy: ASTM B 32, 60 percent lead and 40 percent tin with low antimony, as recommended by panel manufacturer.
 - 2. Stripping:
 - a. “Stay-Clean” soldering flux for removal of zinc-alloy preweathering layer.
 - b. Abrasive disc for removal of backside coating.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances, supports, and other conditions affecting performance of work.
 - 1. Verify that substrate is plumb, sound, dry, smooth, clean, sloped for drainage, and completely anchored, and that provision has been made for piping, flashings, and penetrations through roof panel system.
 - 2. Examine primary and secondary roof framing to verify that purlins, angles, channels, and other structural support members, sheathing, roof deck and anchorages have been installed correctly.
 - 3. Prepare written report, endorsed by installer, listing conditions detrimental to performance of Work of this section. Submit copy of report to Architect.
- B. Examine roughing-in for components and systems penetrating roof to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install metal roof panel in accordance with manufacturer’s written and published instructions and installation guides.
- B. Install panels in orientation, sizes, and locations indicated on the drawings.
- C. Install metal roof panels plumb, level, square, true to line, and within installation tolerances.
- D. Self-Adhering Sheet Underlayment:
 - 1. Install underlayment per manufacturer’s recommendations.
 - 2. Lay in fashion to shed water, lapping joints, edges, per manufacturer’s recommendations.
 - 3. Apply primer to sheathing substrates, per manufacturer’s recommendations.
 - 4. Overlap sides and edges, and stagger per manufacturer’s recommendations.
 - 5. Roll laps and field of underlayment to provide a wrinkle free installation.
- E. Underlayment Installation:
 - 1. Install and fasten fabric underlayment per manufacturer’s recommendations.
 - 2. Lay in fashion to shed water, lapping joints, edges, minimum of 6”. Cover underlayment within 60 days with finished roof system.
- F. Panel Installation:
 - 1. Install the roof panels, starting at the lowest point, or bottom starter flashing.
 - 2. Attach the roof panels with concealed clips and manufactured supplied screws. Anchor panels and other components of the Work securely in place, with provisions for thermal and structural movement.

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3. Cut the roof panels with cutting shears to accommodate terminations, and placement around penetrations, and discontinuities. Do not field-cut metal panels by torch.
 4. Fasten roof panels in accordance with manufacturer's written and published instructions and installation guides.
 5. Flash and seal the metal panels with weather closure at termination, edges and at perimeter of openings.
 6. Install flashings and trim with provisions for thermal and structural movement as metal panel installation proceeds.
 7. Fasten flashings and trim with provisions for thermal and structural movement around openings and similar elements.
 8. Provide weatherproof escutcheons for piping or conduit penetrating exterior roofs. Do not allow piping or conduit to penetrate panel rib.
 9. Do not allow construction debris to contaminate metal roof panels.
- G. Fasteners: Use fasteners of type and size that will secure roof components in compliance with design load requirements.
- H. Provide concealed fasteners and expansion provisions, where possible, in exposed work and locate to minimize possibility of leakage.
- I. Metal Protection: Do not install roof panel system with non-compatible materials. Protect the metal roof panels from masonry and products containing lime by leaving the protective coating on the zinc until project and clean-up completion.

3.3 UL RATED ROOF ASSEMBLIES

- A. Install roof panels, complete with barrier board, underlayment, fasteners and accessories as required to achieve the UL rated assembly. Include performance requirements as required for wind-uplift.
- B. Wind-Uplift Rating: UL 1897. 90 mph.
- C. Wind-Uplift Resistance:
1. Provide metal roof panel system capable of resisting design pressures as specified and as indicated on the Drawings.
 2. Provide clips, fasteners, and clip spacing of type as specified and as indicated on the Drawings capable of sustaining design loads without failure.

3.4 TOLERANCES

- A. Installation Tolerances:
1. Maximum Alignment per Panel Variation: 1/8 inch.

3.5 CLEANING

- A. Clean exposed metal surfaces in accordance with manufacturer's written and published instructions and installation guides.
- B. Clean and neutralize flux materials. Remove excess solder.
- C. Clean finished surfaces on completion of installation, including removing unused fasteners, metal filings, rivet stems, and pieces of flashing.
- D. Maintain panels in clean condition during construction.
- E. Remove protective film within 60 days of installation, removing all film per elevation on the same day.

3.6 PROTECTION

- A. Protect installed metal roof panel system to ensure that, except for normal weathering, panel system will be without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 07600

SHEET METAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Coping flashings.
- B. Fascias.
- C. Sill and lintel flashings.
- D. Flashing receiver and cap flashing over base flashings.
- E. Counterflashings at vent stacks.
- F. Gutters and downspouts.
- G. Concrete splash blocks.

1.3 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete.
- B. Section 04200 - Unit Masonry: Thru-wall flashing, placement of flashing receivers and substrate construction.
- C. Section 06114 - Wood Blocking and Curbing: Wood nailers and substrate construction.
- D. Section 07410 - Pre-formed Roof Panels: Related flashings, gutters and downspouts.
- E. Section 07900 - Joint Sealers.
- F. Section 08410 - Aluminum Entrances and Storefronts: Sill flashings associated with doors and storefronts.
- G. Section 08520 - Aluminum Windows: Sill flashings associated with windows.
- H. Division 15 Section: Flashing sleeves and collars for mechanical items protruding through roofing membrane.
- I. Division 15 Section: Flashing sleeves and collars for plumbing items protruding through roofing membrane.
- J. Division 16 Section: Flashing sleeves and collars for electrical items protruding through roofing membrane.

1.4 REFERENCES

- A. AA DAF - 45 - Designation System for Aluminum Finishes.
- B. AAMA 603.8 - Performance Requirements and Test Procedures for Pigmented Organic Coatings on Extruded Aluminum.
- C. AAMA 605.2 - Specification for High Performance Organic Coatings on Architectural Extrusions and Panels.
- D. AAMA 611 - Standards for Anodized Architectural Aluminum.
- E. ASTM A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.

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- F. ASTM A653/A653M - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated by the Hot-Dip Process.
 - G. ASTM A755/A755M - Steel Sheet, Metallic coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
 - H. ASTM A792 - Steel Sheet, 55% Aluminum-Zinc Alloy Coated by the Hot-Dip Process.
 - I. ASTM B32 - Solder Metal.
 - J. ASTM B101 - Lead-Coated Copper Sheet and Strip for Building Construction.
 - K. ASTM B209/B209M - Aluminum and Aluminum-Alloy Sheet and Plate.
 - L. ASTM B370 - Copper Sheet and Strip for Building Construction.
 - M. ASTM B486 - Paste Solder.
 - N. ASTM B749 - Lead and Lead Alloy Strip, Sheet, and Plate Products.
 - O. ASTM C728 - Perlite Thermal Insulation Board.
 - P. ASTM D226 - Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
 - Q. ASTM D 1970 - Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
 - R. ASTM D2178 - Asphalt Glass Felt Used in Roofing and Waterproofing.
 - S. ASTM D4397 - Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.
 - T. ASTM D4586 - Asphalt Roof Cement, Asbestos Free.
 - U. CDA (Copper Development Association) - Copper in Architecture - Handbook.
 - V. CDA (Copper Development Association) - Contemporary Copper, A Handbook of Sheet Copper Fundamentals, Design, Details and Specifications.
 - W. FS TT-C-494 - Coating Compound, Bituminous, Solvent Type, Acid Resistant.
 - X. AISI (American Iron and Steel Institute) - Stainless Steel - Uses in Architecture.
 - Y. NRCA (National Roofing Contractors Association) - Roofing Manual.
 - Z. SMACNA - Architectural Sheet Metal Manual - Fifth Edition with Addendum no. 1.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Shop Drawings: Indicate material profiles, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
- C. Product Data: Submit data on manufactured components metal types, finishes, and characteristics.
- D. Samples
 - 1. Submit two samples, minimum 2 x 4 inches long illustrating typical standing seam, external corner, internal corner, valley, ridge, junction to vertical dissimilar surface, material and finish.
 - 2. Submit two samples minimum 2 x 4 inch in size illustrating metal finish color.

1.6 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA and NRCA standard details and requirements.
- B. Conform to SMACNA Manual for sizing components for rainfall intensity determined by a storm occurrence of 1 in 5 years.
- C. Maintain one copy of each document on site.

1.7 REGULATORY REQUIREMENTS

- A. Conform to applicable code as indicated on drawings for size and method of rain water discharge.

1.8 QUALIFICATIONS

- A. Fabricator and Installer: Company specializing in sheet metal flashing work with 7 years documented experience.

1.9 PRE-INSTALLATION CONFERENCE

- A. Convene one week prior to commencing work of this section, under provisions of Section 01300.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01600.
- B. Stack preformed and prefinished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials which may cause discoloration or staining.

1.11 COORDINATION

- A. Coordinate work under provisions of Section 01300.
- B. Coordinate with the work of Section 04200 for installing flashing, reglets and receivers.
- C. Coordinate with the work of Section 06114 for installing nailers and sheathing.
- D. Coordinate the work with downspout discharge pipe inlet.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Preformed Metal and Accessories
 - 1. Cheney Flashing Co.;
 - 2. Keystone Flashing Co.;
 - 3. Metal-Era Inc; Waukesha, WI.
- B. Prefinished Metal
 - 1. AEP/Span Metals Corp., Dallas, Texas
 - 2. Alumax Corp., Mesquite, Texas
 - 3. MBCI - Grand Prairie, Texas
 - 4. Peterson Aluminum – Elk Grove Village, IL.
- C. Substitutions: In accordance with Section 01600 - Product Requirements.

2.2 SHEET MATERIALS

- A. Galvanized Steel: ASTM A653/A653M, G90 (Z275) zinc coating; 24 gage thick steel, except as otherwise indicated in schedule at end of this section.
- B. Pre-Finished Galvanized Steel Sheet: ASTM A755/A755M using ASTM A653/A653M, G90 (Z275) zinc coated sheet; 24 gage core steel, pre-coated with PVDF (polyvinylidene fluoride) coating.

2.3 ACCESSORIES

- A. Fasteners: Same material as item being attached, with soft neoprene washers at exposed locations.
- B. Underlayment: ASTM D226, No. 15 or No. 30 asphalt saturated roofing felt.
- C. Slip Sheet: Rosin sized building paper.
- D. Protective Backing Paint: Bituminous type conforming to FS-TT-C-494.
- E. Sealant: Specified in Section 07900.
- F. Bedding Compound: Rubber-asphalt type.
- G. Plastic Cement: ASTM D4586, Type I.
- H. Reglets: Recessed type, galvanized steel; face and ends covered with plastic tape.
- I. Gutter and Downspout Anchorage Devices: SMACNA requirements of same material as gutter and downspout.
- J. Gutter Supports: Brackets and straps.
- K. Downspout Supports: Brackets of same material as gutter and downspout.
- L. Solder: ASTM B32; type suitable for application and material being soldered.
- M. Touch-up Paint: To match factory finish.

2.4 COMPONENTS

- A. Splash Blocks: Precast concrete type, of size and profiles indicated; minimum 3000 psi at 28 days, with minimum 5 percent air entrainment complying with requirements of Section 03300 - Cast-In-Place Concrete.
- B. Termination Bars: ASTM B211, 6061 Alloy T6, extruded aluminum, 1/8 inch thick x 1 inch wide, with slotted holes spaced at 6 inches o.c. Form with top flange projected out to receive sealant.
- C. Termination Bar Cover: Manufacturer's standard mill finish aluminum, color as selected by Architect.
- D. Tapered Edge Strip: ASTM C728; minimum 2 inch thick, tapered to match coping flashing profile, same width as parapet.

2.5 FABRICATION

- A. General
 - 1. Fabricate sheet metal items in accordance with SMACNA details indicated in paragraph Schedule at the end of this section unless otherwise indicated on the drawings.
 - 2. Form sections true to shape, accurate in size, square, and free from distortion or defects.
 - 3. Fabricate cleats of same material as item being attached minimum 2 inches wide; interlockable with sheet or flashing.
 - 4. Form pieces in longest possible lengths.
 - 5. Fabricate with required connection pieces.
 - 6. Hem exposed edges on underside 2 inches; miter and seam corners.

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7. Form material with flat lock seams.
 8. Fabricate cleats under pre-finished metal; solder for rigidity, seal with sealant.
 9. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
 10. Fabricate flashings to allow toe to extend 2 inches over roofing. Return and brake edges.
- B. Fabricate all sheet metal from pre-finished galvanized steel sheet.
- C. Fabricate all concealed sheet metal and sheet metal hidden from normal view from galvanized steel.
- D. Sealant Pans
1. ASTM A653, galvanized steel, formed with minimum 2 inch horizontal distance from penetrating item, with 3 inch upstand, and 4 inch flanges.
 2. Form top edge with continuous 45 degree backbend, minimum 1/4 inch long, facing toward inside of pan.
- E. Gutters
1. Fabricate gutter to profile indicated in schedule at end of this section.
 2. Provide expansion joint at maximum 40 feet on center unless otherwise indicate on drawings.
 3. Form metal and seal watertight.
 4. Size: 4 inch width x 4 1/2 inch front height.
 5. Accessories: Profile to suit gutters and downspouts.
- F. Downspouts
1. Fabricate downspouts to profile indicated in schedule at end of this section.
 2. Fabricate bottom of downspout with 45 degree turn-out with 3 inch long top face.
 3. Form metal and seal watertight.
 4. Downspout Size: 4 inch wide x 4 inch deep.
 5. Accessories: Profile to suit gutters and downspouts.
- G. Coping Flashings
1. Fabricate to profile indicated in schedule at end of this section.
 2. Fabricate with integral slope tapering 1 inch from front to back unless otherwise required by slope of tapered insulation filler or otherwise indicated on drawings.
 3. Provide minimum 4 inch vertical leg on front side with continuous cleat.
 4. Provide minimum 4 inch vertical leg on back side.
 5. Fabricate inside and outside corners with continuously factory mechanically seamed and sealed joints. Provide finish to match remainder of cap flashing.

2.6 FINISH

- A. Field painting of expose metal: As specified in section 09900 - Painting.
- B. Prefinished Metal: Fluoropolymer coating produced with Hylar 5000 or Kynar 500 resin complying with the following:
1. Salt Spray Test
 - a. Withstand salt spray test for a minimum of 1000 hours in accordance with ASTM B 117, including scribe requirement in test.
 - b. Receive a rating of 10, no blistering, as determined by ASTM D 714 immediately upon removal of panel from test, and rating of 7, 1/16-inch failure at scribe, as determined by ASTM D 1654.
 2. Formability Test: No evidence of fracturing to naked eye when subjected to a 180-degree bend over a 3/8-inch diameter mandrel in accordance with ASTM D 522.

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3. 2000 Hour Accelerated Weathering Requirements
 - a. Test Conformance: ASTM G 23 using a Type D apparatus.
 - b. No cracking, peeling, blistering, loss of adhesion of protective coating, or corrosion of base metal.
 - c. Loss of Adhesion: Protective coating that can be readily removed from base metal with tape in accordance with ASTM D 3359, Test Method B.
 - d. Chalking: Not greater than No. 8 rating in accordance with ASTM D 4214 test procedures.
 - e. Color Change: Maximum 2 NBS units in accordance with ASTM D 4214 and ASTM D 2244 test procedures.
 4. Humidity Test: No signs of blistering, cracking, creepage or corrosion when scored panel subjected to a humidity cabinet test in accordance with ASTM D 2247 for 1000 hours.
 5. Impact Resistance: Withstand direct and reverse impact in accordance with ASTM D 2794 equal to 1.5 times metal thickness in mils, expressed in inch-pounds, with no loss of adhesion.
 6. Abrasion Resistance Test: Withstand a minimum of 80 liters of sand before appearance of base metal when subjected to falling sand test in accordance with ASTM D 968.
 7. Pollution Resistance: No visual effects when immersion tested in a 10 percent hydrochloric acid solution for 24 hours in accordance with ASTM D 1308.
 8. Color
 - a. As selected by Architect from manufacturer's standard line.
 - C. Exposed Fasteners: Factory finished to match color of item being fastened.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.2 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.
- B. Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant.

3.3 INSTALLATION

- A. Conform to details on drawings and details included in the SMACNA manual.
- B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.
- C. Fill back of cap flashing with plastic roofing cement.
- D. Backbed lap joints of flashings in horizontal position.
- E. Insert cap flashing into flashing receiver to form tight fit. Bend top of flashing receiver down over cap flashing without hammer marks, dents or other visual distractions.
- F. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.

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- G. Termination Bars
 - 1. Install in longest practical lengths.
 - 2. Seal top of bar to supporting construction with sealant as specified in Section 07900 - Joint Sealers.
 - H. Coping Flashing
 - 1. Install with front edge engaged in continuous cleat.
 - 2. Fasten back edge to parapet substrate with hex head washered fasteners.
 - I. Apply plastic cement compound between metal flashings and felt flashings.
 - J. Fit flashings tight in place.
 - K. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
 - L. Seal metal joints watertight.
 - M. Secure gutters and downspouts in place using concealed fasteners.
 - N. Slope gutters 1/4 inch per foot minimum.
 - O. Connect downspouts to downspout boots system. Seal connection watertight.
 - P. Set concrete splash blocks under all downspouts.

3.4 FIELD QUALITY CONTROL

- A. Field inspection will be performed under provisions of Section 01410.
- B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

3.5 SCHEDULE

- A. Metal Fabrications – SMACNA References

ITEM		PLATE & FIGURE	GAGE
			Galv. Steel
1.	Gutter		
	a. Gutter Profile	1-2 Style A	24
	b. Expansion Joint	1-7	24
	c. Straps	1-18A	24
	d. Screens	1-24 D (wire diameter)	
	e. Outlet Tube	1-24 C	24
2.	Downspouts		
	Downspout	1-32 B, Smooth surface	24
	a. Discharge	1-32 H	24
	b. Connections	1-33 Detail 1	24
	c. Hangers	1-35A Similar	24
3.	Flashing Receiver		
	a. In Face Brick	4-3A	24
4.	Counter Flashing		
	a. In Face Brick	4-3A	24
5.	Stepped Flashing	4-7B	24
6.	Pipe Flashing	4-14A	24

7.	Vent Pipe Flashing	4-14B	2.5# lead
8.	Coping Flashing		
	a. Form	3-4A	24
	b. Anchorage	3-7A	24
	c. Joint	Table 3-1, Type J2	

END OF SECTION

SECTION 07900

JOINT SEALERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Preparing sealant substrate surfaces.
- B. Sealant and backing.

1.3 RELATED SECTIONS

- A. Section 07410 - Preformed Roof Panels: Sealants used in conjunction with paneling.
- B. Section 07600 - Flashing and Sheet Metal: Sealants used in conjunction with metal flashings.
- C. Section 08410 - Aluminum Entrances and Storefronts: Gaskets used in conjunction with framing and glazing methods.
- D. Section 08800 - Glazing: Sealants used in conjunction with glazing methods.
- E. Section 09250 - Gypsum Board Systems: Sealants used in conjunction with sound rated partitions.

1.4 REFERENCES

- A. AAMA 803.3 - Voluntary Specification for Narrow-Joint Seam Sealer.
- B. AAMA 808.3 - Voluntary Specification for Exterior Perimeter Sealing Compound
- C. ASTM C719 - Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement.
- D. ASTM C792 - Effects of Heat Aging on Weight Loss, Cracking, and Chalking of Elastomeric Sealants.
- E. ASTM C570 - Oil and Resin - Base Caulking Compound for Building Construction.
- F. ASTM C834 - Latex Sealing Compounds.
- G. ASTM C920 - Elastomeric Joint Sealants.
- H. ASTM C1311 - Solvent Release Sealants.
- I. ASTM C1193 - Use of Joint Sealants.
- J. ASTM D1056 - Flexible Cellular Materials - Sponge or Expanded Rubber.
- K. ASTM D1667 - Flexible Cellular Materials - Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam).

1.5 SUBMITTALS

- A. Product Data
 - 1. Submit product data indicating sealant chemical characteristics, performance criteria, limitations and color availability.
 - 2. Submit manufacturer's standard printed installation instructions.

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- B. Samples
 - 1. Submit four sample kits in form of manufacturer's standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.
 - C. Mockup
 - 1. Construct field sample panel illustrating sealant type, color, and tooled surface.
 - 2. Locate where directed.
 - 3. Accepted sample may not remain as part of the Work.
 - D. Certificates
 - 1. Submit manufacturer's certificate that products meet or exceed specified requirements and are suitable for use indicated.
 - 2. Joint sealant manufacturer's certification that sealants, primers, and cleaners required for sealant installation comply with local regulations controlling use of volatile organic compounds.

1.6 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum ten years documented experience.
- B. Applicator: Company specializing in applying the work of this Section with minimum five years documented experience.
- C. Conform to ASTM C1193 requirements for materials and installation.
 - 1. Obtain joint sealant materials from a single manufacturer for each different product required.
 - 2. Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- D. Preconstruction Field Testing: Prior to installation of joint sealants, field-test sealant adhesion to joint substrates as follows:
 - 1. Locate test joints where indicated or, if not indicated, as directed by Architect.
 - 2. Conduct field tests for each type of elastomeric and non-elastomeric sealant joint substrate indicated.
 - 3. Notify Architect one week in advance of the dates and times when mock-ups will be erected.
 - 4. Test Method: Test joint sealants by hand pull method described below:
 - a. Install joint sealants in 5-foot joint lengths using same materials and methods for joint preparation and joint sealant installation required for completed Work. Allow sealants to cure fully before testing.
 - b. Make knife cuts horizontally from one side of joint to other followed by 2 vertical cuts approximately 2 inches long at side of joint and meeting horizontal cut at top of 2-inch cuts. Place mark 1 inch from top of 2-inch piece.
 - c. Use fingers to grasp 2-inch piece of sealant just above 1-inch mark; pull firmly down at a 90-degree angle or more while holding a ruler along side of sealant. Pull sealant out of joint to distance recommended by sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for 10 seconds.
 - 5. Report whether or not sealant in joint connected to pulled-out portion, failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.

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- 6. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.
 - E. Field-Constructed Mock-Ups: Prior to installation of joint sealants, apply elastomeric sealants as follows to verify selections made under sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution:
 - 1. Joints in field-constructed mock-ups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants specified in this Section.
 - F. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.8 PROJECT CONDITIONS

- A. Environmental Requirements
 - 1. Do not install solvent curing sealants in enclosed building spaces.
 - 2. Do not install sealants when joint substrates are wet.
 - 3. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.9 SEQUENCING AND SCHEDULING

- A. Coordinate the work of this Section with all Sections referencing this Section.

1.10 WARRANTY

- A. Provide five year warranty.
- B. Warranty: Include coverage of installed sealants and accessories which fail to achieve air tight and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Elastomeric Sealants
 - 1. General: Manufacturer's standard chemically curing, urethane, polyurethane, or polysulfide polymer based elastomeric sealant complying with ASTM C 920.
 - 2. Types
 - a. S-1: Type M, Grade P, Class 25.
 - b. S-2: Type S, Grade P, Class 25.

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- c. S-3: Type M, Grade NS, Class 25.
 - d. S-4: Type S, Grade NS, Class 25.
 - 3. Color: As selected by Architect from manufacturer's full range of standard colors.
 - 4. Use Locations: As indicated in Schedule at end of this Section.
 - B. Latex Sealants
 - 1. General: Manufacturer's standard one-part, nonsag, mildew-resistant, paintable latex sealant of formulation indicated that is recommended for exposed applications on interior and protected exterior locations and that accommodates indicated percentage change in joint width existing at time of installation without failing either adhesively or cohesively.
 - 2. Types
 - a. S-5; Acrylic-Emulsion Sealant
 - 1) Composition: Manufacturer's standard product accommodating joint movement of not more than 5 percent in both extension and compression for a total of 10 percent.
 - 2) Conformance: ASTM C 834
 - b. S-6; Silicone Emulsion Sealant
 - 1) Composition: Manufacturer's standard product that accommodates joint movement of not more than 25 percent in both extension and compression for a total of 50 percent.
 - 2) Conformance: ASTM C 834 and, except for weight loss measured per ASTM C 792, ASTM C 920.
 - 3) Special Properties: Fungus and mildew resistant.
 - 3. Color: As selected by Architect from manufacturer's full range of standard colors.
 - 4. Use Locations: As indicated in Schedule at end of this Section.
 - C. Type S-7; Acrylic Sealant
 - 1. General: Manufacturer's standard one-part, nonsag, solvent-release-curing acrylic terpolymer sealant complying with AAMA 808.3, with capability to withstand 15 percent maximum cyclic movement (7-1/2 percent movement in both extension and compression) at time of application and remain adhered to joint substrates indicated for Project without failing cohesively when tested for adhesion and cohesion per ASTM C 719.
 - 2. Color: As selected by Architect from manufacturer's full range of standard colors.
 - 3. Use Locations: As indicated in Schedule at end of this Section.
 - D. Type S-8; Butyl Sealant
 - 1. General: Manufacturer's standard one-part, nonsag, nonstaining, paintable, solvent-release-curing, polymerized butyl sealant formulated with minimum of 75 percent solids and tack-free time of 24 hours or less, complying with ASTM C 1311.
 - 2. Color: As selected by Architect from manufacturer's full range of standard colors.
 - 3. Use Locations: As indicated in Schedule at end of this Section.
 - E. Type S-9; Pigmented Narrow Joint Sealant
 - 1. General: Manufacturer's standard, solvent-release-curing, pigmented synthetic rubber sealant formulated for sealing joints 3/16 inch or smaller in width, complying with AAMA 803.3
 - 2. Color: As selected by Architect from manufacturer's full range of standard colors.
 - 3. Use Locations: As indicated in Schedule at end of this Section.
 - F. Accessories
 - 1. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
 - 2. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

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3. Joint Backing: ANSI/ASTM D1056; round, closed cell polyethylene foam rod; oversized 30 to 50 percent larger than joint width.
 4. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.
 5. Masking Tape: Non-staining, non-absorbing type as recommended by sealant manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that joint openings are ready to receive work and field measurements are as shown on Drawings and recommended by the manufacturer.
- B. Beginning of installation means installer accepts existing conditions and substrate.

3.2 PREPARATION

- A. Clean and prime joints in accordance with manufacturer's instructions.
- B. Remove loose materials and foreign matter which might impair adhesion of sealant.
- C. Verify that joint backing and release tapes are compatible with sealant.
- D. Perform preparation in accordance with ASTM C1193.
- E. Install masking tape where required to protect adjacent finished surfaces.

3.3 INSTALLATION

- A. Perform installation in accordance with ASTM C1193 and manufacturer's written instructions.
- B. Measure joint dimensions and size materials to achieve required width/depth ratios.
- C. Install joint backing to achieve a neck dimension no greater than 1/2 the joint width.
- D. Install bond breaker where joint backing is not used.
- E. Remove and replace joint backing which has become wet, dirty, or exposed to weather for extended period of time.
- F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- G. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- H. Tool joints concave in accordance with ASTM C1193 and manufacturer's written instructions.

3.4 CLEANING AND REPAIRING

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.
- B. Repair or replace defaced or disfigured finishes caused by work of this Section.
- C. Cut out and remove damaged or deteriorated joint sealants and repair so that repaired areas are indistinguishable from original work.

3.5 PROTECTION OF FINISHED WORK

- A. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion.

3.6 SCHEDULE

- A. Exterior Joints
 1. Horizontal traffic joints not exposed to fuel or gas spillage: Sealant types S-1 or S-2.
 2. Horizontal traffic joints exposed to fuel or gas spillage: Sealant types S-1 or S-2.
 3. Horizontal non-traffic joints not exposed to fuel or gas spillage: Sealant types S-1, S-2, S-3 or S-4.
 4. Vertical or inclined joints such as panel, coping and control: Sealant types S-3 or S-4.
 5. Vertical or inclined joints such as perimeters of doors, windows, wall penetrations: Sealant types S-3 or S-4.
 6. Threshold Bedding: Sealant type: S-8.
 7. Joints in Masonry Flashing: Sealant Type S-9.
 8. Joints in Sheet Metal Flashing: Sealant Type S-9.
- B. Interior Joints
 1. Horizontal traffic joints not exposed to fuel or gas spillage: Sealant types S-1, or S-2.
 2. Horizontal non-traffic joints not exposed to fuel or gas spillage: Sealant types S-1, S-2, S-3, or S-4.
 3. Vertical or inclined joints such as panel, coping and control: Sealant types S-3, S-4.
 4. Vertical or inclined joints such as perimeters of doors, windows, wall penetrations: Sealant types S-3, S-4 or S-6.
 5. Non-structural hollow metal doors and borrowed lites. Sealant types S-3, S-4 S-5, S-6 or S-7.
 6. Non-structural perimeter seals around plumbing fixtures, joints between ceramic tile and joints between ceramic tile and dissimilar materials: Sealant type S-6.
 7. Non-structural perimeter seals at joints between countertops, backsplashes and walls: Sealant type S-7.

END OF SECTION

SECTION 08110

STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Standard non-rated and fire rated steel doors and frames.
- B. Custom steel astragals on double doors.

1.3 RELATED SECTIONS

- A. Section 04200 – Concrete Unit Masonry: Masonry mortar fill of metal frames.
- B. Section 08800 - Glazing.
- C. Section 09250 - Gypsum Board Systems: Prepared openings.
- D. Section 09900 - Painting: Field painting of doors and frames; bituminous coating of frames in contact with cementitious materials.

1.4 REFERENCES

- A. Architectural and Transportation Barriers Compliance Board - 36 CFR Part 1191, Accessibility Guidelines for Buildings and Facilities.
- B. ANSI A250.3 - Test Procedure and Acceptance Criteria for Factory Applied Finish Painted Steel Surfaces for Steel Doors and Frames.
- C. ANSI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frame Anchors and Hardware Reinforcings.
- D. ANSI- A250.7 - Hardware on Standard Steel Doors (Reinforcement--Application).
- E. ANSI A250.8/SDI-100 - Recommended Specifications for Standard Steel Doors & Frames.
- F. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
- G. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
- H. ASTM A366 - Steel Sheet, Carbon, Cold-Rolled, Commercial Quality.
- I. ASTM A568 – Carbon and High-Strength Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements.
- J. ASTM A569 – Steel, Carbon (0.15 Maximum Percent), Hot-Rolled Sheet and Strip Commercial Quality.
- K. ASTM A591 – Steel, Sheet, Electrolytic, Zinc-Coated, for Light Coating Mass Applications.
- L. ASTM A620 – Steel Sheet, Carbon, Cold-Rolled, Drawing Quality, Special Killed.
- M. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- N. ASTM A366 - Steel Sheet, Carbon, Cold-Rolled, Commercial Quality.
- O. ASTM A924 – Steel Sheet, Metallic-Coated by the Hot-Dip Process.

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- P. SDI-112 – Zinc-Coated (Galvanized/Galvannealed) Standard Steel Doors and Frames.
 - Q. SDI-113 – Standard Practice for Determining the Steady State Thermal Transmittance of Steel Door and Frame Assemblies.
 - R. SDI-117 – Manufacturing Tolerances Standard Steel Doors and Frames.
 - S. NFPA 80 - Fire Doors and Windows.
 - T. NFPA 252 - Fire Tests of Door Assemblies.

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements
 - 1. Conform to requirements of 36 CFR Part 1191.
 - 2. Conform to NFPA 80 and NFPA 252 for fire rated class indicated
- B. Manufacturer
 - 1. Company specializing in manufacturing the Products specified with minimum three years documented experience.

1.6 SUBMITTALS

- A. Shop Drawings and Product Data
 - 1. Indicate each type door and frame elevation, reinforcements, hardware locations, metal types and gauges, fire rating and finish. Use same numbering system as indicated on drawings.
 - 2. Indicate frame configuration, anchor spacings and anchor types.
 - 3. Indicate door core construction and door head and door sill closure method.
 - 4. Indicate cut outs for glazing, glazing stop and glazing frame profiles and methods of attachment.
 - 5. Manufacturer's standard printed installation instructions.
- B. Certificates
 - 1. Manufacturer's Certificate certifying that Products and fabrications meet or exceed specified requirements.

1.7 DELIVERY, STORAGE, AND PROTECTION

- A. Provide frames with manufacturer's standard sill spreader bar for all welded units.
- B. Protect doors and frames with manufacturer's standard resilient packaging.
- C. Break seal on-site to permit ventilation.

1.8 WARRANTY

- A. Provide manufacturer's five year warranty.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Interior Doors, Frames
 - 1. Stretcher level steel conforming to ASTM A366, A620 and ASTM A568.
- B. Exterior Doors, Frames
 - 1. Stretcher level steel conforming to ASTM A366 or A620 and ASTM A568.

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- C. Protective Coatings
 - 1. Bituminous Coating: Specified in Section 09900 - Painting.
 - 2. Primer: Manufacturer's standard oven dried, gray alkyd enamel primer, complying with requirements of ANSI A250.10.
 - D. Accessories
 - 1. Jamb Anchors
 - a. Masonry Construction: 'T'-strap type, corrugated and galvanized.
 - b. Steel Stud Construction: Z type, same gage and material as frame.
 - c. Wood Stud Construction: Pre-drilled U type, same gage and material as frame.
 - 2. Silencers: As specified in Section 087100 - Hardware.
 - 3. Glazing Stops: Rolled steel, square profile, mitered corners; prepared for countersunk style flat head sheet metal screws.
 - 4. Door Glazing Frames: Rolled steel, beveled profile as indicated on drawings, mitered corners; prepared for countersunk style thru-bolts at fire rated doors and flat head sheet metal screws at non-fire rated doors.
 - 5. Astragals: 18 gage stainless steel conforming to ASTM A167.

2.2 FABRICATION

- A. General
 - 1. Fabricate doors and frames to sizes and profiles indicated and in conformance with, except as otherwise specified, ANSI A250.4, ANSI A250.8, ANSI A250.10, SDI-112, SDI-113, for non-rated assemblies and NFPA 80 and NFPA 252 for rated assemblies.
 - 2. Fabricate doors and frames with hardware reinforcements in accordance with Table 4 of ANSI A250.8. Weld all hardware reinforcement plates in place.
 - 3. Provide mortar guard boxes for frames set in masonry.
 - 4. Attach fire rated label to each frame and door unit.
 - 5. Provide face welded frames with temporary steel spreader bars.
 - 6. Grind all welds smooth, fill all voids with body putty and seam filler and sand smooth. Welds and joints shall not be visible.
- B. Doors
 - 1. Exterior doors: Level 3 , Model 2.
 - 2. Interior doors: Level 2, Model 2.
 - 3. Close top edge of doors with flush steel channel closure. Seal joints watertight.
 - 4. Close bottom edge of doors with inverted steel channel closure.
 - 5. Door Edges: Beveled.
 - 6. Core Construction, Exterior Doors
 - a. Vertical steel stiffeners formed from not less than 20 gage steel, spaced not more than 6 inches apart, and securely attached to face sheets by spot welds, not more than 6 inches on center.
 - b. Fill spaces between stiffeners full height of door with a minimum 0.6 pound density mineral fiber insulation.
 - c. Thermal Value: Total insulation R-Value of 2.4, measured in accordance with ASTM C236.
 - 7. Core Construction, Interior Doors
 - a. Vertical steel stiffeners formed from not less than 20 gage steel, spaced not more than 6 inches apart, and securely attached to face sheets by spot welds, not more than 6 inches on center.
 - 8. Core Construction, Fire Rated Interior Doors
 - a. Conform to requirements of NFPA 252.

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- C. Frames
 - 1. Exterior Frames: Level 3, 14 gage.
 - 2. Interior Frames: Level 2 16 gage.
 - 3. Fabricate and assemble as complete welded unit.
 - 4. Weld Z anchors to frame.
 - 5. Reinforce frames wider than 48 inches with roll formed steel channels fitted tightly into frame head, flush with top.
 - 6. Prepare interior frame for silencers except where scheduled to receive sound seals or weatherstripping. Provide for three single silencers on strike side of single doors and two single silencers on frame head at double doors without mullions.
 - 7. Provide minimum 14 gage steel floor angle clips welded to each jamb.
 - D. Astragals
 - 1. Fabricate to shape as detailed.

2.3 FINISH

- A. Finish: As Specified in SECTION - 09900.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General
 - 1. Install frames in accordance with ANSI A250.11 and manufacturer's written instructions.
 - 2. Coordinate with masonry and gypsum wallboard wall construction for anchor placement.
 - 3. Coat inside of frame profile with bituminous coating to a thickness of 1/16 inch where in direct contact with masonry.
 - 4. In masonry openings, provide an adjustable T-strap anchor at each hinge location and at same location in strike jamb.
 - 5. Coordinate installation of glass and glazing.
 - 6. Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.
 - 7. Touch-up damaged shop finishes.

3.2 TOLERANCES

- A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.3 ADJUSTING AND CLEANING

- A. Remove temporary spreader bars and welds. Grind and repair frame as required to provide a smooth paint finish.
- B. Adjust for smooth and balanced door movement.

END OF SECTION

SECTION 08211

WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Flush wood doors; flush and flush glazed configuration; fire rated and non-rated.

1.3 RELATED SECTIONS

- A. Section 08800 - Glazing.

1.4 REFERENCES

- A. ANSI A135.4 - Basic Hardboard.
- B. ASTM E152 - Methods of Fire Tests of Door Assemblies.
- C. AWI - Quality Standards of the Architectural Woodwork Institute.
- D. HPMA HP - Hardwood and Decorative Plywood.
- E. NEMA (National Electric Manufacturers Association) LD3 - High Pressure Decorative Laminates.
- F. NFPA 80 - Fire Doors and Windows.
- G. NFPA 252 - Standard Method of Fire Tests for Door Assemblies.
- H. UL 10B - Fire Tests of Door Assemblies.

1.5 SUBMITTALS FOR REVIEW

- A. Section 01300 - Submittals: Procedures for submittals.
- B. Product Data: Indicate door core materials and construction; type and characteristics.
- C. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, factory machining criteria, factory finishing criteria, and identify cutouts for glazing.
- D. Manufacturer's Installation Instructions: Indicate special installation instructions.

1.6 QUALITY ASSURANCE

- A. Perform work in accordance with AWI Quality Standard Section 1300, Premium Grade.
- B. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.7 REGULATORY REQUIREMENTS

- A. Fire Door Construction: Conform to ASTM E152, NFPA 252 and UL 10B.

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- B. Installed Fire Rated Door Assembly: Conform to NFPA 80 for fire rated class as scheduled.

1.8 DELIVERY, STORAGE, AND PROTECTION

- A. Section 01600 - Material and Equipment: Transport, handle, store, and protect products.
- B. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.9 PROJECT CONDITIONS

- A. Section 01300 - Coordination and Meetings.
- B. Coordinate the work with door opening construction, door frame and door hardware installation.

1.10 WARRANTY

- A. Section 01700 - Contract Closeout.
- B. Provide warranty to the following term:
 - 1. Life of Installation: Interior doors.
- C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Algoma Hardwoods, Inc.
- B. Eggers Industries, Inc.
- C. VT Industries, Inc.
- D. Weyerhaeuser
- E. Buell Door Company
- F. Section 01600 - Substitutions: Under provisions of Section 01600.

2.2 DOOR TYPES

- A. Flush Interior Doors: 1-3/4 inches thick; solid core construction, fire rated where scheduled on drawings.

2.3 DOOR CONSTRUCTION

- A. Core (Solid, Non-Rated): AWI Section 1300, Type PC - Particleboard.
- B. Core (Solid, Fire Rated): AWI Section 1300, Type FD as scheduled on the drawings.

2.4 FLUSH DOOR FACING

- A. 5-ply plain sliced birch veneer solid core door. Finish as selected by Architect.

2.5 ADHESIVE

- A. Facing Adhesive: Type II - water resistant.

2.6 ACCESSORIES

- A. Glazing Stops: Rolled steel profile as detailed on the drawings, mitered corners; prepared for countersink style tamper proof screws.

2.7 FABRICATION

- A. Fabricate non-rated doors in accordance with AWI Quality Standards requirements.
- B. Fabricate fire rated doors in accordance with AWI Quality Standards and to UL requirements. Attach fire rating label to door.
- C. Astragals for Fire Rated and Non-Rated Double Doors: Steel, Z shaped, overlapping, specifically for double doors; coordinate with scheduled door hardware for doors with coordinators, flush bolts and surface bolts.
- D. Exposed Edges of Door: Clear transparent finish.
- E. Factory machine doors for finish hardware in accordance with hardware requirements and dimensions. Do not machine for surface hardware. Provide solid blocking for through bolted hardware.
- F. Factory fit doors for frame opening dimensions identified on shop drawings.
- G. Provide edge clearances in accordance with AWI 1600.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01039 - Coordination and Meetings: Verification of existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.2 INSTALLATION

- A. Install fire rated and non-rated doors in accordance with AWI Quality Standard, NFPA 80 and to Warnock Hersey requirements.
- B. Trim door height by cutting bottom edges to a maximum of 3/4 inch. Trim fire door height at bottom edge only, in accordance with fire rating requirements.
- C. Machine cut for hardware.
- D. Coordinate installation of doors with installation of frames specified in Section 08110 and hardware specified in Section 08700.
- E. Coordinate installation of glass and glazing.

3.3 INSTALLATION TOLERANCES

- A. Conform to AWI Section 1300 requirements for maximum diagonal distortion.

3.4 ADJUSTING

- A. Section 01700 - Contract Closeout: Adjusting installed work.
- B. Adjust door for smooth and balanced door movement.

END OF SECTION

SECTION 08352

FOUR-FOLD DOOR SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Four-Fold metal doors with surface mounted tube frames.
- B. Operation of Four-Fold metal doors includes overhead mounted electro-mechanical operators.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each type of product specified consisting of manufacturer's technical Product Data and installation instructions for each type of door required, including data substantiating that products comply with requirements.
- C. Submittal Drawings showing fabrication and installation of Four-Fold metal doors including plans, elevations, sections, details of components, hardware, operating mechanism, and attachments to the other units of Work. Include wiring diagrams for coordination with electrical trade.
- D. Reference list including (5) successful installations of this type of door within the past two (2) years.

1.4 QUALITY ASSURANCE

- A. Doors shall be designed to withstand external or internal horizontal wind loads of 20 pounds minimum per square foot. The maximum allowable deflection shall not exceed 1/120 of the span. Fiber stresses in main members shall be limited to 27,000 pounds per square inch. Steel frames shall be designed in accordance with the AISC "Steel Construction Manual".
- B. Door manufacturer shall have at least 10 years experience in manufacturing door type specified for emergency vehicle applications.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store delivered materials and equipment in dry locations with adequate ventilation, free from dust and water, and so as to permit access for inspection and handling.
- B. Handle materials carefully to prevent damage.

1.6 WARRANTY

- A. The door manufacturer shall provide a written guarantee against defects in material and workmanship for a period of three (3) years from the date of acceptance.
- B. Manufacturer will provide a five (5) year warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Four-Fold industrial metal doors manufactured by Door Engineering and Manufacturing, 400 Cherry Street, Kasota, MN 56050, (800)-959-1352 or equal products by other manufacturers approved in advance.
 - 1. FF300 Series: Glazed.

2.2 MATERIALS

- A. Steel Tube: ASTM A513 and ASTM A500/A500M.
- B. Steel Sheets: Steel sheets of commercial quality, complying with ASTM A1011/A1011M hot-rolled steel sheet.
- C. Hardware: Manufacturer's standard components.
- D. Fasteners: Zinc-coated steel.

2.3 FOUR-FOLD DOORS

- A. Construction: Door framing shall be minimum 14-gauge structural steel tube with 14-gauge steel sheet on the exterior and interior faces. Sheeting shall be formed on the vertical edges with no visible welds on the interior or exterior panel faces. All frames and framing members shall be true to dimension and square in all directions, and no door shall be bowed, warped, or out of line, in the vertical or horizontal plane of the door opening by more than 1/8 inch in 20 feet. Exposed welds and welds which interfere with the installation of various parts shall be ground smooth and flush.
- B. Surface Mounted Tube Frame: Supply pre-hung tube frame system constructed of minimum TS6x4x0.25, designed to anchor to masonry wall construction or weld to steel structure. All hinges, track supports and operator supports shall be factory attached.
- C. Factory finish:
 - 1. Option 2: All exposed steel shall be finished with manufacturer's standard epoxy primer and polyurethane top coat. Customer to select from Manufacturer's standard color chart.
- D. Operating Hardware: Hardware shall include guide tracks and brackets, trolleys, center guides, not less than three pairs of jamb and fold hinges per opening, and all bolts, nuts, fasteners, etc. necessary for complete installation and operation. Jamb hinges shall be dual shear and have two thrust bearings and two needle bearings. Jamb hinges shall be gusseted. Fold hinges shall be dual shear with two thrust bearings. All bearings shall be completely concealed within the hinge barrel and include grease zerks. All hinge pins shall be minimum 3/4" diameter hardened steel.
- E. Weatherstripping: Material shall be adjustable and readily replaceable and provide a substantially weather-tight installation. Weatherstripping at center shall be 1/16" cloth inserted neoprene and include no exposed fasteners on the exterior face of the panel.

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- Weatherstripping at sill shall include two 1/16" cloth inserted neoprene sweeps with an aluminum retainer. The retainer shall be attached to the door with adhesive.
- F. Perimeter Weatherstripping: Provide jamb and head weatherstripping of 1/16" cloth-inserted neoprene bulb (or closed cell neoprene).
 - G. Vision Panels or Grilles: Provide 1" insulated vision panels or grilles of the size, shape and location as noted on the drawings.

2.4 OPERATOR

- A. Each Four-Fold door shall be operated by an overhead mounted electro-mechanical drive unit designed for high cycle operation. Operator consists of an electric motor, gear reducer, and rotating drive arm. The door shall be operated with connecting rods attached to the rotating drive arm on the operator and to control arms attached to the jamb door section and to the door lintel. The connecting rods shall be positive drive, keeping the door under firm control at all times. The connecting rods shall be fitted with spherical bearings and control arms shall be equipped with oil impregnated bronze bearings on polished shafts.
- B. Operator shall be instantly reversible, open and close rapidly and start and stop gradually. Operator shall be adjustable to allow door to fully clear the opening. Operator shall automatically lock the door in the closed position. Operator shall be equipped with disengaging mechanism to convert to free wheeling mode for manual operation.
- C. Operator shall include a formed hood enclosing the motor, gearboxes and limit switches.
- D. Electric motor shall be of sufficient size to operate doors under normal operating conditions at no more than 75 percent of rated capacity. The motor shall be 208V 3-Phase.
- E. Electric Controls: Controls shall be furnished by the door manufacturer and shall be complete for each door, and built in accordance with the latest NEMA standards. Incoming electrical shall be 120/208V 3-phase.
 - 1. Controls shall include a programmable logic controller with digital message display or LED indicators. Controller shall include programmable close timers and programmable inputs/outputs.
 - 2. Motor starters shall be magnetic reversing, factory wired with overload and under voltage protection, and equipped with mechanical interlocks. All control components shall be enclosed in one enclosure with a wiring diagram placed on the inside of the cover.
 - 3. If incoming voltage is single phase, control panel shall include a variable frequency drive to convert voltage to 3-phase for the motor
 - 4. Enclosures shall be NEMA 4 with disconnect switch.
 - 5. Pushbuttons (interior) for each door shall have one (1) momentary pressure three-button push-button station marked "OPEN", "CLOSE" and "STOP". Push button enclosure shall be NEMA 4.
 - 6. Limit switches shall be provided to stop the travel of the door in its fully open or fully closed position.
 - 7. Safety edges: Provide electric safety edges on leading edge of all doors to reverse door upon contact with obstruction. Provide wireless safety edge transmitters with low battery alarm.
 - 8. Photo eyes: Provide (1) exterior, jamb mounted, thru-beam type photo eyes, NEMA 4 rated.
 - 9. Presence Sensor: Provide (1) interior, overhead mounted, presence sensor.
 - 10. Radio controls: Provide one (1) radio receiver and (1) single button remotes per door. Remotes to open and close doors with single button.

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11. Safety Loop Detectors: Provide “safety” loop detector to reverse or hold the door open when activated. G.C. to coordinate installation of preformed loop with installer prior concrete being poured.
 12. Timer Activation Loop Detectors: Provide “pulse on exit type” loop detector to activate auto close timer once loop has been activated and cleared, include hand/auto switch to deactivate timer. G.C. to coordinate installation of preformed loop with installer prior to exterior apron being poured.
 13. Wiring: Door manufacturer shall supply controls and components only. Electrical contractor shall install controls and furnish and install conduits and wiring for jobsite power and control wiring.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install Four-Fold metal doors in strict accordance with the approved drawings by qualified door erection crews. All door openings shall be completely prepared by the general contractor prior to the installation of the doors. Permanent or temporary electric wiring shall be brought to the door opening before installation is started and shall be completed so as not to delay the inspection test.
- B. Doors shall be set plumb, level, and square, and with all parts properly fastened and mounted. All moving parts shall be tested and adjusted and left in good operating condition.

3.2 ADJUSTING AND CLEANING

- A. Inspection of the doors and a complete operating test will be made by the installer in the presence of the general contractor or architect as soon as the erection is complete. Any defects noted shall be corrected. After door approval in the above test, the general contractor must assume the responsibility for any damage or rough handling of the doors during construction until the building is turned over to the owner and final inspection is made.
- B. Clean surfaces and repaint abraded or damaged finished surfaces to match factory-applied finish.

END OF SECTION

SECTION 08364

STEEL SECTIONAL OVERHEAD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES:

- A. Steel sectional overhead doors.
- B. Overhead door operators and remote controllers.

1.3 RELATED SECTIONS:

- A. Section 03300 – Cast-In-Place Concrete: Installation of anchors in concrete.
- B. Section 04200 – Concrete Unit Masonry: Installation of anchors in masonry.
- C. Section 09900 – Painting: Field Painting.
- D. Division 16 - Electric service characteristics for motor operators.

1.4 REFERENCES

- A. ASTM A 446/A 446M-- Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.
- B. ASTM A 525- Standard Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
- C. ASTM A 526/A 526M-- Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.
- D. ASTM E 330- Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- E. NAGDM 102- Specifications for Sectional Overhead Type Doors; National Association of Garage Door Manufacturers.
- F. NEMA ICS 6- Enclosures for Industrial Control and Systems; National Electrical Manufacturers Association.
- G. NEMA MG 1- Motors and Generators; National Electrical Manufacturers Association.
- H. UL 325 -- Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Underwriters Laboratories Inc.

1.5 SYSTEM DESCRIPTION

- A. Design Requirements:
 - 1. Wind loading: Comply with NAGDM 102 wind loading criteria unless otherwise indicated.
 - a. Design and construct sectional overhead doors to withstand indicated wind loads as tested in accordance with ASTM E 330.

1.6 SUBMITTALS

- A. Product Data: Manufacturer's technical information and installation directions demonstrate that products comply with contract documents.
- B. Shop Drawings: Submit drawings only for components which are not described completely in manufacturer's technical information.
- C. Samples, for color selection:
 - 1. Manufacturer's full range of metal finish colors on 4- by 6-inch base metal sample. Primer only may be acceptable, verify at time of submittal.
- D. Quality Control Submittals:
 - 1. Certificates: For information only, manufacturer's written certification, indicating doors comply with specified design criteria for the following:
 - a. General requirements of NAGDM 102.
 - b. Wind loading.
 - c. Thermal performance.
 - 2. Manufacturer's directions: Submit directions for installation and operation of door units; distribute a copy to installer before start of work.
 - 3. Installer qualification: For information only, submit installer's written statement of compliance with installation experience requirement.
- E. Contract Closeout Submittals:
 - 1. Operation and maintenance data: Door operation instructions and maintenance data for each door type.
- F. Warranty: For information only, submit specimen copy of manufacturer's written warranty.

1.7 QUALITY ASSURANCE

- A. Furnish sectional overhead door units by one manufacturer for entire project.
- B. Qualifications:
 - 1. Installer qualifications: Door manufacturer's authorized installer.
- C. Regulatory Requirements:
 - 1. Doors with Motor Operators: Provide automatic reversing operators and sensing hardware in accordance with requirements of UL 325.
- D. Certifications:
 - 1. Submit door manufacturer's written certification that sectional overhead doors comply with wind resistance design criteria.
 - 2. Submit door manufacturer's written certification that sectional overhead doors comply with thermal performance design criteria.
 - 3. Submit door manufacturer's written certification that sectional overhead doors comply with NAGDM 102.

1.8 SEQUENCING AND SCHEDULING

- A. Schedule the building in of masonry anchors for support of overhead sectional doors with masonry work.

1.9 WARRANTY

- A. Manufacturer's Product Warranty: Submit manufacturer's standard 10-year limited product warranty signed by the manufacturer's authorized official, guaranteeing to correct failures in

product which may occur during the warranty period, without reducing or otherwise limiting any other rights to correction which the owner may have under the contract documents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Steel Sectional Overhead Doors

1. Products of the following manufacturers, provided they comply with requirements of the contract documents, will be among those considered acceptable:
 - a. Overhead Door Corporation.
 - b. Raynor Garage Door Company.
 - c. Wayne-Dalton Corp.

2.2 MATERIALS

A. Galvanized Steel:

1. Structural quality carbon steel, ASTM A 446, Class A, or commercial quality steel sheets, ASTM A 526; minimum yield point, 33,000 pounds per square inch; gage as specified or as required for wind load specified.
2. Galvanized coating: ASTM A 525; minimum G90 zinc coating.

B. Paint:

1. Metal primer: Manufacturer's standard epoxy primer.

2.3 MANUFACTURED UNITS

A. Steel Sectional Overhead Door:

1. Wind resistance:
 - a. Load acting inward: 24 pounds per square foot of door surface area.
 - b. Load acting outward: 20 pounds per square foot of door surface area.
2. Insulation: Polyurethane foam.
 - a. Thermal resistance, R-value: 12
3. Interior surface: Painted galvanized steel.
4. Door section material: 20 gage galvanized steel.
5. Galvanized coating: G90, minimum.
6. Door section design: Ribbed profile.
7. Door finish: Manufacturer's standard baked-on epoxy primer for field painting.
8. Counterbalancing mechanism: Torsion spring type.
9. Rollers: Case-hardened steel double rollers.
10. Vision Panels:
 - a. Provide manufacturer's standard insulated, tinted vision panels of materials indicated, located where shown on the drawings.
 - b. Glazing stops: Removable; made from door section frame material.
11. Weather Seals: Continuous rubber, neoprene, or flexible vinyl adjustable weatherstrip gasket at head and jambs of overhead door, for weathertight installation.
12. Infra-red motion stop sensor on each side of each door.
13. Roll-up drum - heavy duty, high performance.

2.4 COMPONENTS

- A. Tracks:
 - 1. Manufacturer's standard galvanized steel tracks and accessories designed to accommodate door size, weight, and clearances indicated from adjacent construction.
 - 2. Accessories: Provide brackets and reinforcing for rigid support of roller guides, for door type and size.
 - 3. Fabricate vertical track sections with slots for door drop safety device at 2 inches on center.
 - 4. Tilt tracks from vertical to achieve closure at jambs when sectional door is closed. Weld or bolt to track supports.
- B. Track Support:
 - 1. Support tracks with manufacturer's standard anchors and brackets for size and weight of door, to provide strength and rigidity, and smooth and continuous operation.
 - 2. Wall support: Provide continuous angle anchored to wall and welded to track in accordance with manufacturer's instructions.
 - 3. Overhead support: Provide continuous angle welded to inclined tracks and braced laterally to overhead structural members at each end of tracks.
- C. Counterbalancing Mechanisms:
 - 1. Torsion spring:
 - a. Tempered steel torsion springs mounted on and secured to a hardened tubular steel shaft, with cable drums attached at each end of shaft.
 - b. Cable drums: Grooved cast aluminum or gray iron castings, wrapped with cable attached to door, heavy duty, high performance.
 - c. Counterbalance supports: One ball-bearing bracket at each end of shaft and at midpoint, for shafts up to 16 feet long. Provide two additional brackets at third points to support shafts over 16 feet long.
 - d. Emergency door stop: Spring-loaded steel or bronze cam secured to bottom door rollers at each track.
 - e. Cushion door stop: Spring bumper attached at end of each horizontal track.
- D. Operators
 - 1. Electric Operator
 - a. Type: Worm and gear reduction primary drive, totally enclosed non-ventilated, clutch disconnect, reversible, constant duty, Class A insulated motor protected against overload, complying with NEMA MG 1.
 - b. Horsepower rating: 3/4 horsepower minimum, or as required to move the door to the fully open position in 13 seconds or less.
 - c. Control Station
 - 1) Type: 3-button push-button type.
 - 2) Enclosure: NEMA Type 1.
 - 2. Remote Control Operator: Manufacturer's standard dual frequency remote controls, with each door set to a unique frequency.
 - 3. Automatic reversing device: Pneumatic bottom bar switch.
 - 4. Provide auxiliary manual chain hoist.
 - 5. Emergency disconnect: Provide mechanism to allow transfer to manual hand chain operation, with safety device to lock out use of motor when chain is in use.
- E. Automatic Reversing Control:
 - 1. Automatic safety switch: Complying with UL 325, installed within neoprene or rubber astragal located along full width of door bottom.
 - 2. Safety switch type: Pneumatic; where indicated.

2.5 ACCESSORIES

A. Hardware:

1. Heavy duty hardware, made from non-corrosive metal and provided with non-corrosive fasteners, as required for door type.
2. Hinges:
 - a. Heavy steel hinges at each end and intermediate stile, of type recommended by manufacturer for size of overhead door.
 - b. Thru-bolt hinges to door sections at stiles and rails using lock washers and nuts, or rivets where access to nuts is not available.
 - c. Provide manufacturer's recommended double hinges for doors exceeding 16 feet in width.
3. Rollers:
 - a. Heavy duty ball-bearing rollers, in steel races. Mount rollers with projections from door surface as required to suit slope of track.
 - b. Double hinges: Install roller shaft through both hinges.
 - c. Roller tires: Type indicated; 3-inch diameter tires for 3-inch track, 2-inch diameter tires for 2-inch track; track size as recommended by door manufacturer for required door size.

2.6 FABRICATION

A. Steel Door Sections:

1. Fabricate from galvanized steel sheet, maximum 24-inch-high section, nominal 2 inches deep, and in profile indicated on the drawings.
2. Section end closures and reinforcing: Provide 16 gage galvanized steel channel end closures, and intermediate 16 gage channel reinforcing at 48 inches on center, maximum along interior surface of section.
3. Bottom section reinforcements: Continuous channel or angle matching section profile.
4. Section reinforcing: Continuous horizontal and diagonal steel reinforcing, as necessary to comply with wind loading performance criteria.

B. Insulation:

1. Type: Manufacturer's standard polyurethane foam insulation.
2. Conceal insulation with manufacturer's standard interior steel facing sheet.

C. Factory Finishing:

1. Steel door sections:
 - a. Pretreatment: Clean zinc-coated steel and apply zinc phosphate conversion coat.
 - b. Factory paint system: Apply prime coats to interior and exterior surfaces of door faces.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:

1. Examine openings to receive sectional overhead doors for conditions that will prohibit proper installation. Correct unacceptable conditions before start of installation.

3.2 PREPARATION

- A. Prepare surfaces at openings where sectional overhead doors will be installed in accordance with manufacturer's recommendations.

3.3 INSTALLATION

- A. Install complete overhead door assembly in compliance with manufacturer's instructions.
- B. Anchor vertical tracks to rough opening perimeter at minimum 24 inches on center.
- C. Horizontal Tracks: Support from overhead framing with welded or bolted steel angles or channels, including diagonal bracing as necessary for secure installation.

3.4 ADJUSTING

- A. After door installation is complete, examine door performance, test operation, and adjust installation to provide smooth and quiet operation.
- B. Adjust door operators for proper performance in accordance with manufacturer's instructions.

3.5 CLEANING

- A. Clean all door surfaces, tracks, springs, and operators, before final acceptance.

3.6 PROTECTION

- A. After installation and until final acceptance, protect door, equipment, and accessories from damage, and maintain in clean condition and operating properly.

END OF SECTION

SECTION 08410

ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Aluminum doors and frames.
- B. Door hardware.
- C. Integral air and vapor barrier.

1.3 RELATED SECTIONS

- A. Section 04200 - Unit Masonry: Preparation of adjacent work to receive work of this Section.
- B. Section 07900 – Joint Sealers: System perimeter sealant and back-up materials.
- C. Section 08800 – Glazing: Glazing, gaskets and glazing accessories.

1.4 REFERENCES

- A. AADAF - 45 - Designation System for Aluminum Finishes
- B. AAMA - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.
- C. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site.
- D. AAMA 605.2 - Specification for High Performance Organic Coatings on Architectural Extrusions and Panels.
- E. AAMA 606.1 - Specifications and Inspection Methods for Integral Color Anodic Finishes for Architectural Aluminum.
- F. AAMA 607.1 - Specifications and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum.
- G. AAMA 608.1 - Specifications and Inspection Methods for Electrolytically Deposited Color Anodic Finishes for Architectural Aluminum.
- H. AAMA 1503.1 - Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
- I. AAMA SFM-1 - Aluminum Storefront and Entrance Manual.
- J. ANSI/ASTM A36 - Structural Steel.
- K. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- L. ANSI/ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate.
- M. ANSI/ASTM B221 - Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube.
- N. ANSI/ASTM E283 - Rate of Air Leakage through Exterior Windows, Curtain Walls and Doors.
- O. ANSI/ASTM E330 - Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

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- P. ANSI/ASTM E331 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 - Q. ASCE 7-95 - Minimum Design Loads for Buildings and Other Structures.
 - R. SSPC - Steel Structures Painting Council.
 - S. 36 CFR 1191 - Accessibility Guidelines for Buildings and Facilities.

1.5 SYSTEM DESCRIPTION

- A. Aluminum entrances and storefront system includes tubular aluminum sections shop fabricated, factory pre-finished, vision glass, related flashings, anchorage and attachment devices.

1.6 PERFORMANCE REQUIREMENTS

- A. Design and size components to withstand dead loads and live loads caused by positive and negative wind pressure acting normal to plane of wall as calculated in accordance with ASCE 7-05 and as measured in accordance with ASTM E330.
- B. Limit mullion deflection to flexure limit of glass with full recovery of glazing materials.
- C. System to accommodate, without damage to components or deterioration of seals, movement within system, movement between system and peripheral construction, dynamic loading and release of loads, deflection of structural support framing.
- D. Limit air leakage through assembly to 0.06 cfm/min/sq. ft. of wall area, measured at a reference differential pressure across assembly of 6.24 psf as measured in accordance with ANSI/ASTM E283.
- E. Vapor Seal: Limit vapor seal with interior atmospheric pressure of 1 inch sp, 72 degrees F., 40 percent RH: no failure.
- F. Water Leakage: None, when measured in accordance with ASTM E331 with a test pressure difference of 20 percent of design pressure, with a minimum differential of 2.86 lbf/sq ft and a maximum of 12.0 lbf/sq ft.
- G. System to provide for expansion and contraction within system components caused by a cycling temperature range of 170 degrees F. over a 12-hour period without causing detrimental effects to system components.
- H. Drain water entering joints, condensation occurring in glazing channels or migrating moisture occurring within system to the exterior by a weep drainage network.

1.7 SUBMITTALS

- A. Shop Drawings: Indicate system dimensions; framed opening requirements and tolerances; affected related work and expansion and contraction joint location and details.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware and internal drainage details.
- C. Samples: Submit four samples 6 inches long illustrating pre-finished aluminum.
- D. Certificates: Manufacturers' Certificates certifying the Products meet or exceed specified requirements.

1.8 QUALITY ASSURANCE

- A. General
 - 1. Perform Work in accordance with AAMA SFM-1 and AAMA-Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.

B. Qualifications

1. Manufacturer: Company specializing in manufacturing aluminum glazing systems with minimum three years experience.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01600.
- B. Handle work of this Section in accordance with AAMA CW-10.
- C. Protect pre-finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

1.10 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop drawings.

1.11 WARRANTY

- A. Provide five year warranty under provisions of Section 01700.
- B. Warranty: Include coverage for complete system for failure to meet specified requirements.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Aluminum Products
 1. Kawneer Co., Inc.; Niles, MI.
 2. Architectural Products; Terrell, TX.
 3. Indal LTD, Tubelite Division; Reed City, MI.
 4. Vistawall Architectural Products;
- B. Substitutions: Under provisions of Section 01600.

2.2 MATERIALS

- A. Extruded Aluminum: ANSI/ASTM B221; 6063 alloy, T5 temper.
- B. Sheet Aluminum: ANSI/ASTM B209; 3003 alloy, H14 temper.
- C. Fasteners
 1. Concealed: Stainless or galvanized steel.
 2. Exposed: Stainless steel or aluminum.
- D. Shop and Touch-Up Primer for Steel Components: SSPC 15, Type 1, red oxide.

2.3 COMPONENTS

- A. Frame: 2 x 4 1/2 inch nominal dimension; flush glazing stops; drainage holes; internal weep drainage system.
- B. Doors: 1-3/4 inches thick, 6 inch nominal wide top rail, 3-3/4 inch nominal wide vertical stiles, 8 inch nominal wide bottom rail; beveled glazing stops.
- C. Flashings: .040 inch thick aluminum; finish to match mullion sections where exposed.
- D. Sealant and Backing Materials: As specified in Section 07900 - Joint Sealers.
- E. Glass and Glazing Materials: As specified in Section 08800 - Glazing.

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- F. Bituminous Paint: As specified in Section 09900 - Painting
 - G. Weatherstripping: Manufacturer's standard wool pile, continuous and replaceable.
 - H. Sill Sweep Strips: Resilient seal type, of neoprene compound.
 - I. Hardware
 - 1. Provide hardware components as indicated in paragraph Hardware Schedule at end of this section.
 - 2. Refer to Section - 08700 - Hardware for quality requirements.
 - 3. Regardless of whether or not the Hardware Schedule, at the end of this section, has every door and every component scheduled for each opening, provide all components required to make every opening functional based on hardware scheduled for similar openings and the referenced codes.

2.4 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- C. Prepare components to receive anchor devices. Fabricate anchors.
- D. Arrange fasteners and attachments to conceal from view.
- E. Prepare components with internal reinforcement for door hardware.

2.5 FINISHES

- A. Exposed Aluminum Surfaces: Clear anodized conforming AA Class I, M10C22A31 and AAMA 607.1.
- B. Concealed Steel Items: Primed with iron oxide paint.
- C. Apply one coat of bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.
- D. Hardware
 - 1. Painting of primed surfaces: Specified in Section 09900 - Painting.
 - 2. Plated or Exposed Metal: Conform to ANSI A156.18 as follows:
 - a. Hinges: BHMA 630
 - b. Lock and door trim: BHMA 630
 - c. Door closers: BHMA 630 or BHMA 690 painted.
 - d. Miscellaneous hardware: Finish appearance to match aluminum framing.
 - e. Aluminum housed weatherstripping: Finish appearance to match aluminum framing.
 - f. Thresholds: Finish appearance to match aluminum framing.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify site opening conditions under provisions of Section 01039.
- B. Verify dimensions, tolerances, and method of attachment with other work.
- C. Verify wall openings and adjoining air and vapor seal materials are ready to receive work of this Section.

3.2 INSTALLATION

- A. Install wall system in accordance with manufacturer's instructions and AAMA - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Coordinate attachment and seal of perimeter air and vapor barrier materials.
- G. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- H. Install flashings.
- I. Set thresholds in bed of sealant and secure.
- J. Install hardware using templates provided. Refer to Section 08700 for installation requirements.
- K. Install glass in accordance with Section 08800, to glazing method required to achieve performance criteria.
- L. Install backing materials and perimeter sealant to method required to achieve performance criteria and installation criteria, in accordance with Section 07900.

3.3 TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inches every 3 feet non-cumulative or 1/16 inch per 10 feet, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.4 ADJUSTING

- A. Adjust work under provisions of Section 01700.
- B. Adjust operating hardware for smooth operation.

3.5 CLEANING

- A. Clean work under provisions of 01700.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- C. Remove excess sealant by method acceptable to sealant manufacturer.

3.6 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provision of Section 01500.
- B. Protect finished Work from damage.

3.7 HARDWARE SCHEDULE

HEADING NO. 1

Door No.
Each Door to have:

1.5 pr.	Hinges	A8112 NRP
1	Latch	E0231 x Lever
1	Cylinder	Specified in Section 08700
1	Closer	C02021
1	Pull	J401, 1" round bent bar, 15" long and projecting 3-1/4" from door face; equal to CS-15 by Kawneer
1	Stop	L02131
1	Threshold	J36170

END OF SECTION

SECTION 08520

ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Extruded aluminum windows with operating sash; glass shop or site glazed.
- B. Operating hardware and insect screens.

1.3 RELATED SECTIONS

- A. Section 04200 - Unit Masonry: Adjacent Construction.
- B. Section 07900 - Joint Sealers: Perimeter Sealant.
- C. Section 08800 - Glazing.

1.4 REFERENCES

- A. AADAF-45- Designation System for Aluminum Finishes.
- B. AAMA 101 - Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors.
- C. AAMA 606.1 - Specifications and Inspection Methods for Integral Color Anodic Finishes for Architectural Aluminum.
- D. AAMA 605.2 - Specifications for High Performance Organic Coatings on Architectural Extrusions and Panels.
- E. AAMA 902.2 - Specification for Sash Balances.
- F. AAMA 904.1 - Specification for Friction Hinges in Window applications.
- G. ASCE 7-95 - Minimum Design Loads for Buildings and Other Structures.
- H. ASTM A123 - Zinc (Hot-Dip Galvanized) coatings on Iron and Steel Products.
- I. ASTM A386 - Zinc Coating (Hot Dip) on Assembled Steel Products.
- J. ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate.
- K. ASTM B221 - Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube.
- L. ASTM D3656 - Insect Screening and Louver Cloth Woven from Vinyl-Coated Glass Fiber Yarn.
- M. ASTM D 4216 - Rigid Poly (Vinyl Chloride) (PVC) and Related Plastic Building Products Compounds.
- N. ASTM E283 - Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors.
- O. ASTM E330 - Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- P. ASTM E331 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- Q. FS-RR-W-365A - Wire Fabric (Insect Screening).

1.5 SYSTEM DESCRIPTION

A. Projected Window Manufacturers

1. Products of the following manufacturers, provided they comply with requirements of contract documents, will be among those considered acceptable:
 - a. Acorn Window Systems, Inc.
 - b. Alenco Division/Redman Building Products, Inc.
 - c. EFCO Corporation.
 - d. Graham Architectural Products Corporation.
 - e. Modu-Line Windows, Inc.
 - f. TRACO.
 - g. Winco Window Company.
 - h. Windows, Inc. ("DeSCo").
 - i. Kawneer, Inc.

B. Projected Windows:

1. Style: As indicated on drawings.
 - a. Top- and bottom-hinged.
 - b. In-swinging and out-swinging.
 - c. Products which have minor differences will be accepted when, in the Architect's judgment, such differences do not detract from design concept or intended performance.
2. Glazing Method: Channel gasket.
3. Grade: P-HC40.
4. Hardware:
 - a. Operator: Rotary type.
 - 1) Provide at out swinging windows.
 - b. Hinges: Two 4-bar hinges.
 - c. Locks: Lever handle, cam type.
5. Finish: Fluoropolymer coating.
6. Insect screens.
 - a. Provide at project-in ventilators.
 - b. Provide at project-out ventilators.

1.6 SYSTEM REQUIREMENTS

A. Design Requirements

1. Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall as calculated in accordance with ASCE 7-95, Section 6, to a design pressure of 20 lb/sq ft. as measured in accordance with ASTM E330.

B. Performance Requirements

1. Limit member deflection to flexure limit of glass; with full recovery of glazing materials.
2. System to accommodate, without damage to components or deterioration of seals, movement between window and perimeter framing, deflection of lintel.
3. Limit air leakage through assembly to 0.15 cfm ft of crack length measured at a reference differential pressure across assembly of 6.24 psf as measured in accordance with ASTM E283.
4. Water Leakage: None, when measured in accordance with ASTM E331 with a test pressure difference of 12.00 lbf/sq ft with a water rate of 5 gal./hr.

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5. Maintain continuous air and vapor barrier throughout assembly, primarily in line with pane of glass and heel bead of glazing compound.
 6. Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.
 7. Condensation Factor: 48
 8. Thermal Transmittance: Provide window units with a U-value maximum
 9. Conformance: Provide complete window assembly complying with AAMA101 classification H-C35

1.7 SUBMITTALS

- A. Submit under provisions of Section 01330.
- B. Shop Drawings
 1. Indicate opening dimensions, framed opening tolerances, affected related work; installation requirements; and interface with adjacent support members.
 2. Indicate profiles of individual components and accessories including sub-sills and jamb closures.
- C. Product Data
 1. Provide product data for each type of window required, including the following:
 - a. Component dimensions.
 - b. Anchorage and fasteners.
 - c. Glass, hardware, screening and finishes.
 - d. Recommendations for maintaining and cleaning exterior surfaces.
- D. Test Reports
 1. Submit test reports from a qualified independent testing agency indicating that each type, grade, and size of window unit complies with performance requirements indicated based on comprehensive testing of current window units within the last 5 years.
 2. Test results based on down-sized units will not be accepted.
- E. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.8 QUALIFICATIONS

- A. Manufacturer and Installer: Company specializing in manufacturing and installing commercial aluminum windows with minimum ten years documented experience.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01600.
- B. Protect pre-finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Do not install sealants when ambient temperature is less than 40 degrees F.
- B. Maintain this minimum temperature during and after installation of sealants.

1.11 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop drawings.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. EFCO Corp.;
- B. Kawneer Co., Inc.
- C. Alenco.
- D. Substitutions: Under provisions of Section 01600.

2.2 MATERIALS

- A. Aluminum Extrusions: Alloy and temper appropriate for the use and finish, providing corrosion resistance, and as required for strength.
 - 1. Minimum wall thickness of any member: 3/16 inch.
 - 2. Fluoropolymer coating: Multiple coats of thermally cured fluoropolymer primer and top coats, resin minimum 70 percent "Kynar 500" or "Hylar 5000"; comply with AAMA 605.2 and AA-C12C42R1X (inhibited chemical-cleaned; acid chromate-fluoride-phosphate chemical conversion coating; organic coating). Provide the number and type of coats as recommended by coating manufacturer for color and sheen required.
 - 3. Colors: Where not indicated, colors are to be selected by the Architect from manufacturer's standard range.
- B. Fasteners: Do not use exposed fasteners, except for hardware.
 - 1. Hardware Fasteners: Match finish of members to which they are fastened.
 - 2. Anchor Fasteners: Same as anchors.
 - 3. Other Fasteners: Noncorrosive and corrosion-resistant material that is compatible with materials being fastened.
- C. Concealed Anchors (one of the following):
 - 1. Steel, cadmium plated after fabrication in accordance with ASTM B 766, Class 8.
 - 2. Steel, zinc electroplated after fabrication in accordance with ASTM B 633.
 - 3. Steel, hot-dip zinc coated after fabrication in accordance with ASTM A 123.
 - 4. Stainless steel.
- D. Glass: Provide products specified elsewhere in Division 8. See window elevations for glass types used.
- E. Sealants: Use only nonhardening, nonshrinking, and nonmigrating materials.
 - 1. For nonworking, metal-to-metal joints within window units: Small joint sealant conforming to 803.3, as described in AAMA 800.
 - 2. For joints between other window components: Suitable for application.
 - 3. For joints between window units and other building components: Provide products specified in Division 7.
 - 4. For glazing: Provide products specified elsewhere.
- F. Dissimilar Metal Coating: Cold-applied asphalt mastic, or other nonconductive, nonabsorptive coating.
- G. Protective Backing Paint: Bituminous type as specified in Section 09900.

2.3 HARDWARE

- A. General: Corrosion-resistant material.
- B. Hinges:
 - 1. For use without operators: Friction type; complying with AAMA 904.1; adjustable friction pivots/slides; nylon or other nonabrasive material.

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- 2. For use with operators: Nonfriction type.
 - 3. 4- and 6-bar hinges: Concealed.
 - C. Rotary Operators: Gear-type; complying with ASTM E 405, after 500 cycles with operating force of 120 pounds-force-inches, and after 7500 cycles with operating moment of 80 pounds-force-inches and closing torque of 60 pounds-force-inches.
 - D. Locks: Complete with strikes and fasteners:
 - 1. Lever Handle: Cam-action sweep type.

2.4 ACCESSORIES

- A. Insect Screens: Formed or extruded aluminum frames with screen fabric.
 - 1. Design to fit tightly, but be removable, using as few exposed fasteners or latches as possible.
 - 2. Do not use wickets for access to window-operating hardware, unless absolutely necessary; make wickets hinged or sliding, with the same type of frames as screens, and tight-fitting.
 - 3. Frame Construction: Minimum wall thickness of 0.040-inch, with joints mitered or coped and fastened with concealed fasteners.
 - 4. Anchor screen fabric with removable plastic or rubber splines.
 - 5. Finish: To match window.
 - 6. Screen Fabric: Glass fiber mesh; complying with FS L-S-125.

2.5 FABRICATION

- A. General
 - 1. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
 - 2. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
 - 3. Prepare components to receive anchor devices. Fabricate anchors.
 - 4. Arrange fasteners and attachments to ensure concealment from view.
 - 5. Prepare components with internal reinforcement for operating hardware.

2.6 FINISHES

- A. Concealed Steel Items: Galvanized in accordance with ASTM A386 to 2.0 oz/sq ft.
- B. Apply one coat of bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify site opening conditions.
- B. Verify wall openings are ready to receive work of this Section.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions and recommendations.
- B. Glaze window frame into perimeter opening to accommodate construction tolerances and other irregularities.
- C. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances, aligning with adjacent work.
- D. Install operating hardware.
- E. Install glass in accordance with Section 08800, to glazing method required to achieve performance criteria.
- F. Install perimeter gaskets to method required to achieve performance criteria specified.

3.3 TOLERANCES

- A. Maximum Variation from Level or Plumb: 0.06 inches every 3 ft non-cumulative or 0.5 inches per 100 ft., whichever is less.
- B. Maximum misalignment of two adjoining members abutting in plane: 1/32 inch.

3.4 ADJUSTING

- A. Adjust work under provisions of Section 01700.
- B. Adjust operating hardware for smooth operation.

3.5 CLEANING

- A. Clean work under provisions of 01700.
- B. Remove protective material from pre-finished aluminum surfaces.
- C. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

END OF SECTION

SECTION 08800

GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Glass glazing for Sections referencing this Section for products and installation.
- B. Glass for hollow metal and aluminum frame work.
- C. Glass for aluminum windows.

1.3 RELATED SECTIONS

- A. Section 08364 - Steel Sectional Overhead Doors
- B. Section 08410 - Aluminum Entrances and Storefronts.
- C. Section 08520 - Aluminum Windows: Glazed windows.
- D. Section 10800 - Toilet and Bath Accessories: Framed mirrors.

1.4 REFERENCES

- A. ANSI/ASTM E330 - Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- B. ANSI Z97.1 - Safety Performance Specifications and Methods of Test for Safety Glazing Used in Buildings.
- C. ASCE 7-95 - Minimum Design Loads for Buildings and other Structures.
- D. ASTM C864 - Dense Elastomeric Compression Seal, Gaskets, Setting Blocks and Spacers.
- E. ASTM C920 - Elastomeric Joint Sealants.
- F. ASTM C1036 - Flat Glass.
- G. ASTM C1048 - Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.
- H. ASTM C1172 - Laminated Architecture Flat Glass.
- I. ASTM C1281 - Preformed Tape Sealants for Glazing Applications.
- J. ASTM C1311 - Solvent Release Sealants.
- K. ASTM E330 - Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
- L. ASTM E546 - Test Method For Frost Point of Sealed Insulating Glass Units.
- M. ASTM E576 - Test Method For Dew/Frost Point of Sealed Insulating Glass Units in Vertical Position.
- N. ASTM E773 - Test Method for Accelerated Weathering of Sealed Insulating Glass Units.
- O. ASTM E774 - Classification of this Durability of Sealed Insulating Glass Units.
- P. ASTM E2010 - Standard Test Method for Positive Pressure Fire Tests of Window Assemblies.
- Q. ASTM E4802 - Poly (Methyl Methacrylate) Acrylic Plastic Sheet.
- R. ASTM F1233 - Standard Test Method for Security Glazing Materials and Systems.
- S. GANA - Glazing Manual.

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- T. GANA - Laminated Glass Design Guide.
 - U. GANA - Sealant Manual.
 - V. FS TT-C-00598 - Caulking Compound, Oil and Resin Base Type.
 - W. FS TT-G-410 - Glazing Compound, Sash (Metal) for Back Bedding and Face Glazing (Not for Channel or Stop Glazing).
 - X. NFPA 80 – Fire Doors and Windows
 - Y. NFPA 257 – Fire Tests of Window Assemblies
 - Z. SIGMA - Sealed Insulated Glass Manufacturers Association.
 - AA. UL 9 – Fire Tests of Window Assemblies
 - BB. UL 752 - Bullet Resisting Equipment.
 - CC. UL 972 - Burglary Resistant Glazing

1.5 PERFORMANCE REQUIREMENTS

- A. Provide continuity of building enclosure vapor and air barrier:
 - 1. In conjunction with materials described in Section 07900.
 - 2. Maintain continuous air and vapor barrier throughout glazed assembly from glass pane to heel bead of glazing sealant.
- B. Size glass to withstand dead loads and positive and negative live loads acting normal to plane of glass as calculated in accordance with ASCE 7-95 code to a design pressure of 20 lb./sq. ft. as measured in accordance with ANSI/ASTM E330.
- C. Limit glass deflection to 1/200 flexure limit of glass with full recovery of glazing materials, whichever is less.
- D. Provide wireless fire-rated glazing listed for use in non-impact safety-rated locations with fire rating specified to meet positive pressure test requirements of ASTM E2010.

1.6 SUBMITTALS

- A. Product Data
 - 1. Glass:
 - a. Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
 - b. Polycarbonate material manufacturer's recommendations for cleaning materials and methods.
 - c. Provide copy of manufacturer's sample warranty.
 - 2. Glazing Sealants, Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements.
- B. Manufacturer's Installation Instructions: Indicate special precautions required.
- C. Samples:
 - 1. Submit four samples, minimum 6 x 6 inch in size, illustrating glass units, coloration and design. Mark each sample to match glazing legend.
 - 2. Submit 3 inch long bead of glazing sealant, color as scheduled.
- D. Manufacturer's Certificates
 - 1. Certify that sealed insulating glass units meet or exceed specified requirements.
 - 2. Compatibility test report from manufacturer of insulating glass edge sealant indicating that glass edge sealants were tested for compatibility with other glazing materials including sealants, glazing tape, gaskets, setting blocks, and edge blocks.

1.7 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA Glazing Manual, GANA Sealant Manual, SIGMA and GANA Laminators Safety Glass Association - Standards Manual for glazing installation methods.
- B. Provide each lite of safety glazing with permanent marking indicating compliance with specified standard(s).
- C. Provide each lite of fire-rated glazing with permanent marking indicating compliance with specified standard(s).

1.8 PRE-INSTALLATION CONFERENCE

- A. Convene one week prior to commencing work of this Section, under provisions of Section 01300.

1.9 ENVIRONMENTAL REQUIREMENTS

- A. Do not install glazing when ambient temperature is less than 50 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.10 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on Drawings.

1.11 COORDINATION

- A. Coordinate the Work with glazing frames, wall openings, and perimeter air and vapor seal to adjacent Work.

1.12 WARRANTY

- A. Provide Warranties in accordance with Section 01700.
- B. Five year manufacturer's warranty:
 - 1. Insulating Glass Units: Include coverage for from seal failure, interpane dusting or misting, and replacement of same.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Basis-of-Design Glass Product: Subject to compliance with requirements, provide product indicated in Glass Schedules or comparable product by one of the following:
 - 1. AGC Glass Company of North America, Inc.
 - 2. Libbey-Owens-Ford Co.
 - 3. Old Castle Building Envelope.
 - 4. Spectrum Glass Products, Inc.
 - 5. Viracon.

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- B. Glazing Compounds
 - 1. Dow Corning Corp.
 - 2. GE Silicones.
 - 3. Norton Co.
 - 4. Pecora Corp.
 - 5. Tremco Mfg. Co.
 - 6. VIP Enterprises, Inc.
 - C. Substitutions: Under provisions of Section 01600.

2.2 MATERIALS

- A. Glazing
 - 1. G 1 - Clear Float Glass: ASTM C1036, Type I - Transparent Glass, Flat; Class 1 Clear; Quality q3 - Glazing select; thickness as scheduled on the drawings.
 - a. Basis-of-Design Product: Solexia Glass by P.P.G.
 - 2. G 2 - Clear Tempered Glass: ASTM C1048, Kind FT - Fully tempered with horizontal tempering; Condition A, uncoated; Type I - Transparent Glass, Flat; Class 1 clear; Quality q3 glazing select; conforming to ANSI Z97.1; thickness as noted on drawings.
 - a. Basis-of-Design Product: Solexia Glass by P.P.G.
 - 3. G 3 - Low E Insulating Glass Units: ASTM E774, Class A, and ASTM E773; double pane with butyl primary seal and silicone secondary edge seal. Inter pane space purged dry (hermetic) air.
 - a. Outer pane of Type G 1 glass. Low E Float Glass complying with ASTM C1036, Type I - Transparent Glass Flat; Class 3 Tinted, Light-Reducing; Quality q3 - Glazing selected; SolarBan R100 Reflective Low-E coating on #2 surface; visible light transmittance of 42 percent.
 - b. Inner pane of Type G 1 glass. Glass complying with ASTM C1036, Type I - Transparent Glass Flat; Class 1 Clear; Quality q3 - Glazing select.
 - c. Spacer: Dessicant filled mill finish aluminum with mitered and bent soldered corners.
 - d. Total Unit Light Transmittance: 31 percent.
 - e. Total Unit Thickness: 1 inch.
 - 4. G 4 - Low E Tempered Insulating Glass Units: ASTM E773, Class A, and ASTM E773; double pane with butyl primary seal and silicone secondary edge seal. Interpane space purged dry (hermetic) air.
 - a. Outer pane of Type G 2 glass. Low E Tinted Float Glass complying with ASTM C1048, Kind FT - Fully tempered with horizontal tempering; Condition A, uncoated; Type I - Transparent Glass Flat; Class 3 Tinted, Light-Reducing; Quality q3 - Glazing select; conforming to ANSI Z97.1; SolarBan R100 Reflective Low E coating on #2 surface; light transmittance of 42 percent.
 - b. Inner pane of Type G 2 glass. Float glass complying with ASTM C1048, Kind FT - Fully tempered with horizontal tempering; Condition A, uncoated.
 - c. Spacer: Dessicant filled mil finish aluminum with mitered and bent soldered corners.
 - d. Total Unit Visible Light Transmittance: 31 percent.
 - e. Total Unit Thickness: 1 inch.
 - 5. G 5 - Tempered Insulating Glass Units: ASTM E774, Class A, and ASTM E773; double pane with butyl primary seal and silicone secondary edge seal. Interpane space purged dry (hermetic) air.
 - a. Outer pane of Type G 2 glass.

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- b. Inner pane of Type G 2 glass.
 - c. Spacer: Dessicant filled mill finish aluminum with mitered and bent soldered corners.
 - d. Total Unit Visible Light Transmittance: 75 percent.
 - e. Total Unit Thickness: 1 inch minimum.
 - B. Glazing Compounds
 - 1. Butyl Sealant: ASTM C1085; Shore A hardness of 10-20 black color; non-skinning.
 - 2. Silicone Glazing Sealant: FS TT-S-01543, Class A; single component, chemical solvent curing; capable of water immersion without loss of properties; cured Shore A hardness of 15-25; clear.
 - a. Structural Silicone: Provide high-modulus structural silicone glazing materials where sealant bonds glass to substrate.
 - 3. Polysulfide Glazing Sealant: ASTM C920, Type M, Grade NS, Class and Use suitable for glazing application indicated; two component; chemical curing, non-sagging type; cured Shore A hardness of 15 to 25.
 - a. Type: 1199 manufactured by Dow Corning.
 - b. Color: Black.
 - C. Glazing Accessories
 - 1. Setting Blocks: Type as recommended by glazing manufacturer for compatibility with edge seal of insulating glazing units.
 - 2. Spacer Shims: Neoprene, 50 - 60 Shore A durometer hardness, minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.
 - 3. Glazing Tape: ASTM C1281, preformed butyl compound with integral resilient tube spacing device; 10 - 15 Shore A durometer hardness; coiled on release paper; size as required for glazing channel; black color.
 - 4. Glazing Gaskets: ASTM C864 Resilient type as recommended by glazing manufacturer for framing system furnished with extruded shape to suit glazing channel retaining slot; black color.
 - 5. Glazing Clips: Manufacturer's standard type.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that openings for glazing are correctly sized and within tolerance.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

3.2 PREPARATION

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant in accordance with sealant manufacturer's instructions.

3.3 INSTALLATION

A. General

1. Comply with combined recommendations of manufacturers of glass, sealants and other glazing materials, except where more stringent requirements are indicated, including those in referenced glazing publications.
2. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
3. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
4. Provide spacers for glass sizes larger than 50 united inches (length plus height) as follows:
 - a. Locate spacers inside, outside, and directly opposite each other. Install correct size and spacing to preserve required face clearances, except where gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and comply with system performance requirements.
 - b. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
5. Provide edge blocking to comply with requirements of referenced glazing publications, unless otherwise required by glass manufacturer.
6. Install elastomeric setting blocks in sill rabbets, sized and located to comply with referenced glazing standard, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

3.4 CLEANING

- A. Remove glazing materials from finish surfaces.
- B. Remove labels after work is complete.
- C. Clean glass and mirrors.

3.5 PROTECTION OF FINISHED WORK

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste. Do not mark heat absorbing or reflective glass units.

END OF SECTION

SECTION 09250

GYPSUM BOARD SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Metal stud wall framing.
- B. Metal channel ceiling framing.
- C. Framing accessories.
- D. Acoustical sealant.
- E. Gypsum board.
- F. Gypsum Sheathing
- G. Cementitious backer board.
- H. Taped and sanded joint treatment.
- I. Texture finish.

1.3 RELATED SECTIONS

- A. Section 06114 - Wood Blocking and Curbing: Wood blocking for support of surface mounted accessories specified in other sections.
- B. Section 07210 - Building Insulation: Thermal and acoustical insulation.
- C. Section 07270 - Firestopping: Fire-resistive-rated joint sealants.

1.4 REFERENCES

- A. ANSI A118.9 - Cementitious Backer Units
- B. ASTM C36 - Gypsum Wallboard.
- C. ASTM C79 – Treated Core and Nontreated Core Gypsum Sheathing Board.
- D. ASTM C442 - Gypsum Backing Board, Gypsum Core Board and Gypsum Shaftliner Board.
- E. ASTM C475 - Joint Compound and Joint Tape for Finishing Gypsum Board.
- F. ASTM C630 - Water Resistant Gypsum Backing Board.
- G. ASTM C645 – Nonstructural Steel Framing Members
- H. ASTM C754 - Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- I. ASTM C840 - Application and Finishing of Gypsum Board.
- J. ASTM C919 - Use of Sealants in Acoustical Applications.
- K. ASTM C931 - Exterior Gypsum Soffit Board.
- L. ASTM C954 - Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases to Steel Studs from 0.033 inches to 0.112 inches in Thickness.
- M. ASTM C1002 – Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- N. ASTM C1047 - Accessories for Gypsum Wallboard and Gypsum Veneer Base.

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- O. ASTM C1280 – Application of Gypsum Sheathing
 - P. ASTM C1311 - Solvent-Release Sealants.
 - Q. ASTM C1325 – Non-Asbestos Fiber-Mat Reinforced Cement Substrate Sheets
 - R. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
 - S. ASTM E90 - Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
 - T. ASTM E96 – Water Vapor Transmission of Materials
 - U. ASTM E1190 - Strength of Power-Actuated Fasteners Installed in Structural Members.
 - V. FS FF-P-395 (Rev. C) - Pin, Drive Guided and Pin Driver, Powder Actuated (Fasteners for Powder Actuated and Hand Actuated Fastening Tools).
 - W. GA-214 - Levels of Gypsum Board Finish.

1.5 SYSTEM DESCRIPTION AND PERFORMANCE

- A. Acoustical Attenuation for Identified Interior Partitions: Minimum STC 54 in accordance with ASTM E90.
- B. Design system to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
- C. Partition Component Sizes and Spacings: Design and provide steel framing member sizes and spacing as indicated but not less than that required to comply with ASTM C 754 under the following maximum deflection and lateral loading conditions:
 - 1. Interior Partitions
 - a. Maximum Deflection: L/240 at 5 lbf per sq. ft.; maximum spacing of 16 inches on center unless otherwise indicated.
 - b. Maximum Deflection: L/120 at 5 lbf per sq. ft.; maximum spacing of 16 inches on center unless otherwise indicated.
 - c. Maximum Deflection: L/120 at 7.5 lbf per sq. ft.; maximum spacing of 16 inches on center unless otherwise indicated.
 - d. Maximum Deflection: L/120 at 10 lbf per sq. ft.; maximum spacing of 16 inches on center unless otherwise indicated.
 - 2. Ceiling Component Sizes and Spacings: As indicated but not less than that required to comply with ASTM C 754, maximum deflection of L/240 and deadload of 5 lbf per sq. ft. minimum, maximum spacing of 16 inches on center for attachment of ceiling to sub-support and 48 inches on center for attachment of main support to sub-support and to structure unless otherwise indicated.

1.6 SUBMITTALS

- A. Submit following in accordance with provisions of Section 01330:
 - 1. Product Data: Provide data on metal framing, gypsum board, joint tape, joint compounds; and moldings.

1.7 QUALITY ASSURANCE

- A. Qualifications
 - 1. Applicator: Company specializing in performing the work of this section with minimum seven years documented experience.
- B. Material Compatibility
 - 1. Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.
- C. Neatly stack gypsum panels flat to prevent sagging.
- D. Handle gypsum board to prevent damage to edges, ends, and surfaces.
- E. Do not bend or otherwise damage metal corner beads and trim.

1.9 PROJECT CONDITIONS

- A. Environmental Conditions
 - 1. General: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C840 and with gypsum board manufacturer's recommendations.
 - 2. Room Temperatures
 - a. For nonadhesive attachment of gypsum board to framing, maintain not less than 40 deg F.
 - b. For adhesive attachment and finishing of gypsum board, maintain not less than 50 deg F for 48 hours prior to application and continuously after until dry.
 - c. Do not exceed 95 deg F when using temporary heat sources.
 - 3. Ventilation: Ventilate building spaces, as required, for drying joint treatment materials. Avoid drafts during hot dry weather to prevent finishing materials from drying too rapidly.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Metal Studs
 - 1. Dale Industries
 - 2. Unitech
 - 3. Dietrich
 - 4. Alabama Metals Corp.
 - 5. Celotex Building Products
 - 6. G-P Gypsum Corp.
 - 7. National Gypsum Co.
 - 8. United States Gypsum Co.

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- B. Gypsum Board
 - 1. Celotex Building Products
 - 2. G-P Gypsum Corp.
 - 3. National Gypsum Co.
 - 4. United States Gypsum Co.
 - C. Cement Backer Board
 - 1. BED-ROC Industries, British Columbia, Canada.
 - 2. Select Engineering, Inc.; Bakersfield, CA.
 - 3. Smartboard Building Products, Inc; Ontario, Canada.
 - 4. U.S. Architectural Products; Lincoln, RI.
 - D. Sheathing Tape
 - 1. W.R. Grace & Co.; Columbia, MD
 - 2. Protecto Wrap Co.; Denver CO.
 - 3. Tamko Roofing Products, Inc; Joplin, MO.
 - E. Accessories
 - 1. Celotex Building Products
 - 2. Fire Trak Corp.; Kimball, MN.
 - 3. Flex-Ability Concepts; Edmond, OK.
 - 4. G-P Gypsum Corp.
 - 5. National Gypsum Co.
 - 6. The Steel Network, Inc.; Raleigh NC.
 - 7. United States Gypsum Co.
 - F. Substitutions: Section 01600 - Product Requirements.

2.2 MATERIALS

- A. Interior Framing
 - 1. Studs
 - a. To Receive Gypsum Board: ASTM C645; galvanized sheet steel, minimum 25 gage thick (unless otherwise specified or required by partition height for loading specified in "SYSTEM DESCRIPTION AND PERFORMANCE"), C shape, with knurled faces. Double 20 gage studs at door frame jambs.
 - b. To receive Plaster: ASTM C645; galvanized sheet steel, 22 gage thick unless otherwise indicated, C shape, with knurled faces.
 - 2. Bottom Tracks: ASTM C645; galvanized sheet steel, same as studs, C shape.
 - 3. Top Tracks
 - a. Partitions Not Extending to Bottom of Deck or Structure: Same material and construction as bottom track.
 - b. Partitions Extending to Bottom of Deck or Structure: At contractor's option, provide shop fabricated deflection track or deep leg track with deflection clips complying with the following;
 - 1) Deflection Track: Galvanized sheet steel, same gage as metal studs, C shaped, with minimum 3 inch legs offset 5/8 inch at the midpoint. Track equal to "Shadowline" design by Fire Track.
 - 2) Deep Leg Track: Stud manufacturer's galvanized sheet steel, same gage as metal studs, C shaped, with minimum 3 inch legs.
 - 3) Deflection Clips: Galvanized sheet steel, same gage as metal studs, L shaped, with 2 or 3 slots as required by stud depth with allowance for 3/4 inch maximum vertical deflection. Clips equal to Steel Network SL or SLD series.

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4. Furring, Framing and Accessories: ASTM C645.
 5. Channels: ASTM C645; Hot or Cold-rolled steel, ASTM A525 G-60, hot dipped galvanized coating.
 6. Grid Suspension System for Interior Ceilings: ASTM C645, manufacturer's standard direct-hung grid suspension system composed of main beams and cross furring members that interlock to form a modular supporting network.
 7. Steel Resilient Furring Channels: Manufacturer's standard product designed to reduce sound transmission, fabricated from steel sheet complying with ASTM A 525 or ASTM A 568 to form 1/2-inch-deep channel of the following configuration:
 - a. Single-Leg Configuration: Asymmetric-shaped channel with face connected to a single flange by a single slotted leg (web).
 - b. Double-Leg Configuration: Hat-shaped channel, with 1-1/2-inch-wide face connected to flanges by double slotted or expanded metal legs (webs).
 - c. Configuration: Either configuration indicated above.
- B. Gypsum Board
1. Fire Rated Gypsum Board: ASTM C36; fire resistive type, UL rated; 5/8 inch thick except where otherwise scheduled, maximum permissible length; ends square cut, square edges.
 2. Moisture Resistant Gypsum Board: ASTM C630; 5/8 inch thick except where otherwise scheduled, maximum permissible length; ends square cut, square edges.
 3. Exterior Gypsum Soffit Board: ASTM C931; standard type, 5/8 inch thick except where otherwise scheduled, maximum permissible length; ends square cut, square edges.
 4. Gypsum Sheathing Board: ASTM C79; moisture resistant type; 5/8 inch thick except where otherwise scheduled, maximum permissible length; ends square cut, square edges; water repellent paper faces and edges.
 5. Cementitious Backing Board: ASTM C 1325/ANSI A 118.9, high density, glass fiber reinforced, 1/2 inch (nominal) thick.
- C. Accessories
1. Acoustical Sealant: ASTM C1311; Non-hardening, non-skinning, for use in conjunction with gypsum board; black in concealed locations; color as selected from manufacturer's standard in exposed locations.
 2. Trim:
 - a. Corner Beads: ASTM C1047; Metal and paper combination; 1-1/4 inch wide flanges.
 - b. Edge Trim: ASTM C1047; Galvanized steel with knurled faces, types as indicated.
 3. Sheathing Tape
 - a. 40 mil thick, self-adhering rubberized asphalt adhesive tape, minimum 6 inches wide.
 - b. Acceptable Product: W.R. Grace & Co. "Vycor Plus" wall seam tape.
 4. Furring Brackets: ASTM C645; galvanized steel. Serrated-arm type, adjustable, minimum thickness of base (uncoated) metal of 0.0329 inch, designed for screw attachment to steel studs and steel rigid furring channels used for furring.
 5. Joint Materials: ASTM C475; reinforcing tape, joint compound, adhesive, and water.
 6. Wall Texture: Latex based non-aggregated texturing material.
 7. Cementitious Backing Board Tape: Manufacturer's standard 2 inch wide, coated glass fiber tape for joints and corners.

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8. Fasteners
 - a. Framing to Substrate: Tie wire, nails, screws and other metal supports, of type and size to suit application; to rigidly secure materials in place.
 - b. Powder-Actuated Fasteners in Concrete: FS FF-P-395 (Rev. C), size and type recommended by framing manufacturer.
 - c. Metal Framing to Metal Framing: Manufacturer's standard screw attachments.
 - d. Gypsum Board to Metal Framing
 - 1) Screws complying with ASTM C954; type as required for substrate indicated.
 - 2) Adhesive: ASTM C557.
 9. Tie and Hanger Wire: ASTM A 641, Class 1 zinc coating, soft temper, with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify site conditions under provisions of Section 01039.
- B. Verify that site conditions are ready to receive work and substrates to which gypsum board assemblies attach comply with requirements for installation tolerances and other conditions affecting performance of assemblies specified in this Section.
- C. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Metal Studs
 1. General
 - a. Install studs in accordance with ASTM C754 and manufacturer's instructions.
 - b. Metal Stud Spacing: Maximum of 16 inches on center or less as required to meet "SYSTEM DESCRIPTION AND PERFORMANCE" criteria (regardless of fire rated partition allowances for wider spacings) unless otherwise indicated.
 2. Form all corners and intersections using conventional three stud framing.
 3. Interior Partition
 - a. Refer to Drawings for indication of partitions extending through the ceiling bracing and for partitions extending through the ceiling structure above.
 - b. Non-Fire Rated Partitions: Brace partitions, with runner track running diagonally from top of partition to underside of roof or floor deck above and space alternately at 4 feet on center maximum.
 4. Door Opening Framing: Install double studs at door frame jambs. Install stud tracks on each side of opening, at frame head height, and between studs and adjacent studs.
 5. Blocking: Screw wood blocking to studs. Install blocking for support of finish carpentry items, plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, and hardware.
 6. Coordinate installation of wood bucks, anchors, and wood blocking with electrical and mechanical work to be placed within or behind stud framing.

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- B. Metal Wall Furring
 - 1. Erect wall furring for direct attachment to concrete block walls.
 - 2. Erect furring channels vertically; space maximum 16 inches on center, not more than 4 inches from abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.
 - 3. Erect free-standing metal stud framing spaced 1 inch from concrete masonry walls, attached by adjustable furring brackets in accordance with manufacturer's instructions.
 - C. Ceiling Framing
 - 1. Install in accordance with ASTM C754, and manufacturer's instructions.
 - 2. Coordinate location of hangers with other work.
 - 3. Install ceiling framing independent of walls, columns, and above ceiling work.
 - 4. Reinforce openings in ceiling suspension system which interrupt main carrying channels or furring channels, with lateral channel bracing. Extend bracing minimum 24 inches past each end of openings.
 - 5. Laterally brace entire suspension system.
 - D. Acoustical Accessories
 - 1. Install acoustical sealant within partitions in accordance with ASTM C919, ASTM E497, and manufacturer's instructions.
 - 2. Caulk all penetrations of partitions by conduit, pipe, duct work, and rough-in boxes, and in conformance with ASTM E497.
 - E. Gypsum Board
 - 1. Install gypsum board in accordance with ASTM C840 and manufacturer's instructions.
 - 2. Erect single layer standard gypsum board in most economical direction, with ends and edges occurring over firm bearing.
 - 3. Erect exterior gypsum sheathing horizontally, with edges butted tight and ends occurring over firm bearing.
 - 4. Use screws when fastening gypsum board to metal furring or framing.
 - 5. Erect exterior gypsum soffit board perpendicular to supports, with staggered end joints over supports.
 - 6. Treat cut edges and holes in moisture resistant gypsum board and exterior gypsum soffit board with sealant.
 - 7. Control Joints
 - a. Place control joints consistent with lines of building spaces as required by ASTM C840.
 - b. Install control joints centered above each jamb of all door frames. Extend control joint from top of frame head to top of partition.
 - 8. Place corner beads at all exposed external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials at all exposed locations. Leave a 1/4 inch space between edge trim and dissimilar material. Seal joint with sealant specified in Section 07900.
 - F. Joint Treatment
 - 1. Gypsum Board: Install joint treatment in conformance with ASTM C840 and to level as defined by GA-214 and as scheduled at the end of this Section.
 - 2. Cementitious Backing Board: Tape joints and corners in accordance with manufacturer's written instructions.
 - G. Gypsum Sheathing
 - 1. Install gypsum sheathing horizontally, with edges butted tight and ends occurring over framing members.
 - 2. Stagger vertical joints.

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3. Install sheathing with minimum width of two framing spaces.
 4. Apply sheathing tape to all horizontal and vertical joints in accordance with manufacturer's written instructions.
- H. Texture Finish
1. Walls: Spray or Roller apply light finish texture coating in accordance with manufacturer's instructions and approved sample, to all surfaces scheduled to receive paint.

3.3 TOLERANCES

- A. Maximum Variation of Finished Gypsum Board Surface from plumb and true Flatness: 1/8 inch in 10 feet in any direction.

3.4 JOINT TREATMENT SCHEDULE

- A. Level 1: All gypsum board surfaces concealed above ceilings.
- B. Level 2: All gypsum board surfaces scheduled to receive ceramic tile, and behind fixed millwork.
- C. Level 3: All gypsum board surfaces scheduled to receive spray applied texture.
- D. Level 4: All gypsum board surface scheduled to receive wall coverings.
- E. Level 5: All gypsum board surfaces scheduled to receive paint.

END OF SECTION

SECTION 09300

TILE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 - General Requirements apply to Work of this Section.

1.2 SECTION INCLUDES

- A. Ceramic mosaic tile floor finish using the thinset application method.
- B. Mortar bed installation.
- C. Ceramic tile walls, ceilings and base finish using the thinset application method.
- D. Marble thresholds.

1.3 RELATED SECTIONS

- A. Section 03300 - Cast-in-Place Concrete: Troweling of floor slab for tile application and floating of floor slab for mortar bed.
- B. Section 04200 - Unit Masonry: Substrate to receive finish.
- C. Section 07900 - Joint Sealers: Control joint components.
- D. Section 09250 - Gypsum Drywall: Substrate to receive finish.
- E. Division 15 - Sanitary Drainage and Vent Systems: Floor drains.

1.4 REFERENCES

- A. ANSI/TCNA A108.4 - Installation of Ceramic Tile with Water Resistant Organic Adhesive.
- B. ANSI/TCNA A108.5 - Ceramic Tile Installed with Dry-Set Portland Cement Mortar or Latex Portland Cement Mortar.
- C. ANSI/TCNA A118.4 - Latex-Portland Cement Mortar.
- D. ANSI/TCNA A136.1 - Organic Adhesives for Installation of Ceramic Tile, Type 1 and Type 2.
- E. ANSI/TCNA A137.1 - Specifications for Ceramic Tile.
- F. ANSI/TCNA A108.1B - Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set Portland Cement Mortar or Latex Portland Cement Mortar.
- G. ANSI A108.10 - Installation of Grout in Tilework.
- H. ANSI 118.6 - Ceramic Tile Grouts.
- I. ANSI 108.5 - Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex Portland Cement Mortar.
- J. TCNA (Tile Council of America) - Handbook for Ceramic Tile Installation.

1.5 SUBMITTALS

- A. Shop Drawings and Product Data:
 - 1. Submit shop drawings indicating tile layout, perimeter conditions, junctions with dissimilar materials, and setting details.
 - 2. Submit product data indicating material specifications, characteristics, and instructions for using adhesives and grouts.
 - 3. Submit manufacturer's standard printed installation instructions.
 - 4. Submit maintenance data including recommended cleaning and stain removal methods, cleaning materials, and polishes and waxes.
- B. Samples:
 - 1. Provide a minimum of one square foot to indicate pattern and color variations.
- C. Certificates:
 - 1. Submit manufacturer's certificate that products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 - 1. Company specializing in the manufacture of products specified in this Section with minimum 5 years experience.
 - 2. Conform to ANSI/TCA A137.1
- B. Installer Qualifications:
 - 1. Conform to TCNA Handbook for Ceramic Tile Installation.
 - 2. Installer: Company specializing in applying the work of this Section with minimum 5 years documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Do not install adhesives in a closed, unventilated environment.
- B. Maintain 50 degrees F. during installation of mortar materials.

PART 2 - PRODUCTS

2.1 MATERIAL

- A. Tile – Dal-Tile
 - 1. CT-1 (Accent Tile) Vermillion, (ODM1), 3"x6" Field Tile from the "Semi-Gloss" series.
 - 2. CT-2 (Field Tile 1) Desert Gray, (X714), 3"x6" Field Tile from the "Matte" series.
 - 3. CT-3 (Field Tile 2) Graphite, (QF08), 3"x6" Field Tile from the "Festiva" series.
 - 4. Ceramic Wall and Ceiling Tile: ANSI/TCNA A137.1, conforming to the following:
 - a. Moisture Absorption: 0.5 to 3.0 percent.
 - b. Size: 4 1/4 x 4 1/4 x 5/16 inch.
 - c. Edge: Cushioned.
 - d. Surface Finish: Matte glazed.
 - e. Color: As selected by Architect from manufacturer's standard.

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5. Base at walls scheduled to receive tile: Match wall tile for moisture absorption, surface finish, size and color; coved bottom and external corner; square top edge; field butted, square internal corners.
 6. Base at walls not scheduled to receive tile: Match wall tile (4-1/4 x 4-1/4 x 5/16 inch) for moisture absorption, surface finish; coved bottom and external corners; bull nose top edge; field butted, square internal corners.
 7. Trim Shapes: Surface caps, corners and miscellaneous pieces to match adjacent tile surface.
- B. Adhesive
1. Organic Adhesive: ANSI/TCNA A136.1, Type 1; thinset bond type.
- C. Thinset Mortar
1. ANSI/TCNA A118.4; Portland cement, sand, latex additive, and water.
- D. Grout
1. Grout: Pre-mixed cementitious type with latex additive; ANSI 118.6.
 2. Colors
 - a. Floor Tile: Manufacturer's standard dark grey.
 - b. Walls Tile: Selected from Manufacturer's full range of colors.
- E. Mortar Bed
1. Portland Cement: ASTM C150 Type I.
 2. Sand: ASTM C-144.
 3. Water: Potable.
- F. Accessories
1. Thresholds: Marble, gray color, honed finish, 2 inches deep x full width of opening beveled with eased edges; leading edges to project no more than 1/8 inch vertically above adjoining floor surface, total rise not to exceed 1/2 inch; bevel edges at 1 vertical: 2 horizontal.
 2. Shower Pan
 - a. Thickness: 30 mils.
 - b. Fungus, mildew and mold resistant PVC membrane flashing.
 - c. Install per TCNA B415; extend up wall a min. 6" behind cementitious backer board.
 - d. Apply butyl caulk at perimeter of drain and membrane without clogging weep holes.
 - e. Acceptable product:
 - 1) Composeal; Compotite Corp, Los Angeles, CA (800) 221-1056.
- G. Cementitious Backing Board:
1. Install full height at all walls and ceiling. High density, glass fiber reinforced.
 2. Thickness: 1/2 inches.
 3. Accessories: 2 inch wide coated glass fiber tape for joints and corners.

2.2 MIXES

- A. Mortar Bed
1. Mix 1 part Portland Cement to 6 parts damp sand by volume.
 2. Add minimum amount of water to produce workable consistency.
- B. Thinset and Grout
1. Mix and proportion pre-mix bond coat and grout materials in accordance with manufacturer's instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are ready to receive work.
- B. Beginning of installation means installer accepts condition of existing substrate.

3.2 PREPARATION

- A. Protect surrounding work from damage or disfiguration.
- B. Vacuum clean existing substrate and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
- D. Apply conditioner to surfaces as recommended by adhesive manufacturer.

3.3 INSTALLATION

- A. General
 - 1. Install adhesive, tile, and grout in accordance with manufacturer's instructions.
 - 2. Lay floor tile in grid running bond pattern centered in both directions in each space or on each wall area.
 - 3. Lay wall tile in grid pattern centered in both directions in each space or on each wall area.
 - 4. Do not interrupt tile pattern through openings.
 - 5. Place edge strips at exposed tile edges in floors.
 - 6. Cut and fit tile tight to penetrations through tile.
 - 7. Form corners and bases neatly.
 - 8. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.
 - 9. Keep control joints free of adhesive or grout. Apply sealant to joints.
 - 10. Allow tile to set for a minimum of 48 hours prior to grouting
 - 11. Grout tile joints and damp cure for minimum of 72 hours after installation.
 - 12. Apply sealant to junction of tile and dissimilar materials, inside wall corners and at junction of dissimilar planes.
- B. Mortar Bed
 - 1. Apply mortar bed to thickness as indicated on the drawings. Slope to floor drains maximum of 1/8 inch per foot.
 - 2. Use mortar within 2 1/2 hours of initial mixing.
 - 3. Do not use mortar after it has begun to set.
- C. Floor Tile
 - 1. Install in accordance with ANSI A108.1B, ANSI A108.10, and TCNA Handbook number F112 over mortar bed when scheduled as "Mud Bed".
 - 2. Install in accordance with ANSI A108.5, ANSI A108.10 and TCNA Handbook number F113 when scheduled as "Thin Set".
 - 3. Install marble thresholds at door locations and where indicated on drawings.
- D. Wall and Ceiling Tile
 - 1. Over masonry walls and tile backer board, install in accordance with ANSI 108-5 and TCNA Handbook number W202.
 - 2. Over gypsum wallboard, install in accordance with ANSI 108-4 and TCNA Handbook number W242.

3.4 FIELD QUALITY CONTROL

- A. Sound tile after setting.
- B. Replace hollow sounding units.

3.5 ADJUSTING AND CLEANING

- A. Wash tile thoroughly to remove all residue.
- B. Use of acid in cleaning solutions is prohibited.
- C. Replace all broken chipped or otherwise damaged tile.

3.6 PROTECTION

- A. Do not permit traffic over finished floor surface for minimum of seven days after installation.

END OF SECTION

SECTION 09510

ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 - General Requirements apply to Work of this Section.

1.2 SECTION INCLUDES

- A. Suspended metal grid ceiling system.
- B. Acoustical panels.
- C. Non-fire rated assemblies.
- D. Perimeter trim.

1.3 RELATED SECTIONS

- A. Section 07210 - Building Insulation: Sound attenuation batts over acoustical ceilings.
- B. Division 15 - Air Outlets and Inlets: Air diffusion devices in ceiling system.
- C. Division 16 - Interior Luminaires: Light fixtures in ceiling system.

1.4 REFERENCES

- A. ASTM E 84-87 Test Method for Surface Burning Characteristics of Building Materials.
- B. ASTM E 90-87 Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
- C. ASTM E 119-83 Fire Tests of Building Construction and Materials.
- D. ASTM E 413-87 Determination of Sound Transmission Class.
- E. ASTM C635 - Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
- F. ASTM C636 - Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
- G. ASTM E 1264 Standard Classification for Acoustical Ceiling Products

1.5 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacture of ceiling suspension system and ceiling panels with five years minimum experience.
- B. Installer: Company with three years minimum documented experience.

1.6 REGULATORY REQUIREMENTS

- A. Conform to UBC-1991 for combustibility requirements for materials.
- B. Provide acoustical panels with the following surface burning characteristics as determined by testing identical products per ASTM E 84:
 - 1. Flame Spread: Class II, 26-75.
 - 2. Smoke Developed: 450 or less.
- C. Identify acoustical panels with appropriate markings of applicable testing and inspecting organization.

1.7 SUBMITTALS

- A. Product Data
 - 1. Provide product data on metal grid system components, acoustic units, and accessories.
 - 2. Submit manufacturer's standard printed installation instructions.
- B. Samples
 - 1. Submit one sample, 12 x 12 inch in size, illustrating material and finish of each acoustic unit.
 - 2. Submit one sample each, 12 inches long, of suspension system main runner, cross runner, and edge trim.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver acoustical units to project site in original unopened packages.
- B. Store materials in enclosed space protected against damage from moisture, direct sunlight and surface contamination.
- C. Handle acoustic units carefully to avoid chipping edges or surface finish.

1.9 PROJECT CONDITIONS

- A. Maintain uniform temperature of minimum 60 degrees F., and humidity of 20 to 40 percent prior to, during, and after installation.

1.10 SEQUENCING/SCHEDULING

- A. Do not install acoustical ceilings until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Schedule installation of acoustic units after interior wet work is dry.

1.11 EXTRA MATERIALS

- A. Provide 1 box of each type acoustical ceiling unit specified to Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Suspension Systems
 - 1. Grid - Type I units
 - a. Conformance: ASTM C635, intermediate duty, non-fire rated as required for ceiling tile scheduled.
 - b. Type: Exposed T.
 - c. Finish: Factory applied white baked enamel.
 - d. Materials: Commercial quality cold rolled steel with galvanized coating.
 - e. Acceptable Product: Donn Fineline DXF/DXLF
 - 2. Accessories:
 - a. Stabilizer bars, clips, splices, edge moldings, pop rivets and hold down clips as required for suspended grid system.
 - b. Fabricate edge moldings for circular penetrations to diameter required to fit penetration exactly.
 - c. Finish: Exposed accessory items to match exposed grid finish.
- B. Support Channels and Hangers: Galvanized; size and type to suit application, to rigidly secure acoustic ceiling system including integral mechanical and electrical components with maximum deflection of 1/360.
- C. Acoustic Units
 - 1. Conformance: ASTM E1264.
 - 2. Loading: Units capable of supporting 3/4 pounds per sq/ ft. with no visible sagging.
 - 3. Finish: Manufacturer's standard factory applied white vinyl acrylic latex paint unless otherwise specified.
 - 4. Type I
 - a. Size: 24 x 24 inches.
 - b. Thickness: 3/4 inches.
 - c. Type: III
 - d. Form: 2
 - e. Light Reflectance: Minimum 72 percent.
 - f. NRC Range: .7
 - g. CAC Range: Minimum 35.
 - h. Fire Hazard Classification: None.
 - i. Edge Detail: Flat.
 - j. Surface Color: White.
 - k. Pattern: D
 - l. Acceptable Product: Bria Clima Plus.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that existing conditions are ready to receive work.
- B. Verify that layout of hangers will not interfere with other work.
- C. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION

A. Suspension System

1. Install system in accordance with ASTM C636, manufacturer's instructions and as supplemented in this Section.
2. Install system capable of supporting imposed loads to a deflection of 1/360 maximum.
3. Install after major above ceiling work is complete.
4. Coordinate the location of hangers with other work.
5. Hang system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
6. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
7. Center system on room axis leaving equal border units no less than 50 percent of acoustical unit dimension perpendicular to wall, in accordance with reflected ceiling plan.
8. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
9. Support fixture loads by supplementary hangers located within 6 inches of each corner; or support components independently.
10. Do not eccentrically load system, or produce rotation of runners.
11. Install edge molding at intersection of ceiling and vertical surfaces, using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions. Mechanically attach edge moldings to wall substrate with screws.
12. Use pop rivets only at locations where formed anchoring system is not provided.

B. Acoustic Units

1. Fit in place, free from damaged edges or other defects detrimental to appearance and function.
2. Lay units one way with pattern parallel to shortest room axis.
3. Fit border neatly against abutting surfaces.
4. Install level, in uniform plane, and free from twist, warp and dents.

C. Accessories

1. Install hold-down clips to retain panels tight to grid system within 10 ft of all exterior doors.

3.3 TOLERANCES

- A. Variation from Flat and Level Surface: 1/8 inch in 10 ft.
- B. Maximum variation from Plumb of Grid Members Caused by Eccentric Loads: Two degrees maximum.

END OF SECTION

SECTION 09650

RESILIENT FLOORING AND BASE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 - General Requirements apply to Work of this Section.

1.2 SECTION INCLUDES

- A. Resilient base.

1.3 RELATED SECTIONS

- A. Section 04200 – Concrete Unit Masonry: Wall substrate to receive base.
- B. Section 09250 - Gypsum Board: Wall materials to receive base.

1.4 REFERENCES

- A. ASTM D2047 - Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine
- B. ASTM E84 - Surface Burning Characteristics of Building Materials.
- C. FS L-F-475 Floor Covering Vinyl, Surface (Tile and Roll), with Backing.
- D. FS SS-T-312 - Tile, Floor: Asphalt, Rubber, Vinyl, Vinyl Composition.
- E. FS SS-W-40 - Wall Base: Rubber and Vinyl Plastic.
- F. Rubber Manufacturers Association - Moisture Emission Test Unit
- G. ASTM F1303 - Standard Specification for Sheet Vinyl Floor Covering with Backing.
- H. FS RR-T-650 - Treads, Metallic and Non-metallic, Skid Resistant.

1.5 REGULATORY REQUIREMENTS

- A. Conform to SBC and NFPA 101 for flame/smoke rating requirements of 26-75/0-450 in accordance with ASTM E84.

1.6 SUBMITTALS

- A. Shop Drawings and Product Data
 - 1. Provide product data on specified products, describing physical and performance characteristics, sizes, patterns and colors available.
 - 2. Submit manufacturer's standard printed installation instructions.
 - 3. Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
 - 4. Submit cleaning and maintenance data.
- B. Submittals
 - 1. Submit samples illustrating color and pattern for each floor material specified.
 - 2. Submit samples for each base and stair material.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Store materials for three days prior to installation in area of installation to achieve temperature stability.
- B. Maintain ambient temperature required by adhesive manufacturer three days prior to, during, and 24 hours after installation of materials.

1.8 EXTRA MATERIALS

- A. Section 01700 – Execution Requirements.
- B. Provide one box of each type and color of floor tile for every 50 boxes installed, or fraction thereof.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Resilient Base
 - 1. Vinyl Plastics, Inc., Sheboygan, WI.
 - 2. Johnson Rubber Company, Middlefield, OH.
 - 3. Armstrong World Industries, Inc., Lancaster, PA.
 - 4. Mercer Products Co., Inc., Orlando, FL.
 - 5. R.C. Musson Rubber Co., Akron, OH.
 - 6. Roppe Rubber Corp., Fostoria, OH.
- B. Accessories: As recommended by flooring manufacturer.
- C. Substitutions: Under provisions of Section 01600.

2.2 MATERIALS

- A. Base: FS SS-W-40, Type I rubber or Type 2 vinyl; Style B; 4 inch high; 1/8 inch thick; colors as selected by Architect.
- B. Accessories
 - 1. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.
 - 2. Primers and Adhesives: Water resistant; premium quality clear; types recommended by flooring manufacturer.
 - 3. Edge Strips: To match flooring material.
- C. Vinyl Welding Rod: Solid vinyl bead produced by manufacturer of vinyl flooring for heat welding seams, in color matching field color.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are smooth and flat with maximum variation of 1/8 inch in 10 ft, and are ready to receive Work.

-
- B. Moisture Emission Test
 - 1. Prior to installation of any resilient flooring, conduct quantitative moisture emissions tests in accordance with Rubber Manufacturers Association Guidelines.
 - 2. Maximum Allowable Moisture Content: 3 lbs. per 1000 sq. ft. per 24 hours.
 - 3. Test Quantities: Minimum of 4 tests for areas up to 5,000 sq. ft. and one additional test for each additional 5,000 sq. ft. of floor area.
 - 4. Allow areas of floor containing more than the allowable moisture content to dry a minimum of 48 hours before retesting.
 - C. Verify concrete floors exhibit negative alkalinity, carbonization, or dusting.
 - D. After concrete floor surfaces have been cleaned, small patches of adhesive to be used shall be spread in several locations in each room and allowed to dry overnight.
 - E. If the adhesive can be peeled easily from the floor surfaces, the floor is not sufficiently dry.
 - F. When tests show that the adhesive adheres tightly to the floor surface, the resilient flooring shall be applied.
 - G. If concrete floors are in contact with the ground or over unventilated crawl spaces, small patches of primer shall be used in lieu of adhesive to test for moisture.
 - H. Beginning of installation means acceptance of existing substrate and site conditions.

3.2 PREPARATION

- A. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.
- B. Apply, trowel, and float filler to leave a smooth, flat, hard surface.
- C. Prohibit traffic from area until filler is cured.
- D. Vacuum clean substrate.
- E. Apply primer as recommended by adhesive manufacturer for substrate scheduled.

3.3 INSTALLATION

- A. Base Materials
 - 1. Fit joints tight and vertical. Maintain minimum measurement of 18 inches between joints.
 - 2. Miter cut internal and external corners.
 - 3. Install base on solid backing. Bond tight to wall and floor surfaces.
 - 4. Scribe and fit to door frames and other interruptions.
- B. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.
- C. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated. Secure resilient strips by adhesive.
- D. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.4 PROTECTION

- A. Prohibit traffic on floor finish for 48 hours after installation.

3.5 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.

END OF SECTION

SECTION 09900

PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 - General Requirements apply to Work of this Section.

1.2 SECTION INCLUDES

- A. Surface preparation.
- B. Surface finish schedule.

1.3 SUMMARY

- A. This Section includes surface preparation, painting, and finishing of exposed interior and exterior items and surfaces.
 - 1. Surface preparation, priming, and finish coats specified in this section are in addition to shop priming and surface treatment specified under other sections.
- B. Paint exposed surfaces whether or not colors are designated in "schedules," except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.
- C. Painting is not required on prefinished items, finished metal surfaces, concealed surfaces, operating parts, and labels.
 - 1. Operating parts not to be painted include moving parts of operating equipment such as the following:
 - a. Valve and damper operators.
 - b. Linkages.
 - c. Sensing devices.
 - d. Motor and fan shafts.
 - 2. Labels: Do not paint over Underwriter's Laboratories, Factory Mutual or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

1.4 RELATED SECTIONS

- A. Section 02521 - Concrete Curbs, Gutters and Sidewalks: Pavement markings.
- B. Division 15 - Mechanical: Color schedule for equipment and piping.
- C. Division 16 - Electrical: Color schedule for equipment and piping.

1.5 REFERENCES

- A. ANSI/ASTM D16 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.
- B. ASTM D2016 - Test Method for Moisture Content of Wood.
- C. SSPC - SP1 - Solvent Cleaning.
- D. SSPC - SP2 - Hand Tool Cleaning.

1.6 DEFINITIONS

- A. Conform to ANSI/ASTM D16 for interpretation of terms used in this Section.

1.7 QUALITY ASSURANCE

- A. Product Manufacturer: Company specializing in manufacturing quality paint and finish products with five years experience.
- B. Applicator: Company specializing in commercial painting and finishing with five years documented experience.
- C. Regulatory Requirements: Conform to SBCCI-94 for Class II flame spread/smoke development rating requirements for finishes of 26-75/0-450.
- D. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.
- E. Coordination of Work: Review other sections in which primers are provided to ensure compatibility of the total systems for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
 - 1. Notify the Architect of problems anticipated using the materials specified.
- F. Field Samples: On wall surfaces and other exterior and interior components, duplicate finishes of prepared samples. Provide full- coat finish samples on at least 100 sq. ft. of surface until required sheen, color and texture are obtained; simulate finished lighting conditions for review of in-place work.
 - 1. Final acceptance of colors will be from job-applied samples.
 - 2. The Architect will select one room or surface to represent surfaces and conditions for each type of coating and substrate to be painted. Apply coatings in this room or surface in accordance with the schedule or as specified. After finishes are accepted, this room or surface will be used for evaluation of coating systems of a similar nature.
- G. Material Quality: Provide the manufacturer's best quality trade paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.
 - 1. Proprietary names used to designate colors or materials are not intended to imply that products named are required or to exclude equal products of other manufacturers.
 - 2. Federal Specifications establish a minimum quality level for paint materials, except where other product identification is used. Provide written certification from the manufacturer that materials provided meet or exceed these criteria.
 - 3. Products that comply with qualitative requirements of applicable Federal Specifications, yet differ in quantitative requirements, may be considered for use when acceptable to the Architect. Furnish material data and manufacturer's certificate of performance to Architect for proposed substitutions.

1.8 SUBMITTALS

- A. Shop Drawings and Product Data
 - 1. Provide product data on all finishing products.
 - 2. Submit manufacturer's standard printed application instructions.
- B. Certificates
 - 1. Submit paint manufacturer's certificate(s) stating the following:
 - a. Paints for interior use contain no mercurial mildewcide.
 - b. Paints for interior use contain no insecticide.
 - c. Paints for interior use contain no more than 0.06 percent lead.
 - d. Paints proposed for use meet the VOC regulations of the local Air pollution District having jurisdiction over the geographical area in which the project is located.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01600.
- B. Deliver products to site in sealed and labeled containers; inspect to verify acceptance.
- C. Container labeling to include manufacturer's name, type of paint, brand name, brand code, coverage, surface preparation, drying time, cleanup, color designation, and instructions for mixing and reducing.
- D. Store paint materials at minimum ambient temperature of 45 degrees F. and a maximum of 90 degrees F., in well ventilated area, unless required otherwise by manufacturer's instructions.
- E. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures above 45 degrees F. for 24 hours before, during, and 48 hours after application of finishes, unless required otherwise by manufacturer's instructions.
- B. Do not apply exterior coatings during rain or snow, or when relative humidity is above 50 percent, unless required otherwise by manufacturer's instructions.
- C. Minimum Application Temperatures for Latex Paints: 45 degrees F. for interiors; 50 degrees F. for exterior; unless required otherwise by manufacturer's instructions.
- D. Minimum Application Temperature for Varnish and Synthetic Finishes: 65 degrees F. for interior or exterior, unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

1.11 EXTRA STOCK

- A. Provide a one gallon container of each color to Owner at location designated.
- B. Label each container with color and room locations, in addition to the manufacturer's label.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Glidden Coatings and Resins Co., Cleveland, OH.
- B. Kelly-Moore Paint Co., Inc., San Carlos, CA.
- C. PPG Industries, Inc., Pittsburgh, PA.
- D. The Sherwin Williams Co.
- E. Substitutions: In accordance with Section 01600.

2.2 MATERIALS

- A. Coatings
 - 1. Ready mixed, except field catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.
 - 2. Good flow and brushing properties; capable of drying or curing free of streaks or sags.
 - 3. Compatible with existing coatings in renovation areas.
- B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve finishes specified, of commercial quality.

2.3 FINISHES

- A. Refer to schedule at end of Section for surface finish schedule.
- B. The schedule is based on the products of the Sherwin-Williams Company and Polomylx as follows:

	<u>No.</u>	<u>Product Name</u>	<u>Type</u>
1.	B50 series	Kem Kromik Metal Primer	Alkyd
2.	Y24W20	A-100 Exterior Alkyd Primer	Alkyd
3.	B54 series	Industrial Enamel	Alkyd-Gloss
4.	A8 series	A-100 Exterior Latex	Acrylic-Gloss
5.	B50W3	Galvite Primer	Solvent-Acrylic
6.	B25W25	Preprite Block Filler	Latex
7.	B28W601	Preprite Hi-Build Primer/Surfacer	Latex
8.	A67 series	WoodClassics Polyurethan Varnish	Polyurethane-Satin
9.	B69B50	Coal Tar Epoxy C-200	Coal Tar
10.	B26V43	Wood Classics Sanding Sealer	Vinyl Toluene
11.	B42W41	A-100 Exterior Latex Primer	Acrylic Latex
12.	A6 series	A-100 Exterior Latex	Acrylic Latex
13.	B70 series	Water-Based Catalyzed Epoxy	Acrylic Epoxy
14.	B51W50	Preprite Anchor Bond Adhesive Primer	Acrylic
15.	B42W46	Heavy Duty Block Filler	Acrylic
16.	B51W20	Preprite Probloc Latex Primer	Acrylic Latex
17.	B34W200	Promar 200 Alkyd Semi-Gloss	Alkyd
18.	B30W200	Promar 200 Interior Latex Flat	Acrylic Latex

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- | | | | |
|-----|--------|-------------------------------|-------------------|
| 19. | B49W2 | Preprite Wall and Wood Primer | Alkyd |
| 20. | 4000 | Polomylx | Modified Acrylate |
| | | | Copolymer |
| 21. | B31WJ2 | Incredicoat | Acrylic Enamel |
- C. Dry mill film thickness (DMFT) indicated is minimum acceptable.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that surfaces are ready to receive work as instructed by product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below following maximums:
 - 1. Plaster: 12 percent.
 - 2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
 - 3. Interior Located Wood: 15 percent, measured in accordance with ASTM D2016.
 - 4. Exterior Located Wood: 12 percent, measured in accordance with ASTM D2016.
- D. Beginning of installation means acceptance of existing surfaces.

3.2 PREPARATION

- A. Remove electrical plates, hardware, light fixture trim, and fittings prior to preparing surfaces or finishing.
- B. Correct minor defects and clean surfaces which affect work of this Section.
- C. Shellac and seal marks which may bleed through surface finishes.
- D. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- E. Asphalt, Creosote, or Bituminous Surfaces Scheduled for Paint Finish: Remove foreign particles to permit adhesion of finishing materials. Apply latex based compatible sealer or primer.
- F. Insulated Coverings: Remove dirt, grease, and oil from canvas and cotton.
- G. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
- H. Concrete and Unit Masonry Surfaces Scheduled to Receive Paint Finish: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
- I. Plaster Surfaces: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.
- J. Uncoated Steel and Iron Surfaces: Remove grease, scale, dirt, and rust. Where heavy coatings of scale are evident, remove by wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.
- K. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.

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- L. Interior Wood Items Scheduled to Receive Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats.
 - M. Exterior Wood Scheduled to Receive Paint Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior caulking compound after prime coat has been applied.
 - N. Wood and Metal Doors Scheduled for Painting: Seal top and bottom edges with primer.
 - O. Previously Painted Surfaces
 - 1. Thoroughly clean of all grease, dirt, dust or other foreign matter.
 - 2. Remove blistering, cracking, flaking, peeling or other deteriorated coating.
 - 3. Roughen slick/glossy surfaces.
 - 4. Repair damaged areas such as but not limited to nail holes, cracks, chips and spalls with suitable materials to match adjacent areas.
 - 5. Feather edges of chipped paint and sand smooth.
 - 6. Prepare surfaces using methods SP 1 or SP 2.
 - P. Existing Glazed Structural Clay Tile: Scuff and sand faces of tile without leaving abrasion marks; remove foreign matter; remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry.

3.3 PROTECTION

- A. Protect elements surrounding the work of this Section from damage or disfiguration.
- B. Repair damage to other surfaces caused by work of this Section.
- C. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.
- D. Remove empty paint containers from site.

3.4 APPLICATION

- A. Paint, Stain and Varnish
 - 1. Apply products in accordance with manufacturer's instructions.
 - 2. Do not apply finishes to surfaces that are not dry.
 - 3. Apply each coat to uniform finish.
 - 4. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
 - 5. Sand lightly between coats to achieve required finish.
 - 6. Allow applied coat to dry before next coat is applied.
 - 7. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
 - 8. Prime back surfaces of interior and exterior woodwork with primer paint.
 - 9. Prime back surfaces of interior woodwork scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with mineral spirits.

3.5 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Refer to Division 15 and 16 for schedule of color coding and identification banding of equipment, ductwork, piping, and conduit.
- B. Paint shop primed equipment.
- C. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

- D. In finished spaces, (not mechanical or electrical rooms) prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, except where items are prefinished.
- E. Replace identification markings on mechanical or electrical equipment when painted accidentally.
- F. Where grilles, registers, louvers, panel covers or other prefinished mechanical and electrical equipment occurs in a painted surface, paint said items to match adjacent color as selected by Architect.
- G. Paint interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint, to limit of sight line. Paint dampers exposed behind louvers and grilles to match face panels.
- H. Paint exposed conduit and electrical equipment occurring in finished areas (not mechanical or electrical rooms).
- I. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.
- J. Replace electrical plates, hardware, light fixture trim, and fittings removed prior to finishing.

3.6 CLEANING

- A. As Work proceeds, promptly remove paint where spilled, splashed, or spattered.
- B. During progress of Work maintain premises free of unnecessary accumulation of tools, equipment, surplus materials, and debris.
- C. Collect cotton waste, cloths, and material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

3.7 SCHEDULE

A. Exterior Surfaces

<u>Surface</u>	<u>1st Coat (DMFT)</u>	<u>2nd Coat (DMFT)</u>	<u>3rd Coat (DMF)</u>
Ferrous Metals Columns Exposed Lintels Misc. Metal Doors and Frames Equipment	B50 series (2.5)	B54 series (2.0)	B54 series (2.0)
Plaster	B42W41 (1.4)	A6 series (1.3)	A6 series (1.3)
Galvanized Metals	B50W3 (3.0)	B54 series (2.0)	B54 series (2.0)
Misc. Wood	Y24W20 (2.3)	A8 series (1.3)	A8 series (1.3)
Metal Protection Dissimilar Metals; Metal to Concrete/Mortar	B69B50 (8.0)	B69B50 (8.0)	

B. Interior Surfaces

Masonry (Polomyx) Concrete Masonry	B42W46 (10.0)	4000 (2.5)	4000 (2.5)
Masonry (Enamel) Concrete Masonry Brick	B25W25 (8.0)	B34W200 (1.7)	B34W2000 (1.7)
Masonry (Acrylic Enamel) Restrooms	B25W25 (8.0)	B31WJ2 (1.2)	B31WJ2 (1.2)
Masonry (Epoxy) Concrete Masonry Brick	B42W46 (10.0)	B70 series (2.5)	B70 series (2.5)
Glazed Clay Tile	B51W50 (1.7)	B70 series (2.5)	B70 series (2.5)
Ferrous Metals Doors and Frames Railings Equipment	B50 series (2.5)	B34W200 (1.7)	B34W200 (1.7)
Galvanized Metal Ducts Piping Vents	B50W3 (3.0)	B34W200 (1.7)	B34W200 (1.7)
Gypsum Drywall (Enamel) Walls	5019 (1.1)	1516 (1.5)	1516 (1.5)
Gypsum Drywall (Acrylic Enamel) Walls	B28W601 (1.0)	B31WJ2 (1.2)	B31WJ2 (1.2)
Wood Drawer & Cabinets Interior Transp. Finish.	A67 series (1.7)	A67 series (1.7)	A67 series (1.7)
Cabinets, Ext. & Interiors Opaque Finish.	B49W2 (2.2)	B34W200 (1.7)	B34W200 (1.7)

C. Colors

1. Colors shall be selected by Architect.

END OF SECTION

SECTION 10170

SOLID COLOR REINFORCED COMPOSITE TOILET PARTITIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Solid color reinforced composite toilet compartments and urinal screens.

1.3 RELATED SECTIONS

- A. Section 06114 – Wood Blocking and Curbing.
- B. Section 09250 – Gypsum Board Systems.
- C. Section 10800 - Toilet and Bath Accessories.

1.4 REFERENCES

- A. ASTM A666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- B. ASTM B221 - Aluminum Alloy Extruded Bar, Rod, Shape and Tube.
- C. 36 CFR 1191 - Accessibility Guidelines for Buildings and Facilities.

1.5 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall and floor supports, and door swings.
- C. Product Data: Submit data on panel construction, hardware, and accessories.
- D. Samples: Submit one illustrating panel finish, color, and sheen.
- E. Manufacturer's Installation Instructions: Submit special procedures and perimeter conditions requiring special attention.

1.6 COORDINATION

- A. Section 01300 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate the Work with placement of support framing and anchors in wall.

1.7 WARRANTY

- A. Provide manufacturer's 10 year warranty against breakage, corrosion, delamination and defects in workmanship.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Bobrick Washroom Equipment; Sierra Serves.
- B. Wilsonart; Gibraltar.
- C. Gerali; Custom Design; Privacy Plus.
- D. Shower Shapes; Ultimate Corian.
- E. Substitutions: In accordance with Section 01600.

2.2 COMPONENTS

- A. Toilet Compartments: Solid color reinforced composite panels, doors, and pilasters, floor-mounted headrail-braced.
 - 1. Color: As selected by Architect from manufacturer's full range of colors.
- B. Door and Panel Dimensions:
 - 1. Thickness: 3/4 inch minimum.
 - 2. Door Width:
 - a. Standard Doors: 24 inch
 - b. Handicap Accessible Doors: 36 inch, out-swinging.
 - 3. Height: 58 inch
 - 4. Thickness of Pilasters: 3/4 inch minimum.
- C. Pilasters
 - 1. Thickness: 3/4 inch minimum.
 - 2. Height: 72 inch.
- D. Urinal Screens:
 - 1. Type: Wall mounted with continuous panel brackets.
 - 2. Size: 24 inches deep x 48 inches high.
 - 3. Solid color reinforced composite material.

2.3 ACCESSORIES

- A. Pilaster Shoe: Formed chromed steel with polished s finish, ASTM A666 Type 304 stainless steel with No. 4 finish, 3 inch high, concealing floor fastenings. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.
- B. Head Rails: Hollow anodized aluminum tube, 1 x 1-5/8 inch size, with anti-grip profiles and cast socket wall brackets.
- C. Brackets: Polished stainless steel.
- D. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.
 - 1. For attaching panels and pilasters to brackets: Through-bolts and nuts; tamper proof.
- E. Hardware: Polished Stainless steel.
 - 1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
 - 2. Nylon bearings.
 - 3. Sliding door latch, requiring less than 5 lb force to operate.
 - 4. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
 - 5. Coat hook with rubber bumper; one per compartment, mounted on door.
 - 6. Provide door pull for outswinging doors.
 - 7. Provide metal heat sink at bottom of doors and partitions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01300 - Administrative Requirements: Coordination and project conditions.
- B. Verify field measurements are as indicated on shop drawings.
- C. Verify correct spacing of and between plumbing fixtures.
- D. Verify correct location of built-in framing, anchorage, and bracing.

3.2 INSTALLATION

- A. Maintain 3/8 to 1/2 inch space between wall and panels and between wall and end pilasters.
- B. Attach panel brackets securely to walls using anchor devices.
- C. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.
- D. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.
- E. Install urinal screens 24" above finished floor to bottom of screen.

3.3 ERECTION TOLERANCES

- A. Section 01400 - Quality Requirements: Tolerances.
- B. Maximum Variation From True Position: 1/4 inch.
- C. Maximum Variation From Plumb: 1/8 inch.

3.4 ADJUSTING

- A. Section 01700 - Execution Requirements: Testing, adjusting, and balancing.
- B. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
- C. Adjust hinges to position doors in partial opening position when unlatched. Return out-swinging doors to closed position.
- D. Adjust adjacent components for consistency of line or plane.

3.5 SCHEDULES

- A. Toilet 109: Three toilet stalls of floor mounted, head rail braced type; one urinal screen.

END OF SECTION

SECTION 10350

FLAGPOLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Location of flagpole is shown on drawings.
- B. Flagpole fittings and accessories.

1.3 RELATED SECTIONS

- A. Section 02301 – Earthwork for Buildings.
- B. Section 03300 - Cast-In-Place Concrete.

1.4 REFERENCES

- A. AA DAF-45 -- Designation System for Aluminum Finishes; Aluminum Association; 1980.
- B. ASTM B 241/B 241M-93 -- Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube; 1993.

1.5 PERFORMANCE REQUIREMENTS

- A. Provide flagpole and anchorage system to comply with the following requirements:
 - 1. Flagpole with flag flying: Resist minimum wind velocity of 90 mph without permanent deformation, when flying appropriately sized flag.
 - 2. Flagpole without flag: Resist minimum wind velocity of 90 mph without permanent deformation.
 - 3. Safety design factor: 2.5.

1.6 SUBMITTALS

- A. Product Data: Submit for each type of flagpole required. Include data for fittings and accessories.
- B. Shop Drawings: Submit shop drawings bearing the stamp of a professional structural engineer registered in the state in which the project is located. Include the following:
 - 1. Configuration of flagpoles and bases.
 - 2. Details showing jointing, anchorage, and support systems.
 - 3. Substantiation of compliance with performance requirements indicated in contract documents.
 - 4. Flagpole finishes, fittings, and accessories.

1.7 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Firm regularly engaged in manufacture of products specified in this section, and whose products have been in satisfactory use under similar service conditions for not less than 5 years.
- B. Installer's Qualifications: Firm regularly engaged in installation of products specified in this section, with a minimum of 5 years of experience.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Execute product manufacturer's special instructions to prevent damage to products.
- B. Provide suitable protection for each flagpole before shipment. Spiral-wrap pole with heavy kraft paper or polyethylene material and place pole in hard protective tube.
- C. Deliver flagpoles and accessories properly labeled and in original wrappings.
- D. Store and handle materials in a manner which will prevent damage prior to installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products of the following manufacturers, provided they comply with requirements of the contract documents, will be among those considered acceptable:
 - 1. Aabec Pole Division/Morgan-Francis Company, Inc.
 - 2. Acme Flagpole Division/Lingo, Inc.
 - 3. American Flagpole Division/Kearney-National, Inc.
 - 4. Baartol Company, Inc.
 - 5. Concord Industries, Inc.
 - 6. EMC Division/Eder Manufacturing Corporation.
 - 7. John Ewing & Company, Inc.

2.2 FLAGPOLES

- A. Description:
 - 1. Mounting: Ground-set, embedded.
 - 2. Type: Conventional.
 - 3. Shaft metal: Aluminum.
 - 4. Shaft form: Cone tapered.
 - 5. Exposed length of flagpole: 25 feet.
 - 6. Halyard: Internal.
 - 7. Flag:
 - a. American flag
 - b. 4 x 6.
 - c. 100 percent nylon.

2.3 FABRICATION

- A. General: Provide each flagpole as a complete unit fabricated by a single manufacturer, including base, anchorage devices, fittings, and accessories as necessary for proper installation.

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- B. Fabricate and ship flagpole as a single unit, unless shipping constraints preclude this alternative. Where flagpole size dictates shipment in more than one section, provide self-aligning internal sleeve composed of metal compatible with shaft metal and properly designed to allow precise, weathertight joining during installation.
 - C. Flagpole Diameter and Wall Thickness: Wall thickness of shaft and ratio of top diameter to butt diameter must be appropriate for metal or alloy used and for length of flagpole.
 - D. Joints and Seams: Form joints and seams which are inconspicuous.
 - 1. Exposed welds: Grind exposed welds smooth. Finish to match flagpole shaft.
 - E. Aluminum Shaft:
 - 1. Seamless extruded tube: Comply with ASTM B 241.
 - 2. Alloy: 6063-T6.
 - 3. Minimum wall thickness: 3/16 inch, unless otherwise indicated.
 - 4. Minimum tensile strength: 30,000 psi.
 - 5. Minimum yield point: 25,000 psi.
 - 6. After flagpole is fabricated, heat-treat and artificially age to alter temper of aluminum.
 - 7. Shaft finish: Clear anodized finish, AA-M32C22A41 (medium satin directional textured mechanical finish; medium matte etched chemical finish; clear, architectural Class I anodic coating minimum 0.7 mil thick).
 - F. Ground-Set Flagpole - Embedded Type:
 - 1. Provide flagpole of sufficient overall length to allow setting depth which is not less than 10 percent of exposed length.
 - 2. Flash collar: Fabricate from same metal used for flagpole shaft.
 - a. Product: Selected by the architect from manufacturer's standards based on availability for shaft size.
 - 3. Foundation sleeve: Corrugated galvanized steel tube, 16 gage.
 - 4. Foundation sleeve plate: Square steel plate welded to bottom of foundation sleeve.
 - a. Minimum edge dimension of square plate: 4 inches larger than inside diameter of foundation sleeve.
 - b. Minimum thickness: 3/16 inch.
 - 5. Steel centering wedges: Minimum 1/8-inch-thick wedges, welded to sleeve plate inside foundation sleeve for the purpose of centering pole.
 - 6. Electrical grounding spike: 3/4-inch steel spike, welded to bottom side of sleeve plate.
 - a. Length of extension below concrete foundation: Not less than thickness of concrete footing below sleeve plate.
 - 7. Foundation support plate: Square steel plate welded to electrical grounding spike at base of concrete foundation.
 - a. Minimum edge dimension of square plate: 6 inches.
 - b. Minimum thickness: 3/16 inch.
 - G. Fittings:
 - 1. Truck:
 - a. Truck designed for internal halyard system.
 - 2. Halyards:
 - a. Internal type:
 - 1) Cable: Stainless steel, with vinyl- or neoprene-covered weight.
 - 2) Winch: Direct drive type, internally mounted, with control stop to hold flag in any position on pole.
 - 3) Winch crank: Removable.
 - 4) Winch access door: Flush-mounted, with cylinder lock.

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- 3. Flag snaps:
 - a. Number required: Four flag snaps per halyard.
 - b. Material: Bronze, manufacturer's standard.
 - c. Sheaths: Provide heavy vinyl or neoprene sheath for each flag snap.

2.4 CONCRETE MATERIALS

- A. Provide materials for concrete flagpole foundations as specified in Division 3, 3,000 psi.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that conditions conform to requirements of contract documents.
- B. Ground-Set Flagpole: Verify that foundation is in suitable condition to receive flagpole.
- C. Do not begin flagpole installation until unsuitable conditions have been corrected. Commencement of installation indicates acceptance of conditions.

3.2 PREPARATION

- A. Embedded Ground-Set Pole:
 - 1. Bituminous coating: Apply protective coating of bituminous paint to section of flagpole which will be installed below grade, if not factory-applied by flagpole manufacturer prior to shipment.

3.3 INSTALLATION

- A. Concrete Flagpole Foundation: Comply with requirements specified in Division 3.
- B. Flagpole Installation - General: Install flagpole, base assembly, and fittings as indicated in contract documents and in accordance with manufacturer's instructions.
- C. Install flagpole in erect, plumbed position.
- D. Embedded Ground-Set Pole: Erect flagpole in foundation sleeve and plumb as necessary using hardwood wedges. Pour dry sand into foundation sleeve in successive layers, each layer 6 inches thick. Tamp each layer before adding next layer. When last sand layer is placed, provide moisture seal over sand by applying sealant of proper thickness. Comply with sealant requirements specified in Division 7.
- E. Electrical Grounding: Provide positive lightning ground suitable for flagpole and installation conditions.
- F. Field Joints: Provide snug-fitting, weathertight, hairline joints.
 - 1. Field welding of aluminum flagpole is not acceptable.
- G. Tolerances:
 - 1. Maximum variation from plumb position (90 degrees from horizontal plane): 1 inch.

3.4 ADJUSTING AND CLEANING

- A. Clean surfaces.
- B. Verify smooth and proper operation of all installed fittings. Adjust as necessary.

END OF SECTION

SECTION 10505
METAL LOCKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Wall mounted heavy duty metal lockers.

1.3 WORK NOT INCLUDED

- A. Padlocks: Provided by the owner.

1.4 DEFINITIONS

- A. Heavy Duty: This term is used to designate a particular type of locker specified in this section, regardless of individual manufacturer designations.

1.5 SUBMITTALS

- A. Product Data: Manufacturer's data and installation instructions.
- B. Shop Drawings: Show layouts, dimensions, trim, fillers, and accessories.
 - 1. Indicate installation and anchoring methods.
 - 2. Show verified field measurements.
 - 3. Show locker numbering scheme.
- C. Samples for Color Selection: Locker manufacturer's full range of colors.

1.6 PROJECT CONDITIONS

- A. Fit lockers neatly to actual construction; take field measurements before fabrication.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver lockers until spaces to receive lockers are clean and dry.
- B. Protect lockers from damage.

PART 2 - PRODUCTS

2.1 LOCKER CONFIGURATIONS AND COMPONENTS

A. Lockers:

1. Location: Apparatus Bay
2. Fully welded construction.
3. Heavy duty.
4. Single-tier.
5. Height: 72 inches.
6. Width: 18 inches.
7. Depth: 24 inches.
8. Doors: Expanded metal mesh.
9. Sides, bottoms and vertical dividers: Expanded metal mesh.
10. Shelves: Expanded metal mesh.
11. Top: Flat.
12. Door handles.
13. Shelf.
14. Two wall hooks.
15. Wall mounting brackets as required by locker manufacturer.

2.2 HEAVY DUTY LOCKERS

A. Provide all heavy duty lockers and accessories by one manufacturer.

1. Manufacturers: Products of the following manufacturers, provided they comply with requirements of the contract documents, will be among those considered acceptable:
 - a. American Locker Security Systems, Inc.
 - b. Art Metal Products Division/Fort Knox Storage.
 - c. List Industries Inc.
 - d. Penco products, Inc.
 - e. Republic Storage Systems Co., Inc.

B. Components:

1. Frames: 16 gage steel sheet channels or 13 gage steel angles, minimum.
2. Tops: 16 gage steel sheet, minimum.
3. Bottoms: 13 gage, 3/4 inch, flattened diamond steel mesh.
4. Horizontal dividers: 16 gage steel sheet, minimum.
5. Expanded metal sides and vertical dividers: 13 gage, 3/4-inch, flattened diamond steel mesh.
6. Backs: 13 gage, 3/4-inch, flattened diamond steel mesh.
7. Expanded metal doors: 13 gage, 3/4-inch flattened diamond steel mesh.
8. Door handles: Standard type.
9. Latching mechanism: Concealed in door, designed so that door can be closed while locked, with spring-loaded latches engaging beveled strikes on frame.
 - a. Doors over 36 inches high: Three-point latching, minimum.

C. Miscellaneous Components and Trim: 18 gage steel sheet, minimum.

D. Fabrication: Weld all joints between frame members and weld sheet members to frame; weld latching mechanism and hinges to doors and frames; use no bolts or rivets.

2.3 MATERIALS

- A. Steel Sheet: Cold-rolled, leveled mild steel.
- B. Expanded Metal Mesh: Steel, with 3/4-inch flattened mesh gages as indicated.
- C. Fasteners: Zinc-, cadmium-, or nickel-plated steel or stainless steel.
 - 1. Exposed bolt heads: Tamperproof type.
 - 2. For fastening moving components: Use lock washers or self-locking nuts.
- D. Hinges: 5-knuckle, nonremovable-pin hinges, of loop style with 2 full thicknesses in each leaf; minimum 2 inches high.
 - 1. Minimum of 2 hinges per door.
 - 2. Doors over 42 inches high: Three hinges.
- E. Standard Door Handles: Die-cast zinc alloy or chrome-plated steel latch lifter and padlock hasp, designed so that door can be closed while locked; pry-resistant.
- F. Interior Fittings: Cadmium- or zinc-plated steel or cast aluminum, except shelves.
- G. Number Plates: Aluminum, zinc alloy, or stainless steel; raised or recessed numerals at least 3/8 inch high.
 - 1. Number lockers as directed by the architect.
 - 2. Fasten to doors, centered near the top, using 2 fasteners.

2.4 FABRICATION - ALL LOCKERS

- A. Factory-fabricate and fully assemble lockers; do not knock down for shipping.
- B. Make lockers square with rigid joints, without dents or warped surfaces.
 - 1. Exposed metal edges: Smooth off sharp edges and corners.
 - 2. Exposed welds: Grind flush.
 - 3. Door and frame fronts: No exposed bolts or rivet heads.
 - 4. Where exposed holes for built-in locks are not used, cover holes neatly using permanent materials.
- C. Doors: Fabricate with flanged edges, reinforced if required for stiffness, and designed to open and close without springing.
 - 1. Provide extra stiffeners for doors more than 15 inches wide.
- D. Expanded Metal Components: Weld edges to steel frames at not less than 6 inches on center; enclose sharp edges with frame.
- E. Miscellaneous Components: Provide all parts, filler panels, closures, clips, and fasteners required for a complete installation.
- F. Finishing: Pretreat and finish all surfaces, both exposed and concealed, except stainless steel, chrome, and aluminum.
 - 1. Factory-finish all accessory components to match.
 - 2. Pretreatment: Remove scale, rust, and contaminants; chemically degrease and phosphatize.
 - 3. Finish: Manufacturer's standard baked-on enamel.
 - 4. Color: As selected by the architect from manufacturer's standard range.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean debris from under and behind lockers before installation.

3.2 INSTALLATION

- A. Install lockers plumb and level.
- B. Anchor lockers securely to substrates in manner recommended by manufacturer.
 - 1. Use reinforcing plates and spacers as required to prevent metal distortion.
 - 2. Provide anchors at not more than 48 inches on center.
 - 3. Conceal fasteners wherever possible.
- C. Install accessory components with flush, tight joints using concealed fasteners.

3.3 ADJUSTING

- A. Adjust doors and latches for smooth operation.

3.4 CLEANING

- A. Clean and touch up finishes; if finish cannot be restored to original appearance, replace locker.
- B. Use only cleaning and touch-up materials recommended by manufacturer.

END OF SECTION

SECTION 10800

TOILET AND BATH ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Toilet and bath accessories.
- B. Attachment hardware.

1.3 RELATED SECTIONS

- A. Section 06114 - Wood Blocking and Curbing: In wall blocking and framing for support of accessories.
- B. Section 10170 - Solid Color Reinforced Composite Toilet Partitions: Supporting construction.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements
 - 1. Conform to Texas Accessibility Standards (TAS) 2012 for location and mounting height of accessories.

1.5 REFERENCES

- A. Texas Accessibility Standards (TAS) 2012.
- B. ANSI/ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars and Strips.
- C. ASTM A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
- D. ASTM A269 - Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
- E. ANSI/ASTM A366 - Steel, Carbon, Cold-Rolled Sheet, Commercial Quality.
- F. ANSI/ASTM A386 - Zinc Coating (Hot-Dip) on Assembled Steel Products.
- G. ANSI/ASTM B456 - Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
- H. ASTM A500 - Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- I. ANSI/BHMA A156.16 - Auxiliary Hardware.

1.6 SUBMITTALS

- A. Shop Drawings and Product Data
 - 1. Provide schedule indicating types, quantities, sizes and installation location by room for each toilet accessory item to be provided for project.

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- 2. Provide manufacturer's standard product data on accessories describing size, finish, details of function, and attachment methods.
 - 3. Submit manufacturer's standard printed installation instructions.
 - B. Samples
 - 1. Submit two samples of each component illustrating color and finish.

1.7 KEYING

- A. Supply 6 keys to Owner.
- B. Master key all accessories.

1.8 SEQUENCING AND SCHEDULING

- A. Coordinate the work of this Section with the placement of internal wall reinforcement to receive anchor attachments.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Bobrick Washroom Equipment, Inc.; North Hollywood, CA.
- B. Bradley Corporation; Menomonee Falls, WI.
- C. McKinney/Parker; Scranton, PA.
- D. Substitutions: Under provisions of Section 01600.

2.2 MATERIALS

- A. Sheet Steel: ANSI/ASTM A366.
- B. Exposed Sheet Steel: ASTM A525.
- C. Stainless Steel Sheet: ASTM A167, Type 304.
- D. Tubing: ASTM A500, stainless steel.
- E. Mirror Glass: ASTM C1036, Type I - Transparent Glass, Flat; Class 1 - Clear; Quality q1 mirror select; 1/4 inch thick minimum.
- F. Fasteners, Screws, and Bolts: Hot dip galvanized, tamperproof.
- G. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.
- H. Hardwood: Red oak, first grade in conformance with NHLA.
- I. Primer: Zinc Chromate.

2.3 ACCESSORIES

- A. Grab Bar (GB)
 - 1. Conformance: FS WW-P-541/8B (Am.1), Type IV, Class 2, Form and length as indicated in schedule at end of this Section.
 - 2. Acceptable products
 - a. Form a: Bradley #8120-00 length as indicated on drawings.
 - b. Form h: Bradley #8120-054.
 - c. Form k: Bradley #8120-031.
 - d. Form l: Bradley #8120-118162424.

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- e. Form m: Bradley #8120-06036 x room width x 36"
 - f. Shower Bar: Bradley #8120-036.
 - B. Toilet Tissue Dispenser (TTD)
 - 1. Conformance: FS WW-D-1908A, Type II, stainless steel, surface mounted-dual roll.
 - 2. Size: Approximately 7-5/8" wide x 5-1/4" deep and 12-3/8" tall.
 - 3. Acceptable product:
 - a. Surface mounted dual roll: Bradley #5402.
 - C. Soap Dispenser (SD)
 - 1. Type: Vertical stainless steel tank, liquid type.
 - 2. Size: Approximately 5-inches wide, 3-inches deep and 8-inches tall.
 - 3. Acceptable Product: Bradley #6562.
 - D. Shower Curtain Rods (SR)
 - 1. Conformance: A156.16, L08101, 1 1/4 inch diameter, 18 gauge stainless steel curtain rod with matching flanges for concealed attachment to wall.
 - 2. Acceptable product: Bradley #9539.
 - E. Anti-Bacterial Shower Curtain (SC)
 - 1. Conformance: FS L-C-780.
 - 2. 10 oz. Nylon-reinforced anti-bacterial vinyl fabric with hemmed edges, flameproof, stain resistant and self-deodorizing, with stainless steel grommets on 6" centers through top hem. Furnish in white.
 - 3. Acceptable product: Bradley #9535.
 - F. Shower Curtain Hooks (SH)
 - 1. Chrome plated or stainless steel spring wire curtain hooks with snap fasteners, sized to accommodate curtain rod size specified above.
 - 2. Acceptable product: Bradley #9536.
 - 3. Size: 72" wide x 72" tall.
 - G. Mirrors (M)
 - 1. Conformance: Channel Frame, stainless steel.
 - 2. Size: 18" x 36.
 - 3. Acceptable product: Bradley #9984.
 - H. Janitor's Shelves (JS)
 - 1. 18 gauge stainless steel units with 8" wide shelf and drying rack full length, with rag hooks and spring activated mop holders.
 - 2. Furnish units 36" long with 4 holders and 3 hooks.
 - 3. Acceptable product: Bradley #9984.
 - I. Towel Bars (TB)
 - 1. Conformance: FS WW-P-541/8B (Am.1), Type IV, Class 1, stainless steel, 24-inches long.
 - 2. Acceptable product: Bradley #9065.

2.4 FABRICATION

- A. General
 - 1. Weld and grind smooth joints of fabricated components.
 - 2. Form exposed surfaces from single sheet of stock, free of joints.
 - 3. Form surfaces flat without distortion, scratches or dents.
 - 4. Back paint components where contact is made with building finishes to prevent electrolysis.
 - 5. Shop assemble components and package complete with anchors and fittings.
 - 6. Provide steel anchor plates, adapters, and anchor components for installation.

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7. Fabricate all accessories with concealed mountings covered by finished snap-on or set screw type escutcheons or mountings concealed behind units with doors unless otherwise specified.
 8. Hot dip galvanize exposed and painted ferrous metal and fastening devices.
 9. Provide manufacturer's standard keyed lock in all accessories having doors.
 10. Provide continuous type hinge on all accessories having doors.
- B. Grab Bar (GB)
1. Fabricate from 1-1/2 inch OD seamless stainless steel tubing with 1 1/2 inch clear projection between wall and bar.
 2. Provide integral mounting flange with screw mounting holes concealed on lip of flange and designed to support grab bar in compliance with specified performance requirements.
 3. Provide one piece flange covers fabricated to fit over wall anchors and fixed by means of not less than three set screws.
 4. Fabricate bends in conformance with Texas Accessibility Standards.
 5. Stainless Steel: Either 302 or 304 L, 16 gauge (.064") minimum for 13" for 12" O.D. bars and 18 gauge (.050") minimum for 1" O.D. bars.
 6. Finish: Satin finish. In addition, provide manufacturer's standard non-slip surface, either knurled or peened, over gripping surface of bars.
 7. Attachment: concealed.
 8. Construction: Provide one piece construction with ends returned to wall with integral intermediate supports as required. All joints shall be heliarc welded, ground and polished on exposed surfaces, finished to present uniform matching appearance throughout.
 9. Anchors: Provide sub-anchors as required at each support, size and type as recommended by the manufacturer for each type of wall and finish condition. Support on drywall or plaster bases solely by means of toggle bolts is prohibited.
- C. Combination Paper Towel Dispenser and Waste Receptacle (PTDWR)
1. Fabricate as single framed unit containing upper paper towel dispenser and lower waste receptacle compartment with each concealed behind lockable door.
 2. Fabricate cabinet and frame of not less than 0.0312-inch stainless steel with 1 inch frame face and 1/4 inch return to wall.
 3. Fabricate doors of not less than 0.0500 inch stainless steel.
- D. Mirrors
1. Fabricate with 18 gauge stainless steel angle frame with seamless square mitered corners, welded and ground smooth.
 2. Provide 20 gauge galvanized steel back and 18 gauge cold rolled steel hangar, all welded construction.
- E. Soap Dispenser (SD)
1. Fabricate from not less than 0.0375-inch stainless steel.
 2. Fabricate with clear non-breakable plastic fill level indicator and key type fill cover.
 3. Valve: All purpose liquid type, chrome plated brass valve body and stainless steel valve mechanism with integral check valve.
- F. Towel Pin (TP)
1. Fabricate post from not less than 0.0312-inch stainless steel with 0.0781-inch rectangular hook welded continuously to post.
 2. Fabricate with separate mounting bracket and snap-on stainless steel escutcheon with concealed set screw.

2.5 FACTORY FINISHING

- A. Galvanizing: ANSI/ASTM A123, A386 to 1.25 oz/sq. yd.
- B. Shop Primed Ferrous Metals: Pretreat and clean, spray apply one coat primer and bake.
- C. Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats epoxy electrostatic baked enamel.
- D. Chrome/Nickel Plating: ANSI/ASTM B456, Type SC 2 satin polished finish.
- E. Stainless Steel: No. 4 satin luster.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that site conditions are ready to receive work and dimensions are as indicated on shop drawings.
- B. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION

- A. Deliver inserts and rough-in frames to site at appropriate time for building-in.
- B. Provide templates and rough-in measurements as required.
- C. Verify exact location of accessories for installation.

3.3 INSTALLATION

- A. Install fixtures, accessories and items in accordance with manufacturers' instructions.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Install grab bars in conformance with performance requirements specified.

3.4 SCHEDULE

Accessories Required								
Room	SD	SC	SH	GB	TB	TTD	M	JS
Janitor 112								1
Restroom 115	3	2	24	5	2	1	3	
Officer's Restroom 125	1	1	12	2	1	1	1	
Women's 126	1	1	12	2	1	1	1	
Restroom 127	3	2	24	5	2	1	3	
Restroom 131	1			2	1	1	1	

END OF SECTION

SECTION 11452

RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract, Special Provisions and Division 1 General Requirements apply to work of this Section.

1.2 SECTION INCLUDES

- A. Cooking equipment, including ranges and ovens.
- B. Range hood.
- C. Garbage Disposal.

1.3 RELATED SECTIONS

- A. Division 15: Plumbing connections for appliances.
- B. Division 16: Electrical services and connections for appliances.

1.4 DESIGN REQUIREMENTS

- A. Drawings indicate sizes, profiles, and dimensional requirements of residential appliances and are based on specific types and models indicated. Appliances by other manufacturers may be considered, provided deviations in dimensions and profiles are minor and do not change design concept as judged by Architect. Burden of proof of equality is on proposer.

1.5 QUALITY ASSURANCE

- A. Energy Ratings: Provide residential appliances that carry labels indicating energy cost analysis (estimated annual operating costs) and efficiency information as required by Federal Trade Commission.
- B. UL and NEMA Compliance: Provide electrical components required as part of residential appliances that are listed and labeled by UL and comply with applicable NEMA standards.
- C. AHAM Standards: Provide appliances that conform to the following standards of the Association of Home Appliance Manufacturers:
 - 1. Refrigerators and Freezers: Total volume and shelf area ratings certified according to ANSI/AHAM HRF-1.

1.6 SUBMITTALS

- A. Submit following in accordance with Section 01330 – Submittal Procedures.
- B. Product Data
 - 1. Submit manufacturer's printed descriptive information describing physical and performance characteristics; sizes; cut-out requirements, required utility sizes and locations and installation procedures.
 - 2. Provide complete operating and maintenance instructions for each appliance.
- C. Schedule: Submit schedule of appliances, using same room designations as shown on drawings.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle appliances in conformance with Section 01600.
- B. Deliver appliances to Project site in manufacturer's undamaged protective packaging.
- C. Delay delivery of appliances until utility rough-in is complete and construction in the spaces to receive appliances is substantially complete and ready for installation.

1.8 WARRANTIES

- A. Furnish in conformance with Section 01700.
- B. Submit written warranties, executed by manufacturer of each appliance specified, agreeing to repair or replace units or components that fail in materials or workmanship within specified warranty period.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Tri-Star Manufacturing (Range/Oven).
- B. Vent-a-Hood (Hood).
- C. Insinkerator (Garbage Disposal).

2.2 APPLIANCES

- A. Provide appliances and accessories as scheduled at the end of this section.
- B. Connection Devices: Provide all hoses, cords, clamps, fittings and other incidental devices as recommended by appliance manufacturer and as required for a complete installation.

2.3 RANGE

- A. Gas Range: Provide 60 inch stainless steel range unit with six gas burners, 24 inch griddle, 30 inch oven, and 20 inch oven.
 - 1. Top Grates: 12 inch x 12 inch lift off sections, heavy duty cast iron.
 - 2. Burner Type: Provide 35,000 BTU lift-off burner heads.
 - 3. Work Ledge: 6 inch wide.
 - 4. Ovens:
 - a. One – 20 inch with 30,000 BTU/hr.
 - b. One – 30 inch with 40,000 BTU/hr.
 - c. Fully insulated with non-sag fiberglass.
 - d. Porcelainized interior.
 - e. Controls: Thermostatically adjustable from 100 F to 500F; 100% safety pilot with matchless push button ignition.
 - 5. Finish: Stainless steel.
 - 6. Acceptable Product: Tri-Star TSR-G24-6.
 - 7. Option:
 - a. Casters: Provide casters to replace legs on standard unit.

2.4 EXHAUST HOOD

- A. Exhausted, Island Range Hood:
 - 1. Size: 60 inch x 27 inch x 18 inch European style.
 - 2. CFM: 1200.
 - 3. Finish: Stainless steel.
 - 4. Lights: 4 halogen.
 - 5. Acceptable Product: Vent-a-Hood Model EPITH18-460.
 - 6. Options:
 - a. Duct cover.
- B. Installation shall include all necessary parts and accessories for a full on complete system exhausting thru-roof.
 - 1. Accessories:
 - a. Low profile roof jack Model #UP553; 12 inch round.
- C. The roof jack shall be installed on a 6 inch minimum tall curb. Curb to be provided and installed by General Contractor.

2.5 MICROWAVE

- A. Counter Top Microwave
 - 1. 2.0 cu ft.
 - 2. 1200 watts.
 - 3. 16 inch carousel turntable.
 - 4. 24 inch x 13 3/8 inch x 19 1/8 inch.
 - 5. Stainless steel.
 - 6. Acceptable Product: Sharp Model #12520KS

2.6 GARBAGE DISPOSAL

- A. Acceptable Product: Insinkerator Model #7715E.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with manufacturer's instructions and recommendations.
- B. Built-In Equipment: Securely anchor units to supporting structure with concealed fasteners. Verify that clearances are adequate for proper functioning and rough openings are completely concealed.
- C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.
- D. Utilities
 - 1. Refer to Divisions 15 and 16 for plumbing and electrical requirements.
 - 2. Connect all appliances to utilities as recommended by appliance manufacturer.
- E. All necessary accessories for a full and complete system shall be provided.

3.2 ADJUST AND CLEAN

- A. Testing: Test each item of residential equipment to verify proper operation. Make necessary adjustments.
- B. Accessories: Verify that accessory items required have been furnished and installed.
- C. Cleaning: Remove packing material from residential equipment items and leave units in clean condition, ready for operation.

END OF SECTION

SECTION 15000

GENERAL PROVISIONS FOR MECHANICAL AND ELECTRICAL

PART 1 - GENERAL

1.01 SPECIAL NOTE

- A. The Architectural and Structural Plans and Specifications, including the supplements issued thereto, Information to Bidders, and other pertinent documents issued by the Architect, are a part of these specifications and the accompanying mechanical and electrical plans, and shall be complied with in every respect. All the above is included herewith, will be issued separately or is on file at the Architect's office, and shall be examined by all bidders. Failure to comply shall not relieve the Contractor of responsibility or be used as a basis for additional compensation due to omission of drawings. Where the Supplementary General Conditions conflict with the General Conditions, the Supplementary General Conditions shall govern.

1.02 CHECKING DOCUMENTS

- A. The drawings and the specifications are numbered consecutively. The Contractor shall check the drawings and specifications thoroughly and shall notify the Architect of any discrepancies or omissions of sheets or pages. Upon notification, the Architect will promptly provide the Contractor with any missing portions of the drawings or specifications. No discrepancies or omissions of sheets or pages of the contract documents will relieve the Contractor of his duty to provide all work required by the complete contract documents.

1.03 GENERAL

- A. In general, the lines and ducts to be installed by the various trades under these specifications shall be run as indicated, as specified herein, as required by particular conditions at the site, and as required to conform to the generally accepted standards as to complete the work in a neat and satisfactorily workable manner. The following is a general outline concerning the running of various lines and ducts and is to be excepted where the drawings or conditions at the building necessitate deviating from these standards.
- B. All piping, conduit and ductwork for the mechanical and electrical trades shall be concealed in chases in finished areas, except as indicated on the drawings. Horizontal lines run in areas that have ceilings shall be run concealed in those ceilings, unless otherwise specifically indicated or directed.
- C. Piping, ductwork, conduits and raceways may be run exposed in machinery and equipment spaces, where serving as connections to motors and equipment items in finished rooms where exposed connections are required, and elsewhere as indicated on the drawings or required.
- D. All conduits in any space where they are exposed shall run parallel with the building walls. They shall enter the concealed areas perpendicular with the walls, ceilings or floors. Fittings shall be used where necessary to comply with this requirement.
- E. The Contractor shall thoroughly acquaint himself with the details of the construction and finishes before submitting his bid as no allowances will be made because of the Contractor's unfamiliarity with these details. Place all inserts in masonry walls while they

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- are under construction. All concealed lines shall be installed as required by the pace of the general construction to precede that general construction.
- F. The mechanical and electrical plans do not give exact details as to elevations of lines and ducts, exact locations, etc., and do not show all the offsets, control lines, pilot lines and other installation details. The Contractor shall carefully lay out his work at the site to conform to the architectural and structural conditions, to provide proper grading of lines, to avoid all obstruction, to conform to details of installation supplied by the manufacturers of the equipment to be installed, and thereby to provide an integrated, satisfactorily operating installation.
 - G. The electrical plans show diagrammatically the locations of the various electrical outlets and apparatus and the method of circuiting and controlling them. Exact locations of these outlets and apparatus shall be determined by reference to the general plans and to all detail drawings, equipment drawings, roughing-in drawings, etc., by measurements at the building, and in cooperation with other sections, and in all cases shall be subject to the approval of the Architect. The Architect reserves the right to make any reasonable change in location of any outlet or apparatus before installation (within 10 feet of location shown on drawings) or after installation if an obvious conflict exists, without additional cost to the Owner.
 - H. The mechanical plans do not give exact locations of outlets, fixtures, equipment items, etc. The exact location of each item shall be determined by reference to the general plans and to all detail drawings, equipment drawings, roughing-in drawings, etc., by measurements at the building, and in cooperation with other sections. Minor relocations necessitated by the conditions at the site or as directed by the Architect shall be made without any additional cost accruing to the Owner.
 - I. The Contractor shall be responsible for the proper fitting of his material and apparatus into the space. Should the particular equipment which any bidder proposes to install require other space conditions than those indicated on the drawings, he shall arrange for such space with the Architect before submitting his bid. Should changes become necessary on account of failure to comply with this clause, the Contractor shall make such necessary changes at his (the Contractor's) own expense.
 - J. The Contractor shall submit working scale drawings of all his apparatus and equipment which in any way varies from these specifications and plans, which shall be checked by the Architect before the work is started, and interferences with the structural conditions shall be corrected by the Contractor before the work proceeds.
 - K. Order of precedence shall be observed in laying out the pipe, ductwork, material, and conduit in order to fit the material into the space above the ceiling and in the chases and walls. The following order shall govern:
 - 1. Items affecting the visual appearance of the inside of the building such as lighting fixtures, diffusers, grilles, outlets, panelboards, etc. Coordinate all items to avoid conflicts at the site.
 - 2. Lines requiring grade to function such as sewers.
 - 3. Large ducts and pipes with critical clearances.
 - 4. Conduit, water lines, and other lines whose routing is not critical and whose function would not be impaired by bends and offsets.
 - L. Piping, ducts, and conduits serving outlets on items of equipment shall be run in the most appropriate manner. Where the equipment has built-in chases, the lines shall be contained therein. Where the equipment is of the open type, the lines shall be run as close as possible to the underside of the top and in a neat and inconspicuous manner.
 - M. Exceptions and inconsistencies in plans and specifications shall be brought to the Architect's attention before the contract is signed. Otherwise, the Contractor shall be

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- responsible for any and all changes and additions that may be necessary to accommodate his particular apparatus, material, or equipment.
- N. The Contractor shall distinctly understand that the work described herein and shown on the accompanying drawings shall result in a finished and working job, and any item required to accomplish this intent shall be included whether specifically mentioned or not.
 - O. Each bidder shall examine the plans and specifications for the General Construction. If these documents show any item requiring work under Division 15 or 16 and that work is not indicated on the respective "M", "P" & "E" drawings, he shall notify the Architect in sufficient time to clarify before bidding. If no notification is received, the Contractor is assumed to require no clarification, and shall install the work as indicated on the General Plans in accordance with the specifications.

1.04 DIMENSIONS

- A. Before ordering any material or doing any work, the Contractor shall verify all dimensions, including elevations, and shall be responsible for the correctness of the same. No extra charge or compensation will be allowed on account of differences between actual dimensions and measurements indicated on the drawings. Any difference which may be found shall be submitted to the Architect for consideration before proceeding with the work.

1.05 INSPECTION OF SITE

- A. The accompanying plans do not indicate completely the existing mechanical and electrical installations. The bidders for the work under these sections of the specifications shall inspect the existing installations and thoroughly acquaint themselves with conditions to be met and the work to be accomplished in removing and modifying the existing work, and in installing the new work in the present building and underground serving to and from that structure. Failure to comply with this shall not constitute grounds for any additional payments in connection with removing or modifying any part of the existing installations and/or installing any new work.

1.06 ELECTRICAL WIRING

- A. All electric wiring of every character, both for power supply, for pilot and control, for communications, etc. will be done under Division 16 of these specifications. The Contractor for each section shall erect all his motors in place ready for connections. The Contractor, under Division 16, shall mount all the starters and controls, furnishing the supporting structures and any required outlet boxes. Note that wiring for temperature controls shall be done in accordance with Division 16 by the Division 15 Temperature Control Contractor.
- B. Every electrical current consuming device furnished as a part of this project, or furnished by the Owner and installed in this project, shall be completely wired up under Division 16. Verification of exact location, method of connection, number and size of wires required, voltage requirements, and phase requirements is the responsibility of the Contractor under Division 16. All equipment furnished under the project shall be controlled. If not shown in the temperature control scope of work, the Division 16 contractor shall furnish switches, wiring and conduit to connect all equipment furnished on the project for operation. If conflicts occur between the drawings and the actual requirements, actual requirements shall govern. The contractor shall coordinate the voltage of all motors and any associated variable frequency drives with the Division 16 contractor prior to ordering the devices.

1.07 MOTORS AND CONTROLS

- A. All motors furnished under any of the several sections of these specifications shall be of recognized manufacture, of adequate capacity for the loads involved and wound for the current characteristics shown on the electrical drawings. All motors shall conform to the standards of manufacture and performance of the National Electrical Manufacturers' Association as shown in their latest publications. They shall further be listed by Underwriters Laboratories.
- B. Unless otherwise noted, the Contractor under Division 15 shall furnish each motor with a starter and all controls of the types specified or required. These starters shall be of the totally enclosed type, of capacity rating within the required limits of the motors which they are to serve, shall be suitable for the motor current characteristics and shall provide thermal overload protection. All starters shall be standard of manufacture and performance of the National Electrical Manufacturers' Association. They further shall be listed by Underwriters Laboratories. Provide overload protection in each phase wire.
- C. Note that this project does not have a Building Automation System. All items that are furnished under the project shall be connected for operation by the Division 16 contractor. All devices are intended to be controlled by factory furnished control panels, or by switches that shall be furnished and installed under Division 16. The division 16 contractor shall include in his bid wiring, conduit, boxes, wiring devices, switches and any other components required for a functional system.

1.08 PROGRESS OF WORK

- A. The Contractor shall keep himself fully informed as to the progress of the work and do his work at the proper time without waiting for notification from the Architect or Owner.

1.09 FACTORY STARTUP OF EQUIPMENT

- A. The Contractor shall provide factory startup or factory authorized startup for certain equipment furnished for this project. Equipment requiring factory startup shall include the following: Heat Recovery Units, Water Softener, RO System, Vehicle Exhaust System, Gas-fired radiant heaters. Contractor shall submit the manufacturer's startup checklist substantiating that the equipment has been started and is operating in accordance with the manufacturer's instructions. The startup shall be performed by a person in the direct employ of the manufacturer or by an authorized agent. If the startup is performed by an authorized agent, the startup report shall be accompanied by a letter from the manufacturer identifying the agent as one who is certified to perform factory startup on the equipment furnished. As a minimum, submit the startup checklist with any comments or deficiencies noted during startup. Submit the report with certification letter (as required) to the Commissioning Agent for inclusion in the commissioning documentation. If there is no Commissioning Agent for the project, submit the startup reports as a submittal package to the Architect.

1.10 MANUFACTURER'S DIRECTIONS

- A. All manufactured articles shall be applied, installed and handled as recommended by the manufacturer.

1.11 MATERIALS AND WORKMANSHIP

- A. All materials shall be new unless otherwise specified and of the quality specified. Materials shall be free from defects. All materials of a type for which the Underwriters Laboratories, Inc. have established a standard shall be listed by the Underwriters Laboratories, Inc. and shall bear their label.
- B. Wherever the make of material or apparatus required is not definitely specified, the Contractor shall submit a sample to the Architect before proceeding.
- C. The Architect reserves the right to call for samples of any item of material offered in substitution, together with a sample of the specified material, when, in the Architect's opinion, the quality of the material and/or the appearance is involved and it is deemed that an evaluation of the two materials may be better made by visual inspection. This shall be limited to lighting fixtures, wiring devices, plumbing brass, grilles, registers, ceiling outlets and similar items and shall not be applicable to major manufacturers' items of equipment.
- D. The Contractor shall be responsible for transportation of his materials to and on the job, and shall be responsible for the storage and protection of these materials and work until the final acceptance of the job.
- E. The Contractor shall furnish all necessary scaffolding, tackle, tools and appurtenances of all kinds, and all labor required for the safe and expeditious execution of his contract.
- F. The workmanship shall in all respects be of the highest grade and all construction shall be done according to the best practice of the trade.

1.12 SUBSTITUTION OF MATERIALS

- A. Where a definite material or only one manufacturer's name is mentioned in these specifications, it has been done in order to establish a standard. The product of the particular manufacturer mentioned is of satisfactory construction and any substitution must be of quality as good as or better than the named article. No substitution shall be made without review by the Architect, who will be the sole judge of equality.
- B. Within 30 days of being awarded the Contract for any section or sections of the work under this heading, the Contractor shall submit for approval a complete list of the materials he proposes to use. This list shall give manufacturers' names and designations corresponding to each and every item and the submission shall be accompanied by complete descriptive literature and/or any supplementary data, drawings, etc., necessary to give full and complete details. If the material is not submitted within 30 days of the contract signing, the Contractor shall furnish the specified materials.
- C. Should a substitution be accepted under the provisions of the conditions of these specifications, and should this substitute prove to be defective or otherwise unsatisfactory for the service for which it is intended within the guarantee period, the Contractor who originally requested the substitution shall replace the substitute material with the specified material.

1.13 SHOP DRAWINGS

- A. Wherever shop drawings are called for in these specifications, they shall be furnished by the Contractor for the work involved after review by the Architect as to the make and type of material and in sufficient time so that no delay or changes will be caused. This is done in order to facilitate progress on the job and failure on the part of the Contractor to comply shall render him liable to stand the expense of any and all delays, changes in construction, etc., occasioned by his failure to provide the necessary details. Also, if the Contractor fails to comply with this provision, the Architect reserves the right to go directly to the

manufacturer he selects and secure any details he might deem necessary and should there be any charges in connection with this, they shall be borne by the Contractor.

- B. Shop drawings will be reviewed by the Architect for general compliance with the design concept of the project and general compliance with the information given in the contract documents. Review by the Architect and any action by the Architect in marking shop drawings is subject to the requirements of the entire contract documents. Contractor will be held responsible for quantities, dimensions which shall be confirmed and correlated at the job site, fabrication processes and techniques of construction, coordination of all trades and the satisfactory performance of his work.
- C. Shop drawings submitted shall not consist of manufacturers' catalogues or tear sheets therefrom that contain no indication of the exact item offered. Rather, the submission of individual items shall designate the exact item offered and shall clearly identify the item with the project.
- D. All shop drawings shall be submitted at one time and shall consist of a bound catalogue of all shop drawings under each section, properly indexed and certified that they have been checked by the Contractor.
- E. The omissions of any material from the shop drawings which has been shown on the contract drawings or specified, even though reviewed by the Architect, shall not relieve the Contractor from furnishing and erecting same.

1.14 PROTECTION OF APPARATUS

- A. The Contractor shall at all times take such precautions as may be necessary to properly protect his new apparatus from damage. This shall include the erection of all required temporary shelters to adequately protect any apparatus stored in the open on the site, the cribbing of any apparatus above the floor of the construction, and the covering of apparatus in the incompleting building with tarpaulins or other protective covering. Failure on the part of the Contractor to comply with the above to the entire satisfaction of the Architect will be sufficient cause for the rejection of the pieces of apparatus in question.

1.15 PERMITS, FEES, ETC

- A. The Contractor under each section of these specifications shall arrange for a permit from the local authority. The Contractor shall arrange for all utility services, including sewer, water, gas and electric services as applicable. If any charges are made by any of the utility companies due to the work on this project, the Contractor shall pay these charges, including charges for metering, connection, street cutting, etc. The Contractor shall pay for any inspection fees or other fees and charges required by ordinance, law, codes and these specifications.

1.16 TESTING

- A. The Contractor under each division shall at his own expense perform the various tests as specified and required by the Architect and as required by the State and local authorities. The Contractor shall furnish all fuel and materials necessary for making tests.

1.17 LAWS, CODES AND ORDINANCES

- A. All work shall be executed in strict accordance with all local, state and national codes, ordinances and regulations governing the particular class of work involved, as interpreted by the inspecting authority. The Contractor shall be responsible for the final execution of

the work under this heading to suit those requirements. Where these specifications and the accompanying drawings conflict with these requirements, the Contractor shall report the matter to the Architect, shall prepare any supplemental drawings required illustrating how the work may be installed so as to comply and, on approval, make the changes at no cost to the Owner. On completion of the various portions of the work the installation shall be tested by the constituted authorities, approved and, on completion of the work, the Contractor shall obtain and deliver to the Owner a final certificate of acceptance.

1.18 TERMINOLOGY

- A. Whenever the words "furnish", "provide", "furnish and install," "provide and install", and/or similar phrases occur, it is the intent that the materials and equipment described be furnished, installed and connected under this Division of the Specifications, complete for operation unless specifically noted to the contrary.
- B. Where a material is described in detail, listed by catalogue number or otherwise called for, it shall be the Contractor's responsibility to furnish and install the material.
- C. The use of the word "shall" conveys a mandatory condition to the contract.
- D. "This section" always refers to the section in which the statement occurs.
- E. "The project" includes all work in progress during the construction period.
- F. In describing the various items of equipment, in general, each item will be described singularly, even though there may be a multiplicity of identical or similar items.

1.19 COOPERATION AND CLEANING UP

- A. The contractor for the work under each section of these specifications shall coordinate his work with the work described in all other sections of the specifications to the end that, as a whole, the job shall be a finished one of its kind, and shall carry on his work in such a manner that none of the work under any section of these specifications shall be handicapped, hindered or delayed at any time.
- B. At all times during the progress of the work, the Contractor shall keep the premises clean and free of unnecessary materials and debris. The Contractor shall, on direction at any time from the Architect, clear any designated areas or area of materials and debris. On completion of any portion of the work, the Contractor shall remove from the premises all tools and machinery and all debris occasioned by the work, leaving the premises free of all obstructions and hindrances.

1.20 COORDINATION OF TRADES

- A. The Contractor shall be responsible for resolving all coordination required between trades. For example, items furnished under Division 15 which require electrical connections shall be coordinated with Division 16 for:
 - 1. Voltage
 - 2. Phase
 - 3. Ampacity
 - 4. No. and size of wires
 - 5. Wiring diagrams
 - 6. Starter size, details and location
 - 7. Control devices and details
- B. Items furnished under various sections which require plumbing connections shall be coordinated for services, pressure, size and location of connections, type of fuel, clearances for service, auxiliary devices required, etc.

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- C. Items requiring insulation shall be fully insulated and that insulation shall be checked against manufacturer's directions and job requirements for suitability, coverage, thickness and finish.
 - D. Items installed in/on finished ceilings shall be coordinated with the ceiling construction. The Contractor under each section shall conform to the reflected ceiling plan and shall secure details and/or samples of the ceiling materials as necessary to insure compatibility. Any device not conforming to this requirement shall be replaced by the Contractor at his expense.
 - E. All items specified under Divisions 15 and 16 shall be installed tight, plumb, level, square and symmetrically placed in relation to the work of other trades.

1.21 CUTTING AND PATCHING

- A. The Contractor under each respective section shall perform all structural and general construction modifications and cut all openings through either walls, floors or ceilings required to install all work specified under that section or to repair any defects that may appear up to the expiration of the guarantee. All of this cutting shall be done under the supervision of the Architect and the Contractor shall exercise due diligence to avoid cutting openings larger than required or in wrong locations.
- B. No cutting shall be done to any of the structural members that would tend to lessen their strength, unless specific permission is granted by the Architect to do such cutting.
- C. The Contractor under each respective section shall be responsible for the patching of all openings cut to install the work covered by the Contract and to repair the damage resulting from the failure of any part of the work installed hereunder.
- D. All patching shall be done by workmen skilled in the affected trade and shall comply with the applicable sections of these specifications. Coordinate all cutting and patching requirements with all trades before bidding.

1.22 PAINTING

- A. Painting for Divisions 15 and 16 shall be as follows:
 - 1. If the factory finish on any apparatus or equipment is marred, it shall be touched up and then given one coat of half-flat-half-enamel, followed by a coat of machinery enamel of a color to match the original. Paint factory primed surfaces.
 - 2. Paint all exposed pipe, conduit, boxes, cabinets, hangers and supports, and miscellaneous metal.
 - 3. Paint all exposed sheet metal.
 - 4. Paint all insulated surfaces exposed to view, including piping, equipment, etc. Surfaces until a smooth, non grainy surface is obtained.
- B. Generally, painting is required on all surfaces such that no exposed bare metal or insulation surface is visible.

1.23 SEALING

- A. The Contractor installing pipes, conduits, ducts, etc., shall seal all spaces between pipes and/or sleeves where they pierce walls, partitions or floors by packing fire resistant rope and fire resistant cement. The packing shall effect a complete fire and/or air seal where pipes, conduits, ducts, etc., pierce walls, floors or partitions.

1.24 ACCESS PANELS

- A. Wherever mechanical and/or electrical equipment is installed and where future access is required through either walls or ceilings and such cannot be obtained through the removable ceiling or through other means, the Contractor shall provide Milcor Style "M" access doors at least 12 inches by 12 inches in size or larger if required for access. Provide access doors for all fire dampers, smoke dampers, valves, etc.

1.25 USE OF SYSTEMS

- A. It is considered that it will be necessary to operate the mechanical systems to provide heating and ventilation in portions of the building that are enclosed. As systems or portions of systems become operable, they shall be operated as required to maintain habitable conditions in enclosed portions of the building that are still under construction and portions that are fully complete as may be required to properly protect installed piping, equipment and finishes.
- B. In order to provide protection to ducts, plenums, etc. install temporary filters over or in return air openings until all finished painting is completed. Protect supply outlets, coils, etc. as necessary in each case.
- C. Except for operation of cooling equipment to prove its performance and to adjust and balance the systems, that equipment will not be operated for comfort of construction workers.
- D. During warm weather the Contractor shall arrange for the operation of systems to supply 100 percent outside air. The systems controls shall be reset to their normal cycle of operation in each case during the times that heating is required and when the cooling equipment is operated.
- E. Immediately prior to the time that the systems are to be accepted by the Owner, each system shall be carefully examined and if ductwork is dirty, it shall be carefully cleaned by men skilled in that type of work. All filters shall be put in first class condition by replacement of filters and/or other procedures as directed.
- F. The use of the equipment for maintaining environmental and/or protective temperature conditions shall in no way constitute acceptance of that equipment and the connected piping, ducts, insulation, finishes, etc. by the Owner. Furthermore, it shall in no way shorten the guarantee period hereinafter specified. The Contractor shall either secure extended warranties from the vendors of equipment or shall purchase insurance to provide proper coverage on the equipment through the guarantee period and shall file with the Architect substantiating affidavits from equipment manufacturers or a copy of the insurance policy covering the equipment through the guarantee period. The personal underwriting of the Contractor for equipment manufacturers' warranties is not acceptable, but his personal underwriting of piping, ductwork, insulation and associated materials is acceptable subject to the provisions of the contract.
- G. The Contractor shall provide such labor as may be required in the operation of the systems and shall pay all costs.

1.26 SCHEDULE OF WORK

- A. The work under the various sections must be expedited and close coordination will be required in executing the work. The various trades shall perform their portion of the work at such times as directed so as to insure meeting scheduled completion dates, and to avoid delaying any other trade. The Architect will set up completion dates, schedule the times of work in the various areas involved, etc. Each Contractor shall cooperate in establishing

these times and locations and shall process his work so as to insure the proper execution of it.

1.27 WORKING TIME

- A. Where new connections are to be made into existing lines, present lines must be relocated or rerouted, present equipment items relocated or other work accomplished that would affect the operation of the present building, the work shall be carried on at such times as to cause a minimum of interference with the normal operation of that building. In certain cases the work may be accomplished during normal working hours during certain designated seasons or times of the year. In other cases the work may have to be executed during times of the day outside of the normal working period, on holidays, etc. Each individual case presents a separate decision as to the time during which it shall be performed. The Contractor involved shall present each case to the Architect for his decision, which will be made after due consultation with the Owner. No additional compensation for overtime will be granted for compliance with these requirements.

1.28 SLEEVE DRAWINGS

- A. The Contractor shall, before concrete is poured, prepare 1/8" scale floor plan drawings on tracing paper and shall show on these drawings, with dimension lines, the size and location of every pipe sleeve required for the passage of his lines. Prints shall be reviewed by the Architect prior to the setting of the pipe sleeves.

1.29 INSTALLATION DRAWINGS

- A. It shall be incumbent upon the Contractor to prepare special drawings as called for elsewhere herein or as directed by the Architect to coordinate the work under each section, to illustrate changes in his work, to facilitate its concealment in finished spaces to avoid obstructions or to illustrate the adaptability of any item of equipment which he proposes to use.
- B. These drawings shall be used in the field for the actual installation of the work. Unless otherwise directed, they shall not be submitted for approval but three copies shall be provided to the Architect for his information.

1.30 ROUGH-IN AND MAKE FINAL CONNECTION FOR EQUIPMENT

- A. The shop drawings for all equipment are hereby made a part of these specifications. The Contractor under each section of the specifications shall rough-in for the exact item to be furnished on the job, whether in another section of the specifications or by the Owner. The Contractor shall refer to all drawings and other sections of the specifications for the scope of work involved for the new equipment, and by actual site examination determine the scope of the required equipment connections for the Owner furnished equipment.
- B. Should any of the equipment furnished require connections of a nature different from that shown on the drawings, report the matter to the Architect and finally connect as directed by the Architect.
- C. Should any shop drawings not be available for equipment furnished under other contracts or by the Owner, the Contractor under each section of these specifications shall bid the work as detailed on the drawings.
- D. Minor differences in the equipment furnished and that indicated on the drawings will not constitute ground for additional payment to the Contractor.

1.31 MARKING OF PIPE

- A. The Contractor shall mark all accessible piping systems. The identification of a piping system shall be made by a positive identification of the material content of the system by lettered legend, giving the name of the content in full or abbreviated form. This mark shall be conspicuously placed at frequent intervals on straight runs, close to all valves, at changes of direction and where pipes pass through walls, floors or ceilings. Arrows shall be used to indicate direction of flow. Markers shall be painted on using stencils.
- B. Markers shall be placed on piping at each connection to an item of equipment, at each pump, and on each drop to an outlet. Markers shall be placed on each run of piping at intervals not exceeding 50 feet where exposed in a room and 25 feet when installed above removable ceilings, except that no exposed line shall enter a room without being identified therein. Marker on lines above removable ceilings shall be applied on the undersides of the lines and in other areas shall be applied to be most visible. Also supply directional flow indicators adjacent to identification markers.
- C. Size of Identification:

Outside Diameter	Size of Legend of Pipe or Covering Letters (" Height)
3/4 to 1-1/4	1/2
1-1/2 to 2	3/4
2-1/2 to 6	1-1/4

1.32 IDENTIFICATION AND LABELING

- A. The Contractor shall make it possible for the personnel operating and maintaining the equipment and systems in this project to readily identify the various pieces of equipment, valves, piping, etc., by marking them. All items of equipment such as fans, pumps, etc., shall be clearly marked using engraved nameplates as hereinafter specified. The item of equipment shall indicate the same number as shown on the drawings. For example, pumps will be identified as P-1, P-2, P-3, etc.; exhaust fans will be EF-1, EF-2, etc.; AC Units will be AC-1, AC-2, etc.
- B. All items of mechanical and electrical equipment shall be identified by the attachment of engraved nameplates constructed from laminated phenolic plastic, at least 1/16" thick, 3-ply, with black surfaces and white core. Engraving shall be condensed gothic, at least 1/2" high, appropriately spaced. Nomenclature on the label shall include the name of the item, its mark number, area, space, or equipment served, and other pertinent information. Equipment to be labeled shall include but not be limited to the following:
 - 1. Boilers
 - 2. Chillers
 - 3. Pumps
 - 4. AC Units
 - 5. Convertors
 - 6. Air Conditioning Control Panels and Switches
 - 7. Exhaust and Return Air Fans
 - 8. Miscellaneous - similar and/or related items

1.33 OPERATING INSTRUCTIONS

- A. The Contractor for each section of the work hereunder shall, in cooperation with the representatives of the manufacturers of the various equipment items, carefully instruct the Owner's representatives in the proper operation of each item of equipment and of each system. During the balancing and adjusting of systems, the Owner's representative shall be made familiar with all procedures.

1.34 OPERATING MANUALS

- A. Prepare and submit 3 copies of the operating manuals bound in hard covers. Three weeks prior to completion of the work, the Architect will check the manuals and any additional material necessary to complete the manuals shall be furnished and inserted by the Contractor.
- B. Manuals shall contain the following data:
 - 1. Catalogue data of all equipment.
 - 2. Shop drawings of all equipment.
 - 3. Temperature control drawings (reduced in size)
 - 4. Start-up instructions for major equipment.
 - 5. Trouble shooting procedures for major equipment.
 - 6. Wiring diagrams.
 - 7. Recommended maintenance schedule for equipment.
 - 8. Parts list for all items.
 - 9. Name and address of each vendor.

1.35 GUARANTEE

- A. Unless a longer period is specified elsewhere, the contractor shall guarantee all workmanship and materials for a period of one year from date of final acceptance.

1.36 COMPLETION REQUIREMENTS

- A. Before acceptance and final payment the Contractor under each Division of the specifications shall furnish:
 - 1. Accurate "as built" drawings, shown in red ink on blue line prints furnished for that purpose all changes from the original plans made during installation of the work. Drawings shall be filed with the Architect when the work is completed.
 - 2. All manufacturers' guarantees.
 - 3. All operating manuals.
 - 4. Guarantees.
 - 5. Test and Balance Report.

1.37 CONTRACTOR'S RESPONSIBILITY FOR FINAL INSPECTION

- A. Before calling for the final inspection, the Contractor under each Division shall carefully inspect his work to be sure it is complete and according to plans and specifications.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

SECTION 15300

PIPING AND ACCESSORIES

PART 1 - GENERAL

1.01 NOTE

- A. Drawings, General Conditions of the Contract for Construction, Supplementary Conditions and Division 1 - General Requirements apply to Work of this Section.

1.02 SUBMITTALS

- A. Submit manufacturer's data on all materials.

1.03 SCOPE

- A. This section of the specifications pertains to all labor, materials, equipment and service necessary for and incidental to the piping and accessories as shown on the drawings and/or specified herein.

1.04 INSPECTION

- A. All pipe, valves, fittings, and other accessories shall be inspected upon delivery and during the course of the work. Any defective materials found during field inspection or during hydrostatic and leakage tests shall be removed from the site of the work and replaced by the Contractor.

1.05 PROTECTION DURING STORAGE

- A. The interior of all pipe, fittings, and other accessories shall be kept free from dirt and foreign matter at all times. Valves and fittings shall be drained and stored in a manner that will protect them from damage by freezing.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. All materials shall be manufactured or fabricated in the United States of America.
- B. Materials shall conform to the listed standards. Refer to specific sections for materials to be used under that section. The following tabulation is for reference only to identify the applicable standard.

Cast Iron Soil Pipe and Fittings	ASTM A74, Class SV
Push On Gaskets for C.I. Soil Pipe	ASTM C564
Caulked Joints for C.I. Soil Pipe	Fed. Spec. HH-P-117, Type II
No Hub Joints	ASTM D3183

Clay Tile Pipe and Fittings	ASTM C700
Clay Tile Joints	ASTM C425
Rubber Rings for A.C. Pipe	ASTM D1869
ABS Soil Pipe and Fittings	ASTM D2751
ABS Soil Joints – Elastomeric	ASTM D2751
PVC Soil Pipe and Fittings	ASTM D3034, Type PSM Max. SDR = 35
PVC Soil Fittings – Elastomeric	ASTM D3212
Copper Tubing	ASTM B88
Wrought Copper Solder Fittings	ANSI B16.22
Cast Bronze Solder Fittings	ANSI B16.18
Steel Pipe	ASTM A120, A53, A106
Butt Weld Fittings	ANSI B16.9
Socket Weld Fittings	ANSI B16.11
Steel Flanges	ANSI B16.5
Malleable Iron Threaded Fittings	ANSI B16.3
Cast Iron Threaded Fittings	Fed. Spec. WW-P-501E
Cast Iron Water Pipe	ANSI A21.6
Cement Lining for C.I. Water Pipe	ANSI A21.4
Cast Iron Water Pipe Fittings, Lined	ANSI A21.10 and A21.10a
Push-On Joints for C.I. Water Pipe	ANSI A21.11
Mechanical Joints for Water Pipe	ANSI A21.11
PVC Water Pipe	ASTM D1584 Type 1120
Push On Joints for PVC Water Pipe	ASTM D1585, AWWA C900
Asbestos Cement Water Pipe	AWWA C400 Class 150
AC Water Pipe Fittings	ANSI A21.10, 150 lb.
AC Water Pipe Joints	ASTM D1869
Flange Bolt, Sets	ASME Pressure Piping

- C. Unions in Ferrous Lines: 150 pound malleable iron, screwed pattern, ground joint with brass to iron seat; equal to Crane.
- D. Insulating Fittings: Equal to Maloney.
- E. Unions in Copper or Brass Lines: 125 pound all brass, screwed pattern, ground joint, equal to Chase, Crane or Mueller.

2.02 VALVES

- A. General Service Valves: 3" and smaller, all bronze, screwed; 3-1/2" and larger, flanged, iron body, bronze trimmed, equal to the following Crane Nos:

Type	Fluid Pressure Below 125 PSIG	Fluid Pressure Above 125 PSIG
Gate 2" and smaller	428	424
Gate 2-1/2" and larger	465-1/2	7-1/2 E
Globe 2" and smaller	1	14-1/2 P
Globe 2-1/2" and larger	351	21E
Angle 2" and smaller	2	16-1/2 P
Angle 2-1/2" and larger	353	23E

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- B. Where valves have discs, select the discs for the intended service using materials as recommended by the valve manufacturer. Provide extended stems for valves in insulated lines, so that the handle clears the insulation and jacket.
 - C. Acceptable General Service Valve Manufacturers: Stockham, Jenkins, OIC, Walworth, Hammond.
 - D. Swing Check Valves 2" and Smaller: All bronze screwed, equal to Crane No. 37 for pressures to 125 psi or No. 36 for pressures to 200 psi SWP or 400 PSI WOG.
 - E. Swing Check Valves 2-1/2" and Larger: Iron body, flanged, bronze trimmed; equal to Crane No. 373 for pressures to 125 psi or No. 39E for pressures from 125 psi to 250 psi.
 - F. Ball Valves: Bronze threaded body, chrome plated full port bronze ball, teflon seats and O-rings, bronze shafts, and infinite position handle with memory stops. Memory stops may be deleted for domestic water service. Valve shall be three piece break away for in-line service. Apollo, Crane, Jamesbury and Stockham are acceptable. Ring type two piece ball valves are not acceptable, except for drain line service. Where valves are installed in insulated lines, provide extended stems to clear the insulation and jacket.
 - G. Gas Valves: Iron body, lubricated plug valves equal to Nordstrom Fig. 143 in sizes 2-1/2" and larger. Valves 2" and smaller equal to Crane No. 270 or Lee 10685 iron body flat-head threaded gas stop.

2.03 GAUGE COCKS AND GAUGES

- A. Where gauge connections are installed in insulated lines, install a ConBraCo No. 41-380 T-handle gauge cock on a nipple of sufficient length that the cock handle will be free of the pipe insulation, and position each cock in relation to surrounding piping and equipment so that the gauge may be easily read, and so that a gauge having a 6" diameter dial can be screwed into and out of the cock.
- B. Install gauge cocks at pumps as close to pump suction and discharge connections as possible. Where drilled and tapped gauge connections are provided in the pump casing by the manufacturer, use these tapings.
- C. Pressure Gauges: Phosphor bronze, seamless Bourdon spring type with phosphor bronze bushed rotary movement and link; 4-1/2" dial, nickel plated ring, free standing cast aluminum case; equipped with micrometer adjustment pointer. Furnish each gauge with scale range suitable for the duty.
- D. Water Pressure Gauges: Equal to Weksler No. BA14-I with cast aluminum case, or EA-14 with stainless steel case; Weksler, Weiss, and Terice acceptable.

2.04 THERMOMETER WELLS

- A. Furnish and install brass or stainless steel closed separable thermometer wells for all thermometer and controller bulbs which are designated for liquid measurements. Whenever a thermometer or controller bulb is inserted in a pipe for either remote or local temperature indication or control, locate the thermometer well so that it will be completely surrounded by flowing fluid. Such thermometer locations as shown on the drawings are diagrammatic only-install thermometer wells for maximum effectiveness and in the case of locally indicating instruments, for easy readability.

2.05 MERCURIAL THERMOMETERS

- A. Industrial type with Cyclocac plastic cases, glass fronts, 9" scale, adjustable straight or angle pattern as required for ready readability. Furnish thermometers with 2-1/2" stem extensions where they are installed in insulated lines. Select scale ranges for maximum readability at the design temperature of the medium being measured. Thermometer equal to Weksler No. AA5H9.
- B. Acceptable Manufacturers: Weksler, Trerice, Weiss, Moeller.

PART 3 - EXECUTION

3.01 INSTALLATION OF PIPING SYSTEMS:

- A. Install runs of piping essentially as indicated on the drawings and/or as required. The location, direction and size of the various lines are indicated on the drawings.
- B. Make up all systems straight and true and properly graded for correct flow of contained materials and to provide drainage. Cut pipes accurately to measurements established at the building and work into place without forcing or springing. Except as required for specified grading, run all piping above ground parallel with the lines of the building.
- C. Make all changes in pipe sizes with reducing fittings. Use no long screws or bushings.
- D. Install and support piping systems with loops, bends, expansion joints and/or flexible connectors as required for flexibility, to accommodate expansion and contraction of piping due to temperature changes in the contained fluids and in the surrounding space, and to minimize the transmission of vibration to the building structure.
- E. Provide unions in the lines assembled with screwed and soldered fittings, at points of connection to equipment, and elsewhere as indicated or required to permit proper connections to be made, or to permit valves, equipment items, etc. to be removed. Provide unions also in welded lines at connections to equipment where flanges are not provided. Provide insulating unions where ferrous material joins non-ferrous material.
- F. In piping systems assembled by welding, use factory-fabricated welding fittings of the same material and the same schedule or weight as the piping in which they are installed, except that branches or take-offs of sizes not exceeding 2/3 of the nominal diameter of the mains may be made with Bonney Weldolets or Thredolets. Mitering of pipe to form elbows, notching of straight runs to form tees, and any similar construction will not be permitted.
- G. In general, use listed materials in fabricating the various piping systems. The method of assembly may be varied only to meet special conditions where it is impossible to comply with the specified method of joining piping. Where special classes of piping are involved and are not listed, request exact instructions as to the class of material involved and the method of fabricating it before ordering materials.
- H. Flashing: Flash around all pipes passing through the roof with sheet lead not less than 4 lbs. per square foot, built a minimum of 8" in all directions from the outside of the pipe into the waterproofing. Flashing shall be run up the pipe and turned over into the pipe cavity. Flashing at roof drains shall be 36" square.
- I. Pitch Pans: Small lines thru the roof shall be installed thru pitch pans. Pans shall be 18 gage galvanized, welded, 3" deep, 8" X 8" or larger, packed with lead wool and filled with pitch.

J. Pipe Sleeves:

1. Generally where pipes pass through walls or floors except sewer pipes through floors on grade, pipe sleeves shall be used. The sizes of these sleeves shall be such as to permit readily the subsequent insertion of the pipes of the proper size. In the case of insulated lines, the diameter of the sleeves shall be approximately 1/2 inch greater than the outside diameter of the insulation.
2. The pipes passing through interior walls or floors shall pass through galvanized pipe sleeves. In walls, they shall finish flush with each finished surface. In pipe chases, they shall extend 1-1/2 inches above the floor slab. The annular space between the pipe and sleeve in floor penetrations and fire rated wall penetrations shall be fire-sealed with fire resistive material equal to Dow Corning Silicone RTV Foam Penetration Seal.
3. The pipes passing through concrete beams or walls, and masonry exterior walls and through floors shall be provided with galvanized wrought iron pipe sleeves. Weld at least four No. 4 rods to each pipe sleeve to serve as an anchor as directed by the Architect. After the pipes are installed, in the case of pipes sleeving through exterior beams or walls and floors on grade, the Contractor shall fill the annular space between the pipe and its sleeve with mechanical interlocking synthetic rubber link equal to Link Seal. Contractor shall coordinate sleeve size to insure a watertight joint.

3.02 ESCUTCHEONS, CEILING PLATES

- A. Except as otherwise noted provide and install concealed hinge, chrome plated escutcheons or ceiling plates with spring catches around each pipe passing through any wall, floor, or ceiling in any space, except in underfloor and attic spaces. Plates shall be sized to fit snugly against the outside of the pipe, or against the outside of the insulation on lines which are insulated.
- B. No floor plates will be required around the iron pipe sleeves on exterior walls.

3.03 PROTECTION OF UNDERGROUND PIPING

- A. Underground steel piping shall be cleaned and primed with Humble "Rust-Ban" and wrapped with a double thickness of 3M Scotch "51" vinyl tape over pipe and fittings.

3.04 FABRICATION OF PIPE JOINTS

- A. Copper Tubing: Cut tubing square and deburr. Clean insides of fittings and outsides of tubing with sand cloth before assembly. Exercise care to prevent annealing of fittings and hard drawn tubing. Make all joints with solid string or wire solder, using non-corrosive paste flux of the proper type for each application. No cored solder will be permitted. Use 95-5 solder (95% tin, 5% antimony) or Silvacrite 100 solder (95.5% tin, 4% copper, .5% silver composition) for all copper tubing. Under no circumstances will solder with any lead content be permitted on the jobsite. Where flanges are shown or are required for connection to equipment, they shall be 150 psi flanges.
- B. Welded Joints: Make all welded joints by the metallic arc process. Use base material conforming to ANSI B31.1 for welded pipe ASTM A106 and ASTM A53. Use filler material conforming to ASTM A233 and in accordance with ANSI B31.1. Machine the ends of the material to be joined or gas cut. Make the cut smooth in order that good fit can be made and a full penetration weld made. Use direct current for welding with the electrode

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- positive. Limit the depth of deposit to 1/8" per pass. Remove all slag or flux remaining on any bead of welding before laying down the next successive bead of welding. Remove any cracks or blow holes that appear on the surface of any bead of welding by chipping or grinding before depositing the next successive bead of welding.
- C. Cast Iron Pipes, Caulked Joints: Make joints in cast iron bell and spigot pipe by centering the spigot within the bell, packing the joint with oakum closely compacted, and then pouring the remaining space in the bell full of molten lead. When the lead has cooled, thoroughly caulk at least three times around the joint using caulking tools of the proper width.
 - D. Push-On Pipe: The inside of the bell and the outside of the spigot shall be thoroughly cleaned to remove oil, grit, excess coating, and other foreign matter. The circular rubber gasket shall be flexed inward and inserted in the gasket recess of the bell socket. A thin film of gasket lubricant shall be applied to either the inside surface of the gasket or the spigot end of the pipe or both. Gasket lubricant shall be as supplied by the pipe manufacturer and approved by the Architect. The spigot end of the pipe shall be entered into the socket with care used to keep the joint from contacting the ground. The joint shall then be completed by forcing the plain end to the bottom of the socket with a forked tool or jack type tool or other device. Pipe that is not furnished with a depth mark shall be marked before assembly to assure that the spigot end is inserted to the full depth of the joint. Field cut pipe lengths shall be filed or ground to resemble the spigot end of such pipe as manufactured. Complete assembly instructions from the pipe manufacturer shall be followed.
 - E. Solvent Weld Plastic Joints: Solvent welded according to manufacturers instructions.
 - F. Testing:
 - 1. The Contractor shall have a minimum of 10 percent of all welds made by each welder examined and inspected by radiography. If a faulty weld is discovered, the Contractor shall perform radiographic inspection on all welds made by that welder. Any faulty welds shall be repaired and reinspected at the Contractor's expense.
 - 2. The system shall be hydrostatically tested at 1.5 times the design pressure, as specified in Chapter VI ASME Code B31.1-1986 for Power Piping, and carefully checked for leaks. After leaks are repaired, retest system; repeat repair and test until proved tight. Equipment shall be isolated from hydrostatic testing of piping.
 - 3. Welds which cannot be hydrostatically tested, e.g., branch connections made to existing piping, shall be radiographed per Chapter VI, ASME Code B31.1-1986 at Contractor's expense. The Owner at his option may allow visual inspection of these welds in lieu of radiographs.

3.05 REPAIR OF LEAKS

- A. All leaks in piping systems shall be corrected as follows:
 - 1. Repair leaks in solder joints by remaking the joint; no soldering or brazing over existing joints will be permitted.
 - 2. Repair leaks in screwed joints by tightening the joint; remake the joint if the tightening fails to stop the leak.
 - 3. Leaks in caulked joints may be stopped by additional caulking of the joint; but if that fails, remake the joint.
 - 4. Repair leaks in welded joints by removing the defective weld completely through the base metal and grind smooth. Re-weld, accomplishing 100% penetration of the base metal. The repair weld should in no case be less than 4" in length.
- B. When any defect is repaired, retest that section of the system.

3.06 HANDLING OF MATERIAL

- A. Hauling: All materials furnished by the Contractor shall be delivered and distributed at the site by the Contractor.
- B. Loading and Unloading: Pipe, fittings, valves, and accessories shall be loaded or unloaded by lifting with hoists or skidding so as to avoid shock or damage. Under no circumstances shall such materials be dropped. Pipe handled on skidways shall not be skidded or rolled against pipe already on the ground. Each piece shall be unloaded opposite or near the place where it is to be installed. No material shall be unloaded where it will block any road, drive, building entrance, or walkway or where it will be a hazard to safe vehicular or pedestrian traffic.
- C. Care of Pipe Coating and Lining: Pipe shall be so handled that the coating and lining shall not be damaged. If, however, any part of the coating or lining is damaged, the repair shall be made by the Contractor at his expense. If satisfactory repair cannot be made, the Contractor shall replace the damaged pipe.

3.07 ALIGNMENT AND GRADES

- A. General: All pipe shall be laid and maintained to the required lines and grades with fittings, valves, at the required locations; spigots centered in bells; and all valve stems plumb. All pipe shall be installed straight and true to line.
- B. Deviations Occasioned by Other Structures: Whenever obstructions not shown on the plans are encountered during the progress of the work, the lines and/or grades shall be adjusted so to not interfere with existing obstructions.

END OF SECTION

SECTION 15350

PLUMBING SYSTEMS

PART 1 - GENERAL

1.01 NOTE

- A. Drawings, General Conditions of the Contract for Construction, Supplementary Conditions and Division 1 - General Requirements apply to Work of this Section.

1.02 SUBMITTALS

- A. Submit manufacturer's data on all materials.

1.03 SCOPE

- A. This section of the specifications requires the furnishing and installation of all equipment, labor, materials, transportation, tools and appliances and in performing all operations in connection with the installation of the plumbing systems.

PART 2 - PRODUCTS

2.01 MATERIALS: Refer to Section "Piping and Accessories".

- A. Interior Sanitary Soil, Waste and Drain Lines: PVC-DWV Plastic pipe and fittings conforming to ASTM D-2665-68, assembled with solvent cement conforming to ASTM D-2564-67.
- B. Interior Sanitary Soil, Waste and Drain Lines under fire truck areas (under the apparatus bay and all other areas subject to fire truck traffic): Bell and spigot, Extra Heavy weight cast iron soil pipe and fittings meeting the following specification:
 - 1. Extra Heavy Cast Iron pipe and fittings shall be manufactured from gray cast iron with a tensile strength of not less than 21,000 psi. Compression gaskets shall be manufactured from an elastomer meeting the requirements of ASTM C 564.
 - 2. Pipe and fittings shall comply with ASTM A 74. Compression gaskets shall comply with ASTM C 564. All pipe and fittings shall be made in the United States, and marked with the collective trademark of the Cast Iron Soil Pipe Institute, ®, and listed by NSF® International. All pipe and fittings shall be of the same manufacturer. All systems shall utilize a separate waste and vent system. Extra Heavy Cast Iron pipe and fittings shall be manufactured from gray cast iron with a tensile strength of not less than 21,000 psi. Compression gaskets shall be manufactured from an elastomer meeting the requirements of ASTM C 564.
 - 3. Pipe and fittings shall comply with ASTM A 74. Compression gaskets shall comply with ASTM C 564. All pipe and fittings shall be made in the United States, and marked with the collective trademark of the Cast Iron Soil Pipe Institute, ®, and listed by NSF® International. All pipe and fittings shall be of the same manufacturer. All systems shall utilize a separate waste and vent system.

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- C. Sanitary Fixture Waste Arms: Fixtures served by sanitary soil waste and drain lines shall be connected using cast iron pipe and fittings, red brass pipe, Type L hard copper tubing with cast brass drainage fittings or lead. Use brass soldering nipples or ferrules as required.
 - D. Sanitary Vent Lines: PVC-DWV Plastic pipe and fittings conforming to ASTM D-2665-68, assembled with solvent cement conforming to ASTM D-2564-67.
 - E. Sanitary Vent lines exposed in the apparatus bay: Service weight cast iron bell and spigot pipe and fittings for all lines 2" and larger and standard weight galvanized steel, Type L or heavier weight copper, red brass, or lead for lines smaller than 2" except that the same class of material shall be used throughout, insofar as practicable. C.I. joints may be caulked or push-on.
 - F. Domestic Water Lines (Hot, Cold and Recirculating): All water lines underground or under slabs on grade shall be of Type K hard drawn copper tubing. All interior water lines shall be Type L hard drawn copper tubing. Where connections are made between copper tubing and cast iron pipe, use adapters. Copper tubing shall be assembled using solder-joint fittings. No lead solder will be permitted. All flanges shall be 150 psig rated.
 - G. RO Water Lines: Schedule 40 CPVC plastic with CPVC valves and fittings, solvent welded.
 - H. Gas Lines: Schedule 40 black steel with 150 lbs. banded malleable iron fittings.
 - I. Drain Lines: PVC-DWV Plastic pipe and fittings conforming to ASTM D-2665-68, assembled with solvent cement conforming to ASTM D-2564-67. Smaller lines may be Schedule 40 PVC pipe and fittings.
 - J. Compressed Air Lines: Type L hard copper with solder joint fittings.
 - K. Miscellaneous Lines: Such as pilot lines, bleed lines, control and sampling lines, equalizer lines, drains from air vents and relief vents, etc. shall be fabricated of the materials used in the systems to which they are connected.
 - L. Interior Cleanouts: Cleanouts shall be provided at the bottom of each stack, at each change in direction, and in each horizontal run at intervals not exceeding 50 feet in all interior soil, waste, and drain lines. Where cleanouts occur in walls of finished areas, they shall be concealed behind chrome plated access covers, such as Wade W-8480-R or provided with other special plugs and covers as required to present a finished appearance. Floor cleanouts in unfinished areas shall be Wade W-6000 with threaded adjustable housing, flanged ferrule with cast iron plug and gasket and secured satin bronze scoriated top. Floor cleanouts in finished tile floors shall be Wade W-6000-TS with square tile top; in carpeted areas Wade W-6000-72 with carpet marker. All cleanouts shall be the same size as the line served up to 4" size and shall be 4" for all larger lines.
 - M. Air Chambers: Air chambers of Type L copper, not less than 12" long and no smaller than the supply pipe, shall be provided and installed in each water supply to each and every fixture, outlet, item of equipment, etc. The length and/or the diameter of these air chambers shall be greater where required to eliminate water hammer. PDI shock absorbers may be used if sized in accordance with PDI recommendations.
 - N. Vacuum Breakers: On each water supply line serving a plumbing fixture, item of equipment, or other device which has a water supply below the rim of the fixture, or which has a threaded or tubing spout, provide and install an approved vacuum breaker. These vacuum breakers shall be designed to prevent any possible backflow through them. Where these are installed in chrome plated lines, they shall be chrome plated to match.
 - O. Automatic Air Vents: This Contractor shall furnish and install Crane No. 976 or 977 air vent valves at all high points for the hot water system, as shown and/or as required. Run a 3/4 inch type L hard copper drain line from the discharge of each air vent valve to a floor drain or as directed.

2.02 PLUMBING FIXTURES

- A. The plate numbers on the drawings represent fixtures that will be acceptable on the job. Approved equal fixtures of Crane, American Standard, Eljer, and Kohler will be acceptable.
- B. All exposed trim shall be chrome plated brass. This includes faucets, fittings, stops, risers, strainers, tailpieces, traps, waste, escutcheons, flush valves, brackets, vacuum breakers, goosenecks, hole covers, bolts, nuts and etc.
- C. All threaded supply fittings or outlets with tubing nozzles shall have back flow preventers.
- D. All fixtures shall have quarter turn stainless steel ball type stop valves.
- E. Generally all wall hung fixtures shall be provided with chair carriers so that no weight is supported from the wall.
- F. All fixtures shall be cleaned before final acceptance.
- G. Verify mounting height of each and every fixture before rough-in.
- H. Where fixtures mate with irregular walls, the joint shall be grouted with dental plaster, G. E. Silicone or other grout as directed by the Architect.
- I. The Contractor shall verify all rough in heights before installation and shall secure a current ruling on heights of handicapped fixtures before rough in to insure that they meet the requirements of the parties having jurisdiction.

2.03 PLUMBING FIXTURE SCHEDULE: Refer to the drawings.

2.04 KITCHEN EQUIPMENT CONNECTIONS

- A. The Contractor shall disconnect all existing kitchen equipment plumbing connections and reconnect all equipment in the new location. Furnish and install new unions, gas cocks, valves and fittings and all other materials and labor required to provide a complete functional systems.
- B. In addition, rough-in and make final connections to all new equipment furnished by others. Furnish and install all stops, waste, escutcheons, etc., required to provide a complete functional system.

PART 3 - EXECUTION

3.01 ISOLATION VALVES

- A. The water supplies to each group of fixtures shall have an isolating valve in each line serving the riser. These isolation valves shall be installed at an accessible location. Where these valves are not accessible thru removable ceilings or otherwise, provide access doors in the ceiling or chase.

3.02 INSTALLATION OF PIPING SYSTEMS

- A. Refer to PIPING AND ACCESSORIES for requirements for installing pipes. In addition, the following specifications shall apply.
 - 1. Drain Lines and Sanitary Waste: Grade down toward the sewer connection at a uniform slope of 1/4" per foot to serve individual fixtures or not less than 1/8" per foot to serve multiple stacks or outlets. Slope shall be greater where possible and shall never be less than required to produce a flow velocity of 2 feet per second.

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2. Vents: Grade up to the vent thru the roof. Terminate not less than 10" above the roof.
 3. Water Lines:
 - a. Grade to established low points and provide valved drains to completely drain the system.
 - b. Secure and anchor piping in plumbing chases such that there is no movement of flush valves, stops, etc. at fixture rough-ins.
 4. Gas Lines:
 - a. All gas piping shall run exposed unless specifically detailed otherwise on the drawings, with special venting provisions.
 - b. A drip pocket shall be installed at connection to an item of equipment and at each low point of the gas distribution system. Grade all lines to drip pockets. Drip pockets shall consist of a nipple and cap screwed to the bottom of the drop.
 - c. Provide a gas cock, union and gas pressure regulator at each connection to a gas consuming appliance.
 - d. All gas piping on the roof shall be supported on Miro Pillow Block pipe stands, Model 02 for 2" and below, Model 24-R for piping 2" to 4" and Model 48-R for 5" and above. Pans shall be mopped to roof. Pipes shall be strapped to supports with galvanized strap.
 5. Identification: For other than black steel pipe, exposed gas piping shall be identified by a yellow label marked "Gas" in black letters. The marking shall be spaced at intervals not exceeding 5 feet (1524 mm). The marking shall not be required on pipe located in the same room as the appliances served. All tubing carrying medium-pressure gas shall be marked with a label at the beginning and end of each tubing section.
 6. Testing: Test all pipes before they are concealed in furrings or chases, insulated, painted, or otherwise covered up or rendered inaccessible. Accomplish testing by sections of lines or systems, as required by conditions during construction. Clean all piping and equipment before testing.
 7. Domestic Water Lines Interior: Test for 6 hours at 150 psig. There shall be no leaks whatsoever.
 8. Interior Soil, Waste and Vent Lines: Drainage and venting system piping shall be tested with water before the fixtures are installed. Water test shall be applied to the drainage and venting system either in its entirety or in sections. If the entire system is tested, all openings in the pipes shall be tightly closed except the highest opening and the system shall be filled with water to the point of overflow. If the system is tested in sections, each opening except the highest opening of the section under test shall be tightly plugged, and each section shall be filled with water and tested with at least a 10 foot head of water. The water shall be kept in the system, or in the portion under test, for at least 30 minutes before the inspection starts. The system shall then be tight at all joints. Water shall not drop more than 1" in 8 hours.
 9. Gas Lines: Test with 50 psig air pressure for 24 hours with no pressure drop (except for temperature correction). If any drop occurs, soap test all joints, correct leaks and retest.

3.03 DISINFECTING

- A. After cleaning, flushing and testing, the Contractor shall furnish all labor, equipment and materials necessary for the disinfection of all domestic pipe lines which shall be disinfected by the application of a chlorinating agent. The chlorinating agent may be a liquid chlorine,

liquid chlorine gas water mixture, or a calcium hypochlorite solution, which shall be fed into the lines through a suitable solution feed device.

- B. The chlorinating agent shall be applied at or near the point from which the line is being filled and through a corporation stop or other approved connection inserted in the horizontal axis of the newly laid pipe. The water being used to fill the line shall be controlled to flow into the section to be disinfected very slowly.
- C. The chlorine dose applied to the water entering the lines shall be at least 40 to 60 parts per million. The treated water shall be retained in the pipe lines for a period of not less than 24 hours. At the end of the 24 hour retention period the chlorine residual shall be at least 20 ppm. All treated water shall be thoroughly flushed from the lines until the replacement water in the lines has a chlorine residual of not more than 0.2 parts per million.

END OF SECTION

SECTION 15370

FIRE PROTECTION SPRINKLER SYSTEM

PART 1 – GENERAL

1.01 NOTE

- A. Drawings, General Conditions of the Contract for Construction, Supplementary Conditions and Division 1 - General Requirements apply to Work of this Section.

1.02 SUBMITTALS

- A. Submit manufacturer's data on all materials, provide complete plan layout of system and hydraulic calculation (for hydraulic design) for approval.

1.03 SCOPE

- A. The entire building area shall be protected by an ordinary hazard automatic sprinkler system. The design and installation shall be done by a Contractor regularly engaged in the construction of fire protection sprinklers systems and licensed for such by the authorities having jurisdiction.

1.04 APPLICABLE SPECIFICATIONS

- A. The design and installation of the Automatic Sprinkler Systems and the Alarm and Supervisory Systems shall be in strict accordance with all mandatory and recommended provisions of the NFPA, FM, UBC, and UL publications. All recommended provisions of the NFPA (National Fire Codes) listed below shall be considered as mandatory requirements.
- B. Issues of the following publications, including revisions and amendment as of the date of award of this contract, form a part of this specification.
 - 1. National Fire Protection Association Standards (NFPA)
 - 2. No. 101 Life Safety Code
 - 3. No. 99 Hospital Code (as required)
 - 4. No. 13 Sprinkler System
 - 5. No. 70 National Electrical Code
 - 6. No. 72C Remote Station Protective Signaling Systems
 - 7. No. 24 Outside Protection
 - 8. Factory Mutual System, Factory Mutual Engineering Corporation Publication (FM)
 - 9. Underwriter's Laboratories, Inc. Publication (UL)
 - 10. Approved Equipment Lists (with supplements).
 - 11. Interpretations of state and local authorities

1.05 GENERAL

- A. All material and equipment shall be new and the current standard products of the manufacturer. Where two or more items of equipment performing the same function are required, they shall be exact duplicates, produced by one manufacturer. However, component parts need not be products of the same manufacturer.

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- B. All materials and equipment shall be UL listed and/or FM approved for systems of the type indicated on the drawings, unless otherwise noted, and shall conform to the requirements of NFPA No. 13.

1.06 MATERIALS AND EQUIPMENT

- A. The following is a listing of the materials and specifications. The list is comprehensive in nature. It is not intended that all materials listed will necessarily be required, but that those required for the work be selected from this listing. All pipe and fittings shall be non-galvanized, except where called for on the drawings or required by code.

ITEM	SIZE (INCL)	SPECIFICATIONS
Pipe	All	Schedule 40 steel, ASTM A120 or A53
Fittings, Grooved	All	Schedule 10, ASTM 120 UL/FM Grooved Fittings
Fittings, Screwed	All	Malleable iron, 150 lb, ANSI B16.3. Cast iron acceptable.
Fittings, Flanged	All	Steel, 150 lb, ANSI B16.5. Cast iron not acceptable.
Fittings, Welding	All	Steel, Sch. 40, ANSI B16.9
Flanges	All	Steel, 150 lb, ANSI B16.5. Cast iron not acceptable.
Threadolets Sockolets	Thru 2"	Steel, ANSI B16.11 ASTM A105
Weldolets	2" and larger	Steel, 90 degrees STD only, ANSI B16.9, ASTM 105
Plugs	All	Brass, square head, 125 lb, ANSI B16.5
Unions	Thru 2"	Malleable iron, 300 lb bronze to iron ground joint
Flange Gaskets	All	Red rubber 1/16 inch, ANSI B16.21
<u>Valves:</u>		
Globe Valves	Thru 2"	Screwed, bronze body, rising stem, 175 lb WWP, screw-in bonnet, renewable disc, Kennedy Fig. 97.
Angle Valves	Thru 2"	Screwed, bronze body, rising stem, 175 lb WWP, screw-in bonnet, renewable disc, Kennedy Fig. 98.

Gate Valves	Thru 2"	Screwed, bronze body, OS&Y, 175 lb WWP, Kennedy Fig. 66.
Gate Valves	2-1/2" & Larger	Flanged, iron body, OS&Y, 175 lb WWP, Kennedy Fig. 68
Check Valve	Thru 2"	Screwed, bronze body, 175 lb WWP, horizontal swing, renewable disc, Kennedy Fig. 442.
Check Valves	2-1/2" & Larger	Flanged, iron body, 175 lb WWP, bolted bonnet, horizontal swing, renewable seat & rubber faced disc, Kennedy Fig. 126A.
Auto Ball Drip	1/2 or 3/4	Bronze, Grinnell Model F775.

Sprinklers and Nozzles:

Automatic Sprinklerhead, standard upright and pendant	Reliable Model G Head type, orifice size, thread size, 165 degree temperature rating satin chrome finish where exposed in finished areas. Provide quick response heads where required.
For all spaces with ceilings	Fully recessed, fully concealed sprinkler head with white concealer button, flush mounted with ceiling. Center heads in ceiling tiles. UL/FM flexible drops are permitted.
Sidewall	Grunau Institutional model PH-3. Quick response head.

Water Flow Alarm Devices:

Alarm check valves	Alarm check valve, complete with trim including retard chamber & connections for pressure switches for local alarm bell & water flow transmitter. Reliable Model E.
Water Motor Gong	Reliable Model C.

Miscellaneous:

Pipe Hangers Supports, and Connections	Approved type, in accordance NFPA No. 13 and No. 15 requirements.
Pipe Escutcheons	Chromium-plated iron or chromium-plated brass, either one piece or split pattern, held in place by internal spring tension or setscrew.

Sprinkler Escutcheon	Two-piece, finish to match sprinkler except where otherwise specified on drawings. Depth as required to position sprinkler.
Sprinkler Guard	Approved guard, standard baked red enamel finish.
Hypochlorite	AWWA 300
Water Pressure Gage	3-inch minimum dial, 0-300 psi range, polished brass case, Federal Spec. GG-G-76.
Siamese	2-1/2"x2-1/2"x4" chromium plated flush mounted with caps, chains and sillcock. Mark "AUTO SPKR".

1.07 JOINTS

- A. Joints shall be the grooved or threaded type for 2" and smaller, and shall be grooved, welded or flanged for 2-1/2" and larger.
- B. Threaded Joints: Threads shall be concentric with the outside of the pipe and shall conform to ANSI B2.1. Threaded joints shall be made tight with an approved thread joint compound or tape. Joint compound shall be applied lightly but sufficiently to cover male threads only. Leaking joint shall not be repaired by peening or packing.
- C. Flanged Joints: Flanged joints shall be faced-true, provided with 1/16 inch red rubber gaskets, and made square and tight. When made up, flange bolts shall extend through nuts by at least one full thread. No flanges shall be placed in locations which will be inaccessible after erection.
- D. Welded Joints: All welding, including methods and qualifications of welders, shall be in strict accordance with the standards and requirements specified in NFPA Nos. 13 and 15. All welds are subject to inspection by the Contracting Officer. The Contracting Officer reserves the right to accept, reject, or demand removal of welds which are in violation of these specifications. Welded branch connections to headers shall be made by use of threadlets, socklets or weldlets type fittings.
- E. Cutting: Pipe shall be cut accurately to measurements shown on the shop drawings and to suit field conditions, and shall be carefully worked into place without forcing or springing. All cuts shall be reamed to remove fins and burrs.

1.08 INSTALLATION

- A. Piping material, including valves and fittings, shall be delivered to the site in a clean and protected condition. End seals of pipe, valves and flange covers shall be maintained in place, being removed only as necessary for cleaning, fabrication, erection or for inspection by the Contractor. Care shall be exercised in the handling and storage of all piping materials and prefabricated piping so that contamination by moisture, grease, dirt, or injurious foreign matter shall not occur.
- B. The pipe shall be cut accurately to centerline measurements to suit field conditions, and shall be carefully worked into place without forcing or springing. Piping shall be pitched to allow proper drainage.

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- C. The interior and exterior surfaces of all piping shall be kept clean at all times. Pipe shall be free from fins and burrs and shall be cleaned in accordance with cleaning procedures herein.
 - D. No flanges or unions shall be placed in locations which will be inaccessible after erection.
 - E. All valves shall be properly packed and made leakproof under the test pressures described.
 - F. All piping passing through walls shall be provided with pipe sleeves two pipe sizes larger than the systems piping they accommodate or approved steel sleeves providing annular space around the pipe. Annular space shall be made weather and watertight.
 - G. Where pipes pass through fire walls, fire partitions, or floor/ceiling assemblies, a fire seal of mineral wool, or similar noncombustible material shall be packed between the pipe and sleeve.
 - H. Escutcheons: Pipe escutcheons shall be provided at all finished surfaces where exposed piping passes through floors, walls or ceiling except in boiler, utility, or equipment rooms. Sprinkler escutcheons shall be provided for all pendant heads through ceilings. Escutcheons shall be fastened securely to the pipe.
 - I. Signs: All control drain and inspector's valves shall be provided with porcelainized metal identification signs. All hydraulically designed systems shall be provided with a permanently attached nameplate data sign as recommended by NFPA No. 13.
 - J. Sprinkler Guards: All sprinkler heads installed within 7 feet of the floor or otherwise subject to mechanical damage shall be equipped with sprinkler guards.
 - K. Testing: Testing of the sprinkler systems and alarm systems shall be as prescribed by NFPA Pamphlet No. 13 and 72C. Each test shall be in the presence of an authorized representative of the owner. This representative shall sign the Certificate of Inspection as a witness of a successful test. The Contractor shall deliver these certificates of inspection in duplicate to the Architect.
 - L. Sterilization: All new lines shall be flushed and sterilized with chlorine before acceptance for service. Calcium hypochlorite powder, containing not less than 70% available chlorine, shall be used for sterilization. The amount of chlorine applied shall be such as to provide a dosage of 100 ppm for at least 24 hours. At the conclusion of the 24-hour contact time, Cl₂ residual should be at least 20 ppm. The chlorinating material shall be mixed with treated water in an acceptable container and injected directly into the system, the process being repeated until the system is filled. All valves in the system shall be open and closed 3 times during the procedure to insure that the sterilizing mixture is thoroughly and evenly distributed throughout the system. After a contact period of not less than 24 hours, the system shall be flushed with water.
 - M. Procedure for Placing Systems in Service: The Contractor shall place the systems in service with the operating mediums after purging operations are completed. The Contractor shall furnish all labor and tools required.
 - N. Electrical Work: All electrical work in connection with the installation of the fire protection system shall be performed in accordance with Division 16.
 - O. Spare Sprinkler Heads: The Contractor shall furnish spare heads in accordance with NFPA Pamphlet No. 13. Heads shall be provided in a suitable cabinet and shall be representative of, and in proportion to, the number of each type and temperature rating of heads installed. In addition to the spare heads, the contractor shall furnish not less than one special sprinkler wrench per cabinet. The Cabinets shall be mounted at the system's riser.
 - P. Electrical Rooms: Sprinkler piping shall be routed to avoid all Electrical Rooms, except laterals extending into and serving the electrical room.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

SECTION 15400

AIR DISTRIBUTION

PART 1 - GENERAL

1.01 NOTE

- A. Drawings, General Conditions of the Contract for Construction, Supplementary Conditions and Division 1 - General Requirements apply to Work of this Section.

1.02 SUBMITTALS

- A. Submit manufacturer's data on all materials.

1.03 SCOPE

- A. This section of the specifications comprises the furnishing of all labor, materials, transportation, tools and appliances and in performing all operations in connection with the installation of apparatus casing, ductwork, plenums, linings, air distribution devices, dampers and control devices, relief air vents, curbs and other materials and accessories as described herein and/or as shown on the accompanying drawings, or reasonably implied therefrom.
- B. In addition, connect all air conditioning units, automatic dampers, filters and all other materials and install (and/or cooperate in the installation with other trades) those various items of equipment and materials.

PART 2 - PRODUCTS

2.01 LOW PRESSURE DUCTWORK

- A. Except as otherwise specified herein, in other sections of the specifications, and/or noted on the drawings, low-pressure ducts shall be constructed of galvanized steel sheets in accordance with the recommended construction for low pressure ducts insofar as gauges of metal to be used, bracing of joints and joint construction as established in the latest edition of the ASHRAE HANDBOOK.
- B. Duct construction details shall conform to "HVAC Duct Construction Standards", 1st Edition, (1985) published by the Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA). Refer to the fan schedules (TSP) for system pressures. Construction shall be suitable for actual duct system pressures.
- C. Make square elbows where shown or required, with double thickness factory-fabricated turning vanes. Make all other changes in direction with rounded elbows having a centerline radius equal to 1-1/2 times the width of the duct in the plane of the bend.
- D. Make transformations in duct shape or dimension with gradual slopes on all sides. Make increases in dimensions in the direction of airflow, with a maximum slope of 1" in 7" on any side. Make decreases in dimensions in the direction of air flow preferably with a slope of 1" in 7" on any side, but with a maximum slope of 1" in 4" where conditions necessitate.

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- E. Ducts shall be routed in conjunction with pipes, electrical conduits, ceiling hangers, etc. so as to avoid interferences insofar as possible. Where duct penetrations are unavoidable, provide streamline shaped sleeves around such material penetrations, made airtight at duct surfaces, except that such sleeves are not required at tie rods. Where obstructions are of a size to exceed 10% of the duct area, the duct shall be transformed to maintain the same duct area.
 - F. Round, low pressure duct exposed in spaces: This ductwork shall be round in cross-section, as shown on the drawings. It shall be constructed according to the latest edition of the ASHRAE HANDBOOK. All job-constructed ducts shall be made with longitudinal joints butted and welded. Round ducts 48" in diameter and smaller shall be factory fabricated spirally wound conduit made from zinc coated steel strips. All such ducts shall be delivered in standard lengths and shall be cut to proper length at the site by power saw to insure proper fit and square alignment. Fittings used on round or flat oval ducts shall be shop fabricated by welding. Changes in direction shall be made with mitered fittings of at least 3 sections; 90-degree elbows shall contain not less than five sections. Branch takeoffs shall be at 45 degree, except where indicated on the drawings they may be 90-degree conical taps. The run of a conical take-off shall be not less than the diameter of the branch which it serves. This contractor shall furnish for review drawings of fittings which he proposes to use and shall not proceed with fabrication until review by the Architect. Transitions shall be all welded construction. In any required rectangular ells, provide Airsan "Acoustiturn" double thick acoustical turning vanes. All spiral duct shall be internally lined and painted on the exterior as specified in Division 9.

2.02 DUCT CONSTRUCTION TEST

- A. A trial leak test, as specified herein, shall be made after installation of the first section of each type of ductwork to demonstrate adequacy of the construction details. All testing shall be done in the presence of the Architect.
- B. Each test section shall incorporate at least five transverse joints and all typical fittings.
- C. Drawings showing all construction details of test sections, test procedures and instrumentation, and test results shall be submitted for record purposes. No additional ductwork shall be installed until the trial test installation described above has been approved.
- D. Low pressure duct shall be tested at 3" w.c. Construction of low-pressure systems shall be inherently airtight and leakage shall be of a sufficiently low magnitude as to be inaudible in quiet ambient and not detectable by sense of feel.

2.03 DUCT LINER

- A. Lined ducts and internal sizes are shown on the drawings.
- B. Return air ductwork and other ducts specifically shown on the drawings shall be lined.
- C. Conditioned Spaces:
 - 1. The listed ducts shall be lined to a thickness of 1" with Johns-Manville "Permacote Linacoustic" mat faced duct liner, or equal duct liner coated with immobilized antimicrobial impregnated acrylic surface coating on one side.
 - 2. Duct liner shall have an average thermal conductivity of .25 btu-in./sq. ft.-degree F. at a mean temperature of 75 F.

D. Unconditioned Spaces:

1. The listed ducts shall be lined to a thickness of 1-1/2" with Johns-Manville "Permacote Linacoustic" mat faced duct liner, or equal duct liner coated with immobilized antimicrobial impregnated acrylic surface coating on one side.
2. Duct liner shall have an average thermal conductivity of .20 btu-in./sq. ft.-degree F. at a mean temperature of 75 F.
3. Duct liner shall comply with ASTM C1071 with an NRC not less than 0.70 as tested per ASTM C423.
4. The duct liner shall be applied in accordance with the manufacturer's recommendations with the coated side away from the metal, using weld pins or adhesive Tuffbond and adhesive type metal clips, Gemco, or equal, of the type which do not protrude through the duct. The size of the ducts indicated are actual internal sizes and the sheet metal sizes shall be 2" greater in both dimensions to accommodate the lining. No voids are permitted.
5. Use 100% adhesive coverage and clips at the rate as specified by SMACNA.

2.04 DUCT SEALER

- A. All supply air ductwork from the air unit to the terminal units shall be sealed to provide airtight construction. Metal surfaces to be joined shall be clean, dry and free of dirt or grease. Apply a heavy coat of Kingco Seal-Rite 18-120 to the interior metal surface of the slip joint, then interlock into place metal duct sections. Apply a heavy coat of 18-120 to the exterior metal surface duct joint, making sure any voids are filled to secure a continuous air pressure sealant.
- B. Allow sealant to dry a minimum of 48 hours before pressurizing system.

2.05 AIR CONTROL DEVICES

- A. Manual dampers shall be installed as required to afford complete control of the airflow in the various duct systems. In rectangular supply ducts, a splitter damper shall be installed at each point where a branch is taken off and additional volume dampers shall be installed where shown or required to achieve the final air balance.
- B. Splitter dampers and volume dampers of the "butterfly" type shall be constructed of 20 gauge galvanized steel riveted or welded to square operating rods. Dampers shall have bearings of brass, bronze or approved plastic in most instances. The length of any splitter damper blade shall be 1-1/2 times the width of the smaller split in the duct, but shall be not less than 12". Volume dampers of the butterfly type shall be used only in cases where neither dimension of the damper exceed 18". The metal used shall match that of duct system containing the damper in each case. Use special metals for damper rods and bearings as required to resist corrosion.
- C. In cases where either dimension of the smaller branch duct exceeds 24", volume dampers shall be of the opposed blade type with blades linked together and controlled from a single point. They shall be constructed of No. 16 gauge steel either galvanized or with a baked enamel finish. Dampers shall have brass, bronze or approved plastic sleeve bearings. Blades shall be not more than 12" in width and shall be opposed acting, and those for automatic dampers shall be fitted with felts to insure tight closure. Felts shall be both glued and riveted to the damper blades. Blades shall be mounted in suitable band or angle iron frames strongly braced to insure rigidity.

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- D. Each splitter or volume damper, unless specified for automatic operation, shall be fitted with an adjusting device having a locking mechanism. Wherever the ducts are rendered inaccessible behind non-removable ceilings or furrings, or other construction that is not easily removable to permit access to the ducts, the devices shall be equal to Young Regulator Co. No. 896 concealed air split regulators. On exposed or easily accessible ducts the adjusting devices shall be equal to Young No. 1 or No. 900 and shall be fastened to the ducts.
 - E. Damper rods and operators on insulated ducts shall have extended rods and stand off brackets.

2.06 PLENUMS

- A. The Contractor shall fabricate and install all sheet metal plenums. Plenums shall be constructed and insulated as specified for "Low Pressure Ductwork." In addition as a minimum requirement, plenums shall be braced with 1-1/2 by 10 gauge angles 24" on center, all sides. When plenums are mounted on the floor there shall be an additional angle around the plenum secured to the floor. Caulk all seams air and water tight. All plenums shall be lined with 1" duct liner.
- B. There shall be at least one door in each plenum 18" by 48" with two latches, 12" square Airsan Ductport, piano hinge, and gasket. All plenum doors shall be double metal clad with 1" thick internal insulation. Provide two Ventlock series 300 latches on each door.

2.07 FLEXIBLE DUCT

- A. Flexible ducts shall be used for connecting air terminal devices. Generally flex duct shall not exceed 3'0" in length or have more than 90 degree of bend. Flexible duct shall be a factory-fabricated assembly consisting of an inner sleeve, insulation and an outer moisture barrier. The inner sleeve shall be constructed of a continuous vinyl-coated spring steel wire helix fused to a continuous layer of fiberglass impregnated and coated with vinyl. A 1-1/4 inch thick insulating blanket of fiber glass wool shall encase the inner sleeve and be sheathed with an outer moisture barrier of a reinforced Mylar or neoprene laminate of low permeability. The flexible duct shall be rated for a maximum working velocity of 6000 FPM and shall be listed by the Underwriters' Laboratories under their UL-181 standards as a Class 1 duct and shall comply with NFPA Standard #90A. The flexible duct shall be Thermaflex M-KC for high pressure and Thermaflex M-KE for low-pressure application.

2.08 FLEXIBLE CONNECTIONS

- A. Provide sound isolating flexible connections between connecting ducts and the inlet and outlet of each fan. These connections shall in each case be long enough to permit a minimum separation of 3" between the duct and the fan or unit housing with at least 1" slack in the flexible material itself.
- B. The material shall be of a vinyl coated woven nylon/polyester blend base fabric, 22 oz. per square yard, meeting NFPA 90A and B for flame spread and smoke developed. It shall be fire resistant, waterproof and mildew-resistant. The material shall be equal to Excelon Fabric as manufactured by Duro-Dyne.

2.09 ROUND DUCT TAPS

- A. All round takeoffs shall be made with spin-in type fittings for sheet metal duct or fiberglass ductboard as applicable. Provide each with a factory installed balancing damper, positive locking nut and air scoop.

2.10 ACCESS PANEL

- A. Access doors of sufficient size shall be installed in ducts to permit servicing of contained equipment including fire extinguishing equipment, dampers, etc. Where those panels are in insulated ducts, they shall be double wall panels with material to match the lining and of the same thickness. In uninsulated ducts they shall be single wall construction. All access panels shall have No. 310 Ventlock catches and pulls, No. 260 hinges and No. 390 gaskets.
- B. Where access panels are not exposed or readily accessible above removable ceilings, provide access doors in the general construction.

2.11 AIR DISTRIBUTION DEVICES

- A. Furnish and install all grilles, registers, and diffusers for every purpose. Refer to the tabulation on the drawings for types, sizes and accessories.
- B. All grilles, registers, and diffusers located in the ceiling shall be factory finished in OFF-WHITE. Door grilles shall be factory finished in baked enamel medium birch tan. All other grilles and registers shall be factory primed and spray painted 2 coats on the job. All grilles and registers shall be installed with tamperproof screws and shall be secured to the duct with a minimum of four screws.
- C. Where perforated supply grilles are scheduled, they shall be of the type with adjustable curved blades in the neck of the diffusers. Other types are not acceptable.
- D. Air distribution devices as manufactured by Barber Colman, Titus, Tuttle and Bailey, Metal-Aire or Krueger will be acceptable.

2.12 DRYER VENT

- A. Provide and install the vent on the dryer. It shall include a 4" vent pipe to out-of doors, terminating in a cap with backdraft damper. Each dryer vent (2 required) shall stub out behind the dryer connection. Provide and install a Fantech DBLT4 lint trap recessed in the wall with flush mounted cover. Mount trap where it is accessible above the dryer. Paint the access door to match the adjacent wall. Route 4" smooth wall dryer vent up in wall (concealed) and route to Fantech DBF4XLT dryer booster fan located above corridor lay-in ceiling (2 required). Provide and install monitor panel in Laundry 113 on the west wall. Route the dryer vent from the fan to the apparatus bay, turn up and vent to exterior with dryer vent cap with backdraft damper.

2.13 FLASHING

- A. Where the contractor installs ducts or piping through the roof, he shall flash and counterflash them into the roof construction to the satisfaction of the Architect. All such flashing shall be constructed of copper bearing galvanized steel sheets.

2.14 LOUVERS - FIXED

- A. Provide louvers shown on the drawings. Provide with galvanized blades and frames to fit wall construction. Provide with inside insect screen on exhaust louvers and birdscreen on intake louvers. Louvers shall be 4" thick stormproof, Krueger series XY with K blades. Units shall be factory primed for painting on the job.
- B. Dimensions shown are nominal. Coordinate exact dimensions with the general construction.

2.15 RELIEF HOOD AND INTAKE

- A. Hood and intake construction shall be arched heavy formed galvanized steel with rolled interlocking seams. Hoods and intakes shall be fitted with aluminum birdscreen. Provide factory fabricated self-flashing curbs.
- B. Hood and intake shall be Greenheck Fabra Hood or equal.
- C. Refer to the drawings for size.
- D. Unit shall be finished as selected by architect. Submit finish options with colors to architect for final approval.

PART 3 – EXECUTION

Not Used

END OF SECTION

SECTION 15500

HANGERS AND SUPPORTS

PART 1 - GENERAL

1.01 NOTE

- A. Drawings, General Conditions of the Contract for Construction, Supplementary Conditions and Division 1 - General Requirements apply to Work of this Section.

1.02 SUBMITTALS

- A. Submit manufacturer's data on all materials.

1.03 SCOPE

- A. The Contractor for the work covered by each section of the specifications shall furnish and install all hangers, supports and isolation required by pipe or equipment included in this work.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Materials shall be provided for the support of all piping and equipment. The following tabulation lists materials suitable for this duty. Equal materials manufactured by Fee and Mason, Carpenter-Patterson, Grinnell or Modern will be considered.

MATERIAL	SERVICE	FEE AND MASON CAT.
Hanger	Copper Tubing 4" and Larger	364 copper plated
Hanger	Copper Tubing 3" and smaller	361 copper plated
Hanger	Steel Lines 3" and smaller	215 or 199
Hanger	Steel lines 4" and larger	239
Hanger	Outside Insulation-all lines	239
Hanger	Cast Iron Lines	239
Hanger	Plastic Pipe	108 + 109
Hanger	Refrigerant Pipe	102
Hanger	Glass Pipe	375
Wall Bracket	All	150, 151, or 155
Saddles	Steel Lines On Rollers	71, 1710, 1712, 172, 173
Conc. Inserts	New Construction	185
Rollers	Steel Piping	161, 272
Pipe Clamps	2" and Smaller	304
Pipe Clamps	3" and Larger	241
Pipe Rest	All	295 or 291
Exp Shield	Concrete	374
Beam Clamps	All	249, 254, 255, 282, 280
Adjuster	All	2381

2.02 HANGER RODS

- A. All individually suspended horizontal pipes shall be supported by steel rods sized as follows:

Rod Diameter	Size of Steel Pipe or Copper Tube Supported	Size of Cast Iron Pipe Supported
3/8"	2-1/2" and smaller	3" and smaller
1/2"	3" and 4"	4" through 6"
5/8"	5" through 8"	8" through 10"
3/4"	10" and larger	12" and larger

2.03 HANGER SPACING

- A. All hangers shall be so located as to properly support horizontal lines without appreciable sagging of these lines. The following table gives minimum spacing for copper, and steel lines, but hangers shall be more closely spaced where necessitated by conditions or the type of pipe involved or required by code.

Size of Line	Hanger Spacing in Feet
3/4" and smaller	5
1" through 1-1/2"	7
2" and larger	10
All cast iron lines	5 (Minimum two per joint)

PART 3 - EXECUTION

3.01 INSTALLATION OF SUPPORTS

- A. All pipes shall be adequately supported. All piping shall be installed with due regard to expansion and contraction, and the type of hanger, method of support, location of supports, etc. shall be governed in part by this consideration. Transmission of vibration and noise shall also be considered and any special suspension with vibration dampeners required to minimize transmissions shall be used where specified or required.
- B. All exposed vertical risers running near walls shall be supported from the walls. Each line shall have a minimum of 2 supports, not greater than 10'0" on centers, with the additional provision that there shall be a support near the top of the riser. All supports shall be aligned.
- C. All vertical pipes shall be supported with riser clamps sized to fit the lines and to adequately support their weight. At the bases of lines, where required for proper supports, furnish and install anchor base fittings or other approved supports.
- D. Where vertical lines run down to a point near the floor and a support is needed, they may be supported by means of a pipe leg welded to the pipe, extending down to the floor and terminating in a capped end resting on the floor.
- E. Where pipes other than those specified hereinbefore, are running along walls, they shall be supported using hangers as described hereinbefore, but suspended from brackets bolted to

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- the wall. Specially fabricated clips or U-braces may be used where commercially manufactured items are not available in the proper size.
- F. Where pipes run under steel construction, use beam clamps on beams. Under steel joists, piping may be suspended from rods thru the bottom chord with washers and double nuts. On piping larger than 4", verify the joist strength before installation.
 - G. Where multiple lines are run horizontally at the same elevations and grades, they may be supported on trapezes formed for sections of Unistrut, angle iron, or channels suspended on rods or pipes. Trapeze members, including the suspension rods, shall be properly sized for the number, size and loaded weight of the lines they are to support. Trapeze spacings shall be in accordance with the preceding table for the smallest line supported on or from the trapezes.
 - H. Perforated strap iron and wire will under no circumstances shall be acceptable as hanger material.

3.02 COOPERATION BETWEEN TRADES

- A. Where pipes specified under different sections may possibly be racked on the same supporting structure, each trade shall cooperate with the others involved to properly locate the supporting members and shall furnish a proportionate share of the labor and materials involved in the installation.
- B. Any other special hangers and supports shall be provided and installed as indicated on the drawings, specified elsewhere herein or required by conditions at the site.

3.03 DUCT HANGERS

- A. All ductwork shall be supported in accordance with standards published by Sheet Metal and Air Conditioning Contractors National Association Inc.

END OF SECTION

SECTION 15600

INSULATION

PART 1 - GENERAL

1.01 NOTE

- A. Drawings, General Conditions of the Contract for Construction, Supplementary Conditions and Division 1 - General Requirements apply to Work of this Section.

1.02 SUBMITTALS

- A. Submit manufacturer's data on all materials.

1.03 SCOPE

- A. This section of the specifications comprises the furnishing of all labor, materials, transportation, tools and appliances and in performing all operations in connection with the installation of thermal insulation, coverings, jackets, supports, shields, etc. as described herein and/or as shown on the accompanying drawings, or reasonably implied therefrom. All surfaces which may vary from the ambient temperature shall be insulated unless specifically accepted.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. In describing the various materials, application procedures, and finishes, each item will be described singularly, even though there may be a multiplicity of identical applications. Also where the description is only general in nature, exact dimensions, arrangements and other data shall be determined by reference to plans, schedules, and details, including those provided by equipment manufacturers.
- B. Where materials are described under other sections of the specifications and are pertinent to this section, they shall be installed hereunder as though they were repeated herein.
- C. All insulation shall have composite fire and smoke hazard ratings as tested by procedure NFPA 225, not exceeding flame spread 25, smoke developed 50. Accessories such as adhesives, mastics, cement, tape, cloth, etc. shall have these same component ratings.
- D. All materials installed under this section of the specifications shall be manufactured in the United States of America.

2.02 VAPOR BARRIER JACKETS

- A. Factory-applied vapor-barrier jackets shall be laminated of flame resistant white kraft paper and .001 inch thick aluminum foil reinforced with glass fiber fabric between the foil and the paper. The foil and paper shall be adhered with a flame resistant latex adhesive.
- B. Where specified, insulate valves and fittings with two fiberglass inserts and preformed Manville "Zeston" covers with taped seams.

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- C. Where metal jackets in apparatus bay are specified, they shall be 0.016" thick No. 5005 tempered aluminum secured with machine drawn 0.020" stainless steel bands.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The installation of all thermal insulation shall be performed by a recognized firm regularly engaged in the insulation business, using skilled insulation mechanics and using insulation materials which are the product of reputable manufacturer of the materials, using any special materials as required by these specifications and by those published standards.
- B. Any insulation which is not applied in a workmanlike manner will be rejected and replaced. All coverings shall be smooth, flush, dressed to line and tight. Mastic shall be neatly applied and tooled. The Architect reserves the right to reject any insulation whose appearance he deems unacceptable.

3.02 JACKETS

- A. Provide metal jackets on all insulated piping that is visible in the apparatus bay (fire truck area) or any other areas where the piping is exposed to view (visible)
- B. Metal jackets shall be 0.016" thick No. 5005 tempered aluminum secured with machine drawn 0.020" stainless steel bands.
- C. Provide metal jackets on all insulated lines, including domestic hot water, domestic cold water, and domestic hot water recirculation lines.

3.03 APPLICATION OF INSULATION

- A. Apply insulation and pipe covering after all work has been tested, found to be tight and accepted as such by the Architect. Thoroughly clean and dry all surfaces to be covered.
- B. On glass fiber pipe covering with factory-applied vapor-barrier jacket, lap the jacket on the longitudinal seams and seal with vapor barrier lap adhesive equal to Benjamin Foster 82-07 or use self sealing lap. Tightly butt the ends and cover butt joints with a 4" wide band of vapor barrier jacket secured with the same adhesive.
- C. Except where insulation is cloth jacketed, band all pipe insulation, following the completion of painting operations. Bands shall be aluminum not less than 3/4 inch wide. Space bands a maximum of 12" on centers, with three bands per section of covering. Where sections of insulation are overlapped as at flanges, apply a band at each of the overlapping sections and one on the basic line covering immediately adjacent to the end of the overlap. Provide bands also on each side of each valve, fitting, etc. and at the end terminal where the insulation is beveled off as specified herein. Also band the hanger shields on insulated cold lines with a band at each end of each shield.
- D. Exclusions: No insulation shall be applied to:
 - 1. Exposed chrome plated lines.
- E. Metal Jackets: Note that metal jackets shall be applied to all insulated piping that is exposed to view in any area. Some metal jackets may be painted in living areas.

3.04 INSULATION ON EQUIPMENT AND PIPING SYSTEMS

- A. The following describes materials, thicknesses and finishes for insulation and coverings. In the following, the word "exposed" shall apply to any line, duct, or other material or surface

in any room above the lowest floor in any building unit, exterior to the building and above ground, and/or in equipment rooms; the word "concealed" shall apply to any line, duct, or other material or surface in other underfloor areas, ceiling spaces furrings and chases.

1. Domestic Hot Water and Circulating Lines: Insulate with 1" thick Manville "Micro-Lok APT 650" molded sectional glass fiber pipe covering with all purpose jacket. Insulate valves and fittings with Manville preformed "Zeston" PVC covers over fiberglass insulation.
2. Domestic Cold Water Lines: All cold water lines throughout with those exceptions noted hereinbefore, shall be insulated with 1/2" thick Manville "Micro-lok APT 650" molded glass fiber pipe covering with factory applied vapor barrier jacket. Insulate valves and fittings with Manville preformed "Zeston" PVC covers over fiberglass insulation.
3. Refrigeration Suction Piping: 1" Manville Type II "Aerotube" threaded onto piping during fabrication and sealed with adhesive.
4. Drain Lines: 3/8" thick Armaflex. Insulation may be slit flange type or threaded on during fabrication.
5. Fire Barrier Wrap: For PVC or other Plastic Piping installed in Return Air Plenum spaces for all waste, vent, water, roof drainage, and other piping constructed of PVC or other plastic and installed in plenum spaces, provide and install fire barrier wrap for complete coverage. Fire barrier wrap shall be equal to 3M Fire Barrier Plenum Wrap 5A fire resistant wrap consisting of an inorganic blanket encapsulated with a scrim-reinforced foil. The assembly shall provide a flexible, non-combustible enclosure for piping in return air plenum as tested to UL 910. The product shall contain no asbestos. Wrap shall be tested in accordance with the following standards - ASTM C 411, ASTM C 518, ASTM E 84, ASTM E 136 AND UL910. Surface burning characteristics per ASTM E84 shall be Flame Spread - 0 and Smoke Developed - 0. Wrap shall be 1/2" minimum thickness. Wrap shall be installed in strict accordance with the manufacturer's installation instructions.
6. Duct Insulation: Refer to Section 'AIR DISTRIBUTION' for duct liner specification.
7. Ducts:
 - a. Insulate the supply, return and fresh air ducts with 0.75 lb. density, 2" thick Manville "Microlite R Series" glass fiber flexible insulation having a factory applied FSKL vapor barrier jacket.
 - b. This insulation shall be secured, vapor barrier side out, to sheet metal. On horizontal runs, lap top and bottom sheets over edges of side pieces. Butt joints tightly. Except on ducts handling warm air only, seal all joints, punctures, breaks and fasteners with 3" wide pressure sensitive foil type applied with moving pressure using an appropriate sealing tool. Staples shall be outward clinch, maximum 6" on center. Install with not more than 25% compression in accordance with manufacturer's installation instructions.
 - c. Cover all joints, punctures and breaks with three-inch wide facing strip.
 - d. Ducts handling warm air only need not be vapor sealed.

END OF SECTION

SECTION 15700

EQUIPMENT

PART 1 - GENERAL

1.01 NOTE

- A. Drawings, General Conditions of the Contract for Construction, Supplementary Conditions and Division 1 - General Requirements apply to Work of this Section.

1.02 SUBMITTALS

- A. Submit manufacturer's data and shop drawings on all items specified.

1.03 SCOPE

- A. This section of the specifications pertains to all labor, materials, equipment and service necessary for and incidental to the mechanical equipment as shown on the drawings and/or as specified herein.
- B. This section requires the furnishing of all equipment specified and/or shown on the drawings. Equipment referred to singularly shall mean each item, and the total number of items shown or specified shall be furnished.
- C. All appurtenances and auxiliary equipment necessary to the function of any specified item of equipment shall be furnished with the item of equipment, whether specifically mentioned or not. Each item of equipment shall perform the function for which it is intended, and all work necessary to provide a complete functional system shall be provided.
- D. This specification requires that all items of equipment be completely installed, finally connected, tested and placed in service.
- E. It shall be the responsibility of the Contractor to verify all requirements of the equipment and the contract and certify with the submittal of the shop drawings that all requirements have been met, including:
 - 1. Space requirements
 - 2. Electrical requirements (voltage, phase, wires - no. and size)
 - 3. Capacities
 - 4. Clearance for maintenance
 - 5. Quality
 - 6. Quantity

PART 2 - PRODUCTS

2.01 MOTORS

- A. Motors shall be furnished for all motor driven equipment. Motors with special operating conditions such as multiple speed or in hazardous locations shall be as specified under the equipment served. General service motors driving through flexible couplings or belts shall conform to the following requirements:

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1. Less than 1/6 HP: Split phase, 40 degree C ambient, dripproof or enclosed as required by exposure, with a service factor of 1.0. Provide with inherent thermal overload protection.
 2. Fractional larger than 1/6 HP: Capacitor start, 40-degree C ambient, dripproof or enclosed as required by exposure, with a service factor of 1.0 or greater. Provide with inherent thermal overload protection.
 3. Integral Horsepower, Single Phase: Capacitor type, 40-degree C ambient, dripproof or enclosed as required by exposure, with a service factor of 1.15.
 4. Three Phase: High efficiency continuous duty squirrel cage type, 40 degree C ambient, dripproof or totally enclosed fan cooled as required by exposure with a service factor of 1.15. Power factor shall be 85% or greater. Motors shall be equal to Gould E-Plus.

2.02 MOTOR STARTERS

- A. Except where starters are shown integral to motor control centers (see electrical drawings), the Division 15 Contractor shall furnish all motor starters (controllers) and control equipment for equipment specified under Division 15. The Contractor under this section of the specifications shall be responsible for coordinating starter sizes, characteristics, heater element sizes and all other details. All starters shall be combination starter/disconnect devices, and shall include control transformers, hand-off-auto switches, and pilot lights.
- B. All individual starters shall be the product of a single manufacturer and submitted for review at the same time.
- C. Where starters are specified with items of equipment, the starters shall be factory mounted and wired.
- D. Magnetic Starters (Full Voltage): Starters shall be individual units, combination starter/molded case circuit breaker units, combination starter/fused disconnect switch units or combination starter/unfused disconnect switch units unless otherwise indicated.
- E. Units shall be of General Electric, Square D, Westinghouse, Federal or Gould manufacture with the proper enclosures.
- F. Provide pilot lights and either pushbutton stations or hand-off-automatic switches as required for the control of each item of equipment. Generally, pushbutton stations shall be used only where no interlock or remote functions are specified. Control devices shall be in the starter cover unless otherwise indicated.
- G. Provide auxiliary contacts on starters to accomplish interlocks and control as specified. Starter disconnecting means shall have auxiliary contacts to disconnect all control circuits when the starter is disconnected.
- H. Provide all three phase starters with three overload elements, one per phase. Overloads shall be solid state type.
- I. Equip each starter unit with a control power transformer, with 120 volt secondary, a secondary fuse in one leg and the other secondary leg grounded.
- J. Manual Starters: Where manual starters are indicated, they shall consist of a horsepower rated on-off switch, or hand-off-auto switch with a pilot light and overload element(s) in the same enclosure. Where the starter is installed in public areas, it shall be in a recessed box with a stainless steel coverplate.

2.03 BELT GUARDS

- A. Belt guards shall be provided for all belt driven equipment installed under this contract. Guards shall be rigidly constructed of 18-gauge sheet metal on angle iron frame, with fronts of expanded metal or 1/2 inch mesh hardware cloth. Guards shall be sized to permit belt

tightening to the full extent of the motor slide rails. They shall be securely installed in such fashion as to permit ready removal for servicing of the protected drive. Guards shall have tach holes.

2.04 FLUE VENTS

- A. Provide and install flue vents on all gas burning devices including water heaters, unit heaters and furnaces.
- B. All such flue vents shall be constructed of Metalbestos double wall metal conduit and shall be of the sizes recommended by the manufacturers of the devices vented. They shall be complete with all couplings and other required fittings and shall terminate 24" above the roof in a ventilator type weatherproof rainhead similar and equal to a Breidert Air-X-Hauster. Where any vent passes through combustible construction it shall be provided with a separation in accordance with the standards of the NFPA. All vents shall be flashed and counterflashed into the roofing construction to the satisfaction of the Architect and shall be watertight.

2.05 WATER HEATER

- A. Provide the water heater shown and scheduled on the drawings. It shall be a glass lined, jacketed, insulated package water heater.
- B. The gas fired unit shall be complete with draft diverter, adjustable thermostatic control, gas pressure regulator and all standard accessories including a thermomagnetic safety pilot designed to shut off gas flow completely to both main burner and pilot burner, if pilot flame is extinguished.
- C. Provide in the outlet of each heater a Watts temperature and pressure relief valve, with a drain line therefrom full size to the floor drain. Size valve according to the applicable codes.
- D. Gas fired water heaters shall bear the ASME Stamp and shall be installed in accordance with the Boiler Code if the capacity is 120 gallons or more, or the input is 200,000 BTUH or more. Specifically, 2' of clearance is required on all sides, and 4' of clearance is required above the heater.
- E. Refer to drawings for capacities.

2.06 HOT WATER CIRCULATOR

- A. The contractor shall furnish and install an all bronze in-line circulator as shown on the drawings. The pump shall be Bell & Gossett Model No. PR-1-1/4, or approved equal, with a capacity of 10 GPM at 15 ft. head when directly driven by a 1/6 HP self-aligning flexible coupled oil-lubricated motor, 120 volt, 60 cycle, single phase, 1750 RPM. The pump shall be suitable for 125 lb. working pressure.
- B. The pump shall have a ground and polished steel shaft with integral thrust collar. The shaft shall be supported by two horizontal sleeve bearings designed to circulate oil. The pump is to be equipped with a watertight seal to prevent leakage. Mechanical seal faces to be carbon on ceramic. The motor shall be non-overloading at any point on pump curve.
- C. The motor shall be of the open, drip-proof, sleeve-bearing, quiet-operating, rubber-mounted construction. Motors shall have built-in thermal overload protectors.
- D. The pump shall be supported such that the weight of the pump is not carried by the adjoining pipe.
- E. Provide a manual starter and aquastat to cycle the pump on a 20 degree F. temperature drop.

2.07 FANS

- A. The fans indicated on the drawings shall be provided in accordance with the schedule on the drawings.
- B. All v-belt drives shall be a variable pitch type and shall be so selected that the specified fan performance occurs at approximately the midpoint of the adjustable range. Motor mounting shall be flexible to permit belt tightening. The static pressure tabulated in the schedule is for bidding purposes only. The fan shall be adjusted to achieve the air delivery specified and if changing of the motor and drive is required it shall be done at no increase in the contract.
- C. Motor and Drive: The motor shall be open drip proof NEMA T frame design to meet horsepower and electrical requirements specified. The adjustable v-belt drive shall be selected for a 1.4 service factor based on motor horsepower and shall be factory set for the specified rpm. The motor shall be mounted for alignment and tensioning the belts. Conduit shall be flexible.
- D. Provide isolators and flexible duct connections with each fan to limit the transmission of noise and vibration.
- E. Fans shall be AMCA rated as scheduled.
- F. Fans shall be furnished with backdraft dampers and disconnect.
- G. Fans shall be statically and dynamically balanced.
- H. Fans shall have factory-applied finish.
- I. Fan motors 1/8 HP and larger shall be permanent capacitor start type.

2.08 CEILING EXHAUST FANS

- A. Unitary exhaust fans shall be as scheduled on the drawings. They shall be centrifugal, direct driven fans in a sound insulated sheet metal housing for installation above the ceiling. There shall be a finished integral grille for each unit. Provide a backdraft damper, duct thru the roof and suitable rain cap for each. Fans shall be Penn, Greenheck, or equal.

2.09 UTILITY VENT SET

- A. Provide the centrifugal belted vent sets shown and scheduled on the drawings. Fans shall be AMCA rated and installed in accordance with NFPA 96. Fans shall be equal to Trane Type "BI". Arrangement shall be upblast.
- B. Fan wheels shall be backward inclined, non-overloading, coated for corrosion resistance. Inlet shall be a smooth cone. Scroll shall be all welded, heavy gage steel, coated for corrosion resistance and weather protection. Rotating assembly shall be dynamically balanced. Bearings shall be prelubricated ball type rated for 100,000-hour life.
- C. Motor and drive shall be enclosed in a weatherproof housing. Drive shall be adjustable.
- D. Refer to the drawings for special mounting requirements.

2.10 ENERGY RECOVERY VENTILATORS

- A. Manufacturers: Available Manufacturers: Subject to compliance with specifications contained within this document, manufacturers offering products that may be incorporated into the work include, but are not limited to:
 - 1. Greenheck Fan Corporation or equal
- B. Manufactured Units: Unit shall be fully assembled at the factory and consist of an insulated metal cabinet, , energy wheel, motorized intake damper, motorized exhaust damper,

sensors, filter assembly for intake and exhaust air, supply air blower assembly, exhaust air blower assembly and an electrical control center. All specified components and internal accessories factory installed and tested and prepared for single-point high voltage connection.

C. Cabinet:

1. Materials: Formed single wall insulated metal cabinet, fabricated to permit access to internal components for maintenance.
 - a. Outside casing: 18 gauge, galvanized (G90) steel meeting ASTM A653 for components that do not receive a painted finish. Pre-painted components as supplied by the factory shall have polyester urethane paint on 18 gauge G60 galvanized steel. Internal assemblies: 18 gauge, galvanized (G90) steel except for motor supports which shall be minimum 14 gauge galvanized (G90) steel.
2. Access doors shall be hinged. This is an optional accessory which shall be included.
3. Cabinet Insulation: Comply with NFPA 90A and NFPA 90B and erosion requirements of UL 181.
 - a. Materials: Fiberglass insulation. If insulation other than fiberglass is used, it must also meet the Fire Hazard Classification shown below.
 - (1) Thickness: 1 inch (25 mm)
 - (2) Fire Hazard Classification: Maximum flame spread of 25 and smoke developed of 50, when tested in accordance with ASTM C 411.
 - (3) Location and application: Full coverage of entire cabinet exterior to include walls, roof and floor of unit. Insulation shall be of semi-rigid type and installed between inner and outer shells of all cabinet exterior components.
4. Energy wheel: Energy wheel shall be of total enthalpy, rotary air-to-air type and shall be an element of a removable energy wheel cassette. The cassette shall consist of a galvanized steel framework (designed to produce laminar air flow through the wheel), an energy wheel as specified and a motor and drive assembly. The cassette shall incorporate a pre-tensioned urethane drive belt with a five year warranty. The wheel media shall be a polymer film matrix in a stainless steel framework and be comprised of individual segments that are removable for servicing. Non-segmented energy wheels are not acceptable. Silica gel desiccant shall be permanently bonded to the polymer film and shall be designed and constructed to permit cleaning and servicing. The energy wheel is to have a five year warranty. Performance criteria are to be as specified in AHRI Standard 1060, complying with the Combined Efficiency data in the submittal.
5. Supply Air and Exhaust Air blower assemblies: Blower assemblies consist of an electric motor as specified by A/E and a belt driven blower. Assembly shall be mounted on heavy gauge galvanized rails and further mounted on 1.125 inch thick neoprene vibration isolators.
6. Control panel / connections: Energy Recovery Ventilator shall have an electrical control center where all high and low voltage connections are made. Control center shall be constructed to permit single-point high voltage power supply connections
7. Frost control: modulating wheel
8. Motorized dampers / Exhaust Air, Intake Air: Motorized dampers of low leakage type shall be factory installed.
9. Sensors are considered to be part of various optional operational modes or device controllers and are to be factory supplied and installed as specified by the A/E. See IOM / Sensors Installed by Factory

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- D. Blower:
1. Blower section construction, Supply Air and Exhaust Air: Belt drive motor and blower shall be assembled onto a 14 gauge galvanized steel platform and must have neoprene vibration isolation devices
 2. Blower assemblies: Shall be statically and dynamically balanced and designed for continuous operation at maximum rated fan speed and horsepower.
 3. Centrifugal blower housing: Formed and reinforced steel panels to make curved scroll housing with shaped cutoff.
 4. Forward curved blower (fan) wheels: Galvanized or aluminum construction with inlet flange and shallow blades curved forward in direction of airflow. Mechanically attached to shaft with set screws.
 5. Blower performance shall be factory tested for flow rate, pressure, power, air density, rotation speed and efficiency. Ratings are to be established in accordance with AMCA 210, "Laboratory Methods of Testing Fans for Rating".
- E. Motors:
1. General: Blower motors greater than $\frac{3}{4}$ horsepower shall be "NEMA Premium™" unless otherwise indicated. Minimum compliance with EPA minimum energy-efficiency standards for single speed ODP and TE enclosures is not acceptable. Motors shall be heavy-duty, permanently lubricated type to match the fan load and furnished at the specified voltage, phase and enclosure. Drives shall be sized for a minimum of 150% of driven horsepower and pulleys shall be fully machined cast-type, keyed and fully secured to the fan wheel and motor shafts. Electric motors of ten horsepower or less shall be supplied with an adjustable drive pulley. Comply with requirements in Division 23 05 13, matched with fan load.
 2. Motors shall be 60 cycle, 3 phase 208 volts
- F. Unit Controls:
1. The unit shall be constructed so that it will function as a stand-alone heating and cooling system controlled by factory-supplied controllers, thermostats and sensors. This unit shall be controlled by a factory-installed microprocessor programmable controller (DDC) that is connected to various optional sensors which shall be furnished with this unit.
 2. Unit shall incorporate a DDC controller with integral LCD screen that provides text readouts of status, operating settings and alarm conditions. DDC controller shall have a built-in keypad to permit operator to access read-out screens and change settings without the use of ancillary equipment, devices or software. DDC controllers that require the use of equipment or software that is not factory-installed in the unit are not acceptable. Alarm readouts consisting of flashing light codes are not acceptable. Owner-specified ventilating conditions can be input by means of pushbuttons.
 - a. Operating protocol: The DDC shall be factory-programmed for BACnet IP for monitoring of the unit's status
 3. Remote Interface: Contractor shall provide and install a Remote Interface that functions as a remote indicator of owner-selected operating parameters and also permits remote inputting of new operating parameters. Each remote panel shall have a large LCD user interface screen similar in form and function to the screen on the DDC. Installed location of room display shall be coordinated with architect and engineer prior to mounting.
 4. Sensors:
 - a. Room / Space Temperature Sensors
 - b. Dirty Filter Sensor
 - c. Temperature Sensors- OAI, EAW,RA,OAD
 - d. Pressure Sensor- OAW-P,OAF-P, EW-P, EW-F

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- e. Current Sensor- OAF-A, EF-A
 - f. Rotation Sensor
 - G. Filters: MERV 8 disposable pleated filters shall be provided in the intake air stream and MERV 8 filters in the exhaust air stream
 - H. Examination:
 - 1. Prior to start of installation, examine area and conditions to verify correct location for compliance with installation tolerances and other conditions affecting unit performance. See unit IOM.
 - 2. Examine roughing-in of plumbing, electrical and HVAC services to verify actual location and compliance with unit requirements. See unit IOM.
 - 3. Proceed with installation only after all unsatisfactory conditions have been corrected.
 - I. Installation: Installation shall be accomplished in accordance with these written specifications, project drawings, manufacturer's installation instructions as documented in manufacturer's IOM, Best Practices and all applicable building codes.
 - J. Connections:
 - K. In all cases, industry Best Practices shall be incorporated. Connections are to be made subject to the installation requirements shown above.
 - 1. Duct installation and connection requirements are specified in Division 23 of this document.
 - 2. Electrical installation requirements are specified in Division 26 of this document.
 - L. Field Quality Control:
 - 1. Manufacturer's Field Service: Engage a factory authorized service representative to inspect field assembled components and equipment installation, to include electrical and piping connections. Report results to A/E in writing. Inspection must include a complete startup checklist to include (as a minimum) the following: Completed Start-Up Checklists as found in manufacturer's IOM.
 - M. Start-Up Service: Engage a factory authorized service representative to perform startup service. Clean entire unit, comb coil fins as necessary, and install clean filters. Measure and record electrical values for voltage and amperage. Refer to Division 23 "Testing, Adjusting and Balancing" and comply with provisions therein.
 - N. Demonstration and Training: Engage a factory authorized service representative to train owner's maintenance personnel to adjust, operate and maintain the entire unit. Refer to Division 01 Section Closeout Procedures and Demonstration and Training.

2.11 FILTERS

- A. Provide all filters specified herein and/or scheduled or shown on the drawings. All filters shall be erected in holding frames, tight fitting, with no bypass path.
- B. All filters of every type shall be UL listed Class I or II.
- C. Every air-handling device which supplies air to any space shall have a filter bank. No., size, and type of filters, shall be as scheduled on the drawings.
- D. All frames shall be fitted with new media at final acceptance. In addition provide 100% spare filters.
- E. Filter Racks: Flat filters shall be installed in factory fabricated slide rails with access door. Provide closures as required.

2.12 DISPOSABLE MEDIUM EFFICIENCY FILTERS

- A. Filters shall be medium efficiency (30-35% based on ASHRAE 52-68) at a velocity of 500 FPM. Media shall be pleated, non woven reinforced cotton fabric supported by a welded wire grid with 95% open area. Frame shall be heavy-duty waterproof chipboard. Filter

shall have not less than 4.5 square feet of media per foot of face area. Filters shall be equal to Farr 30/30 series.

2.13 ELECTRIC HEATERS

- A. Furnish and install as shown on the drawings the recessed electric wall heaters. The heaters shall be 1500 watt, 120 volts, single phase rated at 5118 BTUH. The heating elements shall be totally enclosed corrosion resistant. The unit shall have a 16 gage louvered steel grille, permanently lubricated impedance protected motor, integral disconnect and front panel mounted thermostat with "off" position. Wall heaters shall be equivalent to Dayton 5ZK52.

2.14 GAS FIRED RADIANT HEATERS

- A. Provide and install the gas fired radiant heaters indicated on the drawings. The heaters shall be as manufactured by Space Ray Corporation.
- B. Each heater shall be complete with the following components:
 - 1. Frame and burner assembly, suspended from structure at the height directed.
 - 2. Reflector constructed of .050 mirror polished aluminum.
 - 3. Ceramic Radiator.
 - 4. Nichrome burner screen.
 - 5. Automatic firing assembly including a gas pressure regulator, firing valve, gas stop and pilot.
 - 6. Electrical controls including remote thermostat, on-off switch, and prewired control assembly.
- C. Each heater shall be suspended at the height directed, and at the angle directed.
- D. Each unit shall be equipped with automatic ignition.
- E. Each unit shall be controlled by a spring timer switch, 0-120 minutes.

2.15 FURNACE - GAS FIRED

- A. Furnace shall have the heating and fan capacities scheduled. It shall be a Lennox steel forced warm air, gas fired winter air conditioner complete with heavy furniture steel casing, heat transfer element, burner, draft diverter, gas pressure regulator, automatic pilot and safety controls, squirrel cage fans with motors and v-belt drives, filter and all other standard accessories.
- B. Automatic controls at each unit shall include magnetic gas valves, remote room thermostats, limit controls, and thermostatic fan switch. Fan motors shall be provided with thermal overload protection.
- C. Temperature controls shall be furnished by the unit manufacturer.
- D. Similar and equal furnaces as manufactured by Carrier, Trane and Westinghouse are acceptable.

2.16 PACKAGED DX COOLING COIL FOR FURNACE

- A. Cooling coil shall fit the furnace. It shall be of the configuration indicated on the drawings. Provide complete with coil, casing, drain pan, expansion device and other accessories required. When performing with the furnace and condensing unit it shall deliver the scheduled capacity.
- B. Provide the refrigerant piping to completely connect the coils with the condensing units. The piping shall consist of precharged lines with quick couplings. Suction piping shall be

insulated with foam plastic insulation threaded on and sealed. Support the piping with Unistrut hangers.

- C. Provide a liquid line filter dryer and a sight glass at each coil.
- D. Provide a drain line from each coil to the floor drain.

2.17 PACKAGED AIR COOLED CONDENSING UNITS

- A. The air-cooled condensing units shall be of the self contained packaged type suitable for outdoor mounting. Each shall be factory assembled complete with refrigeration system, condensing coils, fans, controls, etc. all in a rigidly constructed and finished housing. The condensing unit shall be connected to the remote cooling coil. The units shall be mounted as shown on the drawings.
- B. The refrigeration system shall be of the hermetically sealed type utilizing Freon as a refrigerant. It shall be of the air cooled type with the refrigerant condensed in copper coils with aluminum fins.
- C. The fan in each unit shall be direct driven with motor of the permanently sealed lubrication type.
- D. Each unit shall have minimum performance characteristics as tabulated on the drawings. It shall be furnished with the manufacturer's standard thermostatic, manual, and safety controls, and shall be completely internally wired. Each shall be as manufactured by Lennox, Trane or Carrier.
- E. Each compressor shall be guaranteed for 5 years.
- F. Hail Guard Screen: Entire condenser coil shall be covered with 18 gauge, 1/2" mesh galvanized wire screen.

2.18 TOUCHSCREEN PROGRAMMABLE THERMOSTAT

- A. Programmable thermostats shall be equal to Honeywell VisionPRO 8000 series TB8220 commercial thermostat with touchscreen LCD screen. Features shall include large backlit digital display and touchscreen interaction. Unit shall be equipped with real time clock with battery backup during power failures and automatic compensation for daylight savings time. Unit shall be capable of seven-day program with intuitive, menu-driven, on-screen programming. Unit shall include Heat - Cool - Auto feature for compliance with International Energy Conservation Code. Unit shall include multiple HOLD options to temporarily override programming. Unit shall control within one degree fahrenheit. Unit shall be equipped with up to three heat and two cool stages and shall be heat-pump compatible. Coordinate stages and heat-pump compatibility with equipment served by each thermostat. Unit shall carry a 5-year warranty.

2.19 DUCTLESS SPLIT SYSTEM HEAT PUMP UNITS

- A. System Description: The Heat Pump system shall be equal to Mitsubishi Electric split system heat pumps. The system shall consist of a wall mounted indoor section with wired, wall mounted controller.

System Model Numbers	
Indoor Units	Outdoor Units
PKA-24GL	PUY-A24NHA

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- B. **Quality Assurance:**
1. The units shall be tested by a Nationally Recognized Testing Laboratory (NRTL) and shall bear the ETL label.
 2. All wiring shall be in accordance with the National Electrical Code (N.E.C.).
 3. The units shall be rated in accordance with Air-conditioning Refrigeration Institute's (ARI) Standard 210 and bear the ARI Certification label.
 4. The units shall be manufactured in a facility registered to ISO 9001 and ISO 14001, which is a set of standards applying to environmental protection set by the International Standard Organization (ISO).
 5. A dry air holding charge shall be provided in the indoor section.
 6. The outdoor unit shall be pre-charged with R-410a refrigerant for 70 feet of refrigerant tubing.
 7. System efficiency shall meet the minimum efficiency standards described in the International Energy Conservation Code (2009 IECC).
- C. **Delivery, Storage And Handling:**
1. Unit shall be stored and handled according to the manufacturer's recommendations.
 2. The wireless controller shall be shipped inside the carton with the indoor unit and able to withstand 105°F storage temperatures and 95% relative humidity without adverse effect.
- D. **Warranty:**
1. The units shall have a manufacturer's parts and defects warranty for a period one (1) year from date of installation. The compressor shall have a warranty of 6 years from date of installation. If, during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced or repaired at the discretion of the manufacturer. This warranty does not include labor.
 2. Manufacturer shall have over 25 years of continuous experience in the U.S. market.
- E. **Performance:** Each system shall perform in accordance to the ratings shown in the table below. Cooling performance shall be based on 80°F DB, 67°F WB (26.7°C DB, 19.4°C WB) for the indoor unit and 95°F DB, 75°F WB (35°C DB, 29.3°C WB) for the outdoor unit.

System Model Number	Cooling Capacity Btu/h	Heating Capacity Btu/h	TPW Cooling	TPW Heating	HSPF IV (V)	CFM (Hi/Dry)
PKA-24GL	12,000 – 24,000	12,000 – 26,000	2,650	2,570	8.5 (6.8)	705

TPW = Total Power Watts

- F. **Design:**
1. **Unit Cabinet:**
 - a. The indoor unit cabinet shall be wall mounted by means of a factory supplied mounting plate. The cabinet shall be formed from high strength molded plastic with front panel access for filter. Cabinet color shall be white – 18,000 Munsell 0.70 8.59/097 and 24,000, 30,000, and 36,000 Munsell 3.4Y 7.7/08.
 - b. The indoor unit shall be factory assembled, wired and tested. Contained within the unit shall be all factory wiring and internal piping, control circuit board and fan motor.

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- c. The unit in conjunction with the wired, wall mounted controller shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, and a test run switch. Indoor unit and refrigerant pipes shall be purged with dry nitrogen before shipment from the factory.
 2. Fan: The evaporator fan shall be high performance, double inlet, forward curve, direct drive sirocco fan with a single motor – One for 18,000 and 2 for 24,000, 30,000, and 36,000. The fans shall be statically and dynamically balanced and run on a motor with permanently lubricated bearings. The indoor fan shall consist of four (4) speeds: Low, M1, M2, and Hi for the 18,000 and two (2) speeds: Low, High for the 24,000, 30,000, and 36,000 models.
 3. Vane: There shall be a motorized horizontal vane to automatically direct air flow in a horizontal and downward direction for uniform air distribution. The horizontal vane shall significantly decrease downward air resistance for lower noise levels, and shall close the outlet port when operation is stopped. There shall also be a set of vertical vanes to provide horizontal swing airflow movement selected by remote control.
 4. Filter: Return air shall be filtered by means of an easily removable washable filter.
 5. Coil: The evaporator coil shall be of nonferrous construction with pre-coated aluminum strake fins on copper tubing. The multi-angled heat exchanger shall have a modified fin shape that reduces air resistance for a smoother, quieter airflow. All tube joints shall be brazed with PhosCopper or silver alloy. The coils shall be pressure tested at the factory. A condensate pan and drain shall be provided under the coil.
 6. Electrical: The electrical power of the unit shall be 208 volts or 230 volts, 1 phase, 60 hertz. The system shall be capable of satisfactory operation within voltage limits of 198 volts to 253 volts. The power to the indoor unit shall be supplied from the outdoor unit, using the Mitsubishi Electric A-Control system. For A-Control, a three (3) conductor AWG-14 wire with ground shall provide power feed and bi-directional control transmission between the outdoor and indoor units.
 7. Control:
 - a. The control system shall consist of two (2) microprocessors, one on each indoor and outdoor unit. Field wiring shall run directly from the indoor unit interconnected by a single non-polar two-wire AWG-16 stranded cable to the wall mounted controller with no splices. The control system between the outdoor unit and indoor unit shall be supplied from the outdoor unit using the Mitsubishi Electric A-Control system. Reference **Electrical**.
 - b. The system shall be capable of automatic restart when power is restored and after power interruption. The system shall have self-diagnostics ability, including total hours of compressor run time. Diagnostic codes for indoor and outdoor units shall be displayed on the wired controller panel.
 - c. The microprocessor located in the indoor unit shall have the capability of monitoring return air temperature and indoor coil temperature, receiving and processing commands from the wired controller, providing emergency operation and controlling the outdoor unit.
 - d. The indoor unit shall be connected to a wall mounted wired controller to perform input functions necessary to operate the system. The wired controller shall have a large multi-language DOT liquid crystal display (LCD).
 - e. There shall be a built-in weekly timer with up to eight pattern settings per day. The controller shall consist of an On/Off button, Increase/Decrease Set Temperature buttons, a Heat/Auto/Cool/Dry/Fan mode selector, a Timer Menu button, a Timer On/Off button, Set Time buttons, a Fan Speed selector, a Vane Position selector, a Louver Swing button, a Ventilation button, a Test Run

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- button, and a Check Mode button. The controller shall have a built-in temperature sensor. Temperature shall be displayed in either Fahrenheit (°F) or Celsius (°C). Temperature changes shall be by increments of 1°F (1°C) with a range of 67°F to 87°F (19°C to 30°C).
- f. The wired controller shall display operating conditions such as set temperature, room temperature, pipe temperatures (i.e. liquid, discharge, indoor and outdoor), compressor operating conditions (including running current, frequency, input voltage, On/Off status and operating time), LEV opening pulses, sub cooling and discharge super heat.
 - g. Normal operation of the wired controller shall provide individual system control in which one wired controller and one indoor unit are installed in the same room. The controller shall have the capability of controlling up to a maximum of sixteen systems at a maximum developed control cable distance of 1,500 feet (500 meters).
 - h. The control voltage from the wired controller to the indoor unit shall be 12 volts, DC. The control signal between the indoor and outdoor unit shall be pulse signal 24 volts DC. Up to two wired controllers shall be able to be used to control one unit.
 - i. Control system shall control the continued operation of the air sweep louvers, as well as provide On/Off and mode switching. The controller shall have the capability to provide sequential starting with up to fifty seconds delay.
- G. Outdoor Unit:
- 1. The outdoor unit shall be compatible with the three different types of indoor units (PKA - wall mounted, PCA - ceiling suspending, and PLA - four way ceiling cassette). The connected indoor unit must be of the same capacity as the outdoor unit.
 - 2. The outdoor unit shall be capable of operating at 0°F (-18°C) ambient temperature without additional low ambient controls (optional wind baffle may be required).
 - 3. The outdoor unit shall be able to operate with a maximum height difference of 100 feet (30 meters) between indoor and outdoor units.
 - 4. Units shall have a maximum refrigerant tubing length of 100 feet (30 meters) for the 18,000 and 165 feet (50 meters) for the 24,000, 30,000, and 36,000 units between indoor and outdoor units without the need for line size changes, traps or additional oil.
 - 5. Model PUY-A24NHA shall be pre-charged for a maximum of 70 feet (20 meters) of refrigerant tubing. The outdoor unit shall be completely factory assembled, piped, and wired. Each unit must be test run at the factory.
- H. Cabinet: The casing shall be constructed from galvanized steel plate, coated with a finished with an electrostatically applied, thermally fused acrylic or polyester powder coating for corrosion protection and have a munsell 3Y 7.8/1.1 finish. The fan grille shall be of ABS plastic.
- I. Fan: Model PUY-A24NHA shall be furnished with an AC fan motor. The fan motor shall be of aerodynamic design for quiet operation, and the fan motor bearings shall be permanently lubricated. The outdoor unit shall have horizontal discharge airflow. The fan shall be mounted in front of the coil, pulling air across it from the rear and dispelling it through the front. The fan shall be provided with a raised guard to prevent contact with moving parts.
- J. Coil: The L shaped condenser coil shall be of copper tubing with flat aluminum fins to reduce debris build up. The coil shall be protected with an integral metal guard. Refrigerant flow from the condenser shall be controlled by means of linear expansion valve

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- (LEV) metering orifice. The LEV shall be control by a microprocessor controlled step motor.
- K. Compressor: The compressor for model PUY-A24NHA shall be a DC rotary compressor. Standard constant speed units shall be acceptable, provided they meet all other provisions of this specification. The compressor shall be driven by inverter circuit to control compressor speed. The compressor speed shall dynamically vary to match the room load for significantly increasing the efficiency of the system which results in vast energy savings. To prevent liquid from accumulating in the compressor during the off cycle, a minimal amount of current shall be intermittently applied to the compressor motor to maintain enough heat. The outdoor unit shall have an accumulator and high pressure safety switch. The compressor shall be mounted to avoid the transmission of vibration.
- L. Electrical:
1. The electrical power of the unit shall be 208volts or 230 volts, 1 phase, 60 hertz. The unit shall be capable of satisfactory operation within voltage limits of 198 volts to 253 volts. The outdoor unit shall be controlled by the microprocessor located in the indoor unit.
 2. The control signal between the indoor unit and the outdoor unit shall be pulse signal 24 volts DC. The unit shall have Pulse Amplitude Modulation circuit to utilize 98% of input power supply.

2.20 WATER SOFTENER

- A. Scope:
1. Provide as indicated a vertical pressure type water softener system complete with pressure vessel, softening resin, control valve, brine maker and electronic controller. The system will be of an approved design as fabricated by a manufacturer regularly engaged in the production of water treatment equipment. All equipment and material will be supplied in compliance with the specifications as intended for a complete and operational system.
 2. Qualified manufacturers of water softener equipment must be engaged in the manufacture of this equipment for a period of not less than fifteen (15) years. Acceptable manufacturers are Culligan International Company or the Engineer's approved equal.
- B. General Description: The system specifications are based on Culligan International model CSM 210-2NC configured as Single/Water Meter/Delay. The purpose of the Culligan International Series CSM Single/Water Meter/Delay automatic water softener will be to remove mineral hardness from a known water supply to a level not to exceed 17.1 mg/l, as determined by an accepted ASTM or EDTA test method, when the system is operated at 53.0 gpm and in accordance with the operating instructions. The system will be capable of supplying 5000.0 gallons of softened water between regenerations based on the influent water analysis listed in Section 3.1 of this equipment specification. The systems performance is rated at a design flow rate of 53.0 gpm with a rated pressure drop of 8.3 psi, and will be capable of a peak flow rate of 102.0 gpm for sustained periods of 90 minutes with a pressure drop of 25.0 psi. There shall be a quantity of one (1) of the above described systems.
- C. Performance and Design Data:
1. Influent Water Analysis:
 - a. Total Hardness, gpg : 30.0 Eff. Hardness, gpg @ 100% Cap. : 30.0
 - b. Calcium, Ca : N/A Magnesium, Mg : N/A (Constituents above are expressed in mg/l as CaCO₃ or as otherwise specified.)
 - c. Iron, Fe : 0 Turbidity, NTU : 0

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- d. Total Dissolved Solids, TDS : N/A pH : 7
 - e. Manganese, Mn : 0 Color : 0 (Constituents above are expressed in mg/l or as otherwise specified.)
2. Design Parameters:
- a. Normal System Flow & Pressure Drop : 76.0 gpm @ 15.0 psi
 - b. Maximum System Flow & Pressure Drop : 102.0 gpm @ 25.0 psi
 - c. Backwash/Rinse Flow : 13.5 gpm
 - d. Backwash Volume : 515.0 gallons nominal
 - e. Daily Water Usage : 2000.0 gpd
 - f. Daily Hours of Water Demand : 8
 - g. Operating Temperature Range : 40-120 °F
 - h. Operating Pressure Range (System) : 30-100 psi
 - i. Electrical Requirements : 24 Volts AC, 50/60 Hz, 1 Ph (dedicated receptacle req'd, ref. ¶ 4.6)
 - j. System Dimension (L x W x H) : 66.0 in. L x 35.0 in. W x 74.0 in. H
3. Effluent Water Quality: ZERO GPG HARDNESS (ASTM soap test method)
- D. Equipment Specifications:
1. Softener Tank(s): Each system shall include one (1) tank(s). Each softener tank shall be 24.0 in. in diameter. The sideshell height shall be 54.0 in., sufficient to allow for a proper freeboard space above the resin bed for adequate expansion of the resin during backwashing.
- a. Tank Construction: Tank(s) shall be electrical welded pressure vessel, low carbon steel construction rated for 100.0 psi working pressure and a minimum design pressure of 1.2 times the working pressure amount. Additionally, the tanks shall be capable of withstanding testing with pressure fluctuations from 0 to 120 psi for a minimum of 30,000 cycles.
 - b. Access Openings: Each tank will be equipped with openings for mineral filling and periodic inspection.
 - c. Tank Finish – Exterior: Tank finish on the exterior shall be a high solids polyurethane monochromatic gloss enamel applied to a 1.25 to 1.50 mils DFT over a 1.00 to 1.25 mil DFT prime coat.
 - d. Tank Finish – Interior: Tank interior shall have near white sandblast and be coated to 8 to 10 mil DFT with an epoxy phenolic designed specifically as a high chemical resistant, non toxic, odorless protective coating. The lining shall meet the requirements of the US Federal Register, Food and Drug Regulations, Title 21, Chapter 1, Paragraph 175.300.
 - e. Tank Supports: Tank supports shall be structural steel strap leg type welded to lower tank head.
2. Internal Distribution:
- a. The upper distribution system shall be of the single point baffle type, constructed of PVC pipe.
 - b. The lower distribution system shall be of the hub and radial arm type, constructed of PVC pipe, a hub radial and individual distributors arranged for even flow distribution through the resin bed. No distributor slots will face upwards to minimize the opportunity for channeling. The distribution system shall be embedded in a single layer subfill of washed inorganic material to support the resin bed.
3. Main Operating Valve: The main operating valve shall be a fully automatic multiport diaphragm type. The multiport design shall incorporate all valves necessary for complete control of the softener service and regeneration steps. The diaphragm valves shall be slow opening and closing, free of water hammer. The diaphragm

assembly shall be fully guided on its perimeter to assure a smooth reliable shut off without sticking. There shall be no dissimilar metals within the valve and no special tools shall be required to service the valve. The main operating valve shall include a valve mounted automatic self adjusting brine injector to draw brine and control rinse at a constant rate regardless of water pressure in the range of 30.0 and 100.0 psi. The main operating valve shall be designed and manufactured by the same manufacturer as the water softener system and tested prior to shipment. The valve shall have a soft water sampling cock. The unit shall be supplied so that the valve will allow automatic bypass of untreated water during regeneration. The bypass shall be integral to the main operating valve body and be capable of being easily modified to prevent untreated water bypass.

4. Pipe and Fittings: The main operating valves and manifold piping shall be factory assembled and shipped attached to the resin tank for ease of installation and start up. Piping shall be Schedule 40 galvanized steel and galvanized fittings shall be standard Class 150 threaded malleable iron. All system inlet, outlet and drain connections shall be less than 50.0 in. in distance from the softener support level to provide ease of installation and service.
5. Flow Control: The backwash flow controller shall be a pressure-compensating orifice capable of providing and maintaining proper backwash flows over the entire listed operating pressure range of the system. The backwash flow controller shall be easily serviced without special tools and design so that service to the flow controller can be performed without disassembly of the valve body or the sequencing controller and without disconnecting existing inlet and outlet piping connections.
6. Controls: A fully integrated programmable microprocessor driven electronic controller shall be provided to automatically cycle the main operating valve through the regeneration sequence. The electronic controller shall be designed and manufactured by the same manufacturer as the water treatment equipment. The controller shall be capable of initiating a regeneration by accepting an internal signal from the controller time keeping device; an external Hall-Effect flow sensor, a Culligan Aqua-Sensor®, an external device such as a remote start push-button or any combination of these methods. The controller shall sequence all steps of an automatic regeneration and automatically return the softener to a service or stand-by mode. The initiating time and/or volume setpoints shall automatically reset upon completion of the regeneration sequence. The controller shall include a sealed keypad, capable of programming all controller functions, located on the face of the controller. The controller display shall be a multi-line OLED display capable of full text readouts of operating status and codes. An audible alarm beeper capable of emitting a tone of ~70 dBA shall be available but capable of being disabled if so desired. The controller shall allow for a manual initiation of the automatic regeneration sequence by utilizing a regeneration selection from the controller menu. The controller shall operate on a low voltage electrical system. The system shall include a UL/CUL listed transformer. The entire electronic control package and its associated inputs/outputs shall require not more than 24 VAC @ 50VA. The controller shall utilize EEPROM to save pertinent programmed data and statistical functions. The controller must retain all functionality for power interruptions of less than 12 hours. A battery backup shall be installed and capable of maintaining the time of day for a minimum of 5 years.
 - a. System Control Options: An operator selected program of immediate or delayed volume initiated regeneration for single units shall be available. The controller shall be capable of being entirely programmed in the field without additional interface devices. The electronic controller shall indicate various data that includes flow rate, capacity remaining, total flow since installation,

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- number of regenerations in the last 14 days, days since the last regeneration, total number of regenerations for the life of the unit, time of day, and unit in regeneration.
- b. In addition the following functions shall be provided as part of the system controller:
- (1) Regeneration sequence timers: The controller shall allow control customization of individual regeneration cycle times, each programmable from 1 - 99 minutes. The regeneration cycle and time of cycle remaining shall be displayed when in regeneration.
 - (2) Lockout function: The controller shall include a lockout to prevent unauthorized personnel from altering program data.
 - (3) Regeneration override: The controller shall include a function to direct pre-programmed regeneration after a user determined period of time (hours or 24 hour intervals) without an input signal from another regeneration initiation device.
 - (4) Alarm status indicator: The controller shall monitor operation of internal functions. If a fault is identified, the need for operator intervention will be signaled visually within the controller display.
 - (5) Two Auxiliary Outputs: Two Auxiliary Outputs shall be integral to the controller circuit board. Each Output shall be capable of being programmed to provide power to a "Normally Open" or "Normally Closed" contact (user choice). These 24VAC outputs shall be used only for the purpose of energizing a relay coil.
 - (6) Flow rate indication: The controller shall be capable of indicating the flow rate of the treated water.
 - (7) Totalizer: The controller shall include a totalizer function and a display capacity to 99,999,999 units before resetting to zero. The totalizer value shall be displayed through the controller display during operation.
- c. Flow Sensor(s): A flow sensor package shall be provided consisting of an insertion-type Hall Effect flow transducer with an appropriately sized installation fitting; the package shall include a total of one (1) flow sensors with fittings. The fitting provided shall be 2.0 inches, compatible with the specified piping. It will be designed to allow ease of removal of the sensor for inspection without modification of the piping system. A 15 foot length of cable shall be provided for direct connection to the system controller. The flow sensor package provided shall be functional within the flow range of 1.5 to 150.0 gpm and will be provided with a 2.0" flow sensor installation fitting. The operating temperature/pressure range of flow sensor fittings shall be 34°–100°F at 100.0 psi max. The wetted surfaces of the flow sensor shall be constructed of non-corroding materials such as polypropylene, black Polyvinylidene (PVDF) and titanium. The flow sensor shall have an accuracy to 1% over full range and repeatability to +/-0.5% of full range.
7. Exchange Resin: The ion exchange resin shall be virgin high capacity "standard mesh" of sulfonated polystyrene type stable over the entire pH range with good resistance to bead fracture from attrition or osmotic shock. Each cubic foot of resin will be capable of removing 30000.0 grains of hardness as calcium carbonate when regenerated with 15.0 lbs of salt. The resin shall be solid, of the proper particle size of 20-50 mesh, U.S. standard screen and will contain no agglomerates, shells, plates or other shapes that might interfere with the normal function of the water softener. The resin shall be manufactured to comply with the food additive regulation 21 CFR

173.25 as set forth by the USFDA. The system shall include 7.0 ft³ of exchange resin per vessel and a total of 7.0 ft³ of resin for the system.

8. Brine System: Provide a complete brine system consisting of a plastic tank, cover, salt platform, brine well, an automatic brine valve and all necessary fittings for operation with the water softening system. The system shall consist of a combined brine measuring and salt storage tank with salt platform. The tank will be sized 30.0 in. x 50.0 in.; the system will include a total of one (1) brine tank(s). The brine tank can hold 841.0 lbs of salt which provides for 8.0 regenerations per salt fill. The brine tank will be equipped with a float operated non-corrosive field serviceable brine float valve for automatic control of brine withdrawal and fresh water refill. The brine valve will automatically open to admit brine to the resin tank during education and close automatically providing positive shut-off to prevent air from entering the system. The brine valve will also regulate the flow of soft water into the brine tank during refill. The brine valve works with the timed fill feature of the main operating valve controls to admit the correct volume of fresh water to the brine tank in accordance with the refill time setting in the control program. The brine valve will include a float operated safety shut-off valve as a back up to the timed refill from the main operating valve control to prevent brine tank overflow.
- E. Instructions: One (1) complete sets of installation, operating and maintenance manuals shall be provided.
- F. Field Service: The services of a factory authorized service representative can be made available to supervise, inspect and provide operator training as required for initial start-up and system operation. Contact your local Culligan dealer for service rates and scheduling.
- G. Warranty: A single written warranty must be provided from the manufacturer of the water softener system covering workmanship and materials.
- H. CSM Manual Reference:
 1. Installation Instructions : 01016370
 2. Electronic Timer Addendum : 01021161

2.21 RO UNIT

- A. Scope:
 1. Provide as indicated a reverse osmosis system complete with modules, control system and prefilter. The system will be of an approved design as fabricated by a manufacturer regularly engaged in the production of water treatment equipment. All equipment and material will be supplied in compliance with the specifications as intended for a complete and operational system.
 2. Qualified manufacturers of reverse osmosis equipment must be engaged in the manufacture of this equipment for a period of not less than fifteen (15) years. Acceptable manufacturers are Culligan International Company or the Engineer's approved equal.
- B. General Description: The system specifications are based on Culligan International model E1-2S configured as Single. The purpose of the Culligan Series E1 Plus Single reverse osmosis system will be to reduce the dissolved mineral salt content from a known water supply. The system will be capable, upon initial startup, of reducing the dissolved mineral salt content of the water by at least 97%, based on membrane industry design standards, when the system is operated in accordance with the operating instructions. The system will be capable of supplying 0.0 gpd of treated water per day based on the influent water analysis listed in Section 3.1 of this equipment specification. There shall be a quantity of one (1) of the above described systems.

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- C. Performance and Design Data:
1. Influent Water Analysis:
 - a. Calcium, Ca : 0.01 Chloride, Cl : 0.0
 - b. Magnesium, Mg : 0.0 Nitrate, N : 0.0
 - c. Sodium, Na : 0.0 Sulfate, SO₄ : 0.0
 - d. Potassium, K : 0.0 Bicarbonate, HCO₃ : 0.0
 - e. Strontium, Sr : 0.0 Carbonate, CO₃ : 0.0
 - f. Barium, Ba : 0.0 Fluoride, F : 0.0
(Constituents above are expressed in mg/l as CaCO₃ or as otherwise specified.)
 - g. Silica, SiO₂ : 0.0 Total Hardness, gpg as CaCO₃ : 0.01
 - h. Total Dissolved Solids, TDS : 1200.0 Temperature, °F : 77.0
 - i. Manganese, Mn : 0.0 pH : 7.0
(Constituents above are expressed in mg/l or as otherwise specified.)
 2. Design Parameters:
 - a. Nominal Capacity* : 604.5 gpd
 - b. Approximate Recovery : 50.0%©2010 Culligan International Company 2
 - c. Daily Water Usage : 250.0 gpd
 - d. Daily Hours of Water Demand : 8
 - e. Motor, HP : 1/3
 - f. Operating Temperature Range : 33-100 °F
 - g. Max. Operating Pressure (Pump) : 150.0 psi
 - h. Operating Pressure Range (System) : 20-50 psi
 - i. Inlet Pressure (dynamic) : 20-50 psi
 - j. Electrical Requirements : 115V/60/1
 - k. System Dimension (L x W x H) : 35.0 in. L x 9.0 in. W x 35.0 in. H
**Approximate initial capacity is based on properly pretreated feed water as listed in Section 3.1 of this equipment specification.*
 3. Effluent Water Quality: Initial effluent water quality based on the analysis in section C is estimated to be 14 mg/l TDS.
- D. Equipment Specifications:
1. Prefilter: The equipment will include one (1) replaceable element type prefilter. Each filter housing will be of polypropylene construction and will contain one (1) prefilter cartridge. Each filter cartridge will be of polypropylene construction and rated at 5 microns nominal to assure maximum protection of the pump and modules.
 2. Pump: One pump and motor assembly will be provided to boost the incoming water to an operating pressure of 200.0 psig. Each pump will have a discharge flow of 1.6 gpm. A rotary vane positive displacement pump with brass body will be provided. It will be close coupled to a 1/3 HP electrical motor operating at 115V/60/1.
 3. Modules: The unit will use spiral wound reverse osmosis modules. The 2.5 inch diameter by 21.0 inch long modules will be the polyamide thin film composite membrane type. The module array will be capable, upon initial startup, of producing water at a nominal flow of 0.0 gpd based on Culligan equipment specifications as outlined in paragraph 3.2. The module assembly will consist of single element housing(s) in a array arrangement to deliver the design capacity with minimal waste flow requirements. The housings will be constructed of fiberglass (FRP) for corrosion resistance.
 4. Pipe and Fittings: The equipment will include all mechanical, hydraulic and electrical controls for a complete, self contained unit. A 1/2 inch normally closed solenoid valve will be mounted on the inlet to shut off the water supply when the unit is not operating.

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- a. Operating Pressure Control Valve: Operating pressure will be controlled by a needle-type high pressure control valve mounted on the waste line of the modules. The valve will be equipped with a knob for setting the operating pressure.
 - b. Waste Restrictor: A panel mounted throttling valve will be connected to the concentrate return to maintain the proper recovery ratio of product-to-feed water flow.
 - c. Pressure Gauge(s): Two liquid filled pressure gauges will be included. One gauge will indicate the operating pressure of the unit over the range of 0 to 200.0 psi. The other gauge will indicate adequate feed water pressure to the pump over the range of 0 to 200.0 psi.
 - d. Hydraulic Connections: The system will be designed with a 1/2 inch tube connection to the inlet of the prefilter and a 1/2 inch tube connection from the prefilter to the feed connection on the unit. The product water connection will be 1/2 inch tube. The concentrate water connection will be 3/8 inch tube.
 - e. Mounting: All the components will be mounted on a 14 gauge steel frame suitable for wall mounting.
5. Electrical Controls: An electronic controller will be utilized to perform the logical operation of the unit. The enclosure will be hinged and watertight. A pressure sensing switch will be installed after the inlet solenoid to protect the pressure pump from cavitation by shutting down the pump should pressure fall below 30.0 psig. The electronic controller shall control an optional low pressure auto restart. This feature will test for adequate line pressure after 60 minutes of shut down and attempt to restart. The electronic controller shall control a line pressure flush preset to 1 minute after 2 hours of continuous run time. Upon high storage tank level restart, the unit will flush for a period of 1 minute prior to restarting the system. Connections will be provided to allow easy installation of an optional level control/pressurized storage kit, which will shut down the system and prevent overflow/overpressurization of an optional product water atmospheric/pressurized storage tank. Connections will be provided to allow simplified wiring of an external signal switch, which will shut down the inlet solenoid and pressure pump during the regeneration cycle of pretreatment equipment to prevent untreated water from entering the reverse osmosis system. The system will start automatically when the pretreatment equipment has finished regeneration.
6. Accessories: Wall mounting brackets to mount the Control and Module Assembly.
- E. Instructions: One (1) complete sets of installation, operating and maintenance manuals shall be provided.
- F. Field Service: The services of a factory authorized service representative can be made available to supervise, inspect and provide operator training as required for initial start-up and system operation. Contact your local Culligan dealer for service rates and scheduling.
- G. Warranty: A single written warranty must be provided from the manufacturer of the reverse osmosis system covering workmanship and materials.
- H. System Pressure Pump: The system shall be provided with a Grundfos MQ pump with integral pressure tank and controller. The pump shall start automatically when water is consumed and stop when consumption ceases.

2.22 VEHICLE EXHAUST SYSTEM

- A. The operating components of the vehicle exhaust system including hose assemblies, suspension systems, and exhaust fan shall be the standard products of a United States

exhaust system manufacturer and be provided by a single source as a complete package to ensure the integrity of the system. Basis of design is Car-Mon Products, Inc., Elgin, Illinois.

1. CMB Hazardous Fume Exhaust Fan:
 - a. Hazardous fume exhaust fan shall be licensed to bear the AMCA seal for certified performance in accordance with AMCA Standard 210. The fan shall be single inlet, single width, Arrangement 10 and shall have a backward inclined fan wheel with single thickness flat blades welded to both the shroud and back plate. The fan wheel shall be statically and dynamically balanced before assembly. Any required balance weights shall be welded to the outside of the shroud or back plate; no weights are to be installed in the blade air stream. All surfaces of the centrifugal fan shall be painted completely with an acid resistant, polyester powder coating.
 - b. The bearings shall be of the pillow block type with cast steel frame and shall be bolted to the structural bearing supports. The fan shaft shall be fabricated of ground and polished cold drawn steel with machined centers and key slots for both the fan wheel and the drive sheave. It shall be given a rust inhibitive asphaltic coating after assembly. The V-belt drive shall be adjustable. The variable pitch sheave shall be factory set at the appropriate position to provide the specified capacity in the approximate midpoint of the adjustment range. All fans shall be provided with a belt guard enclosing both sheaves and V-belts. The belt guard shall have a tachometer hole. All drives shall be rated for no less than 150% of motor load.
 - c. The scroll and side sheets of the fan housing shall be fabricated of cold rolled steel of 12-gauge minimum thickness. The scroll and side sheets shall be joined through continuous welding. Spot welded or standing seam construction is not acceptable. The fan housing shall have a minimum of 8 attachment studs with flange locking nuts. Any bolts, self-tapping screws or fasteners that protrude into the housing interior are not acceptable. The fan base shall be fabricated of cold rolled steel of 12-gauge minimum thickness. The bearing supports within the base shall be fabricated of cold rolled steel angles having a minimum 3/16" thickness and they shall be welded to the sides of the base. All seams in the individual components shall be continuous welded. The motor base shall be fabricated of cold rolled steel of 12-gauge minimum thickness. Its position shall be adjustable through the use of bolts that travel in slots in the sides of the fan base. A non-hardening, high elasticity caulking shall be applied during assembly between the mating surfaces of the fan housing and the fan base, of the inlet cone and the fan housing, and the inlet support and the inlet cone.
 - (1) Test requirements:
 - (a) The assembled fan shall be test run before shipment with "total frequency" vibration measured at each bearing in both the vertical and horizontal planes. Any fan having an average reading of over 3 mils deflection is not acceptable.
 - (b) Balance report to be provided with installation and maintenance instructions.
 - (2) Exhaust fan platform: Furnish fan platform as required to match specified fan. The platform shall include vibration rail base with suitable vibration isolation for weight load and distribution.
2. HTC Flexible Hose: The exhaust hose shall be of two-ply, triple overlap construction, thermal bonded and cured for heat resistance to 1000° F internal operating temperature. The hose shall have an interior steel spring wire reinforcing spiral encased to prevent the collapsing of the tubing and to help retain its shape.

Outer ply shall be process saturated nomex fabric for abrasion resistance, and inner ply shall be silicone coated glass fabric.

- a. CTA Exhaust adapter:
 - (1) The clamping type exhaust adapter shall be of 20 gauge stainless steel construction.
 - (2) Standard features include Safe-T-Edge for safe handling, heavy duty locking vise grip for secure connection, and an exhaust analyzer opening for emission testing.
 - (3) The adapter and flange set are to match the hose diameter as indicated on plans and specifications and shall be attached to the hose at the factory to maintain the integrity of the assembly. Field assembly is not acceptable.
3. Suspension System – LFT spring retractor:
 - a. The flexible hose suspension system shall support the flexible hose from overhead when not in use, allowing it to be lowered to the operating level when required.
 - b. The lifting device shall be a single spring retractor with ratchet stop and ¼” steel suspension frame with cast eyelet and heavy-duty snap ring.
 - c. The hose sling shall be constructed of a double weave, nylon reinforced, EPDM material, and shall have reinforced eyelets, a stainless steel locking band, safety clip, and harness ring. It shall be manufactured to fit the diameter of the hose specified.

PART 3 – EXECUTION

Not Used

END OF SECTION

SECTION 15800

TESTING, ADJUSTING AND BALANCING MECHANICAL SYSTEMS

PART 1 - GENERAL

1.01 NOTE

- A. Drawings, General Conditions of the Contract for Construction, Supplementary Conditions and Division 1 - General Requirements apply to Work of this Section.

1.02 SCOPE

- A. This section of the specifications comprises the furnishing of all labor, materials, transportation, tools and appliances and in performing all operations in connection with the testing, balancing and adjusting of various systems and portions thereof to produce proper flows of air and water, correct setting of regulation devices, and other end results as more fully described hereinafter.
- B. The division 15 contractor shall include in his bid an amount necessary to provide an NEBB certified TAB report, with all fan, grille, and coil reports as required per NEBB.
- C. Upon completion of the installation and start up of the mechanical equipment, check, adjust, and balance systemic components to obtain optimum conditions in each conditioned space to the building.
- D. Prepare and submit to the Architect complete reports on the balance and operation of the system.
- E. Make a total of three inspections within 90 days after occupancy of the building to insure that satisfactory conditions are being maintained throughout and to satisfy any unusual conditions.
- F. Make inspections in the building during the opposite season from that in which the initial adjustments were made and at those times make any necessary modifications to the initial adjustments required to produce optimum operation of the systemic components, to produce the proper conditions in each conditioned space.
- G. During the balancing, the temperature regulation shall be adjusted for proper relationship between controlling instruments and calibrated by the Contractor. The correctness of the final setting shall be proved by taking hourly readings for a period of 4 successive eight hour days in a typical room on each separately controlled zone. The total variation shall not exceed two degrees from the preset median temperature during the entire temperature survey period.
- H. In all fan systems, the air quantities shown on the plans may be varied as required to secure a maximum temperature variation of 2 degrees within each separately controlled zone, but the total air quantity indicated for each zone must be obtained. It shall be the obligation of the Contractor to furnish or revise fan drives and/or motors if necessary, without cost to the Owner, to attain the specified air volumes.
- I. Before final acceptance is made, furnish the following data:
 - 1. A tabulation of the simultaneous temperature of all spaces on each separately controlled zone, together with the outside temperature at time of measurement.
 - 2. A listing of the measured air quantities at each outlet corresponding to the temperature tabulation specified above.
 - 3. Air quantities at each return and exhaust air handling device.
 - 4. Flow rate and temperature at each coil and heating device.

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- 5. Static pressure readings entering and leaving each supply, and exhaust fan, and other components of the system. These readings shall be related to fan curves in terms of CFM handled.
 - 6. Motor current readings at each fan and pump. The voltages at the time of the reading shall be listed.
 - J. The above data shall be neatly entered on appropriate forms together with any typed supplements required to completely document all results. Written explanations of any abnormal conditions shall be included. All this shall be assembled into a suitable brochure and a total of 4 copies shall be provided.
 - K. When opposite season modifications are made, additional data sheets indicating new settings, readings, etc., shall be prepared and submitted in quadruplicate.

1.03 INSTRUCTIONS

- A. During the test periods instruct the building operating personnel in the operation and maintenance of all equipment.
- B. Deliver to the Owner 3 complete instruction manuals covering the maintenance and operation of the system components. In addition, provide schematic wiring diagrams of each piece of equipment framed under glass and mounted on the wall as directed. Provide complete data on all equipment, including for each item a parts list, and the name and address of the vendor where replacement parts can be purchased.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

SECTION 16010

BASIC ELECTRICAL REQUIREMENTS

PART 1 – GENERAL

1.01 NOTE

- A. The general provisions of the Contract including Uniform General Conditions and Supplementary General Conditions, Special Conditions and General Requirements (Division 1), apply to the work specified in this section.

1.02 SCOPE

- A. The work included in Division 16 of the Specifications includes all electrical work, interior and exterior to the project. Provide all materials, labor, equipment, transportation, tools, permits, fees, and supervision to install, test and make operational the complete electrical systems.

1.03 QUALITY ASSURANCE

- A. Referenced Standards: Provide and install products in accordance with referenced standards. Comply with the standards listed in each section.
- B. Codes: The electrical work shall be in accordance with latest edition of the following codes:
 - 1. National Electrical Code
 - 2. National Electrical Safety Code
 - 3. Life Safety Code
 - 4. International Building Code
 - 5. City of Midland Electrical Ordinance
 - 6. State of Texas codes as applicable
 - 7. National Fire Protection Association
 - 8. Other codes as referenced in individual sections
- C. Material Standards: Materials and equipment shall be listed or labeled as defined in Article 100 of the National Electrical Code (NEC), by a testing agency acceptable to the Owner. Materials shall be marked for their intended use.
- D. Permits and Inspections: Obtain all permits and inspections for the installation of the work and pay all charges incident thereto. Deliver to the Owner all certificates of inspections issued by authorities having jurisdiction.

1.04 SUBMITTALS

- A. Provide submittals for equipment as listed in each Section.
- B. Submittals shall include descriptive material, catalog sheets, diagrams, performance curves, and charts published by the manufacturer to show conformance with drawings and specifications.
- C. Provide complete electrical characteristics for all equipment. Lighting submittals shall include photometric data.
- D. Submittals shall be clearly marked showing the individual item offered.

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- E. All electrical submittals shall be bound in a book, indexed by specification section, and certified that they have been checked by the contractor.
 - F. Omissions from the submittal of any material which has been shown on the drawings or specified, does not relieve the contractor from furnishing and installing the item.

1.05 WARRANTY

- A. The contractor warrants the material and equipment installed to be free from defects for a period of one year after acceptance by the owner. All defects in labor or materials occurring during this period shall be repaired or replaced.

PART 2 - PRODUCTS

2.01 EQUIPMENT REQUIREMENTS

- A. The electrical equipment specified and shown on the drawings is based on information available at the time of design. If the equipment furnished has different electrical requirements, the contractor shall make the required changes to the wire, conduit, controls, overcurrent protection, switchgear, and installation as required to accommodate the equipment supplied, without additional charge to the owner. The cost for such adjustments shall be assigned to the respective section of this Specification under which the equipment is furnished.

2.02 MATERIALS

- A. All materials shall be UL labeled where a Standard exists for the product. If the product does not bear the UL label, the manufacturer shall submit documentation from an independent testing laboratory, acceptable to the authority having jurisdiction, showing evidence that the product is suitable for the installation.
- B. Materials and equipment shall be the standard products in current production of manufacturers regularly engaged in the production of such equipment.
- C. All materials shall be new and free from defects. Materials of the same type shall be the product of one manufacturer.
- D. All material and equipment shall be installed, applied, and handled in accordance with the manufacturer's recommendations and standards.
- E. Where no specific material is mentioned, provide the required material from a reputable manufacturer. The material shall conform to the project requirements, and shall be suitable to the engineer.

PART 3 - EXECUTION

3.01 GENERAL

- A. Fabricate, erect, and install the complete electrical systems in accordance with accepted good practice by qualified personnel who are licensed and experienced in such work. Proceed in an orderly manner so as not to impede the progress of the project.

3.02 DRAWINGS

- A. The electrical drawings are diagrammatic. Carefully coordinate the work with structural, architectural, and mechanical conditions. Make adjustments to avoid conflicts.
- B. The locations shown for electrical equipment is approximate and not intended to convey the exact details of installation. Exact locations are to be determined in the field by actual measurements.
- C. The contractor is responsible for fitting the equipment and material into the space. If the equipment furnished requires different space conditions than shown on the drawings, the contractor shall arrange for such space and shall submit a drawing indicating the exact details of installation prior to construction.
- D. Do not scale drawings. Layout electrical equipment using dimensions obtained from the manufacturer of the equipment and from field measurements.

3.03 SITE INVESTIGATION

- A. Prior to submitting bids, visit the site and become aware of existing conditions that may affect the cost of the project. Include in the bid the work required to remove, extend, relocate, reconnect or modify existing equipment or systems, and to restore them to their original condition.

3.04 MATERIALS HANDLING AND STORAGE

- A. Handle materials in accordance with the manufacturer's standards and recommendations.
- B. All materials, except those specifically designed to be installed outdoors, shall be stored in an enclosed, dry building or trailer. Protect all stored equipment from damage. Remove damaged materials from the premises.
- C. Equipment and materials shall not be installed until such time as the environmental conditions of the job site are suitable to protect the equipment and materials. They shall be protected from water, direct sunlight, cold and heat unless designed for such conditions.

3.05 CUTTING AND PATCHING

- A. Sleeve or cut all openings in walls, floors, ceilings and roof required to install the electrical work.
- B. Do not cut structural members unless specific permission is granted by the structural engineer.
- C. Patch all openings after installation of the work, and repair any damage caused by this activity. Restore the surface to its original condition.

3.06 PAINTING

- A. Refer to PAINTING Section of these Specifications.
- B. Touchup scratched or marred surfaces of all electrical equipment with paint obtained from the equipment manufacturers specifically for that purpose. Remove all oil, dirt, grease and foreign material before painting and prepare the surface as recommended by the manufacturer.
- C. Where plywood backboards are used to mount equipment, paint backboards with two coats of light gray semi-gloss paint.

3.07 TESTING

- A. Provide all field-testing specified in the individual specification sections.

3.08 RECORD DOCUMENTS

- A. Provide record documents as required in Division 1 of the specifications.

3.09 OPERATION AND MAINTENANCE INSTRUCTIONS

- A. Provide Operation and Maintenance manuals as required in Division 1 of the specifications.
- B. Before final inspection, instruct the owner's personnel in operation of the systems under this Division. Use the Operation and Maintenance Manual as basis for the instruction. Review the contents of the manual in detail and explain all aspects of operation and maintenance.
- C. Prepare and insert additional data in the manual when need for such data becomes apparent during instruction.

END OF SECTION

SECTION 16110

RACEWAYS

PART 1 – GENERAL

1.01 NOTE

- A. The general provisions of the Contract including Uniform General Conditions and Supplementary General Conditions, Special Conditions and General Requirements (Division 1), apply to the work specified in this section.

1.02 SUBMITTALS

- A. Submit product data sheets for all conduits and fittings.

1.03 SCOPE

- A. Furnish and install all conduits, wireways, raceways, and fittings for all systems interior and exterior to the building.

1.04 QUALITY ASSURANCE

- A. Referenced Standards: Provide products that comply with the referenced standards. These Standards are incorporated into this Specification by reference.
 - 1. National Fire Protection Association (NFPA)
 - No. 70 National Electrical Code (NEC)
 - 2. American National Standards Institute (ANSI)
 - C-80.1 Rigid Galvanized Conduit
 - C-80.3 Electrical Metallic Tubing
 - 3. Underwriters Laboratories, Inc. (UL)
 - UL 1 Flexible Metal Conduit
 - UL 5 Surface Metal Raceways and Fittings
 - UL 6 Rigid Metal Conduit
 - UL 651 Rigid PVC Conduit
 - UL 797 Electrical Metallic Tubing
 - UL 1242 Intermediate Metal Conduit
 - UL 360 Liquid-Tight Flexible Steel Conduit
 - 4. National Electrical Manufacturers Association (NEMA)
 - RN1 Externally PVC Coated GRS and IMC Conduit

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Subject to project requirements, products manufactured by (but not limited to) the following companies are acceptable:
 - 1. Metal Conduit and Fittings:
 - a. Allied

-
- b. Wheatland
 - c. Appleton
 - d. Raco
 - e. Killark
 - f. O-Z / Gedney
 - 2. PVC Conduit and Fittings:
 - a. Carlon
 - b. Certainteed
 - 3. PVC Coated Metal Conduit:
 - a. Robroy Industries
 - b. Levy

2.02 METAL CONDUIT AND FITTINGS

- A. Rigid Steel Conduit (GRS):
 - 1. Rigid, threaded, galvanized inside and outside or galvanized outside with protective coating inside.
 - 2. Factory made steel threaded couplings.
- B. Intermediate Metal Conduit (IMC):
 - 1. Rigid, threaded, thin wall steel, galvanized outside with protective coating inside.
 - 2. Factory made steel threaded couplings.
- C. Electrical Metallic Tubing (EMT):
 - 1. Steel tubing, galvanized outside with slick corrosion resistant interior coating.
 - 2. Steel set-screw couplings and connectors in dry locations; steel compression couplings and connectors in wet locations.
- D. Flexible Metal Conduit:
 - 1. Spirally wound with interlocking galvanized steel strips. Aluminum is not permitted.
 - 2. Flexible conduit shall be approved for use as equipment grounding conductor.
 - 3. Connectors shall be steel, suitable for grounding continuity.
- E. Liquidtight Flexible Metal Conduit:
 - 1. Spirally wound with interlocking galvanized steel strips with PVC cover extruded over the exterior to make the conduit liquidtight.
 - 2. Shall be approved for use as equipment grounding conductor.
 - 3. Shall be steel, suitable for grounding continuity, liquidtight.

2.03 PVC CONDUIT AND FITTINGS

- A. PVC conduit shall be Schedule 40 unless noted otherwise.
- B. Exterior underground conduit encased in concrete ductbank shall be type EB.
- C. Conduit fittings shall be the same material as the conduit supplied by the same manufacturer.

2.04 PVC COATED METAL CONDUIT AND FITTINGS

- A. PVC coating shall be bonded to the galvanized outer surface of the conduit, minimum 20 mil thick.
- B. Couplings shall have PVC coating with PVC sleeve extending from both ends such that joining the coupling and conduit will cover all metal surfaces.

PART 3 – EXECUTION

3.01 EXCAVATION

- A. Perform all excavation work required in connection with the installation of the work under this Section. After the electrical work has been installed, tested and approved, backfill all excavations with suitable material under the direction of the Architect. Include the cutting of all sidewalks, streets, and other pavement and repairing the openings in them to return the surface to approximately its original condition.
- B. Perform all excavations of every description of whatever substances encountered and to the depths required for installation of the work under this Division.
- C. During excavation, stack material suitable for backfilling in an orderly manner a sufficient distance from the banks to prevent slides or cave-ins. Remove all excavated material not required or suitable for backfill. Control grading to prevent surface water from flowing into excavations, and remove any water accumulating therein by pumping.
- D. Make trenches the necessary width for proper installation of the lines.
- E. Grade the bottom of trenches accurately to provide uniform bearing and support for conduit or duct on undisturbed soil at every point along its entire length.
- F. Where excavation requires the opening of existing walks, streets, drives or other existing pavement, cut the pavement as required. Hold the size of the cut to a minimum consistent with the work to be accomplished. After the installation of the new work is completed, and the excavation has been backfilled, patch the paving using materials to match those cut out. Take care that the patches are level with the original surfaces and thoroughly bond with them.

3.02 BACKFILLING

- A. Carefully backfill trenches with earth, sandy clay, soft shale or other approved material free from large clods of earth deposited in thoroughly and carefully rammed 6-inch layers.
- B. Do not use broken concrete or pavement as backfill material.
- C. Settling the backfill with water is permissible and will be a requirement when so directed.
- D. Re-open any trenches improperly filled or where settlement occurs to the depth required for proper compaction, then refill, mound over and smooth off.
- E. Install continuous identification tape as specified in ELECTRICAL IDENTIFICATION.
- F. Backfill open trenches across roadways or other areas to be paved as specified above except that the entire depth of trench shall be backfilled in 6-inch layers, each layer moistened and compacted to a density of not less than 95% Standard Proctor in such manner as to permit the rolling and compaction of the filled trench together with the adjoining earth to provide the required bearing value and permit paving the area immediately after backfilling as completed.

3.03 INSTALLATION OF UNDERGROUND PLASTIC CONDUIT

- A. Install at least 30 inches below finished grade unless noted to the contrary. Assemble and install raceways in accordance with manufacturer's instructions. Make joints with couplings and solvent cement. Fabricate bends of 30 degrees or more with factory-made elbows, or make field bends with proper heating equipment. Bends showing signs of overheating or flattening are unacceptable. Ream ends of all conduit before joining.
- B. "Snake" plastic conduit in trench, from side to side, with a complete cycle every 40 feet to allow for expansion and contraction. Maintain this configuration during backfilling.

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- C. Where conduit turns up out of earth, or floor slabs, change from plastic to rigid galvanized steel conduit below grade and outside of such structures. Do not extend any plastic conduit above grade. Make similar change from plastic to rigid galvanized steel conduit at connections to underground pull or junction boxes. Wrap all steel conduits and fittings buried in earth as specified elsewhere herein, or use PVC coated steel conduits.

3.04 INSTALLATION OF UNDERGROUND STEEL CONDUIT

- A. All steel conduit in earth shall be rigid galvanized steel conduit. Wrap such conduit with 3M Company 0.020-inch thick No. 51 "scotchrap" vinyl plastic tape, half lapped to give a double thickness wrap. Remove all oil, grease and dirt from conduit with a suitable solvent, and clean and dry conduit before wrapping. If conduit is pre-wrapped in the shop and then cut and joined on the job, wrap all joints on the job, overlapping pipe wrapping 3" on both sides of joints.

3.05 INSTALLATION OF PVC COATED CONDUITS

- A. During installation, visually examine the conduit for cuts. Patch these areas with a paste containing a PVC solvent obtained from the conduit manufacturer. The patch shall be built up to the original thickness of the coating and feathered out on all sides of the damaged area a minimum of 1/2 inch to provide a complete bonded seal over the damaged area.

3.06 INSTALLATION OF BUILDING RACEWAYS

- A. All wiring of every description shall be run in conduit or electrical metallic tubing unless noted or specified otherwise. Conduits may be run exposed in machinery and electrical rooms and unfinished areas. All other conduits shall be run concealed unless otherwise noted. All exposed runs shall be installed parallel to the surface of the building in a neat and orderly manner.
- B. Types: All conduits installed in wet or damp locations, or on roofs shall be rigid galvanized steel conduits. Above grade interior conduits shall be rigid galvanized steel conduit, intermediate metal conduits or electrical metallic tubing. Conduits installed below grade in slabs or buried in earth shall be PVC or PVC coated rigid galvanized steel or wrapped rigid galvanized steel.
- C. Sizes: Size and install raceways so that conductors may be drawn in without injury or excessive strain. Make field bends with approved bending devices. Do not install bends or offsets in which conduit is crushed, deformed or otherwise injured.
- D. Connections: Use lengths of flexible metal conduit, not less than 12" long at final connections to all motors, generators, controls and other devices subject to movement because of vibration or mechanical adjustment. Use flexible metal conduit also at connections to recessed lighting fixtures, and elsewhere as required. In damp or wet locations, and where installed outdoors, use liquidtight flexible metal conduit.
- E. Around Heat Producing Equipment: Do not install raceways within 3" of steam and hot water pipes, breeching and flues, except where crossings are unavoidable, and then keep raceways at least 1" from insulation on the pipe, breeching or flue crossed. Wherever possible, avoid installing raceways directly above or in close proximity to boilers and other like objects operating at high temperatures.
- F. Damp or Wet Locations: In damp or wet locations make every effort to avoid installing raceways in a manner which will create moisture traps. Where they must be so installed, seal both ends of raceways with an approved sealing compound to prevent "breathing" and moisture condensation within the raceways.

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- G. Joining Rigid Conduits: Join with threaded couplings. Ream out all conduit ends after threading. Secure rigid conduits at panel boxes, junction boxes, pull boxes, switchboards, support boxes, or sheet metal outlet boxes by galvanized locknuts, inside and outside, with insulating bushing inside. Unthreaded set screw type couplings or connectors are not acceptable in rigid conduit systems. No running threads shall be used anywhere in conduit systems.
 - H. Protection of Raceways: Seal ends of all raceways with blank discs ("pennies"), push pennies or other approved closers during construction. Do not pull any conductors into raceways until all plastering in the vicinity is completed. Swab out all raceways before pulling in conductors.
 - I. Penetrations: Wherever raceways pass through floors, walls partitions, etc., carefully fill any space between the outside of the raceway and the building material to prevent passage of air, water, smoke and fumes. Filling material shall be fire-resistive and installed to meet requirements of the UL Fire Resistance Directory.

3.07 CONDUIT SUPPORTS

- A. Support Spacing: Use minimum spacing as directed by National Electrical Code, but space hangers more closely where required by conditions.
- B. Vertical Conduit Risers: Support vertical conduits at each floor by means of riser clamps or U-bolts, clamping them to a steel channel bridging the opening in the floor.
- C. Individual Conduits: Support conduits running vertically or horizontally with galvanized malleable iron one hole clamps. Carry individually supported horizontal conduits 1-1/4" and larger on Kindorf No. 150 or Steel City No. C-149 hangers. Use no perforated strap iron as hanger material. Where conduits smaller than 1-1/4" are installed above metal lath and plaster ceilings or mechanically suspended dry ceilings of the non-removable type, they may be supported on ceiling runner channels. Where conduits smaller than 1-1/4" are installed above removable ceilings, attach them to the structure or bar joists (where present) or support them on threaded hanger rods with clips. Do not use any wire to support conduits or to attach conduits to supporting members. Locate conduits a sufficient distance above the ceiling to permit removal of the ceiling panels. Locate them so as not to hinder access to mechanical and electrical equipment through the ceiling panels.
- D. Multiple Conduits: Where multiple raceways are run horizontally at the same elevations, they may be supported on trapezes formed of sections of Unistrut angle iron or channels suspended on rods or pipes. Size trapeze members including the suspension rods for the number size and loaded weight of the conduits they are to support. Space them as required for the smallest conduit supported.

END OF SECTION

SECTION 16120
WIRES AND CABLES

PART 1 – GENERAL

1.01 NOTE

- A. The general provisions of the Contract including Uniform General Conditions and Supplementary General Conditions, Special Conditions and General Requirements (Division 1), apply to the work specified in this section.

1.02 SUBMITTALS

- A. Submit catalog data sheets on all conductors and cables and wire.

1.03 SCOPE

- A. Under this Section, furnish and install all building wires and cables (600 volts and below) complete with connectors and terminations. Exterior branch circuits and feeders are also included in this section. Wiring for communication and alarm systems are included in their respective sections unless they reference this Section.

1.04 QUALITY ASSURANCE

- A. Referenced Standards. Provide products which comply with the referenced standards. These Standards are incorporated into this Specification by reference.
 - 1. National Fire Protection Association (NFPA)
No. 70 National Electrical Code (NEC)
 - 2. Underwriters Laboratories, Inc. (U.L.)
 - UL 44 Thermoset-Insulated Wires and Cables
 - UL 83 Thermoplastic-Insulated Wires and Cables
 - UL 486 Wire Connectors and Soldering Lugs
 - UL 510 Insulating Tape

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Subject to project requirements, products manufactured by (but not limited to) the following companies are acceptable.
 - 1. Insulated Cable:
 - a. Southwire Co.
 - b. Senator Wire & Cable Co.
 - c. Okonite
 - d. Anaconda
 - e. Pirelli Cable Co.

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2. Electrical Spring Connectors:
 - a. Scotch
 - b. Ideal
 - c. Buchanan
 3. Compression Connectors:
 - a. Burndy
 - b. Scotch
 - c. IlSCO
 4. Mechanical Connectors:
 - a. Burndy
 - b. Scotch
 - c. Ideal
 5. Insulating Kits:
 - a. Raychem
 - b. Scotch
 6. Insulating Tape: Scotch

2.02 CONDUCTORS

- A. Type: Soft drawn copper, UL listed, rated at 600 volts, free from flaws and imperfections. Conductors no. 10 and smaller shall be solid. Conductors larger than no. 10 shall be stranded.
- B. Insulation: Unless otherwise indicated on the drawings, otherwise specified in other Sections, or otherwise required by the National Electrical Code, conductors shall have type THHN/THWN or XHHW insulation.
- C. High Temperatures: Use type RHH or RHW-2 for wiring in proximity to boilers and other devices subject to high temperatures.
- D. Markings: Conductors shall be marked on the surface with rated voltage, size, type, and manufacturer. The size shall be repeated at intervals not exceeding 24 inches, with the remaining data repeated at intervals not exceeding 40 inches.
- E. Performance: Conductors shall be electrically continuous and free from shorts or grounds. All open or shorted conductors shall be replaced. All conductors with damaged insulation shall be removed and replaced with new conductors free from defects.
- F. Conductors and cables installed open in ceiling plenums shall be plenum-rated.

2.03 JOINTS AND SPLICES

- A. Solid Conductors (No. 10 AWG and smaller): U.L. approved, screw-on, electrical spring connectors, 600 volt, 105C, insulated.
- B. Stranded Conductors (No. 8 and Larger): Crimp type compression connectors properly selected for the conductor size and material. All connectors shall be applied with properly sized dies and tools as recommended by the manufacturer. Insulate the splice with an insulating kit providing 600 volt, 90C rating.

2.04 COLOR CODING

- A. Equipment Grounding Conductors:
 1. Equipment grounding conductors shall be green. Grounding conductors from isolated grounding system shall be green with yellow stripes.
 2. Equipment grounding conductors, no. 6 awg and smaller shall have continuous color-coding the entire length of the conductor. Sizes larger than no. 6 awg shall be

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- permitted to be identified at each end, and at every point where the conductor is accessible. The marking shall consist of green tape, or green adhesive labels.
- B. Neutral Conductors:
1. Neutral conductors shall be white or natural gray.
 2. Where systems of different voltages are installed, the neutral of the lower voltage shall be white or natural gray, and the neutral of the higher voltage shall have three continuous white stripes on other than green insulation.
 3. Sizes no. 6 awg, or smaller shall have continuous color-coding the entire length of the conductor. Larger sizes shall be permitted to be identified at each end, and at every point where the conductor is accessible. The marking shall consist of white tape or stripped tape or white adhesive labels.
- C. Phase Conductors:
1. Conductors no. 10 awg and smaller shall have continuous color-coding the entire length of the conductor. Larger sizes shall be permitted to be identified at each end, and at every point where the conductor is accessible. The marking shall consist of colored tape, or colored adhesive labels.
 2. The color-coding system employed shall be permanently posted on the inside door of each branch-circuit panelboard. The posting shall identify the color-coding of each phase conductor and shall be applied to the inside of the door with adhesive.
 3. 120/208 volt, 3 phase system:
Phase A – Black
Phase B – Red
Phase C – Blue

PART 3 – EXECUTION

3.01 INSTALLATION OF WIRING

- A. Install all wiring in raceways unless specified otherwise.
- B. Wire Pulling: Provide suitable installation equipment for pulling conductors into raceways or conduits. Use ropes of polyethylene, nylon or other suitable material to pull in conductors. Attach pulling lines to conductors by means of woven basket grips or by pulling eyes attached directly to conductors. All conductors to be installed in a single conduit shall be pulled in together. Use U.L. listed cable pulling compound where necessary.
- C. Cable Lubricants: All cable lubricants shall be UL listed, and shall be certified by their manufacturer to be non-injurious to the insulation on which they are used.
- D. Wire Sizing:
1. No wire shall be smaller than no. 12, except for signal and control circuits, or lighting fixture taps.
 2. Receptacle and motor branch circuits – Use no. 12 conductors unless noted or scheduled otherwise.
 3. 120 volt, 20 amp lighting branch circuits – Where the length of run from panelboard to first lighting outlet exceeds 75 feet use no. 10 conductors; otherwise use no. 12.
 4. Where more than three current-carrying conductors are installed in the same conduit or raceway, the conductors shall be increased in size as required to maintain the required ampacity after application of the adjustment factors of NEC Table 310-15(b)(2)(a).
 5. All branch circuit wiring connected to the load side of dimmers shall have an individual neutral installed with each circuit.

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- E. Joints and Splices:
 - 1. Make joints and splices only where necessary and only at outlet boxes, wiring troughs and other enclosures permitted by the NEC. All joints shall be mechanically and electrically secure.
 - 2. Do not splice conductors in panelboards, safety switches, switchboards, motor control centers or motor control enclosures.
 - 3. Conductors for use with insulated spring connectors shall be twisted together prior to application of the connector.
 - F. Terminations: Tighten electrical connections and terminations in accordance with the manufacturer's published values. A calibrated tool shall be used to insure proper torque values.
 - G. Bundling: Bundle all conductors in panelboards, cabinets, pullboxes and the like using nylon straps made for this purpose. Bundle conductors larger than no. 10 in individual circuits. Bundle smaller conductors in larger groups.
 - H. Identification: Refer to ELECTRICAL IDENTIFICATION SECTION.
 - 1. Mark conductors to clearly identify each circuit by number. Securely attach to each conductor in each junction box, pull box, panelboard, etc.
 - 2. The cover of each junction box and pullbox shall be marked with the designations of each circuit contained therein.
 - 3. Where colored plastic tape is applied to conductors for identification, use half-lapped turns for a distance of 6 inches from the terminal points and in boxes where taps and splices are made. Apply the last two turns with no tension to prevent unwinding. Use 1-inch wide tape applied to avoid obscuring cable identification markings.

3.02 FIELD TESTING

- A. Tests and procedures shall be in accordance with the applicable IPCEA standards. Furnish all instruments, equipment and personnel required for testing. Submit test data to the engineer on data sheets in a format that can be compared with future testing. All test data shall be included in the project operating manual.
- B. Test wires and cables for electrical continuity and short circuits.
- C. Prior to terminating, check each service and feeder conductor with megohmmeter to determine the insulation resistance with respect to ground and other phases. Applied potential shall be 1000 volts dc for 1 minute.
- D. Test cable mechanical connections to the manufacturer's recommended values using calibrated torque wrench.
- E. Energize circuits and demonstrate proper operation.

END OF SECTION

SECTION 16130

BOXES

PART 1 – GENERAL

1.01 NOTE

- A. The general provisions of the Contract including Uniform General Conditions and Supplementary General Conditions, Special Conditions and General Requirements (Division 1), apply to the work specified in this section.

1.02 SUBMITTALS

- A. Submit catalog data sheets for all boxes.

1.03 SCOPE

- A. Furnish and install electrical boxes in accordance with the requirements of the National Electrical Code.

1.04 QUALITY ASSURANCE

- A. Referenced Standards. Provide products that comply with the referenced standards. These Standards are incorporated into this Specification by reference.
 - 1. National Fire Protection Association (NFPA)
 - No. 70 National Electrical Code (NEC)
 - 2. Underwriters Laboratories, Inc. (UL)
 - No. 514 Outlet boxes and fittings
 - No. 50 Enclosures for Electrical Equipment
 - 3. National Electrical Manufacturers Association (NEMA)
 - No. OS 1 Sheet Steel Outlet Boxes, Device Boxes, Covers and Box Supports
 - No. FB 1 Fittings and Supports for Conduit and Cable Assemblies

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Subject to project requirements, products manufactured by (but not limited to) the following companies are acceptable.
 - 1. Sheet Steel Outlet and Device Boxes:
 - a. Raco
 - b. Steel City
 - c. Appleton
 - 2. Cast Metal Device Boxes:
 - a. Crouse Hinds
 - b. Appleton
 - c. Pyle National

2.02 OUTLET AND DEVICE BOXES

- A. All boxes shall be UL listed.
- B. Sheet steel boxes shall be not lighter than 14 gauge, galvanized after fabrication.
- C. Cast metal boxes shall be cast iron or cast alloy.
- D. Outlet boxes for switches, receptacles and communications use shall be 4" square with proper square cornered tile wall cover, plaster cover or finishing plate, except where construction will not permit or the device requires a larger box. Box depth shall be as required by NEC for device and wiring volume requirements, but not smaller than 1-1/2 inches.
- E. Boxes for devices mounted flush in concrete block walls shall be single gang masonry boxes, 3-1/2" deep.
- F. Boxes installed in poured concrete shall be concrete-tight type.
- G. Boxes for surface mounted or pendant fixtures shall be 4" octagonal by 1-1/2" minimum depth.
- H. Boxes for flush mounted fixtures shall be 4" by 4" size with cover installed above the ceiling and accessible by removing ceiling panel or fixture. Connection to fixture shall be with flexible conduit.
- I. Boxes for interior exposed work shall be cast metal boxes (Cast iron or cast alloy).
- J. Boxes for outdoors shall be cast metal boxes with gasketed covers.

2.03 PULLBOXES AND JUNCTION BOXES

- A. Sheet steel galvanized inside and outside, with galvanized covers.
- B. Dimensions shall be as required by NEC for the number, size and locations of conduits entering the box.
- C. Boxes installed above ceilings shall be accessible by removing ceiling panels, installing access door in hard ceiling, or flush mounting the cover on the ceiling.
- D. Boxes installed flush in walls in finished areas shall have overlapping trim with hinged door and lock to match the appearance of electrical panelboard.
- E. All boxes shall have covers.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Provide at each outlet or device of whatever character a metal outlet box in which conduits shall terminate.
- B. All pull and junction boxes shall be accessible after construction is complete. Install access panels in the construction as required to make the box accessible.
- C. Fasten all boxes securely to the building construction, independent of conduit systems.
- D. Where outlet box on grid ceiling supports surface or suspended fixture, provide box with fixture stud and secure the box to ceiling members with steel channel.
- E. Outlet boxes for devices shown back to back shall be offset a minimum of 6 inches.
- F. All boxes shall have covers and unused conduit openings shall be covered.

END OF SECTION

SECTION 16140
WIRING DEVICES

PART 1 – GENERAL

1.01 NOTE

- A. The general provisions of the Contract including Uniform General Conditions and Supplementary General Conditions, Special Conditions and General Requirements (Division 1), apply to the work specified in this section.

1.02 SUBMITTALS

- A. Submit product data sheets for all wiring devices.

1.03 SCOPE

- A. Furnish and install in suitable outlet boxes, the wiring devices indicated complete with coverplates. All shall be properly connected to conductors so as to be operable.

1.04 QUALITY ASSURANCE

- A. Referenced Standards: Provide products that comply with the referenced standards. These Standards are incorporated into this Specification by reference.
 - 1. National Fire Protection Association (NFPA)
No. 70 National Electrical Code (NEC)
 - 2. National Electrical Manufacturers Association (NEMA)
WD 1 General Requirements for Wiring Devices
WD 6 Wiring Devices – Dimensional requirements
 - 3. Underwriters Laboratories (UL)
UL 20 General-Use Snap Switches

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Subject to project requirements, products manufactured by (but not limited to) the following companies are acceptable:
 - 1. Hubbell
 - 2. Leviton
 - 3. Pass & Seymour
 - 4. General Electric
 - 5. Bryant

2.02 CLASSIFICATION

- A. All wiring devices shall be UL listed.
- B. All wiring devices shall be specification grade.

2.03 COLORS

- A. All devices shall have **ivory** finish where mounted in walls finished in light colors, and brown finish where mounted in walls finished in dark colors.

2.04 SWITCHES

- A. The catalog numbers listed are of Hubbell manufacture. Equivalent devices from listed manufacturers are acceptable. Furnish switches in colors specified above even though the numbers listed may not contain the correct suffix.
 - 1. Single pole wall switch – 1221.
 - 2. Three-way wall switch – 1223.
 - 3. Four-way wall switch – 1224.
 - 4. Pilot-lighted switch – 1221-PLC.

2.05 RECEPTACLES

- A. The catalog numbers listed are of Hubbell manufacture. Equivalent devices from listed manufacturers are acceptable. Furnish receptacles in colors specified even though the numbers listed may not contain the correct suffix.
 - 1. Duplex receptacle: 20 amp, 125 volt, grounding (NEMA 5-20R) – No. 5362.
 - 2. Ground Fault Interrupter Receptacle (GFI) – No. GF-5362.
 - 3. Special Receptacles: Furnish devices in the NEMA configuration listed on the drawings.

2.06 WEATHERPROOF DEVICES

- A. Provide the specified device in weatherproof cast box with gasketed coverplate.

2.07 COVERPLATES

- A. Provide coverplates for all wiring devices, including telephone, signal outlets and other devices. Coverplates shall be one piece single or multi-gang type as required.
- B. Indoor Flush Devices:
 - 1. Type 302 stainless steel.
 - 2. Where installed in masonry walls, use jumbo plates.
- C. Indoor Surface Devices: For indoor devices use zinc-coated metal with rounded or beveled edges, same size as the box.
- D. Outdoor devices: TayMac

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install wiring devices plumb and level.
- B. Install SPST wall switches with OFF position down.
- C. Wall switches shall be installed on the strike side of the door as finally hung.
- D. Install receptacles with grounding pole on top.

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- E. Install devices within outlet boxes to allow coverplates to be in full contact with the wall on all sides.
 - F. After connection of each wiring device, install two full wraps of electrical insulating tape around the side terminals prior to installation in the box.
 - G. Replace broken devices and plates with new.
 - H. Clean all paint, plaster and dirt from wiring devices and plates.

3.02 MOUNTING HEIGHTS

- A. Where mounting heights are indicated on the drawings, the device shall be installed with the centerline of the device at the indicated height.
- B. Devices noted to be installed above counters or millwork shall be installed above the backsplash.
- C. Unless otherwise noted on the drawings, or directed by architect, install devices at the following heights above finished floor:

DEVICE	MOUNTING HEIGHT
Wall switch	46"
Receptacle	18"
Wall dimmer switch	46"
Telephone outlet	18"
Data outlet	18"

3.03 IDENTIFICATION

- A. At each wiring device mark the inside of the coverplate with the panel and circuit number to which the device is finally connected. Use black indelible marker.

3.04 FIELD TESTING

- A. Energize lighting circuits and operate each wall switch to verify proper operation.
- B. Energize receptacle circuits and test each receptacle with circuit tester to verify the device is energized and has correct polarity.
- C. Test TRIP and RESET buttons on GFI receptacles. In addition, test GFI receptacles with a GFI tester to verify it trips at 4ma of ground current.

END OF SECTION

SECTION 16170

GROUNDING AND BONDING

PART 1 – GENERAL

1.01 NOTE

- A. The general provisions of the Contract including Uniform General Conditions and Supplementary General Conditions, Special Conditions and General Requirements (Division 1), apply to the work specified in this section.

1.02 SUBMITTALS

- A. Submit product data sheets for all grounding equipment.

1.03 SCOPE

- A. Furnish and install grounding equipment and systems as specified herein. Also refer to, and comply with specific grounding requirements contained in other Sections.

1.04 QUALITY ASSURANCE

- A. Referenced Standards: Provide products that comply with the referenced standards. These Standards are incorporated into this Specification by reference.
 - 1. National Fire Protection Association (NFPA)
No. 70 National Electrical Code (NEC)
 - 2. Institute of Electrical and Electronic Engineers (IEEE)
Standard 81 Guide for Measuring Earth Resistivity, Ground Impedance, and
Earth Surface Potentials of a Ground System
 - 3. Underwriters Laboratories, Inc. (UL)
UL 467 Grounding and Bonding Equipment

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Subject to project requirements, products manufactured by (but not limited to) the following companies are acceptable:
 - 1. Grounding Products:
 - a. Chance / Hubbell
 - b. Copperweld Corp
 - c. Erico Inc.
 - d. Ideal Industries, Inc.
 - e. ILSCO
 - f. Kearney / Cooper Power Systems
 - g. Lincoln XIT Grounding
 - h. Superior Grounding Systems, Inc.

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- i. Thomas and Betts
 - j. Raco, Inc.
 - k. Burndy

2.02 CONDUCTORS

- A. Equipment Grounding Conductors:
 - 1. Use insulated conductors that comply with WIRES AND CABLES Section.
 - 2. Equipment grounding conductors shall be green.
 - 3. Isolated ground conductors shall be green with yellow stripes.
 - 4. No. 6 AWG and smaller shall have continuous color-coding the entire length of conductor. Larger sizes shall be identified with color-coded plastic tape at each end, and at every point where the conductor is accessible. For equipment grounding conductors use green tape. For isolated ground conductors use alternating bands of green and yellow tape with a minimum of three bands of green and two bands of yellow.
- B. Grounding Electrode Conductors: Insulated stranded cable complying with WIRES AND CABLES Section.
- C. Underground Ground Conductors: Bare conductors installed underground shall be tinned, stranded complying with ASTM B8.
- D. Bonding Conductors:
 - 1. Bonding cable: 28 kcmil, 14 strands of no. 17 AWG, copper.
 - 2. Bonding Conductor: Bare stranded copper.
 - 3. Bonding Jumper: Bare copper tape, braided bare copper conductors terminated with copper ferrules.

2.03 GROUND RODS

- A. Ground rods shall be one-piece or sectional type, copper-clad steel, 3/4" in diameter by 10 feet long.

2.04 GROUND CONNECTORS

- A. Compression Connectors:
 - 1. Suitable for direct burial, embedded in concrete, or above grade applications, equal to Burndy Hyground.
 - 2. Connectors shall be equivalent in current-carrying capacity to the maximum size copper conductors being joined.
 - 3. Equipment shall be in accordance with the connector manufacturers recommendation. This shall include cable preparation, installation tools and dies, and the required number of crimps.
- B. Bolted Connectors:
 - 1. UL listed for grounding.
 - 2. Above grade applications.
 - 3. Provide equipment in accordance with connector manufacturers' recommendations for the application.
- C. Welded Connectors:
 - 1. Exothermic-welded type, UL listed for grounding connections.
 - 2. Provided in kit form and selected for the specific types, sizes, conductors and other items to be connected.

PART 3 – EXECUTION

3.01 SERVICE GROUNDING

- A. Provide adequate and permanent service neutral and equipment grounding in accordance with the NEC.
- B. Connect the service ground and equipment ground to a common point within the metallic enclosure containing the main service disconnecting means. From the common point of connection of the service ground and equipment ground, run in conduit a combined service and equipment grounding conductor (grounding electrode conductor) without joint or splice to the grounding electrode system. At each end point of connection, attach the metal conduit containing the grounding electrode conductor to the grounding electrode, or bond the grounding electrode conductor to its conduit as it exits the conduit with a fitting selected for this purpose. Separate bonding jumpers are not permitted for bonding the conduit to the electrode.

3.02 GROUNDING ELECTRODE SYSTEM

- A. Ground rods
- B. Building steel
- C. Water service line
- D. Concrete-encased electrode (Ufer ground)

3.03 EQUIPMENT GROUNDING CONDUCTORS

- A. Comply with NEC Article 250 for types, sizes and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by NEC are indicated.
- B. Install a separate, green-insulated, equipment grounding conductor in each feeder and each branch conduit. Install the grounding conductor in the same raceway with related phase and neutral conductors, and connect to pull boxes or outlet boxes at intervals of 100 feet or less. Where paralleled conductors in separate raceways occur, provide a grounding conductor in each raceway. Connect the grounding conductors to bare grounding bars in panelboards, and ground busses in service equipment to the end that there will be an uninterrupted grounding circuit from the point of a ground fault to the point of connection of the equipment ground and system neutral.
- C. Install equipment grounding conductors in nonmetallic raceways unless they are designated for telephone or data cables.
- D. Install equipment grounding conductors in all flexible metal conduit and liquid-tight flexible metal conduit.

3.04 INSTALLATION

- A. Ground Rods:
 - 1. Install at least 3 rods spaced at least one rod length from each other and located at least the same distance from the other grounding electrodes.
 - 2. Drive rods until tops are 2 inches below finished floor or final grade, unless otherwise indicated.
 - 3. Interconnect ground rods with no 2/0 bare, tinned, stranded copper 24" below grade. Attach with exothermic welds except at test wells.

-
- B. Metallic Water Service Pipe:
 - 1. Clean contact surfaces thoroughly to assure good metal to metal contact.
 - 2. Where a dielectric fitting occurs on the water main, connect the grounding conductor on the street side of the fitting.
 - 3. Connect to the pipe with a grounding fitting designed to attach the grounding conductor and its conduit to the pipe.
 - C. Grounding Building Steel: The building structural steel frame shall be grounded to the grounding electrode system.

3.05 FIELD INSPECTION AND TESTING

- A. Inspection:
 - 1. Visually verify proper grounding connections at the service entrance equipment.
 - 2. Visually verify proper connections to the grounding electrode system.
 - 3. Visually verify proper grounding connections of separately derived systems.
 - 4. Visually verify proper grounding connections at emergency generators.
 - 5. Visually verify proper grounding connections at distribution panels and branch circuit panels.
- B. Testing:
 - 1. Perform ground impedance measurements using the fall-of-potential method described in IEEE Standard 81. Instrumentation utilized shall be specifically designed for ground testing.
 - 2. The testing shall be performed before the electrical distribution system is energized, and shall be made in normally dry conditions not less than 48 hours after rainfall, and without moistening the ground.
 - 3. The impedance-to-ground of the main grounding electrode system shall be 5 ohms or less.
 - 4. Where tests show an impedance to ground of more than 5 ohms, take action to decrease this value to 5 ohms by driving and interconnecting additional ground rods, installing ground plates, or installing chemical electrodes.

END OF SECTION

SECTION 16195

ELECTRICAL IDENTIFICATION

PART 1 – GENERAL

1.01 NOTE

- A. The general provisions of the Contract including Uniform General Conditions and Supplementary General Conditions, Special Conditions and General Requirements (Division 1), apply to the work specified in this section.

1.02 SCOPE

- A. Provide and install electrical identification for electrical conductors and equipment.

1.03 QUALITY ASSURANCE

- A. Comply with National Electrical Code (NEC).
- B. Comply with UL Standard 969.
- C. Comply with ANSI C2.
- D. Comply with NEMA WC-1 and WC-2.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Subject to project requirements, products manufactured by (but not limited to) the following companies are acceptable.
 - 1. W. H. Brady
 - 2. Ideal Industries, Inc.
 - 3. Seton Nameplate Co.
 - 4. Panduit Corp.

2.02 EQUIPMENT NAMEPLATES AND SIGNS

- A. Safety Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145.
- B. Engraved Plastic Nameplates:
 - 1. Melamine plastic laminate, minimum 1/16" thick for signs up to 20 sq. inches, and 1/8" thick for larger sizes.
 - 2. White letters on black face for equipment connected to normal power system.
 - 3. White letters on red face for equipment connected to emergency power system.
 - 4. Attach with self-tapping stainless-steel screws, except contact-type permanent adhesive can be used where screws can not or should not penetrate the surface.

2.03 CONDUCTOR IDENTIFICATION MATERIALS

- A. Color-Coded Plastic Tape: Provide manufacturer's standard self-adhesive vinyl tape not less than 3 mils thick by 1-1/2" wide.

-
- B. Identification Bands: Provide manufacturer's standard vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters to show circuit identification.

2.04 UNDERGROUND LINE WARNING TAPE

- A. Permanent, bright colored, continuous printed, vinyl tape.
 - 1. Not less than 6 inches wide by 4 mils thick.
 - 2. Compounded for permanent direct burial service.
 - 3. Embedded continuous metallic strip or core.
 - 4. Printed legend indication type of underground line.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install electrical identification products in accordance with the manufacturer's written instructions, and requirements of NEC and OSHA.
- B. For items attached with adhesive, degrease and clean the surface as recommended by the manufacturer.
- C. Where items attach to surfaces that require painting, attach after completion of painting.
- D. Install signs at locations for most convenient viewing without interference with operation and maintenance of equipment.
- E. Identification on Boxes:
 - 1. Boxes for fire alarm circuits shall be painted red.
 - 2. Every box containing circuit wiring shall have the circuit numbers marked on the outside cover of the junction box. Use indelible marker with wide tip. Markings for normal circuits shall be black, and shall be red for emergency circuits.

3.02 CONDUCTOR IDENTIFICATION

- A. Apply conductor identification on each conductor in each box, enclosure, cabinet and panel.
- B. Refer to Section 16120 for color-coding of conductors.

3.03 MARKING EXTERIOR UNDERGROUND LINES

- A. During trench backfilling for power, control, signal, and communication lines, install continuous underground plastic line marker located directly above the line at 12 to 16 inches below finished grade.

3.04 EQUIPMENT IDENTIFICATION

- A. Install engraved, plastic laminate sign on each unit of electrical equipment, including central or master unit of each system. This includes power, lighting, communication, signal, and alarm systems unless the units contain their own self-explanatory identification.
- B. Unless otherwise indicated, provide a single line of text with ½" high lettering on 1-1/2" high sign (2" high where 2 lines are required).
- C. Text shall match the notations used on the drawings for identification.

3.05 IDENTIFICATION OF PANELBOARDS, SWITCHBOARDS, AND SWITCHGEAR

- A. Install engraved plastic laminate sign containing 3 lines of text. The top line shall be the panel name. The centerline shall indicate the panel voltage, and the bottom line shall indicate the source of supply.
- B. Signs for equipment fed from the normal system shall have white letters on black background, and equipment fed from the emergency system shall have white letters on red background.
- C. An example of the required identifications is:

Panel 4HA
277/480
Fed From Panel 4DP

END OF SECTION

SECTION 16441
SAFETY SWITCHES

PART 1 – GENERAL

1.01 NOTE

- A. The general provisions of the Contract including Uniform General Conditions and Supplementary General Conditions, Special Conditions and General Requirements (Division 1), apply to the work specified in this section.

1.02 SUBMITTALS

- A. Submit the following information for review:
1. Complete drawings showing dimensions.
 2. Conduit entry/exit locations.
 3. Voltage rating, continuous current rating, and short-circuit rating.
 4. Cable terminal size.
 5. Fuse rating and type.

1.03 SCOPE

- A. Provide, install, and connect all safety switches shown on the drawings or required by codes.

1.04 QUALITY ASSURANCE

- A. Referenced Standards. Provide products that comply with the referenced standards. These Standards are incorporated into this Specification by reference.
1. National Fire Protection Association (NFPA)
No. 70 National Electrical Code (NEC)
 2. Underwriters Laboratories, Inc. (UL)
UL 50 Enclosures for electrical Equipment
UL 98 Enclosed and Dead-Front Switches
 3. National Electrical Manufacturers Association (NEMA)
No. 250 Enclosures for Electrical Equipment

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Subject to project requirements, products manufactured by (but not limited to) the following companies are acceptable:
1. Square D
 2. Cutler Hammer
 3. General Electric

2.02 HEAVY DUTY SWITCHES

- A. Requirements: Provide and install safety switches as shown on the drawings or as required by NEC. Where code requires the installation of safety switches that are not shown on the drawings, provide and install the required switches.
- B. All switches shall be heavy-duty type.
- C. Switches shall be fusible or non-fusible as noted on the drawings or as required by codes.
- D. Provide switches with the voltage and current ratings as shown on the drawings.
- E. Where safety switches serve as motor or motor starter disconnects, provide horsepower rated switches with auxiliary contacts to disconnect all power and control circuits.
- F. Construction:
 - 1. Switch blades and jaws shall be plated copper.
 - 2. Switches shall have a handle that is easily padlockable in the OFF position.
 - 3. Switches shall have defeatable door interlocks that prevent the door from opening when the handle is in the ON position.
 - 4. Switch assembly and operating handle shall be an integral part of the enclosure base.
 - 5. Switches rated 100A to 600A shall have reinforced fuse clips.
 - 6. Switch blades shall be readily visible in the OFF position.
 - 7. Switch operating mechanism shall be non-teasible, positive quick-make / quick-break type.
 - 8. Fusible switches shall be suitable for service entrance equipment.
 - 9. Switches shall have line terminal shields.
 - 10. Switches shall have CU/AL mechanical lugs.
- G. Enclosures:
 - 1. Where installed indoors, all enclosures shall be NEMA I, general purpose type unless otherwise noted.
 - 2. Where installed outdoors, all enclosures shall be NEMA 3R, raintight type unless otherwise noted.
 - 3. Where noted on the drawings, provide the following enclosures:
 - a. NEMA 4 – watertight (304 stainless steel).
 - b. NEMA 12 – dust tight/oil tight.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install safety switches in accordance with manufacturers written instructions and NEC requirements.
- B. Install adjacent disconnects at the same height.
- C. Install disconnects to maintain the required NEC clearances and working space.

3.02 IDENTIFICATION

- A. Identify and color-code conductors in safety switches as specified under WIRES AND CABLES Section.
- B. Install engraved plastic sign on each safety switch as specified in ELECTRICAL IDENTIFICATION Section.
- C. The sign shall contain 3 lines of text. The top line shall identify the load served. The center line shall indicate the voltage. The third line shall indicate the source of supply.

D. An example of the required identification is:

AHU #2
480 V
Fed From Panel PP

3.03 FIELD QUALITY CONTROL

A. Inspection:

1. Visually inspect each switch for proper grounding connections as specified under GROUNDING AND BONDING Section.
2. Visually verify proper color-coding of conductors in safety switches as specified under WIRES AND CABLES Section.
3. Verify fusible switches contain proper type and size of fuses.

B. Testing:

1. Test cable mechanical connections to the manufacturers recommended values with calibrated torque wrench.
2. Operate each switch ON and OFF four times to verify proper operation.
3. Energize circuit and verify proper operation.

END OF SECTION

SECTION 16470

PANELBOARDS

PART 1 – GENERAL

1.01 NOTE

- A. The general provisions of the Contract including Uniform General Conditions and Supplementary General Conditions, Special Conditions and General Requirements (Division 1), apply to the work specified in this section.

1.02 SUBMITTALS

- A. Submit the following information for review:
 - 1. Complete drawings showing dimensions.
 - 2. Conduit entry/exit locations.
 - 3. Voltage rating, continuous current rating, and short-circuit rating.
 - 4. Cable terminal sizes.
 - 5. Catalog product sheets.
 - 6. Nameplate Identification.

1.03 SCOPE

- A. Provide, install, and connect all electrical panelboards shown on the drawings and specified herein. Panels shall be complete assemblies including enclosures, bussing, overcurrent protective devices, and trim.

1.04 QUALITY ASSURANCE

- A. Referenced Standards. Provide products that comply with the referenced standards. These Standards are incorporated into this Specification by reference.
 - 1. National Fire Protection Association (NFPA)
 - No. 70 National Electrical Code (NEC)
 - 2. Underwriters Laboratories, Inc. (UL)
 - UL 50 Cabinets and Boxes
 - UL 67 Panelboards
 - UL 489 Molded Case Breakers / Enclosures
 - 3. National Electrical Manufacturers Association (NEMA)
 - PB-1 Panelboards
 - No. 250 Enclosures for Electrical Equipment
 - AB-1 Molded Case Circuit Breakers

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Subject to project requirements, products manufactured by (but not limited to) the following companies are acceptable:

-
1. Square D
 2. Cutler Hammer
 3. General Electric

2.02 PANELBOARD REQUIREMENTS

- A. All panelboards shall be listed by Underwriters Laboratories.
- B. The building main panel shall be listed as suitable for "Service Entrance Equipment".
- C. Panels shall be arranged for flush mounting, surface mounting, or free-standing as indicated on the drawings.
- D. Panels shall have the voltage ratings, continuous current ratings, and interrupting ratings as scheduled on the drawings.
- E. All panelboard accessories and features scheduled or specified on the drawings shall be provided.
- F. Where a circuit protective device is scheduled as a "spare", provide the device complete for operation. Where the device is scheduled as a "space" or "space only", provide proper space and all necessary connectors for future installation of the size of device scheduled. Where the device is scheduled to serve a "future" load, provide the device complete for operation.
- G. All circuit breakers shall be quick make, quick break, trip-free, thermal magnetic indicating type unless otherwise noted.
- H. Branch circuit breakers shall be fully interchangeable without disturbing adjacent units.
- I. Connect all overcurrent protective devices with sequence phasing.
- J. Provide each panelboard with a neatly typewritten directory of circuits mounted in a plastic covered cardholder on the inside of the panelboard door.
- K. Install laminated plastic nameplate for each panel as specified under ELECTRICAL IDENTIFICATION Section.

2.03 CONSTRUCTION

- A. Cabinets:
 1. Rigidly constructed of galvanized sheet steel per UL 50 Standards. Corners shall be overlapped or welded with the edges turned over to receive trim.
 2. Where two-section panels are required, both sections shall be same height, and have fully rated bussing in separate cabinets connected by conduit nipples.
- B. Trim:
 1. Fabricated from sheet steel meeting the requirements of UL 50 Standards. Trim shall have medium gray enamel finish suitable to serve as the final finish, or suitable to receive field painting.
 2. Trim door shall have rounded corners and edges free from burrs.
 3. Surface trims shall be the same height and width as box. Flush trims shall overlap the box $\frac{3}{4}$ " on all sides.
 4. Furnish each door with substantial flush, cylinder tumbler lock and catch. Doors more than 48" high shall have auxiliary fasteners. Provide each lock with 2 keys. All locks shall be keyed alike.
 5. Unless noted otherwise, interior mounted panels shall have type 1 fronts (one piece with hinged door). Where door-in-door construction is specified, it shall consist of a hinged door within a piano-hinged cover secured with trim clamps.
 6. Exterior mounted panels shall be type 3R in accordance with UL 50 requirements. All doors shall be gasketed and be equipped with a tumbler type vault lock and two additional trunk type latches.

-
- C. Bussing:
1. All bussing shall be plated copper sized in accordance with UL Standards to limit temperature rise on any current-carrying part to a maximum of 65 degrees C above an ambient of 40 degrees C maximum.
 2. Main lugs and main breakers shall be UL approved for copper or aluminum conductors sized to accommodate the conductors to be terminated. Provide oversized lugs to terminate conductors that are increased in size due to voltage drop or temperature requirements.
 3. A bolted ground bus shall be included in all panels. Where scheduled, an isolated ground bus shall also be included.
 4. A full size (100%) neutral bar shall be furnished for panels shown with neutral. Neutrals shall have suitable lugs for each outgoing feeder requiring neutral connection. Where scheduled, provide 200% rated neutrals with lugs for oversized neutral conductors.

2.04 DISTRIBUTION PANELS – CIRCUIT BREAKER TYPE

- A. Distribution panels with bolt-on devices contained therein shall have fully rated interrupting ratings to interrupt fault current values indicated on the drawings. Breakers shall be molded case type.
- B. Molded case circuit breakers shall provide overcurrent and short circuit protection with inverse time and instantaneous tripping characteristics. Also provide ground fault protection where scheduled.
- C. Circuit breakers shall operate by toggle-type handle and shall be quick make, quick-break switching mechanism that is mechanically trip-free. Automatic tripping of the breaker shall be clearly indicated by the handle position.

2.05 LIGHTING AND APPLIANCE PANELS

- A. Bolt-in type, heavy duty, quick-make, quick-break, single- and multi-pole molded case circuit breakers with toggle handles that indicate when unit has tripped.
- B. Circuit breakers shall be thermal magnetic type with common handle for all multiple pole breakers.
- C. Breakers shall be UL listed as type SWD for lighting circuits.
- D. Circuit breaker handle locks shall be provided for all circuits that supply exit signs, emergency lights and fire alarm panels.
- E. Breakers shall be fully rated to interrupt the fault current values scheduled on the drawings.
- F. Provide breaker accessories as scheduled on the drawings.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install panelboards in accordance with manufacturers written instructions, NEMA PB1.1 and NEC standards.
- B. Panelboard enclosures shall be securely fastened to the structure with a minimum of four bolts or screws.
- C. Clean dirt and foreign paint from exterior and interior of all panels.
- D. Do not splice conductors in panels.
- E. Conductors not terminating in panelboard shall not extend through or enter panel enclosure.

-
- F. A single conductor shall terminate in each lug on a circuit breaker. Do not terminate multiple conductors under a single lug.
 - G. During installation carefully balance the electrical loads between the various phases. This may require connecting loads to circuits different from the circuit numbers indicated on the drawings.

3.02 IDENTIFICATION

- A. Identify and color-code conductors in panelboards as specified under WIRES AND CABLES Section.
- B. Install panelboard nameplate identification as specified under ELECTRICAL IDENTIFICATION Section.
- C. Provide individual circuit identification for each circuit with a type-written directory of circuits mounted in a holder on the inside of the panel door. The directory shall identify the type or name of the load served along with the room names and numbers. The room names and numbers shall be the final names and numbers assigned to the space and not those used on the drawings.

3.03 FIELD QUALITY CONTROL

- A. Inspection:
 - 1. Visually inspect each panel for proper grounding connections as specified under GROUNDING AND BONDING Section.
 - 2. Visually inspect breakers and switches for broken parts and loose terminals.
 - 3. Visually verify proper color-coding of conductors as specified under WIRES AND CABLES Section.
 - 4. Visually verify panelboard trim fits properly with no gaps between the trim and panel enclosure.
- B. Testing:
 - 1. Test cable mechanical connections to the manufacturers recommended values with calibrated torque wrench.
 - 2. Operate each breaker ON and OFF to verify proper operation.
 - 3. Energize circuits and demonstrate proper operation.
 - 4. When the facility is under normal use, amperage measurements shall be taken on each phase conductor in each panel feeder, and any unbalances shall be corrected to a point that no conductor load shall be more than 5% high or low (maximum unbalance of 10%).

END OF SECTION

SECTION 16510

LIGHTING

PART 1 – GENERAL

1.01 NOTE

- A. The general provisions of the Contract including Uniform General Conditions and Supplementary General Conditions, Special Conditions and General Requirements (Division 1), apply to the work specified in this section.

1.02 SUBMITTALS

- A. Submit product data sheets for all lighting products.
- B. Submit complete photometric data for each fixture.

1.03 SCOPE

- A. This Section pertains to all labor, material, equipment and services necessary for and incidental to the complete interior and exterior lighting system as shown on the drawings and specified herein.

1.04 QUALITY ASSURANCE

- A. Referenced Standards: Provide products that comply with the referenced standards. These Standards are incorporated into this Specification by reference.
 - 1. National Fire Protection Association (NFPA)
 - No. 70 National Electrical Code (NEC)
 - No. 101 Life Safety Code
 - 2. American National Standards Institute (ANSI)
 - C82.1 Fluorescent Lamp Ballasts
 - C82.4 HID Lamp Ballasts
 - 3. National Electrical Manufacturers Association (NEMA)
 - LE 4 Recessed Luminaires, Ceiling Compatibility
 - 4. Underwriters Laboratories (UL)
 - UL 542 Lampholders, Starters for Fluorescent Lamps
 - UL 924 Emergency Lighting and Power Equipment
 - UL 1029 HID Lamp Ballasts
 - UL 1570 Fluorescent Lighting Fixtures
 - UL 1571 Incandescent Lighting Fixtures
 - UL 1572 HID Lighting Fixtures

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Subject to project requirements, products manufactured by the following companies are acceptable:

-
1. Ballasts:
 - a. Advance
 - b. Lutron
 - c. General Electric
 - d. Valmont
 2. Lamps:
 - a. Osram/Sylvania
 - b. General Electric
 - c. Philips

2.02 LUMINAIRES

- A. Provide and install a lighting fixture on each lighting outlet shown. Furnish fixtures in accordance with the designations scheduled on the drawings. Should any designation be omitted on the drawings, furnish fixtures of the same type as used in rooms of similar usage. All features scheduled for fixtures shall be provided, even if the catalog number given in the schedule lacks the required numerals, prefixes or suffixes corresponding to the feature called for.

2.03 FLUORESCENT FIXTURES

- A. Fixtures shall bear UL label.
- B. Lenses shall be 100% virgin acrylic with nominal thickness of 0.125 inches.

2.04 FLUORESCENT BALLASTS

- A. Use ballasts from manufacturers listed above. Generic ballasts from other manufacturers are not acceptable.
- B. General Requirements:
 1. Designed for type and quantity of lamps indicated for full light output.
 2. Total Harmonic Distortion Rating: Less than 10%.
 3. Sound Rating: A
 4. Power Factor: 95% minimum
 5. Ballasts
- C. Electronic Ballasts for Linear Lamps:
 1. CBM labeled
 2. Encapsulated
 3. Parallel Lamp Circuits: Multiple lamp ballasts connected to maintain full light output on surviving lamps if one or more lamps fail.
- D. Ballasts for Compact Fluorescent Lamps:
 1. Type: Electronic or electromagnet, fully encapsulated in potting compound.
 2. Power Factor: 90% minimum.
 3. Operating Frequency: 20 kHz or higher
 4. Flicker: Less than 5%
 5. Lamp Current Crest Factor: Less than 1.7
- E. Low-Temperature Ballasts:
 1. Where installed in temperatures 0 Deg F and above, ballasts shall be electronic-type with 0 deg F starting temperature.
 2. Where installed in temperatures minus 20 deg F to 0 deg F, ballasts shall be electromagnetic type designed for use with high output lamps.

2.05 LAMPS

- A. Fluorescent Lamps:
 - 1. Color Temperature: 3500 K
 - 2. CRI: 85 or higher
 - 3. Lamp types as scheduled on the drawings.
- B. HID Lamps:
 - 1. Metal Halide Color Temperature: 3600 K
 - 2. CRI: 70 or higher
 - 3. Phosphor coated unless otherwise specified.
 - 4. All metal halide lamps used in open fixtures where people may be exposed to ultraviolet radiation shall be the type that will automatically extinguish when the outer envelope is broken. This feature shall be provided regardless of the lamp code listed in the fixture schedule.
 - 5. Provide HID lamps with correct burning position selected for the fixture orientation and mounting.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Installation of Interior Fixtures: Outlet box locations shown for fluorescent fixtures are diagrammatic. Locate boxes to coincide with stem hangers where such occur. Fixtures shall be level, square with the general construction and securely attached.
- B. Lay-in Type Fixtures: Refer to the ceiling installer's layout for exact location. Center the fixtures in ceiling grids. Wire the fixtures using concealed outlet boxes accessible through ceiling panels. Install conductors in flexible metallic conduit from box to fixture.
- C. Fixtures in Plaster Ceilings: Provide a suitable plaster ring or frame for each fixture recessed in a plaster ceiling.
- D. Surface Mounted Fixtures: Fixtures shall be installed flush with the ceilings. Where fixtures are mounted to an exposed grid ceiling, the fixtures may be clipped to the ceiling grid provided the attachment holds the fixture flush, level, and secure. Where they cannot be centered on a grid, install a structural member to span two tees and attach the fixture to the structural members.
- E. Where fixtures are installed in a continuous row, the row shall be straight and plumb. Lens shall be aligned in all planes and no part of the lamp shall be visible.

END OF SECTION

SECTION 16811

FIRE PROTECTION AND DETECTION SYSTEM

PART 1 - GENERAL

1.01 NOTE

- A. The general provisions of the Contract including Uniform General Conditions and Supplementary General Conditions, Special Conditions and General Requirements (Division 1), apply to the work specified in this section.

1.02 SUBMITTALS

- A. The installing contractor and/or equipment manufacturer shall provide complete and detailed shop drawings and include:
 - 1. Control panel wiring schematics and interconnections.
 - 2. Point to point wiring diagram showing terminal connections to all system devices. This would include the size of conductors to each device and proposed routing. After review, this shall become the installation drawing.
 - 3. Riser wiring diagram and conduit sizes.
 - 4. Floor plan drawings locating all devices associated with the Fire Alarm System.
 - 5. Factory data sheets on each piece of equipment to be used and so marked as to dimensions, size, voltage, style, catalog number, manufacturer's names, and configuration.
 - 6. Detailed system description and operation describing system functions.
 - 7. Complete Bill of Material for reference.
 - 8. One set of installation, operation and maintenance manuals for submittal review of fire alarm system. Required number of manuals are still required at project closet.
 - 9. Printout of system program.
 - 10. Voltage drop, power supply and battery calculations.
- B. All submittal data shall be in bound form with contractor's name, supplier's name, project name, and state fire alarm license number adequately identified.

1.03 QUALIFICATIONS

- A. The installing contractor shall be the authorized representative of the fire alarm manufacturer to sell, install and service the manufacturer's equipment.
- B. The installing contractor must be licensed by the state Fire Marshall to sell, install and service fire alarm systems.
- C. The installing contractor shall have on their staff an installation superintendent who is licensed by the State Fire Marshall's office for such purpose and under whose supervision installation shall take place.
- D. The fire alarm installation firm will have factory trained personnel performing the control panel wiring for the system that they were trained for. The firm shall also maintain a stock of parts and components used in the system.
- E. The qualifications of the installation firm, the availability of replacement parts and service records will be considered.

1.04 CLOSE-OUT MANUALS

- A. Provide three sets of operation and maintenance manuals which includes:
 - 1. Complete typewritten operating instructions.
 - 2. Wiring diagrams for the control panel with all terminals identified.
 - 3. A parts list for the system identifying the components with ordering numbers.
 - 4. A plan showing conduit size, number and size of conductors and locations of all devices.
 - 5. Printout of system program with all levels of passwords.
 - 6. Floor plan locating all fire alarm devices with their identification points labeled. Provide DXF format Cadd disk.

1.05 CODES AND STANDARDS

- A. The installation and testing shall be made under the provisions of the latest National Electrical Code (NFPA-70); NFPA 101 (Life Safety Code). NFPA 71, NFPA 72, UL Standards (1480, 864, 268, 268A, 217, 521, 228, 464, 1638, 38, 346, 1481), and all other applicable state and local codes and ordinances. The Contractor shall submit the new fire alarm equipment layout to the local fire alarm authority having jurisdiction for approval.

1.06 SCOPE

- A. The Contractor shall furnish and install and place in operating condition a 24 VDC, fire detection and alarm system as specified herein and indicated on the drawings. It is the intent to obtain a complete system which shall operate as described herein, and all equipment necessary for such operation shall be provided whether or not each item is enumerated herein or described on the drawings. The system shall include, but not be limited to, all control panels, power supplies, alarm initiating devices, audible and visual alarm devices, conduit, wire, fittings and all other accessories required to provide a complete and operable system. The system shall operate as a continuous sounding system which shall have multiple audible alarm circuits. The system signaling line circuits shall be wired as Class B circuits. The system notification appliance circuits shall be wired as Class B supervised circuits.

1.07 QUALITY

- A. To establish the minimum standards of performance, function, quality, and features of system desired, the equipment specified is that of the Notifier Company.
- B. All equipment, materials, accessories, devices, and other facilities covered by this specification or noted on contract drawings and installation specifications shall be of the best suited for the intended use and shall be provided by a single manufacturer or, if provided by different manufacturers, recognized as compatible by both manufacturers.
- C. All equipment and material shall be new and unused, unless directed otherwise.
- D. Wiring: All wiring shall be in accordance with the National Electric Code, local codes and the National Fire Protection Association-70, Article 760. The minimum wire sizes shall be 12 gauge for AC power supply connections and auxiliary circuits, 14 gauge for DC power supply connections, 16 gauge for audible alarm circuits. Cable for SLC loops shall be 18 to 12 AWG twisted pair with a shield jacket. Shield continuity must be maintained. Intelligent detector wiring must not be routed adjacent to, or in the same conduit with Audio/Visual power wiring, 120/240 VAC power wiring or other high current circuits.

Size SLC conductors per manufacturers' instructions and anticipate all future device additions.

- E. Wire shall be UL listed for limited energy (300V) and fire alarm applications and shall be installed in conduit. All wiring between floors, in mechanical rooms, or in risers shall be installed in conduit with a minimum size of 3/4".

1.08 TESTING, GUARANTEE, SERVICE

- A. A factory trained technical representative of the manufacturer shall perform the final connections, complete system checkout and testing of the system, and it shall be subject to the final acceptance and approval of the engineer and local authorities. Upon completion and acceptance, the owner and/or his representative(s) shall be instructed in the proper use of the system. A written copy of the final system test and checkout shall be provided detailing the function of each device. Furnish the Owner, Architect, Engineer and all authorities having jurisdiction a Certificate of Compliance.
- B. All equipment and wiring shall be free from defects in workmanship and materials, under normal use and service, for a period of one year from owner acceptance or beneficial occupancy, whichever comes first. Any equipment shown to be defective shall be replaced, repaired, or adjusted free of charge.
- C. The manufacturer shall be represented by a local service organization and the name of such supplied to the Owner and Engineer.
- D. The manufacturer's representative shall be prepared to offer a service contract at the end of the warranty period.

1.09 COORDINATION

- A. It shall be the responsibility of the installing contractor to coordinate all requirements surrounding installation of the Fire Alarm System with all trades including, but, not exclusive of: electrical contractor, and elevator contractor. Adequate coordination shall be provided to insure proper installation and interface to all peripheral items required to interact with the Fire Alarm System to provide a complete and functional system.

PART 2 - PRODUCTS

2.01 DESCRIPTION OF SYSTEM

- A. The Fire Alarm and Detection System shall be a single integrated system by a single manufacturer. The Contractor shall assume sole responsibility for its operation. The fire detection portion of the system shall consist of a fire alarm panel and shall contain all power supplies, relays, modules and batteries as required for the operation described herein. The equipment described herein is generally of Notifier manufacture. All components of the system shall be fully supervised.

2.02 DESCRIPTION OF OPERATION

- A. Operation of manual or automatic initiating device shall cause the following events to occur:
 - 1. The System alarm LED shall flash.
 - 2. A local sounding device in the panel shall be activated.

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3. The 80-character LCD display and remote LCD annunciators shall indicate all pertinent information associated with the alarm and its location.
 4. All automatic programs assigned to the alarm point shall be executed and the associated indicating devices and relays activated, such as:
 - a. The appropriate indication shall appear on the fire control panel.
 - b. An evacuation tone shall sound on all alarm horns and all visual strobes shall flash.
 - c. Remote Point Annunciation devices shall show an alarm condition if devices connected to it are in alarm condition.
 - d. DACT shall transmit alarm to monitoring station.
- B. When a trouble condition is detected by one of the system initiating devices, the following functions shall immediately occur:
1. The System Trouble LED shall flash.
 2. A local sounding device in the panel shall be activated.
 3. The 80-character LCD display shall indicate all pertinent information associated with the trouble condition and its location. However, unacknowledged alarm messages shall have priority over trouble messages, and if such an alarm must also be displayed, the trouble message shall not be displayed on the LCD.
 4. DACT shall transmit a trouble condition to monitoring system.
- C. Activation of the control panel Acknowledge switch in response to a single new trouble or alarm condition shall silence the panel sounding device and change the System alarm or Trouble LEDs from flashing to steady-ON. If additional new alarm or trouble conditions exist in the system, activation of this switch shall advance the display to the next alarm or trouble condition that exists, and shall not silence the local audible device or change the LEDs to steady until all new conditions have been so acknowledged.
- D. New alarm conditions shall always be displayed before new trouble conditions. Occurrence of a new alarm or trouble condition shall cause the panel to "resound" and repeat the sequences previously described.
- E. Activation of the Signal Silence Switch shall cause all appropriate indicating appliances and relays to return to the normal condition after an alarm condition. The selection of indicating circuits and relays silenced by this switch shall be fully programmable.
- F. Activation of the System Reset Switch shall cause all electronically-latched initiating devices or zones, as well as all associated output devices and circuits, to return to the normal condition.
- G. If alarm conditions exist in the system after the System Reset Switch activation, the system shall then resound the alarm conditions as previously indicated.
- H. Activation of the System Test Switch shall initiate an automatic test of all intelligent detectors in the system. Such test shall activate the electronics in each intelligent device, simulating an alarm condition. A report summarizing the results of this test shall be displayed automatically on the front panel.
- I. Activation of the Lamp Test Switch shall turn on all LED indicators, LCD display and local sounder, and then return to the previous condition.
- J. The system shall include a special Automatic Detector Test which permits a serviceman to test all intelligent detectors from the main control panel.
- K. The system shall include independent "Watch Dog" timers to detect and report failure of any microprocessor circuit, memory, or software.
- L. The system shall be programmable, configurable and expandable in the field without the need for special tools or PROM programmers and shall not require replacement of memory ICs. All programming may be accomplished through the standard control panel keyboard. All programs shall be stored in non-volatile memory.

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- M. The programming function shall be entered with a special password that may be selected when the system is installed. The password may be changed in the field to a new value at any time by entering the old password and requesting a password change. In the event that the programmer may enter a password and then lose or forget it, the system shall be designed such that the password may be determined by special procedures available through the system manufacturer.

2.03 CONTROL PANEL

- A. The control panel shall be housed in a cabinet designed for mounting directly to a wall or vertical surface.
- B. The control unit shall be modular in structure for ease of installation, maintenance, and future expansion.
- C. The control panels shall provide or be capable of expansion to the following capacities:

Intelligent/Addressable Loops	1
Intelligent Detectors per loop	159
Addressable Monitor/Control Modules per loop	159
Total Intelligent Points	318

- D. Power Supply:
 - 1. The power supply for the panel and all fire alarm peripherals shall be integral to the control panel. The power supply shall provide all control panel and peripheral power needs. The audio-visual power may be increased as needed by adding additional modular expansion power supplies or remote power supplies. All power supplies shall be designed to meet UL and NFPA requirements for power-limited operation on all external initiating circuits and indicating circuits.
 - 2. Positive-temperature-coefficient thermistors, circuit breakers, or other over-current protection shall be provided on all power outputs.
 - 3. This system shall meet the requirements of and be listed by Underwriters Laboratories Inc. and shall be a Notifier Model NFS-320 or equal and digital alarm communication transmitter with 1" conduit to phoneboard.
- E. Battery: The system batteries shall be sealed gelled cell and shall be installed in the control panel enclosure. The batteries shall provide 24 volt DC for system operation and shall be sized in accordance with NFPA 72 for 24-hour operation.

2.04 INTELLIGENT PHOTOELECTRIC SMOKE DETECTORS:

- A. The Intelligent Photoelectric Smoke Detectors shall connect with two wires to one of the control panel loops. The detectors shall use the photoelectric principal to measure smoke density and shall, on command from the control panel, send data to the panel representing the analog level of smoke density. The detectors shall be ceiling-mount and shall include a twist-lock base.
- B. The detectors shall provide a test means whereby they will simulate an alarm condition and report that condition to the control panel. Such a test may be initiated at the detector itself, by activating a magnetic switch, or may be activated remotely on command from the control panel.
- C. The detectors shall provide address-setting means on the detector head using rotary decimal switches. The detectors shall also store an internal identifying code which the control panel shall use to identify the type of detector.

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- D. The detectors shall provide dual alarm and power LEDs. Both LEDs shall flash under normal conditions, indicating that the detector is operational and in regular communication with the control panel. Both LEDs may be placed into steady illumination by the control panel, indicating that an alarm condition has been detected. The detector shall be supplied with a Notifier B710LP base. The smoke detector shall be a Notifier FSP-851, or equal and be listed by Underwriters Laboratories, Inc.

2.05 FIRE ALARM MODULES

A. Monitor Module:

1. The Monitor module shall be used to connect a supervised zone of conventional initiating devices (any n.o. dry contact device, including 4-wire smoke detectors) to one of the SLC loops. The Monitor Module shall mount in a 4-inch square 2-1/8" deep electrical box. The zone may be wired for Style D or Style B operation.
2. The Monitor module shall provide address-setting means using rotary decimal switches and shall also store an internal identifying code which the control panel shall use to identify the type of device. An LED shall be provided which shall flash under normal conditions, indicating that the Monitor module is operational and in regular communication with the control panel. Monitor Module shall be a Notifier FMM-1, or equal and UL listed.

B. Control Module:

1. The Control Module shall be used to connect a conventional indicating appliance circuit (IAC) of 24 VDC compatible polarized audio/visual indicating appliances to one of the SLC loops. The Control Module shall mount in a standard 4-inch square 2-1/8" deep electrical box. The IAC may be wired for Style Z or Style Y operation. The control module may also be wired as a dry contact (from C) relay. Power for the relay coil shall be provided by the SLC loop to reduce wiring connection requirements. Audio/visual power shall be provided by a separate loop from the main control panel or from supervised remote power supplies.
2. The Control Module shall provide address-setting means using rotary decimal switches and shall also store an internal identifying code which the control panel shall use to identify the type of device. An LED shall be provided which shall flash under normal conditions, indicating that the Control Module is operational and in regular communication with the control panel. Control Module shall be a Notifier FCM-1, or equal and UL listed.

C. Isolator Module:

1. The Isolator Module shall be used to isolate wire-to-wire short circuits on an SLC loop in order to limit the number of other modules or detectors that are in capacitated by the short circuit fault. If a wire-to-wire short occur, the isolator shall automatically open-circuit the SLC loop. When the short is corrected, the isolators shall automatically re-connect the isolated section of the SLC loop.
2. The Isolator module shall not require any address-setting, although each isolator will electrically reduce the capacity of the loop by two detector or module address. The isolator module will mount in a standard 4-inch deep electrical box. It shall provide a single LED which shall flash to indicate that the isolator is operational and shall illuminate steadily to indicate that a short has been detected and isolated. Isolator module shall be a Notifier ISO-X, or equal and UL listed. Provide an isolator for every 20 devices.

2.06 DUCT DETECTORS

- A. Duct detector shall be a Notifier DNR/FSP851R with smoke detector or equal. Provide remote indicator and key test station.

2.07 MANUAL PULL STATIONS

- A. Manual fire alarm stations shall be non-coded, non-breakglass type equipment with a key to reset unit. Each manual stations shall be Notifier NBG-12LX or equal and shall be U.L. listed.

2.08 INDICATING DEVICES

- A. The alarm indicating devices shall be UL listed strobe/horn with synchronized temporal pattern ANSI S3.41 and synchronized strobes housed in common frame and finished in white. The alarm signals shall be Wheelock #NS-24MCW-FW flush mounted unit or equal with DSM-12/24-R-SYNC module.
- B. The strobe unit shall be a Wheelock #RSS-24MCW-FW synchronized module.

2.09 REMOTE ANNUNCIATOR PANEL

- A. Remote annunciator panel shall be a Notifier FDU-80 and all require cable and backbox.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The installation of the system shall be made by the Contractor under the supervision of a representative of the manufacturer who shall make the final connection to the system, perform the functional tests of the system and place it in operation.
- B. Installation shall be in strict compliance with manufacturer's recommendations. Consult manufacturer for all wiring diagrams, schematics, sizes, outlets, etc. before installing conduits and pulling wires.
- C. Fire alarm devices shall be mounted upon and all splices made in Listed Boxes. Wiring splices are to be avoided to the extent possible and Transposing or changing colors will not be permitted".
- D. Fire Alarm Control Panel shall be connected to a separate dedicated branch circuit, maximum 20 amperes. Circuit shall be labeled as "FIRE ALARM".
- E. As indicated on the drawings, each zone shall be labeled on the Fire Alarm Control Panel. Names of the zones shall be coordinated with the Owner, and shall meet with the Owner's approval.
- F. Use only identified conduit entries at Fire Alarm Panel or request approval for other penetrations in cabinets (certain areas require clear space for interior components). Cabinet shall be grounded to either a cold water pipe or grounding rod.
- G. Heat and Smoke Detectors: The location of detectors shown on the plans is schematic only. The detector must be located according to code requirements.
- H. Smoke detectors should be installed to favor the air flow towards return openings and not located where air supply diffusers can dilute smoke before it reaches the detector.
- I. Mount pull stations at 4'AFF and indicating devices at 80"AFF.
- J. Provide a maintenance record box equal to Space Age Electronics FDB.

3.02 FINAL INSPECTION

- A. After the system has been placed in service and all items are functioning properly, call for a final inspection. The manufacturer's representative shall be present and shall demonstrate the operation of the system to the satisfaction of the Owner.

3.03 INSTRUCTION

- A. The representative of the manufacturer shall allot eight (8) hours to instruct the Owner's personnel as to the complete operation of the system.

END OF SECTION



ADDENDUM NO: 01

TO: ALL PLANHOLDERS
FROM: PARKHILL, SMITH & COOPER, INC.
PROJECT NAME: MIDLAND FIRE STATION
PROJECT NO.: 03.8686.12
DATE: April 24, 2013



4/24/13

Attention of all Prospective Bidders/Plan Holders is directed to the following modifications to the referenced Drawings and Project Manual. This Addendum becomes a part of, and shall be attached to the Contract Documents and modifies the original Bidding Documents dated April 13, 2013 as noted below:

This Addendum consists of 2 pages, Section 08700, 15700, and the revised attached drawings nos. S-102, S-503, M101, M201, E-201, E-301, E-302 and E-701

I. CHANGES TO PROJECT MANUAL:

A. SECTION A-1 ADVERTISEMENT FOR BIDS

1. Change Section 1.10 to read "A Pre-Bid Conference will be held Monday April 29, 2013 at 2:00 p.m. at Parkhill, Smith & Cooper, Inc. Midland Office, 1700 West Wall Street, Midland, Texas 79701. All general contractors and major subcontractors are encouraged to attend.
2. Change Section 1.11 from Formalities to Opening of Bids
3. Add Section 1.12 Formalities

B. SECTION 08700 – HARDWARE

1. ADD this section in its entirety as attached to the Addendum.

C. SECTION 15700 – EQUIPMENT

1. Replace section with attached Section 15700 as attached to the Addendum.

II. CHANGES TO DRAWINGS:

- A. SHEET S-102
 - 1. Refer to revisions on attached drawings.
- B. SHEET S-503
 - 1. Refer to revised details on attached drawings.
- C. SHEET M-101
 - 1. Refer to Mechanical Sheet M-101 to include the MagneGrip equipment.
- D. SHEET M-102
 - 1. Refer to Mechanical Sheet M-102 to include the MagneGrip equipment.
- E. SHEET E-201
 - 1. Refer to Electrical sheet E-201 for revised lighting fixture schedule, added type "N" fixtures in commons 102 and light fixture types in patio were revised.
- F. SHEET E-301
 - 1. Refer to Electrical sheet E-301 – Added general note E.
- G. SHEET E-302
 - 1. Refer to Electrical sheet E-302 – EF-4-13 has been revised.
- H. SHEET E-701
 - 1. Refer to Electrical sheet E-701 Panel P – EF-4-13 has been revised.

End of Addendum No 01

SECTION 08700

HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract for Construction, Supplementary Conditions (if any) and Division 1 - General Requirements apply to the work of this Section.

1.2 SECTION INCLUDES

- A. All finish hardware necessary for completion of project.

1.3 RELATED WORK

- A. Section 08110 - Steel Doors and Frames.
- B. Section 08211 - Wood Doors.
- C. Section 08410 - Aluminum Entrances and Storefronts: Hardware scheduled as part of aluminum doors.

1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications
 - 1. Companies specializing in manufacturing door hardware with minimum three years experience.
- B. Regulatory Requirements
 - 1. Fire Door Hardware
 - a. Conform to requirements of NFPA 80 and 101 for doors shown, scheduled, or specified to be in a fire rated wall or to receive a UL-label.
 - b. In case of conflict between hardware specified and NFPA requirements, provide type required by NFPA.

1.5 REFERENCES

- A. NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION (NEMA LB3-1985) - Performance Standards for High Pressure Decorative Laminate.
- B. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
 - 1. ANSI A156.1 Butts and Hinges.
 - 2. ANSI A156.2 Bored and Preassembled Locks and Latches.
 - 3. ANSI A156.3 Exit Devices.
 - 4. ANSI A156.4 Door Controls - Closers.
 - 5. ANSI A156.5 Auxiliary Locks & Associated Products.
 - 6. ANSI A156.6 Architectural Door Trim.
 - 7. ANSI A156.7 Template Hinge Dimensions.
 - 8. ANSI A156.8 Door Controls - Overhead Holders.
 - 9. ANSI A156.16 Auxiliary Hardware.
 - 10. ANSI A156.17 Self-Closing Hinges and Pivots.

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- 11. ANSI A156.18 Materials and Finishes.
 - 12. ANSI A156.21 Thresholds
 - C. BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA)
 - 1. BHMA Directory of Certified Locks & Latches.
 - 2. BHMA Directory of Certified Door Closers.
 - 3. BHMA Directory of Certified Exit Devices.
 - D. CODE OF FEDERAL REGULATIONS (CFR)
 - 1. 36CFR Part 1191 - Americans With Disabilities Act (ADA)
 - E. DOOR AND HARDWARE INSTITUTE (DHI)
 - 1. DHI-02 Installation Guide for Doors and Hardware.
 - 2. DHI-03 Keying Systems and Nomenclature.
 - 3. DHI-04 Recommended Locations for Builders' Hardware for Custom Steel Door and Frames.
 - F. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
 - 1. NFPA 80 Fire Doors and Windows.
 - G. STEEL DOOR INSTITUTE
 - 1. SDI-107 Hardware on Steel Doors (Reinforcement and Application).

1.6 SUBMITTALS

- A. Product Data
 - 1. Provide product data on specified hardware.
 - 2. Submit manufacturer's parts lists, templates, and installation instructions.
 - 3. Submit operation and maintenance data including data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- B. Hardware Schedule
 - 1. Include for each item: quantities; manufacturer's name and catalog numbers; sizes; detail information or catalog cuts; finishes; door and frame size and materials; location and hardware set identification cross-referenced to drawings; lock trim material thicknesses; lock trim material evaluation test results; corresponding ANSI or BHMA standard type number or function number from manufacturer's catalog if not covered by ANSI or BHMA; and list of abbreviations.
 - 2. Indicate locations and mounting heights of each type of hardware.
 - 3. Indicate lock side of single cylinder doors.
- C. Certificates of Compliance
 - 1. Submit certificates of compliance attesting that hardware items conform to the NFPA, CFR and ANSI or BHMA standards specified. In lieu of certificates, submit statement that proposed hardware items appear in current BHMA directories of certified products.
 - 2. Fire Rated Doors: Submit certificates of compliance, attesting that doors which are indicated, scheduled, or specified to be fire rated are fitted with the required hardware (i.e. active latch bolts, self-closing devices) and operate in accordance with the requirements of NFPA 80. Identify all such doors on certificates.
- D. Maintenance Instructions
 - 1. Furnish 2 complete copies of maintenance instructions listing routine maintenance procedures, possible breakdowns and repairs, and trouble shooting guides.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle hardware to site in accordance with provisions of Section 01600.
- B. Individually package each article of hardware in manufacturer's standard commercial carton or container, and properly mark or label to be readily identifiable with approved hardware schedule.
- C. Tag or otherwise identify each change key with door for which its cylinder is intended.

1.8 COORDINATION

- A. Coordinate requirements for hardware to be mounted on metal doors or metal frames between hardware manufacturer and door or frame manufacturer to establish location, reinforcement required, size of holes, and similar details.

1.9 WARRANTY

- A. Provide five year warranty for door closers.
- B. Provide two year warranty for all hardware items except door closers.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Hinges
 - 1. Hager Companies.
 - 2. McKinney Products Company; an ASSA ABLOY Group Company.
 - 3. PBB, Inc.
 - 4. Stanley Commercial Hardware; Div. of The Stanley Works.
- B. Mechanical Lock and Latches
 - 1. Best Access Systems; Div. of Stanley Security Solutions, Inc.
 - 2. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group Company.
 - 3. Falcon Lock; An Ingersoll-Rand Company.
 - 4. SARGENT Manufacturing Company; an ASSA ABLOY Group Company.
 - 5. Yale Security Inc.; an ASSA ABLOY Group Company.
- C. Auxiliary Locks
 - 1. Best Access Systems; Div. of Stanley Security Solutions, Inc.
 - 2. SARGENT Manufacturing Company; an ASSA ABLOY Group Company.
 - 3. Yale Security Inc.; an ASSA ABLOY Group Company.
- D. Narrow Stile Auxiliary Locks:
 - 1. Adams Rite Manufacturing Co.; an ASSA ABLOY Group Company.
- E. Push-Button Combination Locks
 - 1. Kaba Ilco Corp.; a Kaba Group company.
- F. Electromagnetic Locks
 - 1. Door Controls International, Inc.
 - 2. SARGENT Manufacturing Company; an ASSA ABLOY Group Company.
 - 3. Securitron Magnalock Corporation; an ASSA ABLOY Group Company.
- G. Self-Contained Electronic Locks
 - 1. Best Access Systems; Div. of Stanley Security Solutions, Inc.
 - 2. Kaba Ilco Corp.; a Kaba Group company.

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- 3. SARGENT Manufacturing Company; an ASSA ABLOY Group Company.
 - 4. Simplex.
 - 5. Yale Security Inc.; an ASSA ABLOY Group Company.
 - H. Surface Bolts
 - 1. Burns Manufacturing Incorporated.
 - 2. Don-Jo Mfg., Inc.
 - 3. Door Controls International, Inc.
 - 4. Rockwood.
 - 5. Trimco.
 - I. Manual Flush Bolts
 - 1. Burns Manufacturing Incorporated.
 - 2. Don-Jo Mfg., Inc.
 - 3. Door Controls International, Inc.
 - 4. Rockwood.
 - 5. Trimco.
 - J. Automatic and Self-Latching Flush Bolts
 - 1. Burns Manufacturing Incorporated.
 - 2. Don-Jo Mfg., Inc.
 - 3. Door Controls International, Inc.
 - 4. Rockwood.
 - 5. Trimco.
 - K. Exit Devices and Auxiliary Items
 - 1. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group Company.
 - 2. Precision Hardware, Inc.; Division of Stanley Security Solutions, Inc.
 - 3. SARGENT Manufacturing Company; an ASSA ABLOY Group Company.
 - 4. Yale Security Inc.; an ASSA ABLOY Group Company.
 - L. Lock Cylinders
 - 1. Best Access Systems; Div. of Stanley Security Solutions, Inc.
 - 2. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group Company.
 - 3. SARGENT Manufacturing Company; an ASSA ABLOY Group Company.
 - 4. Yale Security Inc.; an ASSA ABLOY Group Company.
 - M. Push/Pulls
 - 1. Rockwood
 - 2. Triangle Brass Manufacturing Co.
 - 3. Trego Industries, Inc.
 - N. Exit Devices
 - 1. Sargent, Inc.
 - 2. Von Duprin, Inc.
 - 3. No substitutions.
 - O. Closers
 - 1. LCN Closers Division, Schlage Lock Co.
 - 2. Sargent Manufacturing, Co.
 - 3. No substitutions.
 - P. Gasketing/Thresholds
 - 1. Pemko Manufacturing Co.
 - 2. Reese Enterprises, Inc.
 - 3. Zero International, Inc.
 - 4. National Guard Products, Inc.

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- Q. Protection Plates
 - 1. Triangle Brass Manufacturing Co.
 - 2. Rockwood.
 - 3. Trego Industries, Inc.
 - R. Door Stops/Bumpers
 - 1. Triangle Brass Manufacturing Co.
 - 2. H.B. Ives, Harrow Co.
 - 3. Rockwood.
 - S. Door Silencers
 - 1. Triangle Brass Manufacturing Co.
 - 2. H.B. Ives, Harrow Co.
 - 3. Rockwood.
 - T. Substitutions: Under provisions of Section 01600 for items not indicated as "No Substitutions".

2.2 MATERIALS

- A. Closers
 - 1. General
 - a. Surface type closers: Size 1 or 2 through size 6.
 - b. Closers for outswinging exterior doors: Size one size larger than manufacturer's published recommendations, but not less than size 5.
 - c. Size requirements for other closers: Conform to manufacturer's published recommendations, except as specified otherwise.
 - d. Closers for outswinging exterior doors: Provide parallel arms or top jam mount closers for outswinging exterior doors. Parallel arm must be Heavy Duty.
 - e. Provide narrow projection closers for doors close to a wall so as not to strike wall at 90-degree open position.
 - f. Set closing force on doors accessible to the physically handicapped for a push-pull of 5 pounds applied at knob or handle for interior doors; for exterior doors, set to minimum required to relatch door.
 - g. Closer must have all-weather fluid.
- B. Accessories
 - 1. Special Tools: Provide special tools such as spanner and socket wrenches and dogging keys, required to adjust hardware items.
- C. Fastenings
 - 1. Provide proper type, size, quantity, and finish with each article of hardware.
 - 2. Concrete or Masonry: Provide machine screws and expansion shields.
 - 3. Fastenings exposed to weather and in finished work: brass, bronze, or stainless steel.
 - 4. Provide one-way or tamperproof screws on exterior doors equipped with half or full surface hinges.
- D. Fire Door Hardware
 - 1. Conform to requirements of NFPA 80.
- E. Keys: Nickel silver.
- F. Lock Cylinders
- G. Mullions
 - 1. Shall be steel.

2.3 KEYING

- A. General: Locks keyed per Owner's instructions.
- B. Provide 2 keys per cylinder.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that doors and frames are ready to receive work and dimensions are as indicated on shop drawings.
- B. Verify that power supply is available to power operated devices.
- C. Beginning of installation means acceptance of existing conditions.
- D. Schedule meeting with Architect and Owner prior to installation of hardware.

3.2 INSTALLATION

- A. General
 - 1. Locate in accordance with DHI 04 and DHI 05 recommended Locations for Builders' Hardware for Standard Steel Doors and Frames and DHI Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames.
 - 2. Install in accordance with DHI-02.
 - 3. When approved, slight variations in locations or dimensions will be permitted.
 - 4. Attach door control devices for interior doors such as closers and holders to doors with thru bolts such as sex bolts and nuts.
 - 5. Conform to 36CFR Part 1191 for positioning requirements for handicapped.
 - 6. All screws must be flush.
 - 7. All screw holes shall be drilled or tapped. No self-drill screws allowed.
- B. Door-Closing Device
 - 1. Install and adjust in accordance with templates and printed instructions supplied by manufacturer.
 - 2. Insofar as practicable, mount closer on room side of door for doors opening to or from halls and corridors.
 - 3. Install with sex bolt at all interior doors.
 - 4. All hollow metal doors shall have reinforcement plates for closers.
 - 5. All screw holes shall be drilled and tapped. No self-drill screws allowed.
 - 6. Adjust closer as specified by manufacturer.
- C. Kick Plates
 - 1. Install kick plates on push side of single-acting doors.
- D. Thresholds
 - 1. Install in a bed of sealant with stainless steel screws and expansion shields.
 - 2. Provide proper clearance and an effective seal with specified weather stripping.
 - 3. Minimum screw size: #10, length dependent on job conditions.
- E. Weatherseals
 - 1. Locate as indicated, snug to door face and fastened in place with color matched metal screws after door and frames have been finish painted.
 - 2. Install to exclude light and air flow when door is in closed position.
 - 3. Screw spacing: as recommended by manufacturer.

- F. Gasketing
 - 1. Install at inside edge of hinge, head and latch side of door frame.
- G. Hardware for Labeled Fire Doors
 - 1. Install in accordance with requirements of NFPA 80 AND NFPA 105.
- H. Exit Devices
 - 1. Install as specified by manufacturer.
 - 2. All screw holes shall be drilled and tapped. No self-drill screws allowed.
- I. Locks
 - 1. Install locks as specified by manufacturers.
 - 2. All backset and strike plates shall be flush.
- J. Finish
 - 1. Butts and Locksets shall be US26D finish.
 - 2. Pull and Push Plates, Kickplates shall be US32D finish.
 - 3. Stops and Bumpers shall be US26D unless otherwise noted.
 - 4. Overhead stops shall be US26D finish.
 - 5. Closers shall be sprayed aluminum finish.

3.3 HARDWARE SCHEDULE

Hardware Set 1.0

Doors: 101, 101A

Each to Receive:

1	EA	MORT. CYLINDER	73-47-41-101 x 90-1/4	US26D	SARGENT
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Balance of Hardware by Door Supplier.

Verify Cylinder Type and Quantity with Door Supplier.

Hardware Set 2.0

Doors: 102, 102A, 103, 112, 113, 129

Each to Receive:

3	EA	HINGES	TA2714 4-1/2 x 4-1/2	US26D	MC KINNEY
1	EA	PASSAGE SET	28-10U15 LL	US26D	SARGENT
1	EA	CLOSER	EN1431-UO x TB	689	SARGENT
1	EA	KICKPLATE	1050 10" x 2" LDW	630	ROCKWOOL
1	EA	WALL STOP	409	630	ROCKWOOL
1	EA	THRESHOLD	271A x DW	ALUM	PEMKO
1	SET	GASKETING	S88D x DW x DH	BROWN	PBB INC.
1	EA	AUTO DR BOTTOM	4301CPKL x DW	ALUM	PEMKO

Hardware Set 3.0

Doors: 128B, 128C

Each to Receive:

3	EA	HINGES	TA2714 4-1/2 x 4-1/2	US26D	MC KINNEY
1	EA	PASSAGE SET	28-10U15 LL	US26D	SARGENT
1	EA	CLOSER	EN1431-CPS x TB	689	SARGENT
1	EA	KICKPLATE	1050 10" x 2" LDW	630	ROCKWOOL
1	EA	THRESHOLD	271A x DW	ALUM	PEMKO
1	SET	GASKETING	S88D x DW x DH	BROWN	PBB INC.
1	EA	AUTO DR BOTTOM	4301CPKL x DW	ALUM	PEMKO

Hardware Set 4.0

Doors: 128A

Each to Receive:

3	EA	HINGES	TA2714 4-1/2 x 4-1/2	US26D	MC KINNEY
1	EA	STOREROOM LOCK	73-28-10G04 LL	US26D	SARGENT
1	EA	CLOSER	EN1431-CPS x TB	689	SARGENT
1	EA	KICKPLATE	1050 10" x 2" LDW	630	ROCKWOOD
1	EA	THRESHOLD	271A x DW	ALUM	PEMKO
1	SET	GASKETING	S88D x DW x DH	BROWN	PBB INC.
1	EA	AUTO DR BOTTOM	4301CPKL x DW	ALUM	PEMKO

Hardware Set 5.0

Doors: 108, 124, 132

Each to Receive:

3	EA	HINGES	TA2714 4-1/2 x 4-1/2	US26D	MC KINNEY
1	EA	OFFICE LOCK	73-28-10G05 LL	US26D	SARGENT
1	EA	KICKPLATE	1050 10" x 2" LDW	630	ROCKWOOD
1	EA	WALL STOP	409	630	ROCKWOOD
3	EA	SILENCERS	608	GRAY	ROCKWOOD

Hardware Set 6.0

Doors: 106, 107

Each to Receive:

3	EA	HINGES	TA2714 4-1/2 x 4-1/2	US26D	MC KINNEY
1	EA	OFFICE LOCK	73-28-10G05 LL	US26D	SARGENT
1	EA	O H STOP	4424	689	ABH MFG.
1	EA	KICKPLATE	1050 10" x 2" LDW	630	ROCKWOOD
1	EA	WALL STOP	409	630	ROCKWOOD
3	EA	SILENCERS	608	GRAY	ROCKWOOD

Hardware Set 7.0

Doors: 116, 117, 118, 119, 120, 121, 122, 123, 125, 126, 131

Each to Receive:

3	EA	HINGES	TA2714 4-1/2 x 4-1/2	US26D	MC KINNEY
1	EA	PRIVACY SET	28-10U65 LL	US26D	SARGENT
1	EA	KICKPLATE	1050 10" x 2" LDW	630	ROCKWOOD
1	EA	WALL STOP	409	630	ROCKWOOD
3	EA	SILENCERS	608	GRAY	ROCKWOOD

Hardware Set 8.0

Doors: 109, 110

Each to Receive:

3	EA	HW HINGES	T4A3786 4-1/2 x 4-1/2 NRP	US26D	MC KINNEY
1	EA	STOREROOM LOCK	73-28-10G04 LL	US26D	SARGENT
1	EA	CLOSER	EN1431-UO x TB	689	SARGENT
1	EA	KICKPLATE	1050 10" x 2" LDW	630	ROCKWOOD
1	EA	FLOOR STOP	471	626	ROCKWOOD
1	EA	THRESHOLD	2005AV x DW	ALUM	PEMKO
1	SET	WEATHERSTRIP	303AV x DW x DH	ALUM	PBB INC.
1	EA	DOOR SWEEP	345CV x DW	ALUM	PEMKO
1	EA	RAIN DRIP	346C x DW +4"	ALUM	PEMKO

Hardware Set 9.0

Doors: 114A, 127A, 129A, 130

Each to Receive:

3	EA	HW HINGES	T4A3786 4-1/2 x 4-1/2	US26D	MC KINNEY
1	EA	RIM EXIT DEVICE	8810	US32D	SARGENT
1	EA	PB EXIT TRIM	E5010-B-WL-626-41	US26D	SIMPLEX \ KABA ILCO
1	EA	I.C. CORE	7300	US4	SARGENT
1	EA	CLOSER	EN1431-UO x TB	689	SARGENT
1	EA	KICKPLATE	1050 10" x 2" LDW	630	ROCKWOOD
1	EA	FLOOR STOP	441H	626	ROCKWOOD
1	EA	THRESHOLD	271A x DW	ALUM	PEMKO
1	SET	GASKETING	S88D x DW x DH	BROWN	PBB INC.

Hardware Set 10.0

Doors: 102B, 114, 133

Each to Receive:

3	EA	HW HINGES	T4A3786 4-1/2 x 4-1/2 NRP	US26D	MC KINNEY
1	EA	RIM EXIT DEVICE	73-8813 ETL	US32D	SARGENT
1	EA	CLOSER	EN1431-UO x TB	689	SARGENT
1	EA	KICKPLATE	1050 10" x 2" LDW	630	ROCKWOOD
1	EA	FLOOR STOP	471	626	ROCKWOOD
1	EA	THRESHOLD	2005AV x DW	ALUM	PEMKO
1	SET	WEATHERSTRIP	303AV x DW x DH	ALUM	PBB INC.
1	EA	DOOR SWEEP	345CV x DW	ALUM	PEMKO
1	EA	RAIN DRIP	346C x DW +4"	ALUM	PEMKO

Hardware Set 11.0

Doors: 115, 127

Each to Receive:

3	EA	HINGES	TA2714 4-1/2 x 4-1/2	US26D	MC KINNEY
1	EA	PUSHPLATE	70C	630	ROCKWOOD
1	EA	PULLPLATE	1220x 70C	630	ROCKWOOD
1	EA	CLOSER	EN1431-UO x TB	689	SARGENT
1	EA	KICKPLATE	1050 10" x 2" LDW	630	ROCKWOOD
1	EA	WALL STOP	409	630	ROCKWOOD
3	EA	SILENCERS	608	GRAY	ROCKWOOD

Hardware Set 12.0

Doors: 201

Each to Receive:

6	EA	HW HINGES	T4A3786 4-1/2 x 4-1/2	US26D	MC KINNEY
1	EA	STOREROOM LOCK	73-28-10G04 LL	US26D	SARGENT
2	EA	CLOSER	EN1431-UO x TB	689	SARGENT
2	EA	WALL STOP	409	630	ROCKWOOD
1	EA	THRESHOLD	271A x DW	ALUM	PEMKO
1	SET	WEATHERSTRIP	303AV x DW x DH	ALUM	PBB INC.
1	EA	ASTRAGAL SEAL	S88D x DH	BROWN	PBB INC.
2	EA	DOOR SWEEP	345CV x DW	ALUM	PEMKO
1	EA	RAIN DRIP	346C x DW +4"	ALUM	PEMKO

Hardware Set 13.0

Doors: 133A, 133B, 133C, 133D, 133E, 133F

Each to Receive:

All hardware by door manufacturer.

END OF SECTION

SECTION 15700

EQUIPMENT

PART 1 - GENERAL

1.01 NOTE

- A. Drawings, General Conditions of the Contract for Construction, Supplementary Conditions and Division 1 - General Requirements apply to Work of this Section.

1.02 SUBMITTALS

- A. Submit manufacturer's data and shop drawings on all items specified.

1.03 SCOPE

- A. This section of the specifications pertains to all labor, materials, equipment and service necessary for and incidental to the mechanical equipment as shown on the drawings and/or as specified herein.
- B. This section requires the furnishing of all equipment specified and/or shown on the drawings. Equipment referred to singularly shall mean each item, and the total number of items shown or specified shall be furnished.
- C. All appurtenances and auxiliary equipment necessary to the function of any specified item of equipment shall be furnished with the item of equipment, whether specifically mentioned or not. Each item of equipment shall perform the function for which it is intended, and all work necessary to provide a complete functional system shall be provided.
- D. This specification requires that all items of equipment be completely installed, finally connected, tested and placed in service.
- E. It shall be the responsibility of the Contractor to verify all requirements of the equipment and the contract and certify with the submittal of the shop drawings that all requirements have been met, including:
 - 1. Space requirements
 - 2. Electrical requirements (voltage, phase, wires - no. and size)
 - 3. Capacities
 - 4. Clearance for maintenance
 - 5. Quality
 - 6. Quantity

PART 2 - PRODUCTS

2.01 MOTORS

- A. Motors shall be furnished for all motor driven equipment. Motors with special operating conditions such as multiple speed or in hazardous locations shall be as specified under the equipment served. General service motors driving through flexible couplings or belts shall conform to the following requirements:

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1. Less than 1/6 HP: Split phase, 40 degree C ambient, dripproof or enclosed as required by exposure, with a service factor of 1.0. Provide with inherent thermal overload protection.
 2. Fractional larger than 1/6 HP: Capacitor start, 40-degree C ambient, dripproof or enclosed as required by exposure, with a service factor of 1.0 or greater. Provide with inherent thermal overload protection.
 3. Integral Horsepower, Single Phase: Capacitor type, 40-degree C ambient, dripproof or enclosed as required by exposure, with a service factor of 1.15.
 4. Three Phase: High efficiency continuous duty squirrel cage type, 40 degree C ambient, dripproof or totally enclosed fan cooled as required by exposure with a service factor of 1.15. Power factor shall be 85% or greater. Motors shall be equal to Gould E-Plus.

2.02 MOTOR STARTERS

- A. Except where starters are shown integral to motor control centers (see electrical drawings), the Division 15 Contractor shall furnish all motor starters (controllers) and control equipment for equipment specified under Division 15. The Contractor under this section of the specifications shall be responsible for coordinating starter sizes, characteristics, heater element sizes and all other details. All starters shall be combination starter/disconnect devices, and shall include control transformers, hand-off-auto switches, and pilot lights.
- B. All individual starters shall be the product of a single manufacturer and submitted for review at the same time.
- C. Where starters are specified with items of equipment, the starters shall be factory mounted and wired.
- D. Magnetic Starters (Full Voltage): Starters shall be individual units, combination starter/molded case circuit breaker units, combination starter/fused disconnect switch units or combination starter/unfused disconnect switch units unless otherwise indicated.
- E. Units shall be of General Electric, Square D, Westinghouse, Federal or Gould manufacture with the proper enclosures.
- F. Provide pilot lights and either pushbutton stations or hand-off-automatic switches as required for the control of each item of equipment. Generally, pushbutton stations shall be used only where no interlock or remote functions are specified. Control devices shall be in the starter cover unless otherwise indicated.
- G. Provide auxiliary contacts on starters to accomplish interlocks and control as specified. Starter disconnecting means shall have auxiliary contacts to disconnect all control circuits when the starter is disconnected.
- H. Provide all three phase starters with three overload elements, one per phase. Overloads shall be solid state type.
- I. Equip each starter unit with a control power transformer, with 120 volt secondary, a secondary fuse in one leg and the other secondary leg grounded.
- J. Manual Starters: Where manual starters are indicated, they shall consist of a horsepower rated on-off switch, or hand-off-auto switch with a pilot light and overload element(s) in the same enclosure. Where the starter is installed in public areas, it shall be in a recessed box with a stainless steel coverplate.

2.03 BELT GUARDS

- A. Belt guards shall be provided for all belt driven equipment installed under this contract. Guards shall be rigidly constructed of 18-gauge sheet metal on angle iron frame, with fronts of expanded metal or 1/2 inch mesh hardware cloth. Guards shall be sized to permit belt

tightening to the full extent of the motor slide rails. They shall be securely installed in such fashion as to permit ready removal for servicing of the protected drive. Guards shall have tach holes.

2.04 FLUE VENTS

- A. Provide and install flue vents on all gas burning devices including water heaters, unit heaters and furnaces.
- B. All such flue vents shall be constructed of Metalbestos double wall metal conduit and shall be of the sizes recommended by the manufacturers of the devices vented. They shall be complete with all couplings and other required fittings and shall terminate 24" above the roof in a ventilator type weatherproof rainhead similar and equal to a Breidert Air-X-Hauster. Where any vent passes through combustible construction it shall be provided with a separation in accordance with the standards of the NFPA. All vents shall be flashed and counterflashed into the roofing construction to the satisfaction of the Architect and shall be watertight.

2.05 WATER HEATER

- A. Provide the water heater shown and scheduled on the drawings. It shall be a glass lined, jacketed, insulated package water heater.
- B. The gas fired unit shall be complete with draft diverter, adjustable thermostatic control, gas pressure regulator and all standard accessories including a thermomagnetic safety pilot designed to shut off gas flow completely to both main burner and pilot burner, if pilot flame is extinguished.
- C. Provide in the outlet of each heater a Watts temperature and pressure relief valve, with a drain line therefrom full size to the floor drain. Size valve according to the applicable codes.
- D. Gas fired water heaters shall bear the ASME Stamp and shall be installed in accordance with the Boiler Code if the capacity is 120 gallons or more, or the input is 200,000 BTUH or more. Specifically, 2' of clearance is required on all sides, and 4' of clearance is required above the heater.
- E. Refer to drawings for capacities.

2.06 HOT WATER CIRCULATOR

- A. The contractor shall furnish and install an all bronze in-line circulator as shown on the drawings. The pump shall be Bell & Gossett Model No. PR-1-1/4, or approved equal, with a capacity of 10 GPM at 15 ft. head when directly driven by a 1/6 HP self-aligning flexible coupled oil-lubricated motor, 120 volt, 60 cycle, single phase, 1750 RPM. The pump shall be suitable for 125 lb. working pressure.
- B. The pump shall have a ground and polished steel shaft with integral thrust collar. The shaft shall be supported by two horizontal sleeve bearings designed to circulate oil. The pump is to be equipped with a watertight seal to prevent leakage. Mechanical seal faces to be carbon on ceramic. The motor shall be non-overloading at any point on pump curve.
- C. The motor shall be of the open, drip-proof, sleeve-bearing, quiet-operating, rubber-mounted construction. Motors shall have built-in thermal overload protectors.
- D. The pump shall be supported such that the weight of the pump is not carried by the adjoining pipe.
- E. Provide a manual starter and aquastat to cycle the pump on a 20 degree F. temperature drop.

2.07 FANS

- A. The fans indicated on the drawings shall be provided in accordance with the schedule on the drawings.
- B. All v-belt drives shall be a variable pitch type and shall be so selected that the specified fan performance occurs at approximately the midpoint of the adjustable range. Motor mounting shall be flexible to permit belt tightening. The static pressure tabulated in the schedule is for bidding purposes only. The fan shall be adjusted to achieve the air delivery specified and if changing of the motor and drive is required it shall be done at no increase in the contract.
- C. Motor and Drive: The motor shall be open drip proof NEMA T frame design to meet horsepower and electrical requirements specified. The adjustable v-belt drive shall be selected for a 1.4 service factor based on motor horsepower and shall be factory set for the specified rpm. The motor shall be mounted for alignment and tensioning the belts. Conduit shall be flexible.
- D. Provide isolators and flexible duct connections with each fan to limit the transmission of noise and vibration.
- E. Fans shall be AMCA rated as scheduled.
- F. Fans shall be furnished with backdraft dampers and disconnect.
- G. Fans shall be statically and dynamically balanced.
- H. Fans shall have factory-applied finish.
- I. Fan motors 1/8 HP and larger shall be permanent capacitor start type.

2.08 CEILING EXHAUST FANS

- A. Unitary exhaust fans shall be as scheduled on the drawings. They shall be centrifugal, direct driven fans in a sound insulated sheet metal housing for installation above the ceiling. There shall be a finished integral grille for each unit. Provide a backdraft damper, duct thru the roof and suitable rain cap for each. Fans shall be Penn, Greenheck, or equal.

2.09 UTILITY VENT SET

- A. Provide the centrifugal belted vent sets shown and scheduled on the drawings. Fans shall be AMCA rated and installed in accordance with NFPA 96. Fans shall be equal to Trane Type "BI". Arrangement shall be upblast.
- B. Fan wheels shall be backward inclined, non-overloading, coated for corrosion resistance. Inlet shall be a smooth cone. Scroll shall be all welded, heavy gage steel, coated for corrosion resistance and weather protection. Rotating assembly shall be dynamically balanced. Bearings shall be prelubricated ball type rated for 100,000-hour life.
- C. Motor and drive shall be enclosed in a weatherproof housing. Drive shall be adjustable.
- D. Refer to the drawings for special mounting requirements.

2.10 ENERGY RECOVERY VENTILATORS

- A. Manufacturers: Available Manufacturers: Subject to compliance with specifications contained within this document, manufacturers offering products that may be incorporated into the work include, but are not limited to:
 - 1. Greenheck Fan Corporation or equal
- B. Manufactured Units: Unit shall be fully assembled at the factory and consist of an insulated metal cabinet, , energy wheel, motorized intake damper, motorized exhaust damper,

sensors, filter assembly for intake and exhaust air, supply air blower assembly, exhaust air blower assembly and an electrical control center. All specified components and internal accessories factory installed and tested and prepared for single-point high voltage connection.

C. Cabinet:

1. Materials: Formed single wall insulated metal cabinet, fabricated to permit access to internal components for maintenance.
 - a. Outside casing: 18 gauge, galvanized (G90) steel meeting ASTM A653 for components that do not receive a painted finish. Pre-painted components as supplied by the factory shall have polyester urethane paint on 18 gauge G60 galvanized steel. Internal assemblies: 18 gauge, galvanized (G90) steel except for motor supports which shall be minimum 14 gauge galvanized (G90) steel.
2. Access doors shall be hinged. This is an optional accessory which shall be included.
3. Cabinet Insulation: Comply with NFPA 90A and NFPA 90B and erosion requirements of UL 181.
 - a. Materials: Fiberglass insulation. If insulation other than fiberglass is used, it must also meet the Fire Hazard Classification shown below.
 - (1) Thickness: 1 inch (25 mm)
 - (2) Fire Hazard Classification: Maximum flame spread of 25 and smoke developed of 50, when tested in accordance with ASTM C 411.
 - (3) Location and application: Full coverage of entire cabinet exterior to include walls, roof and floor of unit. Insulation shall be of semi-rigid type and installed between inner and outer shells of all cabinet exterior components.
4. Energy wheel: Energy wheel shall be of total enthalpy, rotary air-to-air type and shall be an element of a removable energy wheel cassette. The cassette shall consist of a galvanized steel framework (designed to produce laminar air flow through the wheel), an energy wheel as specified and a motor and drive assembly. The cassette shall incorporate a pre-tensioned urethane drive belt with a five year warranty. The wheel media shall be a polymer film matrix in a stainless steel framework and be comprised of individual segments that are removable for servicing. Non-segmented energy wheels are not acceptable. Silica gel desiccant shall be permanently bonded to the polymer film and shall be designed and constructed to permit cleaning and servicing. The energy wheel is to have a five year warranty. Performance criteria are to be as specified in AHRI Standard 1060, complying with the Combined Efficiency data in the submittal.
5. Supply Air and Exhaust Air blower assemblies: Blower assemblies consist of an electric motor as specified by A/E and a belt driven blower. Assembly shall be mounted on heavy gauge galvanized rails and further mounted on 1.125 inch thick neoprene vibration isolators.
6. Control panel / connections: Energy Recovery Ventilator shall have an electrical control center where all high and low voltage connections are made. Control center shall be constructed to permit single-point high voltage power supply connections
7. Frost control: modulating wheel
8. Motorized dampers / Exhaust Air, Intake Air: Motorized dampers of low leakage type shall be factory installed.
9. Sensors are considered to be part of various optional operational modes or device controllers and are to be factory supplied and installed as specified by the A/E. See IOM / Sensors Installed by Factory

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- D. Blower:
1. Blower section construction, Supply Air and Exhaust Air: Belt drive motor and blower shall be assembled onto a 14 gauge galvanized steel platform and must have neoprene vibration isolation devices
 2. Blower assemblies: Shall be statically and dynamically balanced and designed for continuous operation at maximum rated fan speed and horsepower.
 3. Centrifugal blower housing: Formed and reinforced steel panels to make curved scroll housing with shaped cutoff.
 4. Forward curved blower (fan) wheels: Galvanized or aluminum construction with inlet flange and shallow blades curved forward in direction of airflow. Mechanically attached to shaft with set screws.
 5. Blower performance shall be factory tested for flow rate, pressure, power, air density, rotation speed and efficiency. Ratings are to be established in accordance with AMCA 210, "Laboratory Methods of Testing Fans for Rating".
- E. Motors:
1. General: Blower motors greater than $\frac{3}{4}$ horsepower shall be "NEMA Premium™" unless otherwise indicated. Minimum compliance with EPA minimum energy-efficiency standards for single speed ODP and TE enclosures is not acceptable. Motors shall be heavy-duty, permanently lubricated type to match the fan load and furnished at the specified voltage, phase and enclosure. Drives shall be sized for a minimum of 150% of driven horsepower and pulleys shall be fully machined cast-type, keyed and fully secured to the fan wheel and motor shafts. Electric motors of ten horsepower or less shall be supplied with an adjustable drive pulley. Comply with requirements in Division 23 05 13, matched with fan load.
 2. Motors shall be 60 cycle, 3 phase 208 volts
- F. Unit Controls:
1. The unit shall be constructed so that it will function as a stand-alone heating and cooling system controlled by factory-supplied controllers, thermostats and sensors. This unit shall be controlled by a factory-installed microprocessor programmable controller (DDC) that is connected to various optional sensors which shall be furnished with this unit.
 2. Unit shall incorporate a DDC controller with integral LCD screen that provides text readouts of status, operating settings and alarm conditions. DDC controller shall have a built-in keypad to permit operator to access read-out screens and change settings without the use of ancillary equipment, devices or software. DDC controllers that require the use of equipment or software that is not factory-installed in the unit are not acceptable. Alarm readouts consisting of flashing light codes are not acceptable. Owner-specified ventilating conditions can be input by means of pushbuttons.
 - a. Operating protocol: The DDC shall be factory-programmed for BACnet IP for monitoring of the unit's status
 3. Remote Interface: Contractor shall provide and install a Remote Interface that functions as a remote indicator of owner-selected operating parameters and also permits remote inputting of new operating parameters. Each remote panel shall have a large LCD user interface screen similar in form and function to the screen on the DDC. Installed location of room display shall be coordinated with architect and engineer prior to mounting.
 4. Sensors:
 - a. Room / Space Temperature Sensors
 - b. Dirty Filter Sensor
 - c. Temperature Sensors- OAI, EAW,RA,OAD
 - d. Pressure Sensor- OAW-P,OAF-P, EW-P, EW-F

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- e. Current Sensor- OAF-A, EF-A
 - f. Rotation Sensor
 - G. Filters: MERV 8 disposable pleated filters shall be provided in the intake air stream and MERV 8 filters in the exhaust air stream
 - H. Examination:
 - 1. Prior to start of installation, examine area and conditions to verify correct location for compliance with installation tolerances and other conditions affecting unit performance. See unit IOM.
 - 2. Examine roughing-in of plumbing, electrical and HVAC services to verify actual location and compliance with unit requirements. See unit IOM.
 - 3. Proceed with installation only after all unsatisfactory conditions have been corrected.
 - I. Installation: Installation shall be accomplished in accordance with these written specifications, project drawings, manufacturer's installation instructions as documented in manufacturer's IOM, Best Practices and all applicable building codes.
 - J. Connections:
 - K. In all cases, industry Best Practices shall be incorporated. Connections are to be made subject to the installation requirements shown above.
 - 1. Duct installation and connection requirements are specified in Division 23 of this document.
 - 2. Electrical installation requirements are specified in Division 26 of this document.
 - L. Field Quality Control:
 - 1. Manufacturer's Field Service: Engage a factory authorized service representative to inspect field assembled components and equipment installation, to include electrical and piping connections. Report results to A/E in writing. Inspection must include a complete startup checklist to include (as a minimum) the following: Completed Start-Up Checklists as found in manufacturer's IOM.
 - M. Start-Up Service: Engage a factory authorized service representative to perform startup service. Clean entire unit, comb coil fins as necessary, and install clean filters. Measure and record electrical values for voltage and amperage. Refer to Division 23 "Testing, Adjusting and Balancing" and comply with provisions therein.
 - N. Demonstration and Training: Engage a factory authorized service representative to train owner's maintenance personnel to adjust, operate and maintain the entire unit. Refer to Division 01 Section Closeout Procedures and Demonstration and Training.

2.11 FILTERS

- A. Provide all filters specified herein and/or scheduled or shown on the drawings. All filters shall be erected in holding frames, tight fitting, with no bypass path.
- B. All filters of every type shall be UL listed Class I or II.
- C. Every air-handling device which supplies air to any space shall have a filter bank. No., size, and type of filters, shall be as scheduled on the drawings.
- D. All frames shall be fitted with new media at final acceptance. In addition provide 100% spare filters.
- E. Filter Racks: Flat filters shall be installed in factory fabricated slide rails with access door. Provide closures as required.

2.12 DISPOSABLE MEDIUM EFFICIENCY FILTERS

- A. Filters shall be medium efficiency (30-35% based on ASHRAE 52-68) at a velocity of 500 FPM. Media shall be pleated, non woven reinforced cotton fabric supported by a welded wire grid with 95% open area. Frame shall be heavy-duty waterproof chipboard. Filter

shall have not less than 4.5 square feet of media per foot of face area. Filters shall be equal to Farr 30/30 series.

2.13 ELECTRIC HEATERS

- A. Furnish and install as shown on the drawings the recessed electric wall heaters. The heaters shall be 1500 watt, 120 volts, single phase rated at 5118 BTUH. The heating elements shall be totally enclosed corrosion resistant. The unit shall have a 16 gage louvered steel grille, permanently lubricated impedance protected motor, integral disconnect and front panel mounted thermostat with "off" position. Wall heaters shall be equivalent to Dayton 5ZK52.

2.14 GAS FIRED RADIANT HEATERS

- A. Provide and install the gas fired radiant heaters indicated on the drawings. The heaters shall be as manufactured by Space Ray Corporation.
- B. Each heater shall be complete with the following components:
 - 1. Frame and burner assembly, suspended from structure at the height directed.
 - 2. Reflector constructed of .050 mirror polished aluminum.
 - 3. Ceramic Radiator.
 - 4. Nichrome burner screen.
 - 5. Automatic firing assembly including a gas pressure regulator, firing valve, gas stop and pilot.
 - 6. Electrical controls including remote thermostat, on-off switch, and prewired control assembly.
- C. Each heater shall be suspended at the height directed, and at the angle directed.
- D. Each unit shall be equipped with automatic ignition.
- E. Each unit shall be controlled by a spring timer switch, 0-120 minutes.

2.15 FURNACE - GAS FIRED

- A. Furnace shall have the heating and fan capacities scheduled. It shall be a Lennox steel forced warm air, gas fired winter air conditioner complete with heavy furniture steel casing, heat transfer element, burner, draft diverter, gas pressure regulator, automatic pilot and safety controls, squirrel cage fans with motors and v-belt drives, filter and all other standard accessories.
- B. Automatic controls at each unit shall include magnetic gas valves, remote room thermostats, limit controls, and thermostatic fan switch. Fan motors shall be provided with thermal overload protection.
- C. Temperature controls shall be furnished by the unit manufacturer.
- D. Similar and equal furnaces as manufactured by Carrier, Trane and Westinghouse are acceptable.

2.16 PACKAGED DX COOLING COIL FOR FURNACE

- A. Cooling coil shall fit the furnace. It shall be of the configuration indicated on the drawings. Provide complete with coil, casing, drain pan, expansion device and other accessories required. When performing with the furnace and condensing unit it shall deliver the scheduled capacity.
- B. Provide the refrigerant piping to completely connect the coils with the condensing units. The piping shall consist of precharged lines with quick couplings. Suction piping shall be

insulated with foam plastic insulation threaded on and sealed. Support the piping with Unistrut hangers.

- C. Provide a liquid line filter dryer and a sight glass at each coil.
- D. Provide a drain line from each coil to the floor drain.

2.17 PACKAGED AIR COOLED CONDENSING UNITS

- A. The air-cooled condensing units shall be of the self contained packaged type suitable for outdoor mounting. Each shall be factory assembled complete with refrigeration system, condensing coils, fans, controls, etc. all in a rigidly constructed and finished housing. The condensing unit shall be connected to the remote cooling coil. The units shall be mounted as shown on the drawings.
- B. The refrigeration system shall be of the hermetically sealed type utilizing Freon as a refrigerant. It shall be of the air cooled type with the refrigerant condensed in copper coils with aluminum fins.
- C. The fan in each unit shall be direct driven with motor of the permanently sealed lubrication type.
- D. Each unit shall have minimum performance characteristics as tabulated on the drawings. It shall be furnished with the manufacturer's standard thermostatic, manual, and safety controls, and shall be completely internally wired. Each shall be as manufactured by Lennox, Trane or Carrier.
- E. Each compressor shall be guaranteed for 5 years.
- F. Hail Guard Screen: Entire condenser coil shall be covered with 18 gauge, 1/2" mesh galvanized wire screen.

2.18 TOUCHSCREEN PROGRAMMABLE THERMOSTAT

- A. Programmable thermostats shall be equal to Honeywell VisionPRO 8000 series TB8220 commercial thermostat with touchscreen LCD screen. Features shall include large backlit digital display and touchscreen interaction. Unit shall be equipped with real time clock with battery backup during power failures and automatic compensation for daylight savings time. Unit shall be capable of seven-day program with intuitive, menu-driven, on-screen programming. Unit shall include Heat - Cool - Auto feature for compliance with International Energy Conservation Code. Unit shall include multiple HOLD options to temporarily override programming. Unit shall control within one degree fahrenheit. Unit shall be equipped with up to three heat and two cool stages and shall be heat-pump compatible. Coordinate stages and heat-pump compatibility with equipment served by each thermostat. Unit shall carry a 5-year warranty.

2.19 DUCTLESS SPLIT SYSTEM HEAT PUMP UNITS

- A. System Description: The Heat Pump system shall be equal to Mitsubishi Electric split system heat pumps. The system shall consist of a wall mounted indoor section with wired, wall mounted controller.

System Model Numbers	
Indoor Units	Outdoor Units
PKA-24GL	PUY-A24NHA

- B. Quality Assurance:
1. The units shall be tested by a Nationally Recognized Testing Laboratory (NRTL) and shall bear the ETL label.
 2. All wiring shall be in accordance with the National Electrical Code (N.E.C.).
 3. The units shall be rated in accordance with Air-conditioning Refrigeration Institute's (ARI) Standard 210 and bear the ARI Certification label.
 4. The units shall be manufactured in a facility registered to ISO 9001 and ISO 14001, which is a set of standards applying to environmental protection set by the International Standard Organization (ISO).
 5. A dry air holding charge shall be provided in the indoor section.
 6. The outdoor unit shall be pre-charged with R-410a refrigerant for 70 feet of refrigerant tubing.
 7. System efficiency shall meet the minimum efficiency standards described in the International Energy Conservation Code (2009 IECC).
- C. Delivery, Storage And Handling:
1. Unit shall be stored and handled according to the manufacturer's recommendations.
 2. The wireless controller shall be shipped inside the carton with the indoor unit and able to withstand 105°F storage temperatures and 95% relative humidity without adverse effect.
- D. Warranty:
1. The units shall have a manufacturer's parts and defects warranty for a period one (1) year from date of installation. The compressor shall have a warranty of 6 years from date of installation. If, during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced or repaired at the discretion of the manufacturer. This warranty does not include labor.
 2. Manufacturer shall have over 25 years of continuous experience in the U.S. market.
- E. Performance: Each system shall perform in accordance to the ratings shown in the table below. Cooling performance shall be based on 80°F DB, 67°F WB (26.7°C DB, 19.4°C WB) for the indoor unit and 95°F DB, 75°F WB (35°C DB, 29.3°C WB) for the outdoor unit.

System Model Number	Cooling Capacity Btu/h	Heating Capacity Btu/h	TPW Cooling	TPW Heating	HSPF IV (V)	CFM (Hi/Dry)
PKA-24GL	12,000 – 24,000	12,000 – 26,000	2,650	2,570	8.5 (6.8)	705

TPW = Total Power Watts

- F. Design:
1. Unit Cabinet:
 - a. The indoor unit cabinet shall be wall mounted by means of a factory supplied mounting plate. The cabinet shall be formed from high strength molded plastic with front panel access for filter. Cabinet color shall be white – 18,000 Munsell 0.70 8.59/097 and 24,000, 30,000, and 36,000 Munsell 3.4Y 7.7/08.
 - b. The indoor unit shall be factory assembled, wired and tested. Contained within the unit shall be all factory wiring and internal piping, control circuit board and fan motor.

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- c. The unit in conjunction with the wired, wall mounted controller shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, and a test run switch. Indoor unit and refrigerant pipes shall be purged with dry nitrogen before shipment from the factory.
 2. Fan: The evaporator fan shall be high performance, double inlet, forward curve, direct drive sirocco fan with a single motor – One for 18,000 and 2 for 24,000, 30,000, and 36,000. The fans shall be statically and dynamically balanced and run on a motor with permanently lubricated bearings. The indoor fan shall consist of four (4) speeds: Low, M1, M2, and Hi for the 18,000 and two (2) speeds: Low, High for the 24,000, 30,000, and 36,000 models.
 3. Vane: There shall be a motorized horizontal vane to automatically direct air flow in a horizontal and downward direction for uniform air distribution. The horizontal vane shall significantly decrease downward air resistance for lower noise levels, and shall close the outlet port when operation is stopped. There shall also be a set of vertical vanes to provide horizontal swing airflow movement selected by remote control.
 4. Filter: Return air shall be filtered by means of an easily removable washable filter.
 5. Coil: The evaporator coil shall be of nonferrous construction with pre-coated aluminum strake fins on copper tubing. The multi-angled heat exchanger shall have a modified fin shape that reduces air resistance for a smoother, quieter airflow. All tube joints shall be brazed with PhosCopper or silver alloy. The coils shall be pressure tested at the factory. A condensate pan and drain shall be provided under the coil.
 6. Electrical: The electrical power of the unit shall be 208 volts or 230 volts, 1 phase, 60 hertz. The system shall be capable of satisfactory operation within voltage limits of 198 volts to 253 volts. The power to the indoor unit shall be supplied from the outdoor unit, using the Mitsubishi Electric A-Control system. For A-Control, a three (3) conductor AWG-14 wire with ground shall provide power feed and bi-directional control transmission between the outdoor and indoor units.
 7. Control:
 - a. The control system shall consist of two (2) microprocessors, one on each indoor and outdoor unit. Field wiring shall run directly from the indoor unit interconnected by a single non-polar two-wire AWG-16 stranded cable to the wall mounted controller with no splices. The control system between the outdoor unit and indoor unit shall be supplied from the outdoor unit using the Mitsubishi Electric A-Control system. Reference **Electrical**.
 - b. The system shall be capable of automatic restart when power is restored and after power interruption. The system shall have self-diagnostics ability, including total hours of compressor run time. Diagnostic codes for indoor and outdoor units shall be displayed on the wired controller panel.
 - c. The microprocessor located in the indoor unit shall have the capability of monitoring return air temperature and indoor coil temperature, receiving and processing commands from the wired controller, providing emergency operation and controlling the outdoor unit.
 - d. The indoor unit shall be connected to a wall mounted wired controller to perform input functions necessary to operate the system. The wired controller shall have a large multi-language DOT liquid crystal display (LCD).
 - e. There shall be a built-in weekly timer with up to eight pattern settings per day. The controller shall consist of an On/Off button, Increase/Decrease Set Temperature buttons, a Heat/Auto/Cool/Dry/Fan mode selector, a Timer Menu button, a Timer On/Off button, Set Time buttons, a Fan Speed selector, a Vane Position selector, a Louver Swing button, a Ventilation button, a Test Run

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- button, and a Check Mode button. The controller shall have a built-in temperature sensor. Temperature shall be displayed in either Fahrenheit (°F) or Celsius (°C). Temperature changes shall be by increments of 1°F (1°C) with a range of 67°F to 87°F (19°C to 30°C).
- f. The wired controller shall display operating conditions such as set temperature, room temperature, pipe temperatures (i.e. liquid, discharge, indoor and outdoor), compressor operating conditions (including running current, frequency, input voltage, On/Off status and operating time), LEV opening pulses, sub cooling and discharge super heat.
 - g. Normal operation of the wired controller shall provide individual system control in which one wired controller and one indoor unit are installed in the same room. The controller shall have the capability of controlling up to a maximum of sixteen systems at a maximum developed control cable distance of 1,500 feet (500 meters).
 - h. The control voltage from the wired controller to the indoor unit shall be 12 volts, DC. The control signal between the indoor and outdoor unit shall be pulse signal 24 volts DC. Up to two wired controllers shall be able to be used to control one unit.
 - i. Control system shall control the continued operation of the air sweep louvers, as well as provide On/Off and mode switching. The controller shall have the capability to provide sequential starting with up to fifty seconds delay.
- G. Outdoor Unit:
- 1. The outdoor unit shall be compatible with the three different types of indoor units (PKA - wall mounted, PCA - ceiling suspending, and PLA - four way ceiling cassette). The connected indoor unit must be of the same capacity as the outdoor unit.
 - 2. The outdoor unit shall be capable of operating at 0°F (-18°C) ambient temperature without additional low ambient controls (optional wind baffle may be required).
 - 3. The outdoor unit shall be able to operate with a maximum height difference of 100 feet (30 meters) between indoor and outdoor units.
 - 4. Units shall have a maximum refrigerant tubing length of 100 feet (30 meters) for the 18,000 and 165 feet (50 meters) for the 24,000, 30,000, and 36,000 units between indoor and outdoor units without the need for line size changes, traps or additional oil.
 - 5. Model PUY-A24NHA shall be pre-charged for a maximum of 70 feet (20 meters) of refrigerant tubing. The outdoor unit shall be completely factory assembled, piped, and wired. Each unit must be test run at the factory.
- H. Cabinet: The casing shall be constructed from galvanized steel plate, coated with a finished with an electrostatically applied, thermally fused acrylic or polyester powder coating for corrosion protection and have a munsell 3Y 7.8/1.1 finish. The fan grille shall be of ABS plastic.
- I. Fan: Model PUY-A24NHA shall be furnished with an AC fan motor. The fan motor shall be of aerodynamic design for quiet operation, and the fan motor bearings shall be permanently lubricated. The outdoor unit shall have horizontal discharge airflow. The fan shall be mounted in front of the coil, pulling air across it from the rear and dispelling it through the front. The fan shall be provided with a raised guard to prevent contact with moving parts.
- J. Coil: The L shaped condenser coil shall be of copper tubing with flat aluminum fins to reduce debris build up. The coil shall be protected with an integral metal guard. Refrigerant flow from the condenser shall be controlled by means of linear expansion valve

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- (LEV) metering orifice. The LEV shall be control by a microprocessor controlled step motor.
- K. Compressor: The compressor for model PUY-A24NHA shall be a DC rotary compressor. Standard constant speed units shall be acceptable, provided they meet all other provisions of this specification. The compressor shall be driven by inverter circuit to control compressor speed. The compressor speed shall dynamically vary to match the room load for significantly increasing the efficiency of the system which results in vast energy savings. To prevent liquid from accumulating in the compressor during the off cycle, a minimal amount of current shall be intermittently applied to the compressor motor to maintain enough heat. The outdoor unit shall have an accumulator and high pressure safety switch. The compressor shall be mounted to avoid the transmission of vibration.
- L. Electrical:
1. The electrical power of the unit shall be 208volts or 230 volts, 1 phase, 60 hertz. The unit shall be capable of satisfactory operation within voltage limits of 198 volts to 253 volts. The outdoor unit shall be controlled by the microprocessor located in the indoor unit.
 2. The control signal between the indoor unit and the outdoor unit shall be pulse signal 24 volts DC. The unit shall have Pulse Amplitude Modulation circuit to utilize 98% of input power supply.

2.20 WATER SOFTENER

- A. Scope:
1. Provide as indicated a vertical pressure type water softener system complete with pressure vessel, softening resin, control valve, brine maker and electronic controller. The system will be of an approved design as fabricated by a manufacturer regularly engaged in the production of water treatment equipment. All equipment and material will be supplied in compliance with the specifications as intended for a complete and operational system.
 2. Qualified manufacturers of water softener equipment must be engaged in the manufacture of this equipment for a period of not less than fifteen (15) years. Acceptable manufacturers are Culligan International Company or the Engineer's approved equal.
- B. General Description: The system specifications are based on Culligan International model CSM 210-2NC configured as Single/Water Meter/Delay. The purpose of the Culligan International Series CSM Single/Water Meter/Delay automatic water softener will be to remove mineral hardness from a known water supply to a level not to exceed 17.1 mg/l, as determined by an accepted ASTM or EDTA test method, when the system is operated at 53.0 gpm and in accordance with the operating instructions. The system will be capable of supplying 5000.0 gallons of softened water between regenerations based on the influent water analysis listed in Section 3.1 of this equipment specification. The systems performance is rated at a design flow rate of 53.0 gpm with a rated pressure drop of 8.3 psi, and will be capable of a peak flow rate of 102.0 gpm for sustained periods of 90 minutes with a pressure drop of 25.0 psi. There shall be a quantity of one (1) of the above described systems.
- C. Performance and Design Data:
1. Influent Water Analysis:
 - a. Total Hardness, gpg : 30.0 Eff. Hardness, gpg @ 100% Cap. : 30.0
 - b. Calcium, Ca : N/A Magnesium, Mg : N/A (Constituents above are expressed in mg/l as CaCO₃ or as otherwise specified.)
 - c. Iron, Fe : 0 Turbidity, NTU : 0

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- d. Total Dissolved Solids, TDS : N/A pH : 7
 - e. Manganese, Mn : 0 Color : 0 (Constituents above are expressed in mg/l or as otherwise specified.)
2. Design Parameters:
- a. Normal System Flow & Pressure Drop : 76.0 gpm @ 15.0 psi
 - b. Maximum System Flow & Pressure Drop : 102.0 gpm @ 25.0 psi
 - c. Backwash/Rinse Flow : 13.5 gpm
 - d. Backwash Volume : 515.0 gallons nominal
 - e. Daily Water Usage : 2000.0 gpd
 - f. Daily Hours of Water Demand : 8
 - g. Operating Temperature Range : 40-120 °F
 - h. Operating Pressure Range (System) : 30-100 psi
 - i. Electrical Requirements : 24 Volts AC, 50/60 Hz, 1 Ph (dedicated receptacle req'd, ref. ¶ 4.6)
 - j. System Dimension (L x W x H) : 66.0 in. L x 35.0 in. W x 74.0 in. H
3. Effluent Water Quality: ZERO GPG HARDNESS (ASTM soap test method)
- D. Equipment Specifications:
1. Softener Tank(s): Each system shall include one (1) tank(s). Each softener tank shall be 24.0 in. in diameter. The sideshell height shall be 54.0 in., sufficient to allow for a proper freeboard space above the resin bed for adequate expansion of the resin during backwashing.
- a. Tank Construction: Tank(s) shall be electrical welded pressure vessel, low carbon steel construction rated for 100.0 psi working pressure and a minimum design pressure of 1.2 times the working pressure amount. Additionally, the tanks shall be capable of withstanding testing with pressure fluctuations from 0 to 120 psi for a minimum of 30,000 cycles.
 - b. Access Openings: Each tank will be equipped with openings for mineral filling and periodic inspection.
 - c. Tank Finish – Exterior: Tank finish on the exterior shall be a high solids polyurethane monochromatic gloss enamel applied to a 1.25 to 1.50 mils DFT over a 1.00 to 1.25 mil DFT prime coat.
 - d. Tank Finish – Interior: Tank interior shall have near white sandblast and be coated to 8 to 10 mil DFT with an epoxy phenolic designed specifically as a high chemical resistant, non toxic, odorless protective coating. The lining shall meet the requirements of the US Federal Register, Food and Drug Regulations, Title 21, Chapter 1, Paragraph 175.300.
 - e. Tank Supports: Tank supports shall be structural steel strap leg type welded to lower tank head.
2. Internal Distribution:
- a. The upper distribution system shall be of the single point baffle type, constructed of PVC pipe.
 - b. The lower distribution system shall be of the hub and radial arm type, constructed of PVC pipe, a hub radial and individual distributors arranged for even flow distribution through the resin bed. No distributor slots will face upwards to minimize the opportunity for channeling. The distribution system shall be embedded in a single layer subfill of washed inorganic material to support the resin bed.
3. Main Operating Valve: The main operating valve shall be a fully automatic multiport diaphragm type. The multiport design shall incorporate all valves necessary for complete control of the softener service and regeneration steps. The diaphragm valves shall be slow opening and closing, free of water hammer. The diaphragm

assembly shall be fully guided on its perimeter to assure a smooth reliable shut off without sticking. There shall be no dissimilar metals within the valve and no special tools shall be required to service the valve. The main operating valve shall include a valve mounted automatic self adjusting brine injector to draw brine and control rinse at a constant rate regardless of water pressure in the range of 30.0 and 100.0 psi. The main operating valve shall be designed and manufactured by the same manufacturer as the water softener system and tested prior to shipment. The valve shall have a soft water sampling cock. The unit shall be supplied so that the valve will allow automatic bypass of untreated water during regeneration. The bypass shall be integral to the main operating valve body and be capable of being easily modified to prevent untreated water bypass.

4. Pipe and Fittings: The main operating valves and manifold piping shall be factory assembled and shipped attached to the resin tank for ease of installation and start up. Piping shall be Schedule 40 galvanized steel and galvanized fittings shall be standard Class 150 threaded malleable iron. All system inlet, outlet and drain connections shall be less than 50.0 in. in distance from the softener support level to provide ease of installation and service.
5. Flow Control: The backwash flow controller shall be a pressure-compensating orifice capable of providing and maintaining proper backwash flows over the entire listed operating pressure range of the system. The backwash flow controller shall be easily serviced without special tools and design so that service to the flow controller can be performed without disassembly of the valve body or the sequencing controller and without disconnecting existing inlet and outlet piping connections.
6. Controls: A fully integrated programmable microprocessor driven electronic controller shall be provided to automatically cycle the main operating valve through the regeneration sequence. The electronic controller shall be designed and manufactured by the same manufacturer as the water treatment equipment. The controller shall be capable of initiating a regeneration by accepting an internal signal from the controller time keeping device; an external Hall-Effect flow sensor, a Culligan Aqua-Sensor®, an external device such as a remote start push-button or any combination of these methods. The controller shall sequence all steps of an automatic regeneration and automatically return the softener to a service or stand-by mode. The initiating time and/or volume setpoints shall automatically reset upon completion of the regeneration sequence. The controller shall include a sealed keypad, capable of programming all controller functions, located on the face of the controller. The controller display shall be a multi-line OLED display capable of full text readouts of operating status and codes. An audible alarm beeper capable of emitting a tone of ~70 dBA shall be available but capable of being disabled if so desired. The controller shall allow for a manual initiation of the automatic regeneration sequence by utilizing a regeneration selection from the controller menu. The controller shall operate on a low voltage electrical system. The system shall include a UL/CUL listed transformer. The entire electronic control package and its associated inputs/outputs shall require not more than 24 VAC @ 50VA. The controller shall utilize EEPROM to save pertinent programmed data and statistical functions. The controller must retain all functionality for power interruptions of less than 12 hours. A battery backup shall be installed and capable of maintaining the time of day for a minimum of 5 years.
 - a. System Control Options: An operator selected program of immediate or delayed volume initiated regeneration for single units shall be available. The controller shall be capable of being entirely programmed in the field without additional interface devices. The electronic controller shall indicate various data that includes flow rate, capacity remaining, total flow since installation,

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- number of regenerations in the last 14 days, days since the last regeneration, total number of regenerations for the life of the unit, time of day, and unit in regeneration.
- b. In addition the following functions shall be provided as part of the system controller:
- (1) Regeneration sequence timers: The controller shall allow control customization of individual regeneration cycle times, each programmable from 1 - 99 minutes. The regeneration cycle and time of cycle remaining shall be displayed when in regeneration.
 - (2) Lockout function: The controller shall include a lockout to prevent unauthorized personnel from altering program data.
 - (3) Regeneration override: The controller shall include a function to direct pre-programmed regeneration after a user determined period of time (hours or 24 hour intervals) without an input signal from another regeneration initiation device.
 - (4) Alarm status indicator: The controller shall monitor operation of internal functions. If a fault is identified, the need for operator intervention will be signaled visually within the controller display.
 - (5) Two Auxiliary Outputs: Two Auxiliary Outputs shall be integral to the controller circuit board. Each Output shall be capable of being programmed to provide power to a "Normally Open" or "Normally Closed" contact (user choice). These 24VAC outputs shall be used only for the purpose of energizing a relay coil.
 - (6) Flow rate indication: The controller shall be capable of indicating the flow rate of the treated water.
 - (7) Totalizer: The controller shall include a totalizer function and a display capacity to 99,999,999 units before resetting to zero. The totalizer value shall be displayed through the controller display during operation.
- c. Flow Sensor(s): A flow sensor package shall be provided consisting of an insertion-type Hall Effect flow transducer with an appropriately sized installation fitting; the package shall include a total of one (1) flow sensors with fittings. The fitting provided shall be 2.0 inches, compatible with the specified piping. It will be designed to allow ease of removal of the sensor for inspection without modification of the piping system. A 15 foot length of cable shall be provided for direct connection to the system controller. The flow sensor package provided shall be functional within the flow range of 1.5 to 150.0 gpm and will be provided with a 2.0" flow sensor installation fitting. The operating temperature/pressure range of flow sensor fittings shall be 34°–100°F at 100.0 psi max. The wetted surfaces of the flow sensor shall be constructed of non-corroding materials such as polypropylene, black Polyvinylidene (PVDF) and titanium. The flow sensor shall have an accuracy to 1% over full range and repeatability to +/-0.5% of full range.
7. Exchange Resin: The ion exchange resin shall be virgin high capacity "standard mesh" of sulfonated polystyrene type stable over the entire pH range with good resistance to bead fracture from attrition or osmotic shock. Each cubic foot of resin will be capable of removing 30000.0 grains of hardness as calcium carbonate when regenerated with 15.0 lbs of salt. The resin shall be solid, of the proper particle size of 20-50 mesh, U.S. standard screen and will contain no agglomerates, shells, plates or other shapes that might interfere with the normal function of the water softener. The resin shall be manufactured to comply with the food additive regulation 21 CFR

173.25 as set forth by the USFDA. The system shall include 7.0 ft³ of exchange resin per vessel and a total of 7.0 ft³ of resin for the system.

8. Brine System: Provide a complete brine system consisting of a plastic tank, cover, salt platform, brine well, an automatic brine valve and all necessary fittings for operation with the water softening system. The system shall consist of a combined brine measuring and salt storage tank with salt platform. The tank will be sized 30.0 in. x 50.0 in.; the system will include a total of one (1) brine tank(s). The brine tank can hold 841.0 lbs of salt which provides for 8.0 regenerations per salt fill. The brine tank will be equipped with a float operated non-corrosive field serviceable brine float valve for automatic control of brine withdrawal and fresh water refill. The brine valve will automatically open to admit brine to the resin tank during education and close automatically providing positive shut-off to prevent air from entering the system. The brine valve will also regulate the flow of soft water into the brine tank during refill. The brine valve works with the timed fill feature of the main operating valve controls to admit the correct volume of fresh water to the brine tank in accordance with the refill time setting in the control program. The brine valve will include a float operated safety shut-off valve as a back up to the timed refill from the main operating valve control to prevent brine tank overflow.
- E. Instructions: One (1) complete sets of installation, operating and maintenance manuals shall be provided.
- F. Field Service: The services of a factory authorized service representative can be made available to supervise, inspect and provide operator training as required for initial start-up and system operation. Contact your local Culligan dealer for service rates and scheduling.
- G. Warranty: A single written warranty must be provided from the manufacturer of the water softener system covering workmanship and materials.
- H. CSM Manual Reference:
 1. Installation Instructions : 01016370
 2. Electronic Timer Addendum : 01021161

2.21 RO UNIT

- A. Scope:
 1. Provide as indicated a reverse osmosis system complete with modules, control system and prefilter. The system will be of an approved design as fabricated by a manufacturer regularly engaged in the production of water treatment equipment. All equipment and material will be supplied in compliance with the specifications as intended for a complete and operational system.
 2. Qualified manufacturers of reverse osmosis equipment must be engaged in the manufacture of this equipment for a period of not less than fifteen (15) years. Acceptable manufacturers are Culligan International Company or the Engineer's approved equal.
- B. General Description: The system specifications are based on Culligan International model E1-2S configured as Single. The purpose of the Culligan Series E1 Plus Single reverse osmosis system will be to reduce the dissolved mineral salt content from a known water supply. The system will be capable, upon initial startup, of reducing the dissolved mineral salt content of the water by at least 97%, based on membrane industry design standards, when the system is operated in accordance with the operating instructions. The system will be capable of supplying 0.0 gpd of treated water per day based on the influent water analysis listed in Section 3.1 of this equipment specification. There shall be a quantity of one (1) of the above described systems.

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- C. Performance and Design Data:
1. Influent Water Analysis:
 - a. Calcium, Ca : 0.0 Chloride, Cl : 0.0
 - b. Magnesium, Mg : 0.0 Nitrate, N : 0.0
 - c. Sodium, Na : 0.0 Sulfate, SO₄ : 0.0
 - d. Potassium, K : 0.0 Bicarbonate, HCO₃ : 0.0
 - e. Strontium, Sr : 0.0 Carbonate, CO₃ : 0.0
 - f. Barium, Ba : 0.0 Fluoride, F : 0.0
(Constituents above are expressed in mg/l as CaCO₃ or as otherwise specified.)
 - g. Silica, SiO₂ : 0.0 Total Hardness, gpg as CaCO₃ : 0.01
 - h. Total Dissolved Solids, TDS : 1200.0 Temperature, °F : 77.0
 - i. Manganese, Mn : 0.0 pH : 7.0
(Constituents above are expressed in mg/l or as otherwise specified.)
 2. Design Parameters:
 - a. Nominal Capacity* : 604.5 gpd
 - b. Approximate Recovery : 50.0%©2010 Culligan International Company 2
 - c. Daily Water Usage : 250.0 gpd
 - d. Daily Hours of Water Demand : 8
 - e. Motor, HP : 1/3
 - f. Operating Temperature Range : 33-100 °F
 - g. Max. Operating Pressure (Pump) : 150.0 psi
 - h. Operating Pressure Range (System) : 20-50 psi
 - i. Inlet Pressure (dynamic) : 20-50 psi
 - j. Electrical Requirements : 115V/60/1
 - k. System Dimension (L x W x H) : 35.0 in. L x 9.0 in. W x 35.0 in. H
**Approximate initial capacity is based on properly pretreated feed water as listed in Section 3.1 of this equipment specification.*
 3. Effluent Water Quality: Initial effluent water quality based on the analysis in section C is estimated to be 14 mg/l TDS.
- D. Equipment Specifications:
1. Prefilter: The equipment will include one (1) replaceable element type prefilter. Each filter housing will be of polypropylene construction and will contain one (1) prefilter cartridge. Each filter cartridge will be of polypropylene construction and rated at 5 microns nominal to assure maximum protection of the pump and modules.
 2. Pump: One pump and motor assembly will be provided to boost the incoming water to an operating pressure of 200.0 psig. Each pump will have a discharge flow of 1.6 gpm. A rotary vane positive displacement pump with brass body will be provided. It will be close coupled to a 1/3 HP electrical motor operating at 115V/60/1.
 3. Modules: The unit will use spiral wound reverse osmosis modules. The 2.5 inch diameter by 21.0 inch long modules will be the polyamide thin film composite membrane type. The module array will be capable, upon initial startup, of producing water at a nominal flow of 0.0 gpd based on Culligan equipment specifications as outlined in paragraph 3.2. The module assembly will consist of single element housing(s) in a array arrangement to deliver the design capacity with minimal waste flow requirements. The housings will be constructed of fiberglass (FRP) for corrosion resistance.
 4. Pipe and Fittings: The equipment will include all mechanical, hydraulic and electrical controls for a complete, self contained unit. A 1/2 inch normally closed solenoid valve will be mounted on the inlet to shut off the water supply when the unit is not operating.

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- a. Operating Pressure Control Valve: Operating pressure will be controlled by a needle-type high pressure control valve mounted on the waste line of the modules. The valve will be equipped with a knob for setting the operating pressure.
 - b. Waste Restrictor: A panel mounted throttling valve will be connected to the concentrate return to maintain the proper recovery ratio of product-to-feed water flow.
 - c. Pressure Gauge(s): Two liquid filled pressure gauges will be included. One gauge will indicate the operating pressure of the unit over the range of 0 to 200.0 psi. The other gauge will indicate adequate feed water pressure to the pump over the range of 0 to 200.0 psi.
 - d. Hydraulic Connections: The system will be designed with a 1/2 inch tube connection to the inlet of the prefilter and a 1/2 inch tube connection from the prefilter to the feed connection on the unit. The product water connection will be 1/2 inch tube. The concentrate water connection will be 3/8 inch tube.
 - e. Mounting: All the components will be mounted on a 14 gauge steel frame suitable for wall mounting.
5. Electrical Controls: An electronic controller will be utilized to perform the logical operation of the unit. The enclosure will be hinged and watertight. A pressure sensing switch will be installed after the inlet solenoid to protect the pressure pump from cavitation by shutting down the pump should pressure fall below 30.0 psig. The electronic controller shall control an optional low pressure auto restart. This feature will test for adequate line pressure after 60 minutes of shut down and attempt to restart. The electronic controller shall control a line pressure flush preset to 1 minute after 2 hours of continuous run time. Upon high storage tank level restart, the unit will flush for a period of 1 minute prior to restarting the system. Connections will be provided to allow easy installation of an optional level control/pressurized storage kit, which will shut down the system and prevent overflow/overpressurization of an optional product water atmospheric/pressurized storage tank. Connections will be provided to allow simplified wiring of an external signal switch, which will shut down the inlet solenoid and pressure pump during the regeneration cycle of pretreatment equipment to prevent untreated water from entering the reverse osmosis system. The system will start automatically when the pretreatment equipment has finished regeneration.
 6. Accessories: Wall mounting brackets to mount the Control and Module Assembly.
- E. Instructions: One (1) complete sets of installation, operating and maintenance manuals shall be provided.
 - F. Field Service: The services of a factory authorized service representative can be made available to supervise, inspect and provide operator training as required for initial start-up and system operation. Contact your local Culligan dealer for service rates and scheduling.
 - G. Warranty: A single written warranty must be provided from the manufacturer of the reverse osmosis system covering workmanship and materials.
 - H. System Pressure Pump: The system shall be provided with a Grundfos MQ pump with integral pressure tank and controller. The pump shall start automatically when water is consumed and stop when consumption ceases.

2.22 DIESEL VEHICLE EXHAUST SYSTEM

- A. References: Contractor must certify that they will meet the Federal, State, and Municipal codes and other listed agencies below:
 1. Federal Occupational Safety and Health Reform Act (OSHA).

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2. Texas Occupational Safety and Health Act.
 3. Building Officials and Code Administrators International (BOCA).
 4. Texas Building Code (OBC).
 5. Texas Mechanical Code (OMC).
 6. National Electric Code (NEC).
 7. American Conference of Governmental Industrial Hygienists (AGGIH).
 8. American Institute of Steel Construction (AISC).
 9. National Fire Protection Association (NFPA).
 10. Sheet Metal and Air Conditioning Contractors National Association, Inc (SMACNA).
 11. Underwriters Laboratories (UL).
 12. Environmental Protection Agency.
 13. American Welding Society (AWS).
- B. Submittals:
1. Submittals indicating rated capacities and product features must be included for the following:
 - a. Fan power ratings with blower curves provided
 - b. Motor ratings and electrical characteristics
 - c. Hose Ratings and Testing Verifications
 - d. Controller
 - e. Rail and Track information per specifications
 2. Manufacturer's data sheets on each product to be used, including:
 - a. Preparation instructions and recommendations.
 - b. Storage and handling requirements and recommendations.
 - c. Installation methods.
 3. Shop Drawings: drawing showing detailed layout of the system including elevations, length of track assemblies, duct layout and fan location
 4. Exceptions and Variances from any of the specifications outlined in these bid specifications must be acknowledged and listed.
- C. Quality Assurance:
1. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible, to ensure proper fitting of work. However, allow for adjustments where taking of field measurements before fabrication might delay work.
 2. Coordination: Coordinate delivery with Owner.
- D. Delivery, Storage, and Handling: Store products in manufacturer's unopened packaging until ready for installation.
- E. Manufacturers: MagneGrip- Cincinnati, Ohio
- F. Materials:
1. Extraction System:
 - a. Extraction System Overview:
 - (1 The exhaust system shall be designed to vent 100 % of exhaust gases and particulate safely to the outside of the fire station. The exhaust system shall be designed and installed by factory-authorized personnel, which have been certified by the manufacturer of the exhaust system. Manufacturers shall be required to have a minimum of five years of proven manufacturing experience in the manufacture of emergency vehicle exhaust extraction equipment. System shall be installed as a turnkey project with all labor, tailpipe modifications and duct material included in the scope of work. Electrical connections and Disconnect Switch shall be included within electrical contractor's scope of work.

-
- (2) The fire department shall be able to use the exhaust system for performing engine and pumper checks indoors.
 - (3) System Description: The exhaust system shall be a source capture system designed to handle exhaust fumes generated from 3 apparatus in the bay area. The vehicles will drive through the building and require a suction rail to provide door to door extraction. It shall be an all rail system.
 - b. Airflow Requirements:
 - (1) The exhaust fan for each facility shall provide a minimum of 600 cfm per vehicle at 6.0 inches static pressure loss.
 - (2) The fan shall be a backward incline fan made from continuous welded construction. Fan housings that are screwed together or riveted are not acceptable.
 - (3) Fans shall be tested and balanced prior to installation, be manufactured in an ISO Certified Facility in accordance to AMCA Certification Standards.
 - (4) A safety disconnect in the vicinity of the blower fan motor must be provided.
 - (5) Fan motor shall be a totally enclosed, fan cooled and comply with UL 705 and NEMA Standards.
 - c. Installation and Duct Connections:
 - (1) Complete exhaust system with all equipment and installation including the exhaust fan, control box, ductwork, track, hose and nozzle connection must be completed. Electrical work is not included in this scope of work. Tailpipe modifications from the muffler out that are required to ensure proper system operation are to be included in the scope of the work.
 - (2) Roof penetration shall be properly sealed by roofing contractor
 - (3) All duct material installed as part of this project shall conform to Class II SMACNA Standards. An appropriate rain cap shall be provided on the building exterior.
 - (4) All system components shall be labeled with manufacturer identification.
 - (5) Installation of Exhaust System shall be accomplished by a factory authorized installation team that specializes in the business of installing emergency response exhaust systems.
 - d. Nozzle Attachment:
 - (1) The Exhaust Capture System must provide complete, 100% exhaust removal at the source from vehicle start up to exit of the apparatus from the station. In no event shall the nozzle allow for the potential escaping of diesel exhaust into the bay area by having openings that could allow gases to back wash back into the bay area. Nozzles should sufficiently seal to vent to outside even in the event that fan does not properly activate.
 - (2) The exhaust system shall be attached to the vehicle within 3 feet of the door threshold.
 - (3) The system shall be designed so that attachment to exhaust hose is accomplished by the operator standing erect and with one simple motion to connect system to the vehicle. A rigid lower hose section with handle shall be provided to allow for easy hose connection.
 - (4) Tailpipe Adapter plate shall not exceed 7 inches in diameter to provide sufficient ground clearance.

-
- (5) The nozzle shall allow for the introduction of ambient air to significantly cool the air stream inside the hose and prolong the life of the equipment. Any system that does not seal around the tailpipe and allow for cool ambient air introduction shall not be considered.
 - (6) Nozzle attachment shall be universal and allow vehicles to move from bay to bay.
- e. Nozzle Release:
- (1) The release of the nozzle shall occur by a forward motion of an apparatus. The separation shall be accomplished by a simple mechanical release. Systems requiring support systems for nozzle separation such as pneumatics or electronics are discouraged.
 - (2) The disconnection of the hose shall not be speed dependant and have a balancer that helps lift the exhaust nozzle off the vehicle tailpipe. The nozzle must separate from the tailpipe at the same point each time regardless of the speed of the vehicle.
 - (3) Any auto-release system that is speed sensitive requiring the driver to modify the exit speed to control the nozzle release shall not be accepted. Any nozzle requiring trip switches and support systems such as compressed air or electrical support to operate or release are discouraged.
 - (4) Release of nozzle from the tailpipe shall not cause tugging or stretching of the hose to occur. Stress from separation and transporting of the hose to the door shall be borne by an internal cable to prolong life of the hose.
 - (5) Nozzle elbows constructed of one piece, cast aluminum are required to eliminate the possibility of denting, rusting and breaking.
- f. Suction Rail:
- (1) To best facilitate possible situations where vehicles are parked in tandem and exited in the same direction a suction rail system must be used to provide a neat, clean installation. The suction rail system shall be comprised of Rail Sections which shall have a length of ten feet (10'). Aluminum Material shall be 6063-T-5 with a standard mill finish.
 - (2) The aluminum suction rail shall be constructed from a one-piece continuous extruded aluminum profile. Construction shall be 6" round in diameter, with guide rails on each side to accommodate the external trolley assembly, and molded slots on the top for leg and support bracing
 - (3) The trolley assembly shall be of external guide rail design. Four Delron wheels, using oil less bearing design, shall insure long life and allow the trolley assembly to roll freely along the external guide rails. The chassis shall include a fitted cone assembly, designed to part the memory sealing lips. The cone assembly shall be equipped with a series of friction rollers. These rollers shall be designed to reduce the resistance between the memory lips and the cone assembly.
 - (4) A Shock Absorber Assembly shall incorporate an adjustable hydraulic cylinder, capable of reducing the forward impact of the trolley assembly, without causing damage to either the suction rail or the trolley assembly.
 - (5) A rubber bumper shall be located on the trolley assembly and designed as a contact point. The hydraulic cylinder shall be equipped with a rubber bumper end stop. Both bumpers shall be designed to align upon impact, and at no time shall metal to metal or plastic to metal contact be allowed.

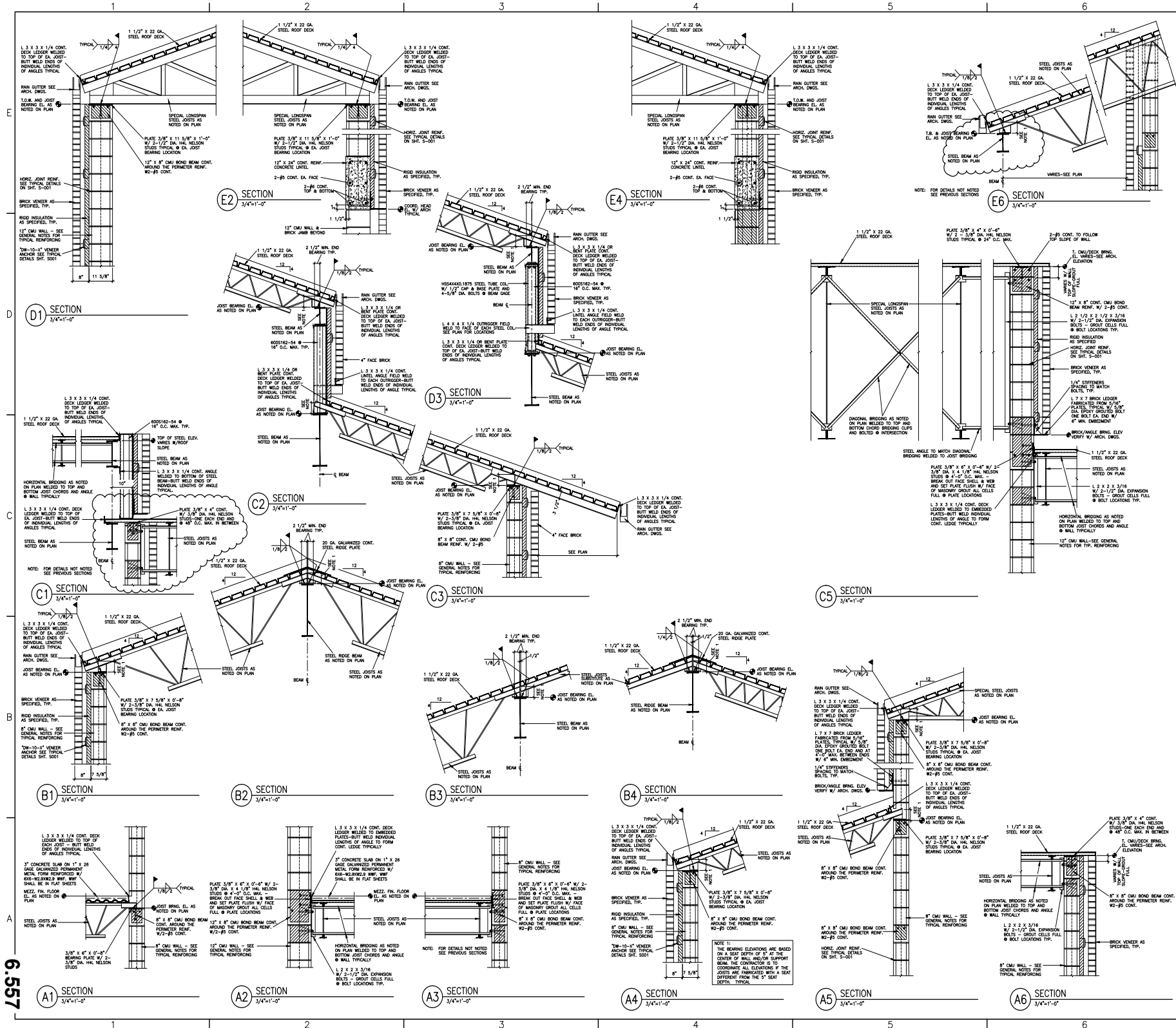
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- g. System Balancer:
 - (1) The System balancer shall retract and keep the hose and nozzle from dangling on the floor for safety concerns.
 - (2) Hose shall be supported by the balancer using a lifting elbow with an internal cable to reduce stress and wear and tear to the hose.
 - h. Extraction System Flex Hose:
 - (1) Exhaust system hose drops shall be the same cross sectional diameter as the vehicle tailpipe or greater. Also, exhaust system shall maintain CFM that matches the cfm of the vehicle engine exhaust when running at 1500 RPM.
 - (2) The flexible exhaust hose is manufactured for the sole purpose of venting high temperature exhaust gases which are produced by internal combustion engines.
 - (3) This construction of hose must be capable of operating at a continuous minimum temperature of 400°F and intermittent temperatures of 550°F. Hoses that are not rated at or higher than these temperatures will not be accepted.
 - (4) Five inch diameter flex hoses are preferred to smaller hoses to provide less static pressure loss and more efficient fan performance.
 - i. Auto Start Control System:
 - (1) Shall be designed to sense the output pressure normally generated by any internal combustion engine. When the nozzle is connected to the vehicle's exhaust tailpipe and the vehicle is started by the operator an automatic controller, the increased output pressure shall be detected by a pressure sensor and activate the exhaust fan. A low voltage timer will keep the exhaust fan operating for a period of time designated by fire department procedures. As an option, ignition start activation may be also offered for consideration.
 - (2) Electrical Controller must be UL listed/approved and manufactured in accordance with Underwriters Laboratories standard UL-508 enclosed industrial control panels and incorporate a limited energy control circuit. The enclosure must be NEMA4 rated fiberglass construction.
 - j. System Warranty: Complete exhaust system parts warranty shall be for a minimum of 3 years. A warranty certificate describing the warranty to be provided must be included. Location and name of nearest service outlet should be listed. Location of parts inventory shall be indicated as well.
 - k. Point of Origin:
 - (1) Equipment shall be manufactured by a U.S. Company that is base headquartered in the USA. Systems shall be built using product and parts supplied from American vendors only. All components shall be American Standard.
 - (2) Product is to be supplied by a manufacturer with a current ISO – 9001-2008 Certificate in manufacturing, design and layout. Certificate documentation shall be included.
- G. Examination:
- 1. Examine all areas for compliance with requirements for installation tolerances, clearances, and other conditions affecting performance of Work in this Section.
 - a. Proceed with installation only after unsatisfactory conditions have been corrected.
- H. Preparation: Prepare surfaces using the methods recommended by the manufacturer for achieving the best result.
-

-
- I. Installation: Install in accordance with approved shop drawings and the manufacturer's printed instructions.
 - J. Protection:
 - 1. Protect installed products until completion of project.
 - 2. Touch-up, repair or replace damaged products before Substantial Completion.

PART 3 – EXECUTION

Not Used

END OF SECTION



FIRE STATION 10

100% CONSTRUCTION DOCUMENTS

SINCLAR PLACE
MIDLAND, TEXAS

KEY PLAN

1.	4/23/13	ADDENDUM #01
2.	4/23/2013	100% CONSTRUCTION DOCUMENTS
3.	3/15/2013	80% CONSTRUCTION DOCUMENTS
4.	1/25/2013	100% DESIGN DEVELOPMENT
5.	NO DATE	DESCRIPTION
6.	ISSUED OFFICER/ARCHITECT	PROJECT NO. 100613

FLOOR/ROOF FRAMING
SECTIONSZAMORA ENGINEERING INC.
STRUCTURAL ENGINEERING CONSULTANTS
7710 WESTINGHOUSE, STE. 301, EL PASO, TX 79962
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FANNING, FANNING & ASSOCIATES
CONSULTING ENGINEERS
1000 W. STREET, LUBBOCK, TEXAS 79403
(806) 790-0001

FIRE STATION 10

100% CONSTRUCTION DOCUMENTS

SINCLAIR
MIDLAND, TEXAS

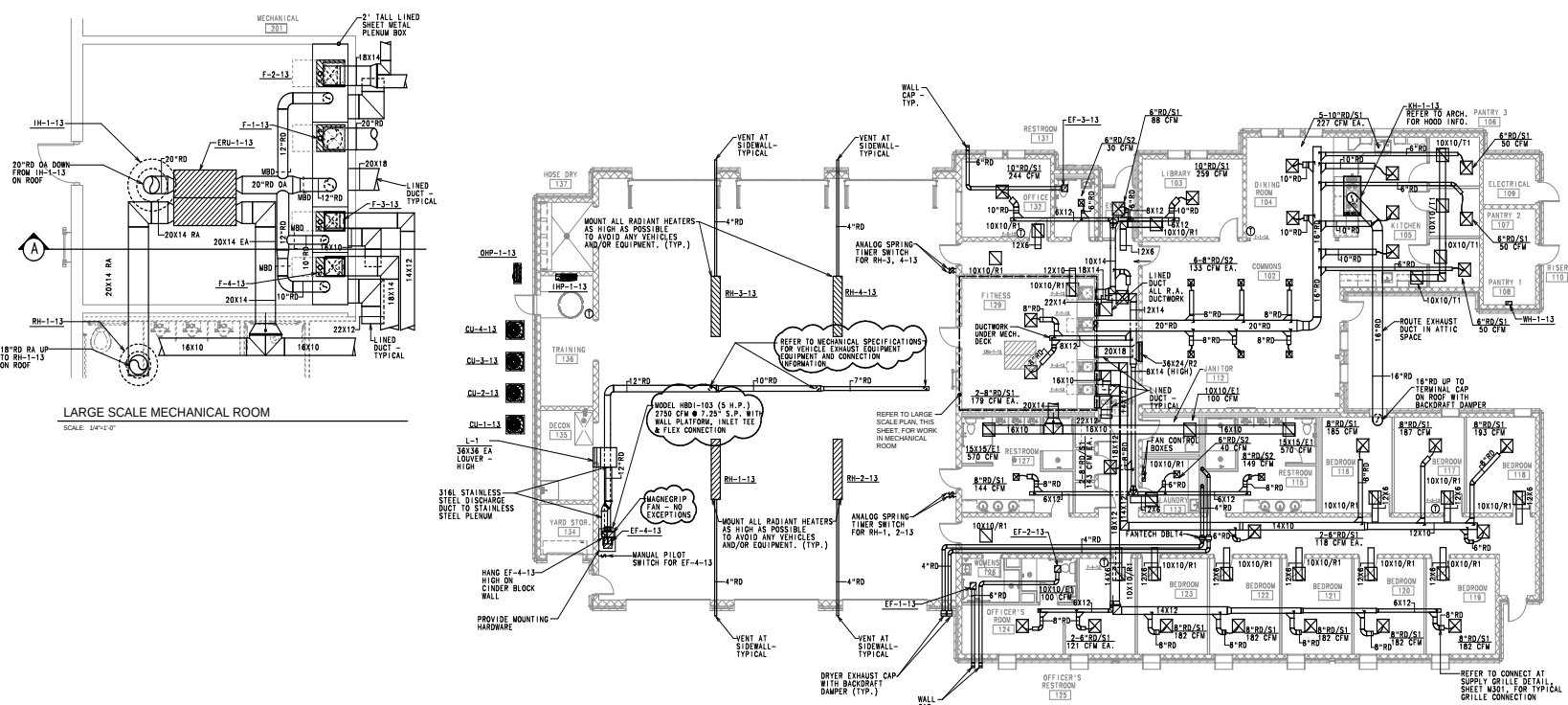
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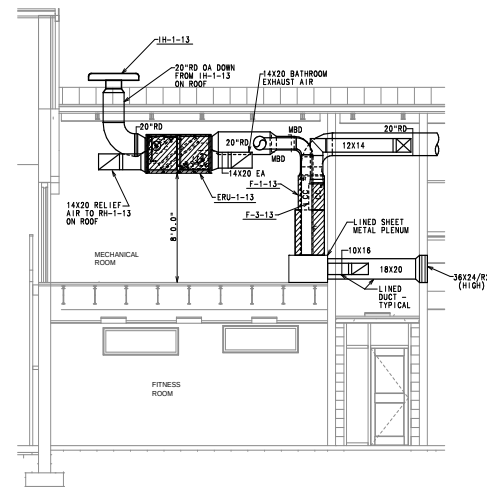
FLOOR PLAN
MECHANICAL

M-101

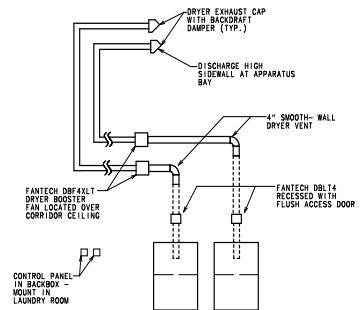
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FLOOR PLAN - MECHANICAL



SECTION A/M101
SCALE: 1/4"=1'-0"



DRYER VENT DETAIL
NO SCALE

MECHANICAL LEGEND	
SYMBOL	DESCRIPTION
	NEW LOW PRESSURE DUCT
	ROUND SPIN-IN CONNECTOR WITH BUTTERFLY DAMPER, SIZE AS SHOWN
	NEW THERMOSTAT
	NEW SUPPLY GRILLE
	NEW RETURN/EXHAUST GRILLE
	NEW EQUIPMENT OR DUCT
	MANUAL BALANCING DAMPER
	ABOVE FINISHED FLOOR
	SWITCH - REFER TO DIVISION 16

NOTES:
1. ALL RETURN AIR DUCTWORK AND PLENUMS SHALL BE LINED. REFER TO SPECIFICATIONS.

6.558

FURNACE SCHEDULE												
MARK	SERVICES	TOTAL CFM	NOV TONS	CFM OA	ESP °WG	DRIVE	HEATING DATA			ELECTRICAL DATA	CONFIGURATION	FRAME MODEL
							FUEL	INPUT (MBH)	OUTPUT (MBH)			
F-1-13	COMMONS/KITCHEN	2000	5	425	0.6	DIRECT	NAT. GAS	120	108	115/1/60	5 TON-SPLIT- COIL UPFLOW	TUH1D1209H5
F-2-13	OFFICE/CORR./BATH	1600	4	340	0.6	DIRECT	NAT. GAS	100	90	115/1/60	4 TON-SPLIT- COIL UPFLOW	TDH2C1009V4
F-3-13	BEDROOMS/CORR.	800	2	170	0.6	DIRECT	NAT. GAS	40	36	115/1/60	2 TON-SPLIT- COIL UPFLOW	TDH1B0409H2
F-4-13	OFFICE/BEDROOMS	1200	3	255	0.6	DIRECT	NAT. GAS	60	56	115/1/60	3 TON-SPLIT- COIL UPFLOW	TUH2B0609V3

NOTES: 1. PROVIDE COMBINATION FLUE/INTAKE FOR EACH FURNACE.
2. PROVIDE HONEYWELL VISION-PRO 8000 TOUCHSCREEN THERMOSTAT FOR EACH UNIT.
3. PROVIDE FARR 30/30 FILTERS IN SIDE ACCESS FILTER RACK FOR EACH UNIT.
4. FURNACES SHALL HAVE DRAFT INDUCERS WITH PRE AND POST PURGE CYCLES.

CONDENSING UNIT AND COOLING COIL SCHEDULE												
NO.	COOLING DATA (MBTUH)					ELECTRICAL	MIN SEER	FRAME		CONDENSING UNIT (CU-#)	COOLING COIL (C-#)	FRAME
	SENS	TOTAL	EAT (DB/WH)	OA								
CU-1-13	41929	54855	80/64	100	208/3/60	17		4TTA3060D3		4TXC00618C3CH		
CU-2-13	33754	44474	80/64	100	208/3/60	13.5		4TTA3048D3		4TXC00488C3CH		
CU-3-13	17610	22187	80/64	100	208/1/60	14		4TTB3024E1		4TXC00238C3CH		
CU-4-13	27709	33793	80/64	100	208/3/60	13.5		4TTA3036A3		4TXC00368C3CH		

NOTES: 1. PROVIDE UNITS WITH INTEGRAL RAIL GUARDS.

AIR DISTRIBUTION SCHEDULE												
MARK	TYPE	LOCATION	DESCRIPTION	EXTR	ODB	FINISH	FRAME	EXAMPLE MODEL				
S1	SUPPLY	CEILING	2X2 SQUARE FACE	Yes	Yes	White	TB	TITUS TMS				
S2	SUPPLY	DUCT	VARIABLE	Yes	Yes	White	TB	TITUS S300FS				
S3	SUPPLY	CEILING	12"X12" SQUARE FACE	Yes	Yes	White	TB	TITUS OM1				
R1	RETURN	CEILING	PERFORATED	No	No	White	TB	TITUS PAR				
R2	RETURN	WALL	VARIABLE	No	No	White	SW	TITUS 300R				
E1	EXHAUST	CEILING	PERFORATED	No	No	White	TB	TITUS PAR				

NOTES: 1. ODB = OPPOSED BLADE DAMPER. 5. WHERE RI GRILLES ARE INSTALLED IN NON-DUCTED APPLICATIONS, PROVIDE SOUND BOOT PER DETAIL.
2. EX1 = EXTRACTOR. 6. WHERE S1 GRILLES ARE INSTALLED IN AREAS WITHOUT CEILINGS, PROVIDE SPIRAL ROUNDOUTS AND ELBOWS TO CONNECT TO THESE GRILLES.
3. PF = PLASTER FRAME.
4. TB = T-BAR.

RADIANT HEATER SCHEDULE												
MARK	TYPE	BLOWER TYPE	VENTED	FUEL	HTG INPUT	CONTROL	ELECTRICAL	EXAMPLE - SPACE-RAY® WEIGHT				
RH-1-13	RADIANT U-TUBE	DRAW-THRU	YES	NAT. GAS	50 MBH	SPRING SWITCH	120V/16/60	CB-50				71
RH-2-13	RADIANT U-TUBE	DRAW-THRU	YES	NAT. GAS	50 MBH	SPRING SWITCH	120V/16/60	CB-50				71
RH-3-13	RADIANT U-TUBE	DRAW-THRU	YES	NAT. GAS	50 MBH	SPRING SWITCH	120V/16/60	CB-50				71
RH-4-13	RADIANT U-TUBE	DRAW-THRU	YES	NAT. GAS	50 MBH	SPRING SWITCH	120V/16/60	CB-50				71

NOTE: 1. ALL UNITS SHALL BE VENTED TO OUTSIDE AS SHOWN. REF: DETAIL SHEET.
2. HEATERS SHALL BE SWITCHED ON MANUALLY WITH TIMER SWITCHES. REFER TO THE ELECTRICAL DRAWINGS.

FAN SCHEDULE												
NO.	CFM	SP	HP/W	HP/W	ELEC.	DRIVE	EXAMPLE:	TYPE	ACCESSORIES	CONTROL		
EF-1-13	100	0.3	950	80	115/1/60	DIRECT	SP-B110	CEILING EXHAUST FAN	PLUG TYPE DISCONNECT	SWITCH W/ LIGHTS		
EF-2-13	100	0.3	950	80	115/1/60	DIRECT	SP-B110	CEILING EXHAUST FAN	PLUG TYPE DISCONNECT	SWITCH W/ LIGHTS		
EF-3-13	100	0.3	950	80	115/1/60	DIRECT	SP-B110	CEILING EXHAUST FAN	PLUG TYPE DISCONNECT	SWITCH W/ LIGHTS		
EF-4-13	2750	7.25	3450	5	208/3/60	DIRECT	MAGNEGRIP HDB1-103	VENT SET	BACKDRAFT DAMPER	PILOT SWITCH ON WALL		

NOTE: 1. PROVIDE EACH FAN WITH STANDARD DISCONNECT, HEAVY DUTY GRAVITY SHUTTER, WIRE GUARDS ON MOTOR AND FAN SIDES.
2. PROVIDE WALL CAPS FOR ALL CEILING EXHAUST FANS - SUBMIT FINISH FOR APPROVAL.
3. EF-1-13 SHALL BE PROVIDED WITH A TREC MOTOR AND A NEMA 4X DISCONNECT. ALSO FURNISH EF-4-13 WITH FULL VOLTAGE, NON-REVERSING MAGNETIC STARTER IN NEMA 1 ENCLOSURE.
4. EF-4-13 SHALL BE MAGNEGRIP - NO EXCEPTIONS.

LOUVER SCHEDULE												
MARK	SIZE(W"xH")	TYPE	FREE AREA	SCREEN	FRAME	FINISH	CONSTRUCTION	RUSKIN				
L-1	36"x36"	STORMPROOF	4.2	YES	FLANGE	DARK BRONZ ANODIZED	ALUMINUM	ELF375X				

NOTES: 1. COORDINATE FRAME STYLE WITH WALL CONSTRUCTION.
2. CONSTRUCTION SHALL BE ALL EXTRUDED ALUMINUM, ANODIZED.

DUCTLESS SPLIT SYSTEM HEAT PUMP SYSTEM SCHEDULE												
MARK	TONS	CFM (H/DRY)	COOLING CAPACITY - BTU/H	MBH HEATING SEER	REFRIG.	ELEC. DATA	MCA, AMPS	MAX FUSE	MFOR.	IHP MODEL	OHP MODEL	
IHP/OHP	2T	800	24000	16.0	13.5	R410A	208V-1P-60Hz	18	20A	MITSUBISHI PKA-A24FA	PWZ-A24NHA	

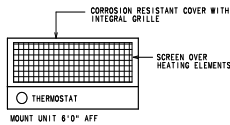
NOTES: 1. DRAIN CONDENSATE TO FLOOR SINK.
2. PROVIDE WITH CONTROLS SPECIFIED - WIRED THERMOSTAT ON WALL.

ELECTRIC WALL HEATER SCHEDULE												
DESIGNATION	TYPE	CAP. BTU	WATTS	VOLTS	EXAMPLE: DAYTON							
WH-1-13	FORCED AIR	5118	1500	120	52K52							

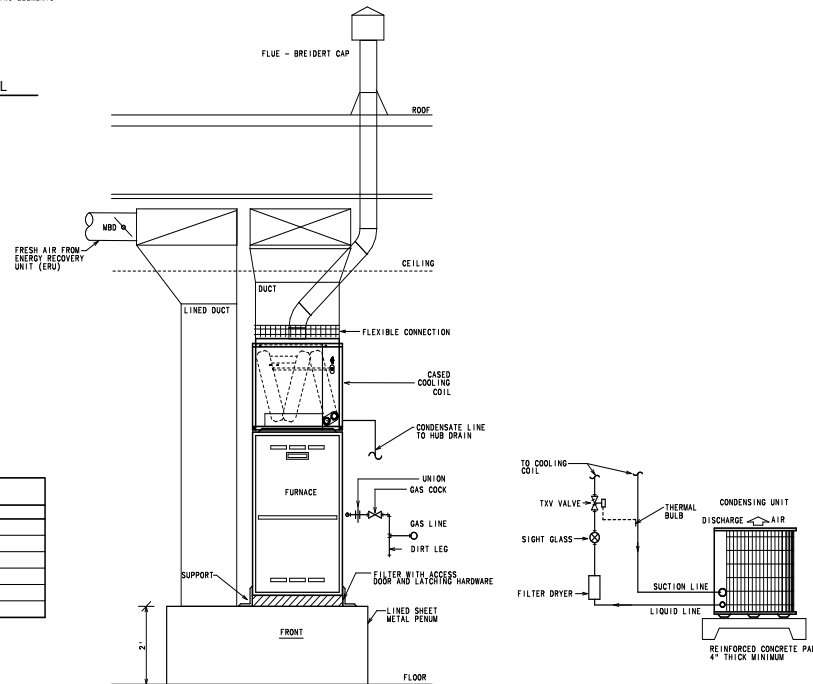
NOTE: PROVIDE WITH INTEGRAL THERMOSTAT.

ENERGY RECOVERY UNIT												
OUTDOOR AIR PERFORMANCE - SUMMER						EXHAUST AIR PERFORMANCE - SUMMER						
NO.	CFM OA	EAT	LAT	EFF.	ESP	POWER HP	CFM EXH	ESP	POWER HP	EFF.	ELEC.	DRIVE
ERV-1-13	2000	100/67	86.2/86.6	55.4/0.50	1.5	1240	0.50	0.5	89.4	208/3/60	BELT	

NOTE: 1. PROVIDE FACTORY CONTROLS FOR THE UNIT, INCLUDING BDC CONTROLLER WITH PANEL MOUNTED AS DIRECTED BY ARCHITECT. CONTROL FEATURES SHALL INCLUDE SENSORS IN EACH AIR STREAM FILTER DP, PROGRAMMED START/STOP, ETC. REFER TO SPECIFICATIONS.
2. WINTER EFFECTIVENESS IS IDENTICAL.



ELECTRIC HEATER DETAIL
NO SCALE



FURNACE / COIL / CONDENSING UNIT DETAIL
NO SCALE

INTAKE/RELIEF HOOD SCHEDULE												
MARK	MAX. CFM	MAX. THROAT VEL.	THROAT SIZE	THROAT AREA	OVERALL SIZE	EXAMPLE: GREENCHECK						
I/R-1-13	2000	397	30.5" RD	11.82 SF	48" RD	GHS1-30						
I/R-1-13	1250	368	24.5" RD	9.62 SF	38.25" RD	GHS1-24						

NOTE: 1. PROVIDE INTAKE AND RELIEF HOOD WITH B100SCREEN.
2. IH = INTAKE HOOD, RH = RELIEF HOOD.



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FIRE STATION 10

100% CONSTRUCTION DOCUMENTS

SINCLAIR
MIDLAND, TEXAS

REV PLAN

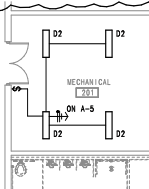
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MECHANICAL
SCHEDULES

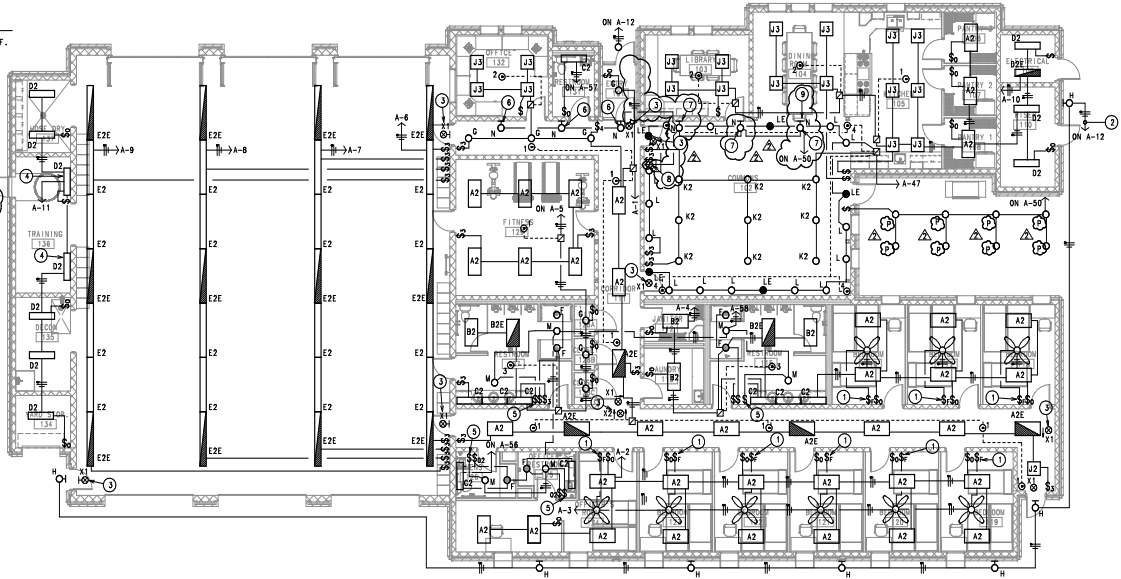


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- NOTES INDICATED BY ○:
- 1 3-SPEED CEILING FAN CONTROL SWITCH EQUAL TO LUTRON # AY50-F.
 - 2 RUN CIRCUIT THROUGH PHOTOCELL ON ROOF EQUAL TO TORK #2101.
 - 3 CONNECT EXIT SIGN TO CIRCUIT A-13. (TYPICAL)
 - 4 TRAINING 136 HAS THREE FLOORS. MOUNT TYPE D2 FIXTURE ON WALL AT 4'-0" ABOVE FINISHED FLOOR. TOTAL OF 8 TYPE D2 FIXTURES TO BE INSTALLED IN TRAINING 136.
 - 5 SPRINGROUND TOWER EQUAL TO TORK #C515M
 - 6 REFER TO ARCHITECTURAL DRAWINGS FOR MOUNTING HEIGHTS
 - 7 MOUNT FIXTURE INSIDE COVE AS AN UPLIGHT.
 - 8 SWITCH TO CONTROL TYPE "M" FIXTURES. CONNECT SO THAT WHEN THE SWITCH IS ON POSITION THE TYPE "M" FIXTURES ARE CONTROLLED BY THE PHOTOCELL. WHEN THE SWITCH IS OFF POSITION THE LIGHTS ARE OFF.
 - 9 FURNISH INSTALL A PHOTOCELL EQUAL TORK #3010 IN WINDOW SILL. INSTALL PHOTO CELL INSIDE SURFACE MOUNTED BOX. PHOTO CELL TO CONTROL TYPE "M" FIXTURES.



MECHANICAL ROOM
1/8"=1'-0"



ELECTRICAL LIGHTING FLOOR PLAN
1/8"=1'-0"



FIRE STATION 10

LIGHTING FIXTURE SCHEDULE															
TYPE	DESCRIPTION	VOLTS	MANUFACTURER	CATALOG No.	Fixture Input Watts	LUMPS	Quantity	Description	Initial Lumens	Color	CRI	Ballasts Type	THD	Ballast Factor	REMARKS
A2	2'x4' Recessed Lens Troffer-Grid	120	Lithonia	25P80-332-A12125-GE101S	61	2	F32W T8		2800	3500K	85+	EIS	10%	0.87	
A2E	Same as type A2 except with emergency battery pack equal to Bedline #B60														
A3	2'x4' Recessed Lens Troffer-Grid	120	Lithonia	25P80-332-A12125-GE101S	91	3	F32W T8		2800	3500K	85+	EIS	10%	0.87	
B2	2'x4' Recessed Lens Troffer-Flanged	120	Lithonia	25P8F-332-A12125-GE101S	61	2	F32W T8		2800	3500K	85+	EIS	10%	0.87	
B2E	Same as type B2 except with emergency battery pack equal to Bedline #B60														
C2	Surface Wall Bracket	120	Lithonia	W-232-00-GE101S-MW	61	2	F32W T8		2800	3500K	85+	EIS	10%	0.87	
D2	Striplight with Wire Guard	120	Lithonia	UNS-232-GE101S-MCUANST	61	2	F32W T8		2800	3500K	85+	EIS	10%	0.87	
D2E	Same as type D2 except with emergency battery pack equal to Bedline #B60														
E2	Industrial Striplight with Wire Guard	120	Lithonia	AF31-296T8HD-GE101S-WGA/VP	146	2	F96W T8HD		8200	3500K	85+	EIS	10%	0.87	
E2E	Same as type E2 except with emergency battery pack equal to Bedline #B60														
F	LED Shower Downlight	120	Gotham	EVO-35/18-40FR	31	---	LED		1400	3500K	83	---	---	---	
G	LED Open Downlight	120	Gotham	EVO-35/22-6AR-TW	28	---	LED		1800	3500K	82	---	---	---	
H	Exterior LED Wall Sconce	120	Lithonia	MSRLED1-10A700/40K-SR3-DDBXD	24	---	LED		---	4000K	---	---	---	---	
J2	2'x2' Recessed Lens Troffer-Grid	120	Lithonia	25P8-317-A12125-GE101S	35	2	F17W T8		2800	3500K	85+	EIS	10%	0.87	
A3	2'x2' Recessed Lens Troffer-Grid	120	Lithonia	25P8-317-A12125-GE101S	45	3	F17W T8		2800	3500K	85+	EIS	10%	0.87	
K2	LED Pendant Downlight	120	Gotham	EVO-CYL-35/22-6AR-PM	32	---	LED		2200	3500K	---	---	---	---	REFER TO ARCHITECTURAL DRAWINGS FOR MOUNTING HEIGHTS
L	LED Open Downlight	120	Gotham	ICD-35/20-6AR-45-TW	35	---	LED		2000	3500K	85	---	---	---	
LE	Same as type L except with emergency battery pack (E.L.B.)														
M	Heat Lamp	120	Nutone	9412D	250	1	250W BR40		---	---	---	---	---	---	
N	Wall Mounted Cylinder Uplight	120	Portfolio	LCRMB-20-D010-CRMB-83SH20-GLMD-LI	36	---	LED		2000	3500K	---	---	---	---	MOUNT FIXTURE AS AN UPLIGHT.
O	LED Pendant Downlight	120	Gotham	EVO-CYL-35/22-6AR-PM-CRS	32	---	LED		2200	3500K	---	---	---	---	COLOR TO BE SELECTED BY ARCHITECT. REFER TO ARCHITECTURAL DRAWINGS FOR MOUNTING HEIGHTS
S1	Parking Lot LED Area Luminaire 20' Square Straight Steel Pole equal to Lithonia #SSS204C-DW18AS-20B	120	Lithonia	CSKLED4-20B700/40K-SR3-SPA-HS-DDBXD	282	---	LED		---	4000K	---	---	---	---	
X1	Single Face Exit Light	120	Lithonia	LOC-1-R-ELN	1	---	LED		---	---	---	---	---	---	
X2	Double Face Exit Light	120	Lithonia	LOC-2-R-ELN	1	---	LED		---	---	---	---	---	---	

Legend:

EIS - Electronic Instant Start
THD - Total Harmonic Distortion
CRI - Color Rendering Index
PS - Pulse Start
DIM - Dimming Ballast
PMS - Program Rapid Start

Note:

Submit data sheet include lamp data and ballast data along with fixture input wattage. Wattage shall not exceed wattage listed in this schedule.

ELECTRICAL LIGHTING SYMBOLS	
SYMBOL	DESCRIPTION
A2	NEW FLUORESCENT LIGHT FIXTURE, TYPE NOTED
B2	NEW FLUORESCENT LIGHT FIXTURE WITH EMERGENCY BATTERY PACK
B O	NEW COMPACT FLUORESCENT DOWNLIGHT
⊙	NEW WALL MOUNTED EXIT SIGN
⊙	NEW CEILING MOUNTED EXIT SIGN
↔	NEW SPST WALLS SWITCH
↔	NEW 3-WAY WALLS SWITCH
↔	NEW OCCUPANCY SENSOR WALL SWITCH
⊙	NEW CEILING MOUNTED OCCUPANCY SENSOR, TYPE NOTED
⊙	NEW OCCUPANCY SENSOR POWER PACK
→	CIRCUIT RUN TO PANEL
—	NO. OF WIRES: GROUND, HOT, NEUTRAL SHOWN
⊙	3-SPEED FAN CONTROL SWITCH

OCCUPANCY SENSOR SCHEDULE	
SYMBOL	SENSOR TYPE
⊙	WATT STOPPER # CI-305 - PASSIVE INFRARED
⊙	WATT STOPPER # CI-305-1 - PASSIVE INFRARED
⊙	WATT STOPPER # UT-305-3 - ULTRASONIC
⊙	WATT STOPPER #DT-205 - WALL DUAL TECHNOLOGY, MOUNT AT 10' AFF.
⊙	WATT STOPPER # PW-100 - PASSIVE INFRARED
⊙	WATT STOPPER # UW-200 - ULTRASONIC
⊙	WATT STOPPER # BZ-150 - POWER PACK

NOTE: THE SENSOR PLACEMENT ON THE DRAWINGS ARE BASED ON THE COVERAGE PATTERNS OF THE SENSORS LISTED IN THE SCHEDULE. IF DIFFERENT MANUFACTURER OR SENSOR TYPES ARE USED, THE MANUFACTURER SHALL PROVIDE SENSING, PLACEMENT AND COVERAGE EQUAL TO OR BETTER THAN THOSE SHOWN. SUBMIT DRAWINGS SHOWING SENSOR TYPE, COVERAGE AND RECOMMENDED PLACEMENT FOR EACH SPACE RECEIVING A SENSOR. THE RECOMMENDED SENSOR TYPES AND PLACEMENT SHALL BE INCLUDED IN BID WITH NO ADDITIONAL COST TO IMPLEMENT THE MANUFACTURER'S RECOMMENDED LAYOUT.

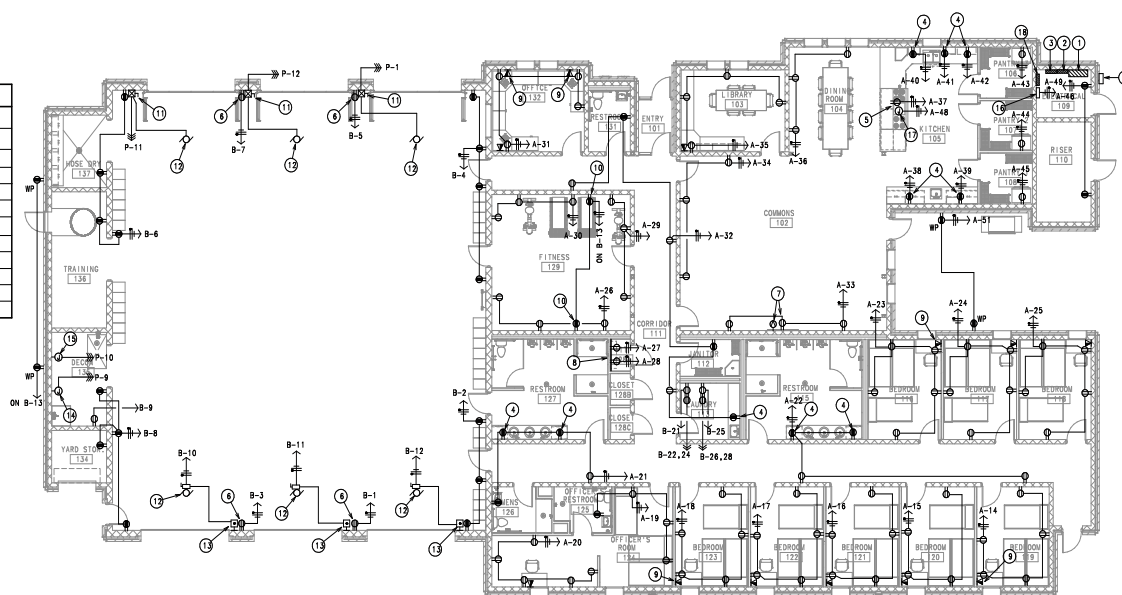
100% CONSTRUCTION DOCUMENTS

SINCLAIR
MIDLAND, TEXAS

02-28-2023	02/28/23	02/28/23	02/28/23
1	04-02-2023	04/02/23	04/02/23
NO.	DATE	DESCRIPTION	
DESIGNED OFFICE:	REVISED:	PROJECT NO. 12004	

LIGHTING FLOOR PLAN

ELECTRICAL POWER SYMBOLS	
SYMBOL	DESCRIPTION
	DUPLEX RECEPTACLE 125V, 20A, 2P, 3W GROUNDED
	GFCI DUPLEX RECEPTACLE
	DISCONNECT SWITCH
	JUNCTION BOX
	CIRCUIT RUN TO PANEL
	ELECTRICAL PANEL
	WEATHERPROOF
	CABLE TV OUTLET
	COMBINATION TELEPHONE/DATA OUTLET
	SPECIAL RECEPTACLE - TYPE NOTED



ELECTRICAL POWER FLOOR PLAN

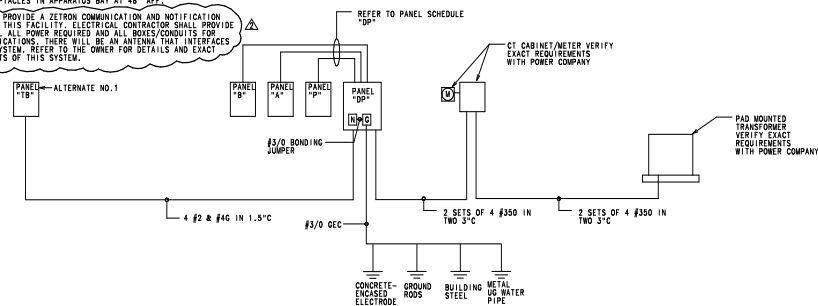


NOTES INDICATED BY "O":

- 1) PANEL. "DP".
- 2) PANEL. "P".
- 3) PANEL. "A".
- 4) MOUNT ABOVE COUNTER.
- 5) RECEPTACLE FOR RANGE, COORDINATE EXACT LOCATION.
- 6) 30A, 125V TWISTLOCK RECEPTACLE. (NEMA LS-30R).
- 7) FOR TV, VERIFY EXACT LOCATION WITH ARCHITECT BEFORE ROUGH-IN.
- 8) 3/4"X4" PAINTED PLYWOOD TELEPHONE BOARD FROM FLOOR TO CEILING.
- 9) FROM EACH TEL/DATA OUTLET, STUD 3/4"C WITH PULLSTROING TO ABOVE ACCESSIBLE CEILING. (TYPE CALL).
- 10) MOUNT IN MECHANICAL ROOM ABOVE.
- 11) MOTOR CONTROLLER WITH STARTER AND DISCONNECT TO BE FURNISHED WITH OVERHEAD DOOR. INSTALLED BY ELECTRICAL CONTRACTOR. COORDINATE EXACT REQUIREMENTS WITH MANUFACTURER'S INSTALLATION DRAWINGS.
- 12) MOTOR FOR OVERHEAD DOOR. COORDINATE EXACT LOCATION AND REQUIREMENTS.
- 13) RAISE/LOWER SWITCH FOR OVERHEAD DOOR.
- 14) JUNCTION BOX FOR EXTRACTOR. COORDINATE EXACT REQUIREMENTS WITH MANUFACTURER'S INSTALLATION DRAWINGS.
- 15) JUNCTION BOX FOR DRYING CABINET. COORDINATE EXACT REQUIREMENTS WITH MANUFACTURER'S INSTALLATION DRAWINGS.
- 16) FIRE ALARM PANEL.
- 17) CONNECT KITCHEN HOOD. COORDINATE EXACT REQUIREMENTS WITH MANUFACTURER'S INSTALLATION DRAWINGS.
- 18) PANEL. "B".
- 19) CABINET/METRIC. VERIFY EXACT REQUIREMENTS WITH CLOSET COMPANY.

GENERAL NOTES:

- 1 FROM EACH DATA OUTLET STUD 3/4" x 1/2" WITH PLAIN STRIP TO ABOVE ACCESSIBLE CEILING. ELECTRICAL CONTRACTOR TO FURNISH BOXES AND CONDUIT, FACILITATES MECHANICAL CONTRACTOR'S SERVER AND FINAL TERMINATIONS TO BE BY OTHERS.
- 2 RUN A SEPARATE NEUTRAL WIRE UNDER EACH CIRCUIT NO SHARED NEUTRALS.
- 3 ALL BOXES, CONDUIT, WIRING AND CONNECTIONS FOR THERMOSTATS AND EQUIPMENT SHALL BE UNDER SECTION 16. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF THERMOSTATS. COORDINATE EXIST REQUIREMENTS WITH MECHANICAL CONTRACTOR.
- 4 MOUNT RECEPTACLES IN APPARATUS BAY AT 48" AFF.
- 5 OWNER WILL PROVIDE A ZETRON COMMUNICATION AND NOTIFICATION SYSTEM FOR THIS FACILITY. ELECTRICAL CONTRACTOR SHALL PROVIDE THE FOLLOWING:
 - a. THE ELECTRICAL CONTRACTOR SHALL PROVIDE THE COMMUNICATIONS; THERE WILL BE AN ANTENNA THAT INTERFACES WITH THE ZETRON SYSTEM. REFER TO OWNER FOR DETAILS AND REQUIREMENTS OF THIS SYSTEM.



ELECTRICAL RISER DIAGRAM
NO SCALE

FIRE STATION 10

100% CONSTRUCTION DOCUMENTS

SINCLAIR
MIDLAND, TEXAS

KEY PLAN

	04-24-2013	ADDENDA #1
1	04-03-2013	100% CD ISSUE
NO	DATE	DESCRIPTION
SUBMIT OFFICE: MFL APP		PROJECT NO.: 13018

POWER
FLOOR PLAN

E-301

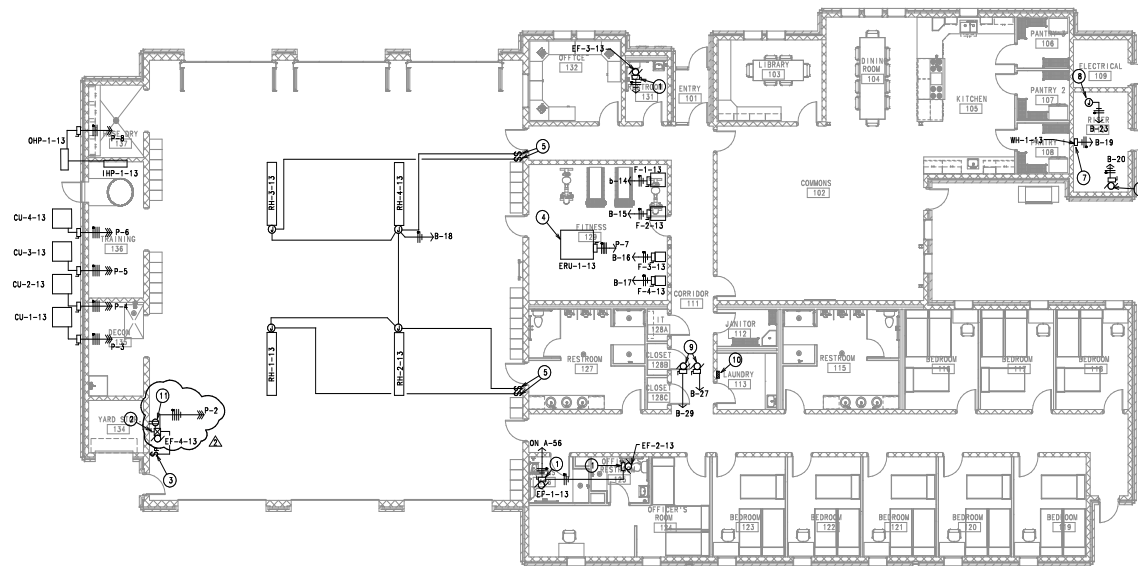
E

D

C

B

A



ELECTRICAL EQUIPMENT CONNECTION FLOOR PLAN

1/8"=1'-0"



GENERAL NOTES:

- 1 RUN A SEPARATE NEUTRAL WIRE WITH EACH CIRCUIT. NO SHARED NEUTRALS.
- 2 ALL BOXES, CONDUIT, WIRING AND CONNECTIONS FOR CONTROLS TO MECHANICAL EQUIPMENT SHALL BE UNDER DIVISION 16. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF THERMOSTATS. COORDINATE EXACT REQUIREMENTS WITH MECHANICAL CONTRACTOR.

NOTES INDICATED BY ○:

- 1 DISCONNECT TO BE FURNISHED WITH FAN. EXHAUST FAN TO BE SWITCHED WITH LIGHTS IN THIS ROOM.
- 2 STARTER/DISCONNECT TO BE FURNISHED WITH FAN. INSTALLED BY ELECTRICAL CONTRACTOR.
- 3 MANUAL SWITCH WITH PILOT LIGHT.
- 4 ERU-1-13 TO RUN CONTINUOUSLY. CONTROL PANEL TO BE FURNISHED WITH THIS UNIT. ELECTRICAL CONTRACTOR TO FURNISH/INSTALL ALL BOXES, CONDUIT AND WIRE FOR CONTROLS TO THE ERU. COORDINATE EXACT REQUIREMENTS WITH MANUFACTURER'S INSTALLATION DRAWINGS. COORDINATE EXACT LOCATION OF CONTROL PANEL.
- 5 SPRINGWOUND TIMER SWITCH EQUAL TO TORK #C502H. INSTALL LABEL ABOVE SWITCH READING "RADIANT HEATER".
- 6 CIRCULATING PUMP. COORDINATE EXACT LOCATION AND REQUIREMENTS.
- 7 COORDINATE EXACT LOCATION.
- 8 PROVIDE POWER TO RD SYSTEM. VERIFY EXACT REQUIREMENTS WITH RD MANUFACTURER.
- 9 DRYER VENT FAN ABOVE CORRIDOR CEILING. REFER TO MECHANICAL DRAWINGS.
- 10 CONTROL PANEL FOR DRYER VENT FANS FURNISHED BY OTHERS. INSTALLED BY ELECTRICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO FURNISH/INSTALL BOX, CONDUIT AND WIRE. REFER TO MANUFACTURER'S INSTALLATION DRAWINGS FOR EXACT REQUIREMENTS.
- 11 DUPLEX RECEPTACLE FOR PLUG-IN TRANSFORMER FOR EXHAUST VENTING SYSTEM. REFER TO MANUFACTURER'S INSTALLATION DRAWINGS FOR EXACT REQUIREMENTS. COORDINATE EXACT LOCATION.



FIRE STATION 10

100% CONSTRUCTION
DOCUMENTSSINCLAIR
MIDLAND, TEXAS

MEP PLAN

NO.	DATE	DESCRIPTION	PROJECT NO.
1	04-02-2013	100% CD ISSUE	10000

MECHANICAL EQUIPMENT
CONNECTION
FLOOR PLAN

PANEL "A"													
CKT	BRKR	WIRE	SERVICES	Continuance VA	Non-Cont VA	SERVICES	WIRE	CKT	BRKR	WIRE	SERVICES	Continuance VA	Non-Cont VA
1	20/1	#12	Corridor	2000	Recept.	Other	Lighting	#12	20/1	2			
3	20/1	#12	Ceiling Fan	800			Lighting	#12	20/1	4			
5	20/1	#12	Lighting	1100			Recept.	#12	20/1	6			
7	20/1	#12	Boys	1100			Boys	#12	20/1	8			
9	20/1	#12	Boys	1100			Boys	#12	20/1	10			
11	20/1	#12	Boys	1100			Lighting	#12	20/1	12			
13	20/1	#12	Exit Lights	200			Exterior Lighting	#12	20/1	14			
15	20/1	#12	120	900	118			#12	20/1	16			
17	20/1	#12	120	900	121			#12	20/1	18			
19	20/1	#12	124, 125	900	123			#12	20/1	20			
21	20/1	#12	126, 127	900	124			#12	20/1	22			
23	20/1	#12	116	900	115			#12	20/1	24			
25	20/1	#12	118	900	117			#12	20/1	26			
27	20/1	#12	128	900	128			#12	20/1	28			
29	20/1	#12	129	900	128			#12	20/1	30			
31	20/1	#12	130	900	129			#12	20/1	32			
33	20/1	#12	102	900	111, 131, 119, 113			#12	20/1	34			
35	20/1	#12	103	900	102			#12	20/1	36			
37	20/1	#12	Range	900	104			#12	20/1	38			
39	20/1	#12	105	900	105			#12	20/1	40			
41	20/1	#12	105	900	105			#12	20/1	42			
43	20/1	#12	106	900	107			#12	20/1	44			
45	20/1	#12	108	900	107			#12	20/1	46			
47	20/1	#12	Lighting	1710	109, 110			#12	20/1	48			
49	20/1	#12	Fire Alarm	200	1200	Head		#12	20/1	50			
51	20/1	#12	Pella	300	1400	Lighting		#12	20/1	52			
53	20/1	—	Space			Space		—	20/1	54			
55	20/1	—	Space			Space		—	20/1	56			
57	20/1	#12	131	132	160	135, 126		#12	20/1	58			
59	20/1	—	Space	81	1500	Heat Lamp		#12	20/1	60			
61	20/1	—	Space			Space		—	20/1	62			
63	20/1	—	Space			Space		—	20/1	64			
65	20/1	—	Space			Space		—	20/1	66			
67	20/1	—	Space			Space		—	20/1	68			
69	20/1	—	Space			Space		—	20/1	70			
71	20/1	—	Space			Space		—	20/1	72			
73	20/1	—	Space Only			Space Only		—	20/1	74			
75	20/1	—	Space Only			Space Only		—	20/1	76			
77	20/1	—	Space Only			Space Only		—	20/1	78			
79	20/1	—	Space Only			Space Only		—	20/1	80			
81	20/1	—	Space Only			Space Only		—	20/1	82			
83	20/1	—	Space Only			Space Only		—	20/1	84			
SERVICE: 120/208 Volt, 3 Phase, 4 Wire & Grd				14543	240	16740	14800	PANEL CONNECTED VA					
MAIN: 225A MLO				14543	240	16740	14800	PANEL DEMAND VA					
MOUNTING: Surface								PANEL CALCULATED VA					
Avail. Fault Current (RMS Sym. Amp) = 20K								PANEL DEMAND VA					
Notes:								PANEL CALCULATED VA					
(1) Copper Bussing								PANEL DEMAND VA					
(2) Hinged Door								PANEL CALCULATED VA					
# Active 33								PANEL DEMAND VA					
# Space 19								PANEL CALCULATED VA					
Av. Load/Ckt. VA								PANEL DEMAND VA					
Amps								PANEL CALCULATED VA					
870								PANEL DEMAND VA					

PANEL "B"													
CKT	BRKR	WIRE	SERVICES	Continuance VA	Non-Cont VA	SERVICES	WIRE	CKT	BRKR	WIRE	SERVICES	Continuance VA	Non-Cont VA
1	20/1	#10	133	950	2000	133	#12	20/1	2				
3	20/1	#10	133	950	2000	133	#12	20/1	4				
5	20/1	#10	133	950	2000	133	#12	20/1	6				
7	20/1	#10	133	950	2000	133	#12	20/1	8				
9	20/1	#10	133	950	2000	133	#12	20/1	10				
11	20/1	#10	133	950	2000	133	#12	20/1	12				
13	20/1	#10	133	950	2000	133	#12	20/1	14				
15	20/1	#10	133	950	2000	133	#12	20/1	16				
17	20/1	#10	133	950	2000	133	#12	20/1	18				
19	20/1	#10	133	950	2000	133	#12	20/1	20				
21	20/1	#10	133	950	2000	133	#12	20/1	22				
23	20/1	#10	133	950	2000	133	#12	20/1	24				
25	20/1	#10	133	950	2000	133	#12	20/1	26				
27	20/1	#10	133	950	2000	133	#12	20/1	28				
29	20/1	#10	133	950	2000	133	#12	20/1	30				
31	20/1	#10	133	950	2000	133	#12	20/1	32				
33	20/1	#10	133	950	2000	133	#12	20/1	34				
35	20/1	#10	133	950	2000	133	#12	20/1	36				
37	20/1	#10	133	950	2000	133	#12	20/1	38				
39	20/1	#10	133	950	2000	133	#12	20/1	40				
41	20/1	#10	133	950	2000	133	#12	20/1	42				
SERVICE: 120/208 Volt, 3 Phase, 4 Wire & Grd				3420	29508	3420	29508	PANEL CONNECTED VA					
MAIN: 225A MLO				3420	29508	3420	29508	PANEL DEMAND VA					
MOUNTING: Surface								PANEL CALCULATED VA					
Avail. Fault Current (RMS Sym. Amp) = 20K								PANEL DEMAND VA					
Notes:								PANEL CALCULATED VA					
(1) Copper Bussing								PANEL DEMAND VA					
(2) Hinged Door								PANEL CALCULATED VA					
# Active 33								PANEL DEMAND VA					
# Space 19								PANEL CALCULATED VA					
Av. Load/Ckt. VA								PANEL DEMAND VA					
Amps								PANEL CALCULATED VA					
1435								PANEL DEMAND VA					

PANEL "P"													
CKT	SERVICES	Ckt. VA		CONDUCTORS / CONDUIT	Continuance VA			Non-Continuance VA			Total		
		Trips	Polys		Line	Load	Line	Load	Line	Load			
1	Overhead Door	20	3	3 #12 & #126 in 3/4" C				4,900		4,900			
2	EC-4-13	40	3	3 #8 & #106 in 1" C				1,800		1,800			
3	CU-1-13	35	3	3 #8 & #106 in 3/4" C				1,800		1,800			
4	CU-2-13	35	3	3 #10 & #106 in 3/4" C				4,900		4,900			
5	CU-3-13	25	3	3 #10 & #106 in 3/4" C				4,900		4,900			
6	CU-4-13	25	3	3 #10 & #106 in 3/4" C				4,900		4,900			
7	ENB-1-13	15	3	3 #12 & #126 in 3/4" C				4,900		4,900			
8	IMP/20P-1-13	25	2	2 #10 & #106 in 3/4" C				2,744		2,744			
9	Extractor	15	3	3 #12 & #126 in 3/4" C				2,700		2,700			
10	Drinking Cabinet	35	3	3 #8 & #106 in 3/4" C				12,000		12,000			
11	Overhead Door	20	3	3 #10 & #106 in 3/4" C				4,900		4,900			
12	Overhead Door	20	3	3 #10 & #106 in 3/4" C				4,900		4,900			
13	Space Only												
Notes Only													
SERVICE: 120/208 volt, 3 phase, 4 wire + G													
WARNING: 225A MLO													
MOUNTING: Surface													
Avail. Fault Current (RMS Sym.) = 20K													
PANEL CONNECTED VA													
PANEL DEMAND VA													
PANEL CALCULATED VA													
PANEL SHARE VA													
PANEL DESIGN VA													
PANEL CONNECTED AMPS / PHASE													
PANEL DEMAND AMPS / PHASE													
PANEL DESIGN AMPS / PHASE													



ADDENDUM NO: 02

TO: ALL PLANHOLDERS

FROM: PARKHILL, SMITH & COOPER, INC.

PROJECT NAME: MIDLAND FIRE STAION NO 10

PROJECT NO.: 03.8686.12

DATE: May 1, 2013



5/1/13

Attention of all Prospective Bidders/Plan Holders is directed to the following modifications to the referenced Drawings and Project Manual. This Addendum becomes a part of the Contract Documents and modifies the original Bidding Documents dated as noted below:

This Addendum consists of 2 pages, Section 03533, Fire Station 10 Prior Approval Arcadia.pdf, and the attached drawings nos. C-102-8686.pdf, C-502-8686.pdf, S101ADD02.pdf, S102ADD02.pdf, S504ADD02.pdf, A-101_8686.pdf, A-305_8686.pdf, A-401_8686.pdf, A-601_8686.pdf, sign in sheet from Pre-Bid Meeting.

I. CHANGES TO PROJECT MANUAL:

- A. SECTION 03533 – POLISHED CONCRETE FLOOR FINISHING
 - 1. Add section in its entirety.
- B. SECTION 07272 FLUID-APPLIED MEMBRANE AIR BARRIERS
 - 1. Paragraph 2.3.A.1.a – ADD subparagraph 11) as noted below:
“11) BASF-Enershield is an acceptable product.”
- C. SECTION 08410 ALUMINUM ENTRANCES AND STOREFRONTS
 - 1. Paragraph 2.1.A – ADD subparagraph 5. as noted below:
“5. Arcadia Inc. is acceptable. Request for substitution is approved.”
- D. SECTION 09300 TILE
 - 1. Paragraph 2.1.A – DELETE paragraph 3. In its entirety. Omit Tile Type CT-3

\\Data1\Projects\2012\8686.12\BID-PROPOSAL PHASE\Addendum No 02\Addendum No. 2.docm

II. CHANGES TO DRAWINGS:

A. SHEET C-102 and C-502

1. Add 2' wide concrete valley in swale as shown on sheets C102 and C502. Eliminate an equal amount of inorganic rock mulch.

B. SHEET L-102

1. Clarification – The 1" Trail Mix rock Mulch, 6"-8" Rock Mulch and Trail Mix screenings are from Desert Rock Company 915.859.5969 or approved equal

C. SHEET S-101

1. Showed Column and Footing at grid B4 and added footing F7 on Column and Footing Schedule

D. SHEET S-102

1. Showed platform at 3rd floor training room and the diagram for Special SPK steel joists.

E. SHEET S-504

1. Added detail C5 for 3rd floor training room platform.

F. SHEET A-101

1. Refer to revisions on attached drawings.

G. SHEET A-305

1. Refer to revisions on attached drawings.

H. SHEET A-401

1. Refer to revisions on attached drawings.

I. SHEET A-601

1. Refer to revisions on attached drawings.

J. SHEET E-101

1. Change note No. 4 to read "Stub out and cap 1 1/2"C under base bid. Panel "TB" and conductors to be under alternate No. 1."
2. Change note No. 6 to read "Stub out cap 1"C with pull string under base bid for telephone."

K. SHEET E-201

1. Ceiling fans to be equal to Hunter Model #23866

L. SHEET E-401

1. Add general note to read "Paging speakers and cables to be furnished and installed by owner. Boxes and conduit to be furnished and installed by electrical contractor. Coordinate exact requirements with owner."

IV. GENERAL/CLARIFICATIONS:

1. Is any manufacturer for the fire alarm system acceptable?

Answer: The fire alarm system is open to any manufacturer's fire alarm system that meets the specification requirements.

2. Is there a permit cost and landfill fees?

Answer: Yes, the city will require fees for each of these.

3. When will the board meeting be held for approval?

Answer: We are hoping it will make it on the May 25th agenda but it could get pushed to the June Board meeting date.

4. Will Certified Payroll be required?

Answer: Yes

5. See attached sign in sheet from the Pre-Bid Meeting.

6. For Finish Schedule see sheet AI100 from the Bid Set.

7. No Cove base required for the tile walls.

8. The tile on the kitchen backsplash is the red tile.

END OF ADDENDUM NO 2

SECTION 03533

POLISHED CONCRETE FLOOR FINISHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Products and procedures for placement, finishing, and polishing cast-in-place concrete floors.

1.2 SUBMITTALS

- A. Product Data: Manufacturer's technical literature for each product indicated, specified, or required. Include manufacturer's technical data, application instructions, and recommendations.
- B. Samples for Initial Selections:
 - 1. Aggregates: Labeled, sealed plastic bags with one pound of each aggregate in concrete mix.
 - 2. Integral Color Pigment: Full range of available standard manufacturers samples of actual products showing colors.
- C. Samples for Verification: Submit 12 inch square samples of polished finish in each color, texture, and pattern specified; include not less than 3 in each sample set showing limits of variations expected for each color, texture, and pattern specified. Resubmit samples until approved.
- D. Maintenance Data: For inclusion in operation and maintenance manual required by Division 01. Include manufacturer's instructions for maintenance of installed work, including methods and frequency recommended for maintaining optimum condition under anticipated use. Include precautions against cleaning products and methods which may be detrimental to polished finishes and performance.

1.3 QUALITY ASSURANCE

- A. Concrete Producer Qualifications: Firm experienced in manufacturing ready-mixed concrete products and that complies with following requirements for production facilities and equipment:
 - 1. ASTM C 94.
 - 2. NRMCA's Certification of Ready Mixed Concrete Production Facilities.
- B. Polisher Qualifications:
 - 1. Experience: Company with not less than 5 years experience in performing specified work similar in design, products, and extent to scope of this Project; with a record of successful in-service performance; and with sufficient production capability, facilities, and personnel to produce required Work.
 - 2. Supervision: Maintain competent supervisor who is at Project during times specified Work is in progress, and, who is experienced in installing systems similar to type and scope required for Project.
- C. Static Coefficient of Friction: Products and polishing operations shall achieve following as determined by quality control testing according to NFSI 101-A:
 - 1. Level Floor Surfaces: Minimum 0.6.
 - 2. Sloping Floor Surfaces: Minimum 0.8.

-
- D. Field Mock-up for Aesthetic Purposes: Before performing work of this Section, provide as many field samples as required to verify selections made under submittals and to demonstrate aesthetic effects of polished finish. Approval does not constitute approval of deviations from Contract Documents, unless such deviations are specifically approved by Architect in writing.
1. Polish 10 ft square floor area for each polished finish type.
 2. Use same personnel, including supervisors, which will perform work.
 3. Install products and materials according to specified requirements.
 4. Work shall be representative of those to be expected for work.
 5. Show maximum variation that will exist in work.
 6. Approval is for following aesthetic qualities:
 - a. Compliance with approved submittals.
 - b. Uniformity of exposed aggregate.
 - c. Uniformity of sheen.
 7. Obtain Architect's approval before starting work on Project.
 8. Protect approved field mock-ups from elements with weather resistant covering.
 9. Maintain field mock-ups during construction in an undisturbed condition as a standard for judging completed Work.
 10. Do not demolish, alter, or remove field mock-ups until acceptable to Owner and Architect.
 11. When directed, demolish and remove field mock-ups from Project.
- E. Pre-Installation Conference: Prior to placing concrete for areas scheduled for polished concrete floor finish, conduct conference at Project to comply with requirements of applicable Division 01 Sections.
1. Required Attendees:
 - a. Owner.
 - b. Architect.
 - c. Contractor, including supervisor.
 - d. Polisher, including supervisor.
 - e. Concrete producer.
 - f. Concrete finisher, including supervisor.
 2. Minimum Agenda: Polisher shall demonstrate understanding of work required by reviewing and discussing procedures for, but not limited to, following:
 - a. Tour mock-up and representative areas of required work, discuss and evaluate for compliance with Contract Documents, including substrate conditions, surface preparations, sequence of installation and other preparatory Work performed by other installers.
 - b. Review Contract Document requirements.
 - c. Review approved submittals.
 - d. Review installation procedures, including, but not limited to:
 - 1) Concrete placement, finishing, and preparation for polished finish.
 - 2) Concrete curing.
 - 3) Application of polishing products.
 - 4) Grinding and polishing operations.
 3. Reports: Record discussions, including decisions and agreements reached, and furnish copy of record to each party attending.

1.4 PROJECT CONDITIONS

- A. Damage and Stain Prevention: Take precautions to prevent damage and staining of concrete surfaces to be polished.

-
1. Prohibit following over concrete surfaces to be polished:
 - a. Vehicle parking.
 - b. Pipe cutting operations.
 - c. Ferrous metals storage.
 2. Protect concrete surfaces to be polished from following:
 - a. Petroleum, oil, hydraulic fluid, or other liquid dripping from equipment.
 - b. Acids and acidic detergents.
 - c. Painting activities.
- B. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting polishing operations.

PART 2 - PRODUCTS

2.1 MANUFACTURER AND PRODUCTS

- A. Available Manufacturers and Products: Subject to compliance with requirements of Contract Documents, manufacturers offering products that may be incorporated into Work include, but are not limited to, those listed alphabetically below.
- B. Basis of Design: Contract Documents are based on products by American Concrete Technologies, Inc. (2242 Forest Park Blvd., Fort Worth, Texas 76110, 817-927-1980, fax 817-926-5024, www.diamondpolish.com) to establish a standard of quality. Other available products having equivalent characteristics may be considered, provided deviations are minor and does not change concept expressed in Contract Documents as judged by Architect.

2.2 CONCRETE MATERIALS

- A. Cementitious Materials: As specified in appropriate Division 03 Section.
- B. Normal-Weight Aggregates:
 1. Description – (2N) Interior Applications; Climates where polished finish will rarely be exposed to freezing and thawing, or exposed to deicing and aggressive chemicals.
 - a. ASTM C 33, Class 2N.
 - b. Selected, hard, and durable gravel; free of material that reacts with cement or causes staining.
 - c. Uniformly or gap graded to match approved sample.
 - d. From single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
 2. Large Aggregate: 3/4 inch nominal.
 3. Pea Gravel Aggregate: 3/8 inch nominal.
 4. Fine Aggregate:
 - a. Type: Fine sand.
 - b. Color: Match approved sample.
- C. Water: ASTM C 94 and potable.
- D. Admixtures: As specified in appropriate Division 03 Section.

2.3 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd.

2.4 APPLIED PRODUCTS

- A. Liquid Densifier:
 - 1. Description: Odorless, non-hazardous, potassium silicate that penetrates concrete to react with free lime and calcium hydroxide to produce permanent chemical reaction that hardens, densifies and tightens concrete surface.
 - 2. Basis of Design: American Concrete Technologies, Inc.; Everhard®.
- B. Patching Compound:
 - 1. Description: Compound composed of 40 percent portland cement, 45 percent limestone, and 15 percent vinyl acetate copolymer, when mixed with dust salvaged from grinding process forms a paste that hardens when surface imperfections are filled.
 - 2. Basis of Design: American Concrete Technologies, Inc.; Durafil™.
- C. Grout Material:
 - 1. Description: Clear modified silicate sealant, containing no pore clogging latex, when mixed with dust salvaged from grinding process forms a paste that reacts with calcium hydroxide in concrete that hardens when surface imperfections are filled.
 - 2. Basis of Design: American Concrete Technologies, Inc.; Filzit™ Surfacing System.
- D. Polish Guard:
 - 1. Description: Non-film forming, stain resistant, food resistant, chemical stain resistant, impregnating sealant designed to be used on concrete surfaces previously densified.
 - 2. Basis of Design: American Concrete Technologies, Inc.; Resistall®.
- E. Protective Cover:
 - 1. Description: Non-woven, puncture and tear resistant, polypropylene fibers laminated with a multi-ply, textured membrane, not less than 18 mils in thickness.
 - 2. Basis of Design: American Concrete Technologies, Inc.; CreteClad™.

2.5 POLISHING EQUIPMENT

- A. Field Grinding and Polishing Equipment:
 - 1. Variable speed, 3 or 4 head counter-rotating, walk-behind machine with not less than 600 lbs of down pressure on grinding or polishing pads.
 - 2. Dust extraction equipment with flow rate suitable for dust generated, with pre-separator and squeegee attachments.
- B. Edge Grinding and Polishing Equipment: Hand-held or single head walk-behind machines which produces same results, without noticeable differences, as field grinding and polishing equipment.
- C. Burnishing Equipment: Single head high speed walk-behind machines.
- D. Grinding Pads: Metal bonded pads with embedded industrial grade diamonds of varying grits fabricated for mounting on equipment.
- E. Polishing Pads: Resin bonded pads with embedded industrial grade diamonds of varying grits fabricated for mounting on equipment.
- F. Burnishing Pads: Maintenance pads coated with embedded industrial grade diamonds for use with burnishing equipment.

2.6 CONCRETE MIX DESIGN

- A. Material Quality Standards: Mix designs for each type and strength of concrete used for floors will be prepared as specified in appropriate Division 03 Section, with following qualifications:
 - 1. Slump Limit: 4 inches, plus or minus 1 inch.

-
2. Maximum Water-Cement Ratio: 0.45.
 3. Air Content: No permitted.
 4. Admixtures: Calcium chloride based compounds not permitted.

PART 3 - EXECUTION

3.1 ACCEPTABLE POLISHERS

- A. Basis of Design: Contract Documents are based on polishing operations by American Concrete Technologies, Inc. (2242 Forest Park Blvd., Fort Worth, Texas 76110, 817-927-1980, fax 817-926-5024, www.diamondpolish.com) to establish a standard of quality. Other polishers with products and polishing capabilities having equivalent characteristics may be considered, provided deviations are minor and does not change concept expressed in Contract Documents as judged by Architect.

3.2 EXAMINATION

- A. Acceptance of Surfaces and Conditions: Examine substrates to be polished for compliance with requirements and other conditions affecting performance. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents. Starting Work within a particular area will be construed as acceptance of surface conditions.

3.3 PREPARATION

- A. Cleaning New Concrete Surfaces: Prepare and clean concrete surfaces. Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, paint splatter, and other contaminants incompatible with polished concrete floor finish.

3.4 PLACING AND FINISHING CONCRETE FOR FLOORS

- A. General: Comply with appropriate Division 03 Section.
- B. Hot and Cold Weather Placement: As specified in appropriate Division 03 Section.
- C. Placement: Deposit and consolidate concrete in continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 2. Screed slab surfaces with a straightedge and strike off to correct elevations.
 3. After screeding, consolidating and leveling, do not work surface until ready for floating.
- D. Float Finishing:
 1. Begin floating operations when water sheen has disappeared, and/or when concrete has stiffened sufficiently to permit proper operation of power-driven equipment.
 2. Consolidate surface with power-driven troweling using steel float pans.
 3. Hand float with wood or cork faced floats in locations inaccessible to power-driven machine.
 4. Level surface using 10 foot highway straightedge.
 5. Cut down high spots and fill low spots to produce planes checking true under straightedge in any direction.

-
- 6. Bring surface to uniform, smooth, granular texture with power-driven troweling using steel float pans.
 - E. Decorative Aggregate: Uniformly broadcast by hand to match approved mock-up.
 - F. Floor Flatness: F(F) 40 according to ASTM E 1155.
 - G. Joints: Saw cut or tool joints to match approved mock-up.
 - 1. Refer to drawings for saw cut joint locations.
 - H. Moisture Curing:
 - 1. Immediately begin after floating.
 - 2. Keep concrete surface continuously wet by covering with absorptive cover or by using continuous water-fog spray.
 - 3. Cover concrete surface with absorptive cover with 4 inch lap over adjacent absorptive covers.
 - 4. Thoroughly saturate cover with water and keep continuously wet.

3.5 CONCRETE POLISHING

- A. Initial Grinding:
 - 1. Use grinding equipment and low grit grinding pads.
 - 2. Grind concrete to specified aggregate exposure imparting uniform scratch pattern in concrete.
 - 3. Vacuum floor using squeegee vacuum attachment.
- B. Level of Grinding:
 - 1. Description: Minimally grind concrete without removing the cement cream leaving surface of uniform color matching approved mock-up.
 - 2. Basis of Design: American Concrete Technologies, Inc.; Luxcrete Basic.
- C. Level of Grinding:
 - 1. Description: Fine aggregate intentionally exposed to create a salt and pepper appearance matching approved mock-up.
 - 2. Basis of Design: American Concrete Technologies, Inc.; Luxcrete.
- D. Level of Grinding:
 - 1. Description: Large aggregate and/or pea gravel aggregate intentionally exposed matching approved mock-up.
 - 2. Basis of Design: American Concrete Technologies, Inc.; Luxcrete Plus.
- E. Treating Surface Imperfections:
 - 1. Mix patching compound and grout material with dust created by grinding operations to match color of adjacent concrete surface.
 - 2. Fill surface imperfections including, but not limited to, holes, surface damage, small and micro cracks, air holes, pop-outs, and voids.
 - 3. Work compound and treatment until color differences between concrete surface and filled surface imperfections are not noticeable.
- F. Applying Liquid Densifier: Apply undiluted to point of rejection, remove excess liquid, and allow to cure.
- G. Grout Grinding:
 - 1. Use grinding equipment and appropriate grit grinding pads.
 - 2. While applying fresh grout material prior to, grind concrete in direction perpendicular to initial grinding to remove scratches.
 - 3. Vacuum floor using squeegee vacuum attachment.
- H. Additional Grinding:
 - 1. Use grinding equipment and increasing finer grit grinding pads.
 - 2. Grind concrete in as many passes necessary with each pass perpendicular to previous pass to remove scratches.

-
- 3. Vacuum floor using squeegee vacuum attachment.
 - I. Polishing:
 - 1. Use polishing equipment and increasing finer grit polishing pads.
 - 2. Polish concrete in as many passes necessary with each pass perpendicular to previous pass to remove scratches.
 - 3. Vacuum floor using squeegee vacuum attachment.
 - J. Applying Polish Guard: Uniformly apply and remove excessive liquid.
 - K. Applying Final Polish: Using burnishing equipment and finest grit burnishing pads, burnish to uniform sheen matching approved mock-up.
 - L. Final Polished Sheen: Uniform satin sheen using 800 grit polishing heads.
 - M. Final Polished Sheen: Uniform semi-gloss sheen using 1500 grit polishing heads.
 - N. Final Polished Sheen: Uniform gloss sheen using 3000 grit polishing heads.

3.6 FIELD QUALITY CONTROL

3.7 PROTECTION

- A. Covering: Protect polished finish work from subsequent construction with protective covering.

END OF SECTION



SUBSTITUTION REQUEST (During the Bidding Phase)

Project: New Fire Station #10, Midland, TX

Substitution Request Number: For Architect to fill in

From: Arcadia Inc. - Nancy M. Lomax

To: Chris Upton - Parkhill Smith & Cooper, Inc.

Date: 4/29/13

Re: Substitution Request - Storefront

A/E Project Number: _____

Contract For: Aluminum Entrances and Storefront

Specification Title: Aluminum Entrances and Storefronts

Description: Non-Thermal 2x4 1/2" Storefront

Section: 08410

Page: 3

Article/Paragraph: 2.3.A

Proposed Substitution: Arcadia's AG 451

Manufacturer: Arcadia Inc.

Address: 4705 McLeod Rd NE, ABQ, NM

Phone: (505) 341-4222

Trade Name: 2 x 4 1/2" center glazed non-thermally broken storefront

Model No.: AG 451

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: Nancy M. Lomax, RA, NCARB, AIA, CSI

Signed by: _____

Firm: Arcadia Inc.

Address: 4705 McLeod Rd NE, Albuquerque, NM 87106

Telephone: (505) 341-4222

A/E's REVIEW AND ACTION

- ☐ Substitution approved - Make submittals in accordance with Specification Section 01330.
- ☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
- ☐ Substitution rejected - Use specified materials.
- ☐ Substitution Request received too late - Use specified materials.

Signed by: _____

Date: _____

Supporting Data Attached:

☐ Drawings

☐ Product Data

☐ Samples

☐ Tests

☐ Reports

☐ _____



Product Comparison Chart

AG-451 SERIES by Arcadia vs. TRIFAB VG451
SERIES by Kawneer

<u>Line by Line Comparison</u>	<u>Arcadia AG-451</u>	<u>Kawneer TRIFAB VG451</u>
Profile	2 x 4 ½"	2" x 4 ½"
Material Aluminum (Domestic)	6063 T6	6063 T6
Glazing (Front Plane)	1" or ¼" with pocket reducer	1" or ¼"
Gasket	EPDM	EPDM
Air Infiltration	0.06 cfm/sf	0.06 cfm/sf
Water Penetration (ASTME 331)	10psf	10psf
Uniform Load	ASTM E 330	ASTM E 330
CRF Testing	Yes	Yes
NFRC Rated	Yes	Yes
Seismic Testing	Yes	Yes
Finish	70% PVDF	70% PVDF
Finish	Anodized Class 1	Anodized Class 1
Recycled Content	Yes	Yes
Acoustic Rating	Yes	Yes
Integrated Custom Sunshade Horizontal/Vertical	Yes	Yes
Plant Location	Albuquerque, NM	Visalia, CA
Year Established	1903	1908



Product Standards and Guide Specifications

AG451 SERIES, 2" X 4½" CENTER GLAZED SYSTEM FOR 1" GLASS

1995 CSI SECTION 08411 Aluminum-Framed Storefront 2004 CSI SECTION 08 41 13 Aluminum-Framed Entrance and Storefront (Window Walls/Ribbon Walls)

Part 1 – General

1.01 Summary

A. Section includes:

1. Aluminum-Framed Storefront.

- a. Arcadia, Inc., AG451 Series, 2" x 4½" Non-Thermal; center glazed, screw spline, shear block, compensating stick or punched opening fabrication for 1" glass.

B. Related Sections:

1.02 References

- A. American Architectural Manufacturers Association (AAMA)
- B. American Society for Testing and Materials (ASTM)
- C. Aluminum Association (AA)

1.03 System Description

A. General: In addition to requirements shown or specified, comply with:

1. Applicable provisions of AAMA Aluminum Storefront and Entrance Manual for design, materials, fabrication and installation of component parts.

B. Design Requirements: Arcadia AG451 Series is a framing system suitable for outside or inside glazing.

C. Performance Requirements:

1. Limit air leakage through assembly to 0.06 CFM/min/sq. ft. (0.0003 m³/sm²) of wall area at 6.24 PSF (300 Pa) as measured in accordance with ASTM E283.
2. Water Resistance: No water leakage when measured in accordance with ASTM E331 with a static test pressure of 10 PSF (480 Pa).
3. Dynamic Water Resistance: No water leakage, when measured in accordance with AAMA 501.1-94 with a dynamic test pressure of 10 PSF (480 Pa).
4. Limit mullion windload deflection of L/175 with full recovery of glazing materials, when measured in accordance with ASTM E 330.
5. System shall not deflect more than 1/8" at the center point, or 1/16" at the center point of a horizontal member, once deadload points have been established.
6. System shall accommodate expansion and contraction movement due to surface temperature differential of 180 degrees F.
7. Seismic testing shall conform to AAMA recommended static test method for evaluating performance of curtain walls and storefront wall systems due to horizontal displacements associated with seismic movements and building sway.

1.04 Quality Assurance

A. Single Source Responsibility:

1. Obtain entrances, storefronts, ribbon walls, window walls, curtain walls, window systems, and finish through one source from a single manufacturer.

B. Provide test reports from AAMA accredited laboratories certifying the performances as specified in 1.03.

1.05 Warranty

A. System shall be warranted against failure and/or deterioration of metals due to manufacturing process for a period of two (2) years

Part 2 – Products

2.01 Manufacturers

A. Acceptable Manufacturers:

1. Arcadia, Inc., 2301 E Vernon, Vernon, CA.
Telephone 323/269-7300, Fax 323/269-7390.

B. Acceptable Products:

1. Arcadia, Inc., AG451 Series.

2.02 Framing Materials and Accessories

A. Framing members, transition members, mullions, adaptors, and mounting: Extruded 6063-T6 aluminum alloy (ASTM B221 – Alloy G.S. 10a T6).

B. Screws, fastening devices, and internal components:

Aluminum, stainless steel, or zinc-plated steel in accordance with ASTM A-164. Perimeter anchors shall be aluminum or steel, providing the steel is properly isolated from aluminum.

C. Glazing Gasket

1. Compression-type design, replaceable, molded or extruded santoprene, polyvinyl chloride (PVC), or ethylene propylene diene monomer (EPDM).
2. Shall be of type that locks securely into the glazing reglet to prevent glazing gaskets from disengaging.

2.03 Finish

A. Finish all exposed areas of aluminum and components as indicated.

1. An Architectural Class II or I color anodic coating conforming with AA-M12C22A34/AA-M12C22A44.

- a. Anodized finish color shall be Colornodic _____ (AB1 Light Champagne, AB2 Champagne, AB3 Light Bronze, AB4 Medium Bronze, AB5 Standard Medium Bronze, AB6 Dark Bronze, AB7 Standard Dark Bronze, AB8 Black, AG2 Gold.)

- (or) 1. An Architectural Class II or I anodic coating conforming with AA-M12C22A31/AA-M12C22A41.

- a. Anodize finish color shall be Colornodic _____ (#11 Clear)

- (or) 1. Fluorocarbon Coating: AAMA 2605.2.

- b. Resin: 70% PVDF Kynar 500/Hylar 5000.

- c. Substrate: cleaned and pretreated with chromium phosphate.

- d. Primer: Manufacturer's standard resin base compatible coating. Dry film thickness.

- (a) Extrusion: Minimum 0.20 mil.

- e. Color Coat: 70% PVDF, dry film thickness.

- (a) Extrusion: 1.0 mil.

- f. Color: As selected by Architect.

- g. Acceptable Coatings Manufacturers:

- (a) PPG Industries, Inc.
- (b) Valspar Corporation
- (c) BASF

2.04 System Fabrication

A. Continuous sub-sill shall be provided under sill members to collect water infiltration and divert from the interior of the system.

B. Framing members shall be internally reinforced and secured at head and sill as necessary for structural performance requirements, for hardware attachment, and as indicated.

C. Fasteners shall be so located as to ensure concealment from view in the final assembly.

Part 3 – Execution

3.01 Examinations

A. Examine conditions and verify substrate conditions are acceptable for product installation.

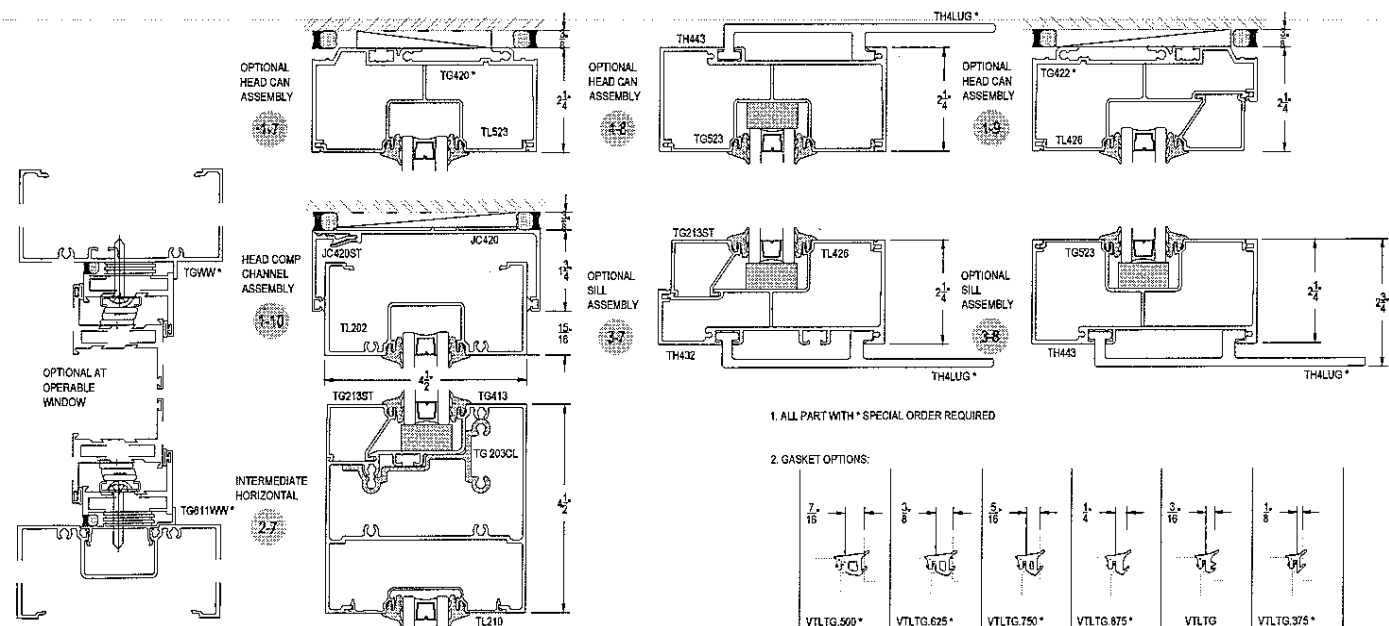
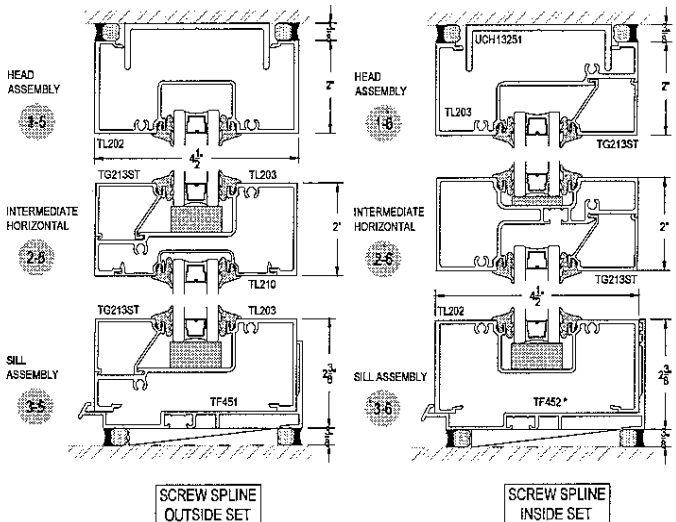
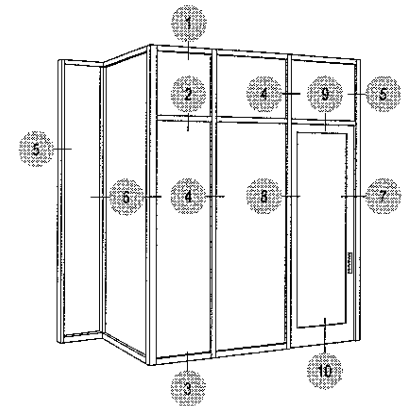
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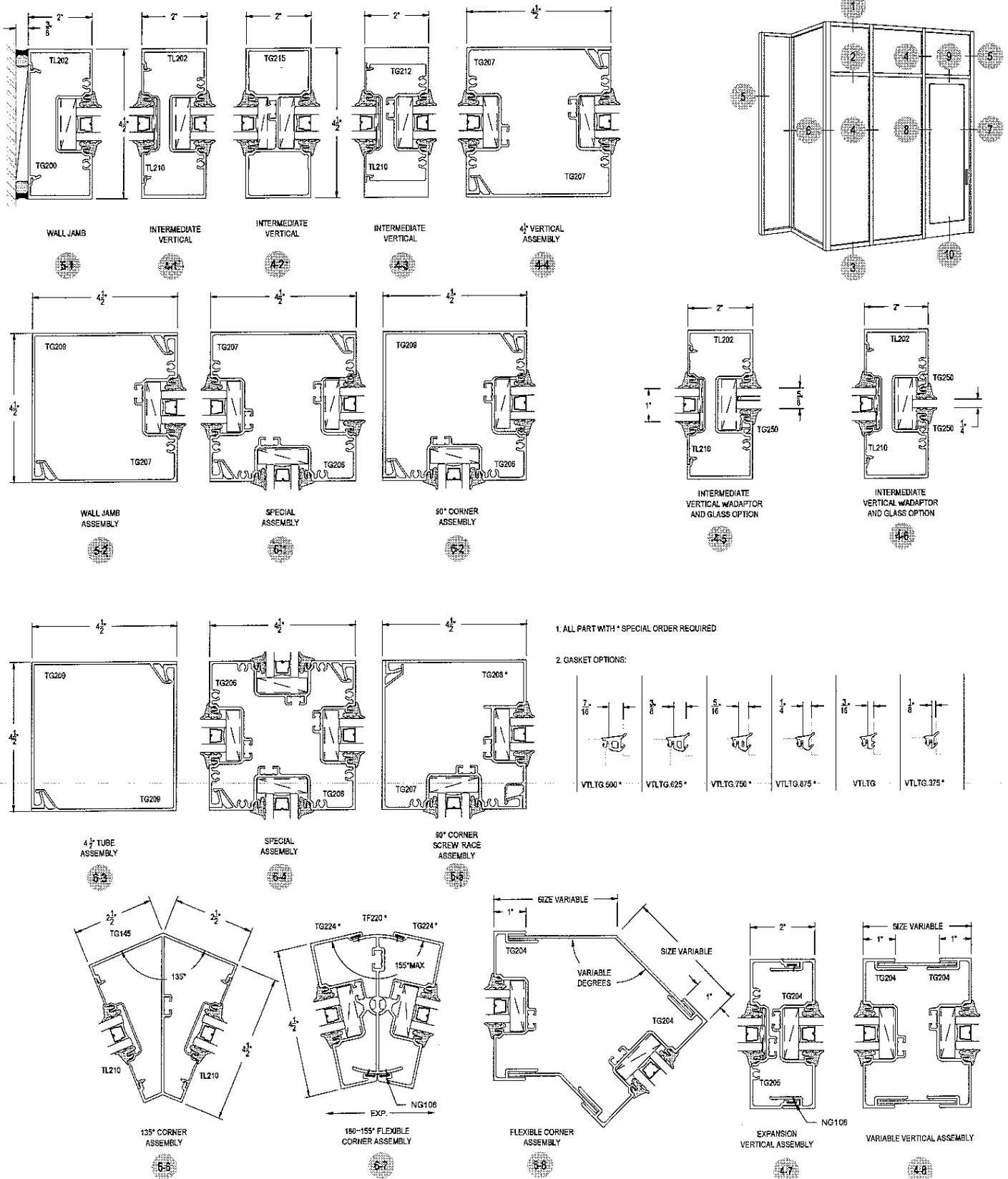
A. Install in accordance with approved shop drawings and manufacturers installation instructions.

3.03 Field Quality Control

A. Test the storefront for water leaks in accordance with AAMA 501.2-94. Conduct test in the presence of the Architect. Correct deficiencies observed as a result of this test.

END OF SECTION





AG451 Series

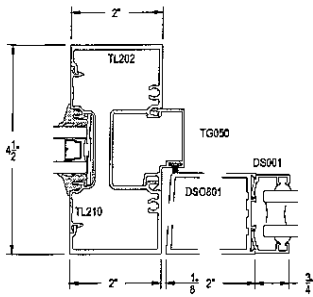
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Function: Storefront

Detail: Doors

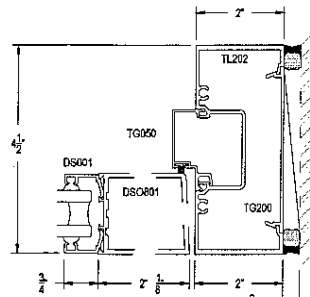
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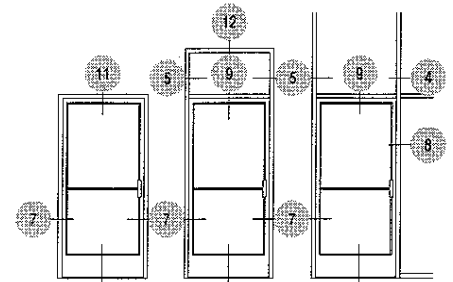
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DOOR JAMB
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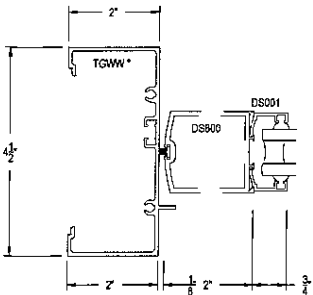
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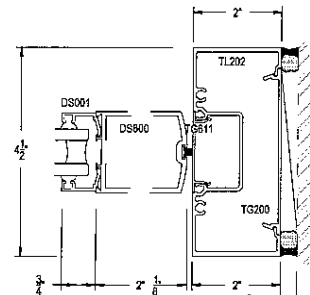
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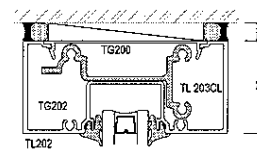
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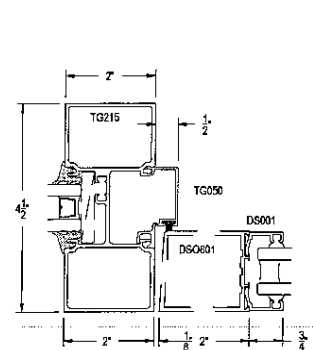
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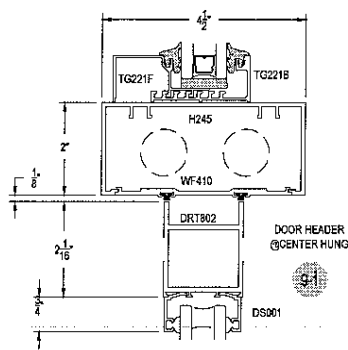
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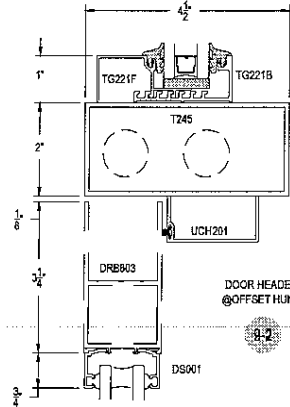
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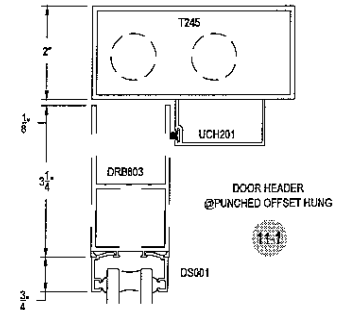
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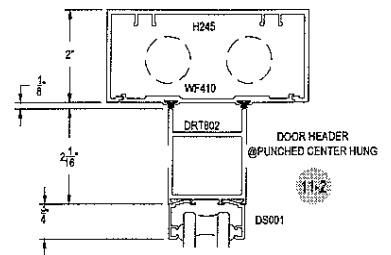
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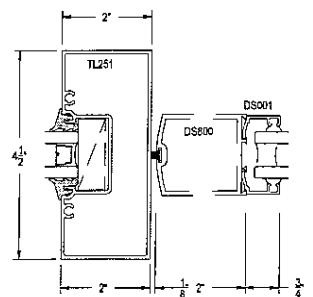
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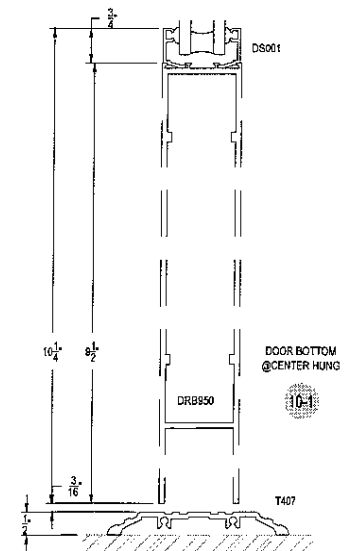
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DOOR JAMB
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8-2



DOOR BOTTOM
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10-1

1. ALL PART WITH * SPECIAL ORDER REQUIRED

2. GASKET OPTIONS.

VLTG.500*	VLTG.625*	VLTG.750*	VLTG.875*	VLTG.	VLTG.375*



SUBSTITUTION REQUEST (During the Bidding Phase)

Project: New Fire Station #10, Midland, TX

Substitution Request Number: For Architect to fill in

From: Arcadia Inc. - Nancy M. Lomax

To: Chris Upton - Parkhill Smith & Cooper, Inc.

Date: 4/29/13

Re: Substitution Request - Doors

A/E Project Number: _____

Contract For: Aluminum Entrances and Storefront

Specification Title: Aluminum Entrances and Storefronts

Description: Medium Stile Aluminum Entrances

Section: 08410 Page: 3

Article/Paragraph: 2.3.B

Proposed Substitution: Arcadia's MS 362

Manufacturer: Arcadia Inc. Address: 4705 McLeod Rd NE, ABQ, NM

Phone: (505) 341-4222

Trade Name: Medium Stile Aluminum Entrance

Model No.: MS 362

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: Nancy M. Lomax, RA, NCARB, AIA, CSI

Signed by: _____

Firm: Arcadia Inc.

Address: 4705 McLeod Rd NE, Albuquerque, NM 87106

Telephone: (505) 341-4222

A/E's REVIEW AND ACTION

- ☐ Substitution approved - Make submittals in accordance with Specification Section 01330.
- ☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
- ☐ Substitution rejected - Use specified materials.
- ☐ Substitution Request received too late - Use specified materials.

Signed by: _____

Date: _____

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____



Product Comparison Chart

MS362 SERIES by Arcadia vs. 350 Series by
Kawneer

<u>Line by Line Comparison</u>	<u>Arcadia MS362</u>	<u>Kawneer 350 Series</u>
Profile	1 ¾" x 3 ½"	1 ¾" x 3 ½"
Material: Aluminum (Domestic)	6063 T6	6063 T6
Gasket	Thermoplastic elastomer	Thermoplastic elastomer
Corner Construction	Mechanical/Welded	Welded
Finish	70% PVDF	70% PVDF
Finish	Anodized Class 1, 2	Anodized Class 1, 2
Rotation	250 lbs	Not Available
Recycled Content	Yes	Yes
Year Established	1930	1908



1995 CSI SECTION 08120 Aluminum Doors And Frames
2004 CSI SECTION 08 11 16 Aluminum Doors And Frames

Part 1 – General

1.01 Summary

- A. Section includes:
 - 1. Aluminum Doors and Frames
- B. Related Sections:

1.02 References

- A. American Architectural Manufacturers Association (AAMA)
- B. American Society for Testing and Materials (ASTM)
- C. Aluminum Association (AA)

1.03 System Description

- A. General: In addition to requirements shown or specified, comply with:
 - 1. Applicable provisions of AAMA Aluminum Storefront and Entrance Manual for design, materials, fabrication and installation of component parts.
- B. Design Requirements: Arcadia MS362 Series Medium Stile Entrance is a single source package of door, doorframe and hardware that is engineered for moderate to high traffic.
- C. Performance Requirements: Each assembly tested by a recognized testing laboratory or agency in accordance with specified test methods.
 - 1. Tested by the dual moment corner joint strength test.
 - 2. Air infiltration tested in accordance with ASTM E283 (offset pivot or butt hung entrances).
 - 3. Water penetration tested in accordance with ASTM E 331 (offset pivot or butt hung entrances).
 - 4. Structural uniform load tested in accordance with ASTM E 330.

1.04 Quality Assurance

- A. Single Source Responsibility:
 - 1. Obtain entrances, storefronts, ribbon walls, window walls, curtain walls, window systems, and finish through one source from a single manufacturer.
- B. Provide test reports from AAMA accredited laboratories certifying the performances as specified in 1.03.

1.05 Warranty

- A. Door warranted against failure and/or deterioration of metals due to manufacturing process for a period of two (2) years.

Part 2 – Products

2.01 Manufacturers

- A. Acceptable Manufacturers:
 - 1. Arcadia, Inc., 3225 East Washington Blvd., Vernon, CA. Telephone 323/269-7300, Fax 323/269-7390.
- B. Acceptable Products:
 - 1. Arcadia, Inc., MS362 Series, Medium Stile Door 1-3/4".
 - a. Vertical Stiles: 3-1/2 inches.
 - b. Top Rail: 3-5/8 inches.
 - c. Bottom Rail: 10/12 inches.
 - d. Glazing Stops: (Square or Beveled) snap-in type for _____ (1/4 or 1 inch) infill.
 - 2. Major portions of the door stiles a nominal .125 inches and glass stops .050 inches thick.

2.02 Materials and Accessories

- A. Door members: Extruded 6063-T6 aluminum alloy (ASTM B221-Alloy G.S. 10a T6).
- B. Screws, fastening devices, and internal components: Aluminum, stainless steel, or zinc plated steel in accordance with ASTM A-164. Shall be aluminum or steel, providing the steel is properly isolated from aluminum.
- C. Glazing Gasket (compression-type design).

2.03 Hardware

- A. Hardware furnished and installed by the door manufacturer, and include the following standard hardware (as selected).
 - 1. Weatherstripping: Hard-backed poly pile in door and/or frame. Meeting stile of all pair of doors have a double line hard-backed poly-pile astragal.
 - 2. Threshold: Extruded Aluminum with ribbed surface.
 - 3. Sill Sweeps: Brush strip (exposed, concealed).
 - 4. Pivoting/Hinging: (Center, offset pivot; butt, continuous.)

- 5. Closers: (Overhead concealed, surface, floor.)
- 6. Latches/Strike: (Dead-latch combination, two-point.)
- 7. Latch Handle: (Lever, eurostyle/ w/return, paddle.)
- 8. Electric Release: (Offset strike, center hung strike.)
- 9. Locks/Strike: (Maximum security hooklock, deadbolt.)
- 10. Auxiliary Locks: (Two-point, three-point, flushbolts.)
- 11. Cylinders: (Mortise, rim, dummy, thumbturn.)
- 12. Panic Devices: (Cross, touch bar, flush mid panel.)
- 13. Push/Pulls: (Standard, offset radius, straight radius.)
- 14. Cylinder Guard: (Security ring/retainer ring.)
- 15. Exit Indicator: (Message panel.)
- 16. Transom Decal: (This door to remain . . .)
- 17. Door Stop/Holder:
- 18. Mail slot.

SPECIFIER NOTE: Refer to Arcadia Architectural Manual, Hardware Section for description of items 4-18.

2.04 Finish

- A. Finish all exposed areas of aluminum and components as indicated.
 - 1. An Architectural Class II or I color anodic coating conforming with AA-M12C22A34/AA-M12C22A44.
 - a. Anodized finish color shall be Colomodic _____ (AB1 Light Champagne, AB2 Champagne, AB3 Light Bronze, AB4 Medium Bronze, AB5 Standard Medium Bronze, AB6 Dark Bronze, AB7 Standard Dark Bronze, AB8 Black, AG2 Gold.)
 - (or) 1. An Architectural Class II or I anodic coating conforming with AA-M12C22A31/AA-M12C22A41.
 - a. Anodize finish color shall be Colomodic _____ (#11 Clear)
 - (or) 1. Fluorocarbon Coating: AAMA 2605.2.
 - a. Resin: 70% PVDF Kynar 500/Hylar 5000.
 - b. Substrate: cleaned and pretreated with chromium phosphate.
 - c. Primer: Manufacturer's standard resin base compatible coating. Dry film thickness.
 - (a) Extrusion: Minimum 0.20 mil.
 - d. Color Coat: 70% PVDF, dry film thickness.
 - (a) Extrusion: 1.0 mil.
 - e. Color: As selected by Architect.
 - f. Acceptable Coatings Manufacturers:
 - (a) PPG Industries, Inc.
 - (b) Valspar Corporation
 - (c) BASF

2.05 Door Fabrication

- A. Stiles and rails shall be tubular sections accurately joined, flush and hairline at corners with heavy concealed reinforcement brackets secured with machine bolts, with optional MIG weld. Exposed screws not permitted.
- B. Each door leaf equipped with an adjusting mechanism, located in the top rail near the lock stile.
- C. Prepare internal reinforcement for door hardware.
- D. Custom hardware templates and physical hardware must be submitted prior to any fabrication.

Part 3 – Execution

3.01 Examinations

- A. Examine conditions and verify substrate conditions are acceptable for product installation.

3.02 Installation

- A. Install in accordance with approved shop drawings and manufacturers installation instructions.

3.03 Field Quality Control

- A. Make all necessary final adjustments to attain normal operation of each door and its mechanical hardware.

END OF SECTION

MS362 Series

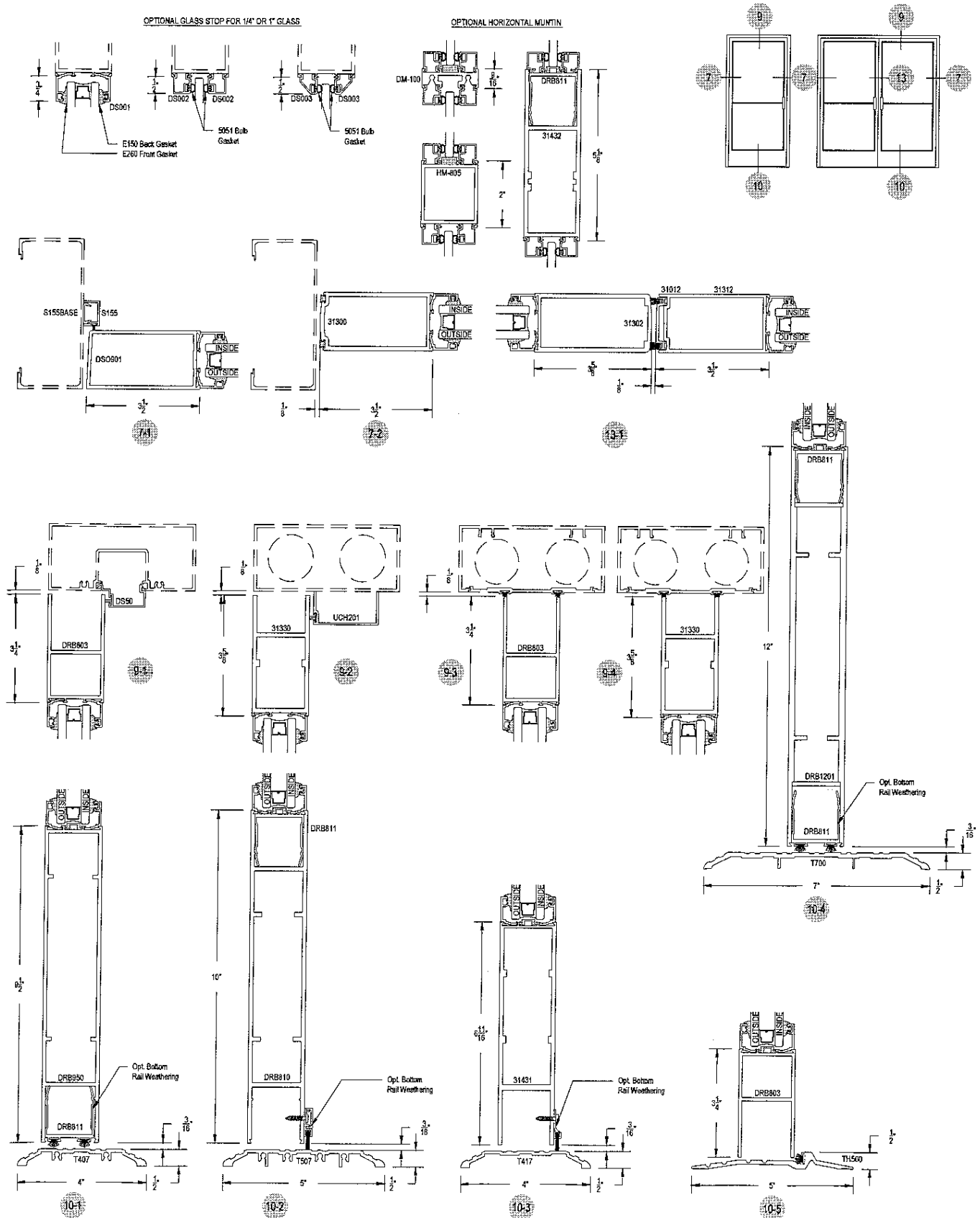
Description: Medium Stile - Offset/Center Door

Function: Entrance

Detail: All

Scale: 3" = 1'-0"

SHEET 1 OF 1



FENESTRATION **T**ESTING **L**ABORATORY

780 E. Francis St., Unit "T", Ontario, CA 91761 • Ph. (909) 923-6260 • Fax (909) 923-6262

ARCADIA ARCHITECTURAL
 3225 Washington Boulevard
 Los Angeles, CA 90023

Report No. : SA97-106
 Date : July 28, 1997
 Page : 1 of 2

Re: Dual Moment Corner Joint Test

Gentlemen:

On July 28, 1997, we performed a door corner joint strength test at our laboratory in Ontario, California. This test was conducted in accordance with the attached procedure:

Identification	Load @ $\frac{1}{16}"$ <u>Gap (lbs.)</u>	Load @ 3° <u>Rotation (lbs.)</u>	<u>Permanent Gap</u> <u>In Inches</u>
1. Medium Stile Door Corner	260	250	.072"
2. Medium Stile Door Corner	220	220	.073"
3. Medium Stile Door Corner.	230	220	.087"
1. Heavy Medium Stile Door Corner	<u>gap (lbs.)</u> 240	<u>rotation (lbs.)</u> 230	.042"
2. Heavy Medium Stile Door Corner	300	280	.046"
3. Heavy Medium Stile Door Corner.	300	300	.042"
1. Wide Stile Door Corner	<u>gap (lbs.)</u> 275	<u>rotation (lbs.)</u> 380	.095"
2. Wide Stile Door Corner	270	340	.082"
3. Wide Stile Door Corner.	270	290	.075"

Structural Testing • Thermal Testing • Computer Simulations • Consulting • Mobile Lab.

Report No. : SA97-106
Page : 2 of 2

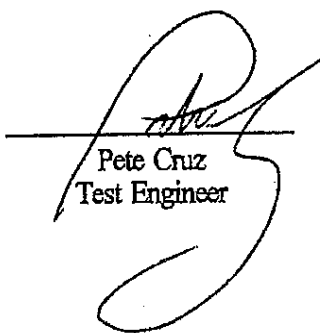
Test was stopped when either 1/16" gap or 3° was reached

Failure is defined as:

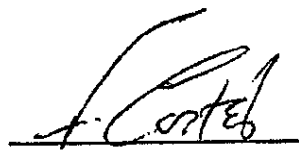
When ultimate load is achieved and corner joint continues to separate.

Complete corner joint separation or disengagement could not be achieved at defined failure.

We certify the above to be a true record of the results obtained when conducting the test.
Tested sample and a copy of this report will be stored with this laboratory for four years.



Pete Cruz
Test Engineer



Felipe Cortés
Test Technician

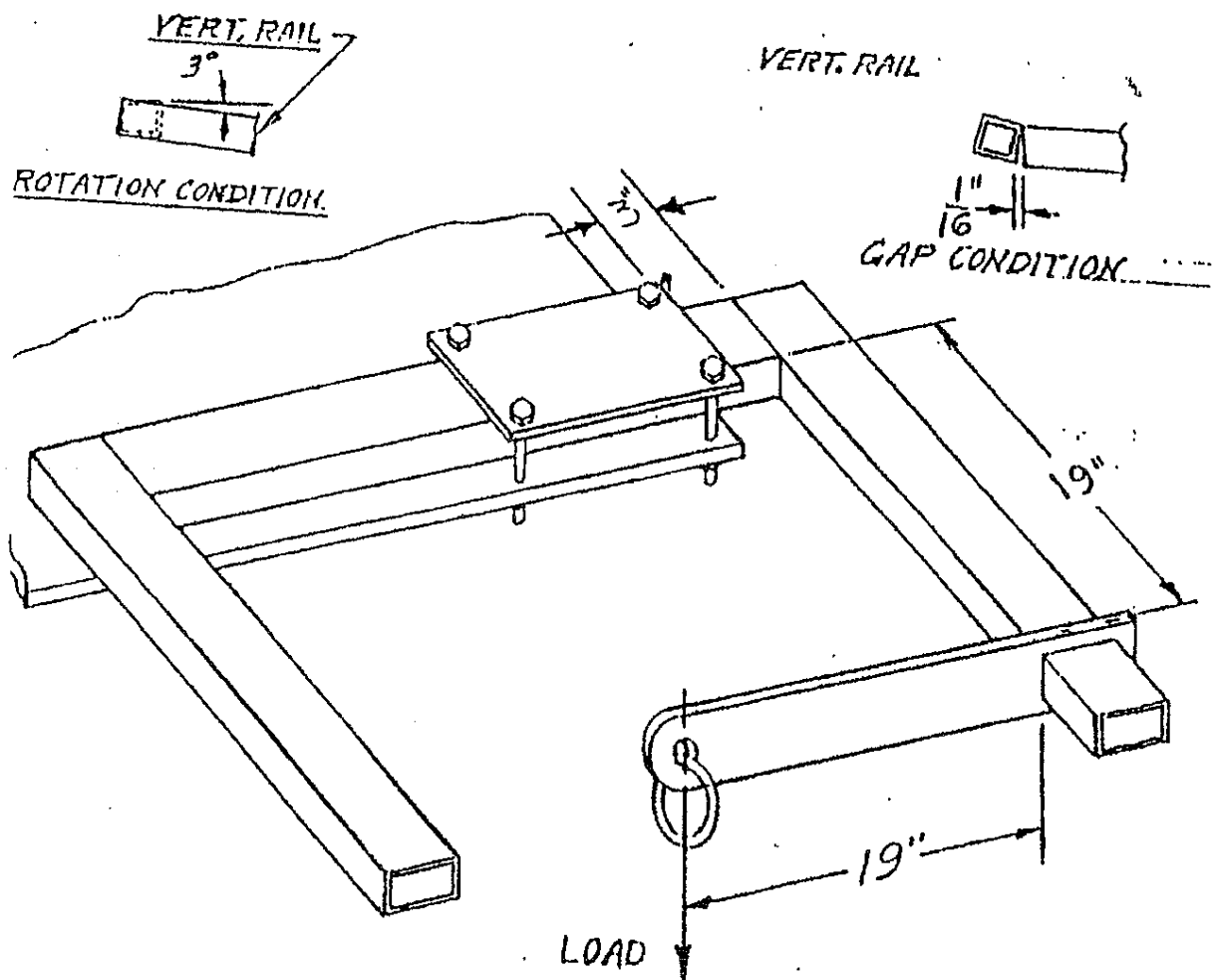
DOOR CORNER JOINT STRENGTH TEST METHOD

OBJECTIVE:

To test an entrance door corner in double moment loading as shown on sketch to determine comparative corner joint strength.

PROCEDURE:

The test corner shall be cut from a door to dimensions specified on sketch, using care during cutting to avoid damaging or overstressing the test corner joint. The corner sample shall be clamped in the test fixture per sketch and the loading arm located as specified. Proceed to load the test sample in 5, 10, or 25 lb. increments, as the sample permits, until a measurable joint separation of $\frac{1}{16}$ " or vertical rail rotation of 3° is attained. Corner condition at this time and amount of load will be recorded. Loading shall continue until the corner fails. Failure shall be defined as complete separation of parts at the corner joint; sudden release at the corner allowing vertical rail section, arm, and weights to rotate rapidly; or attainment of 45° of vertical rail rotation. Corner condition and amount of load will be recorded.



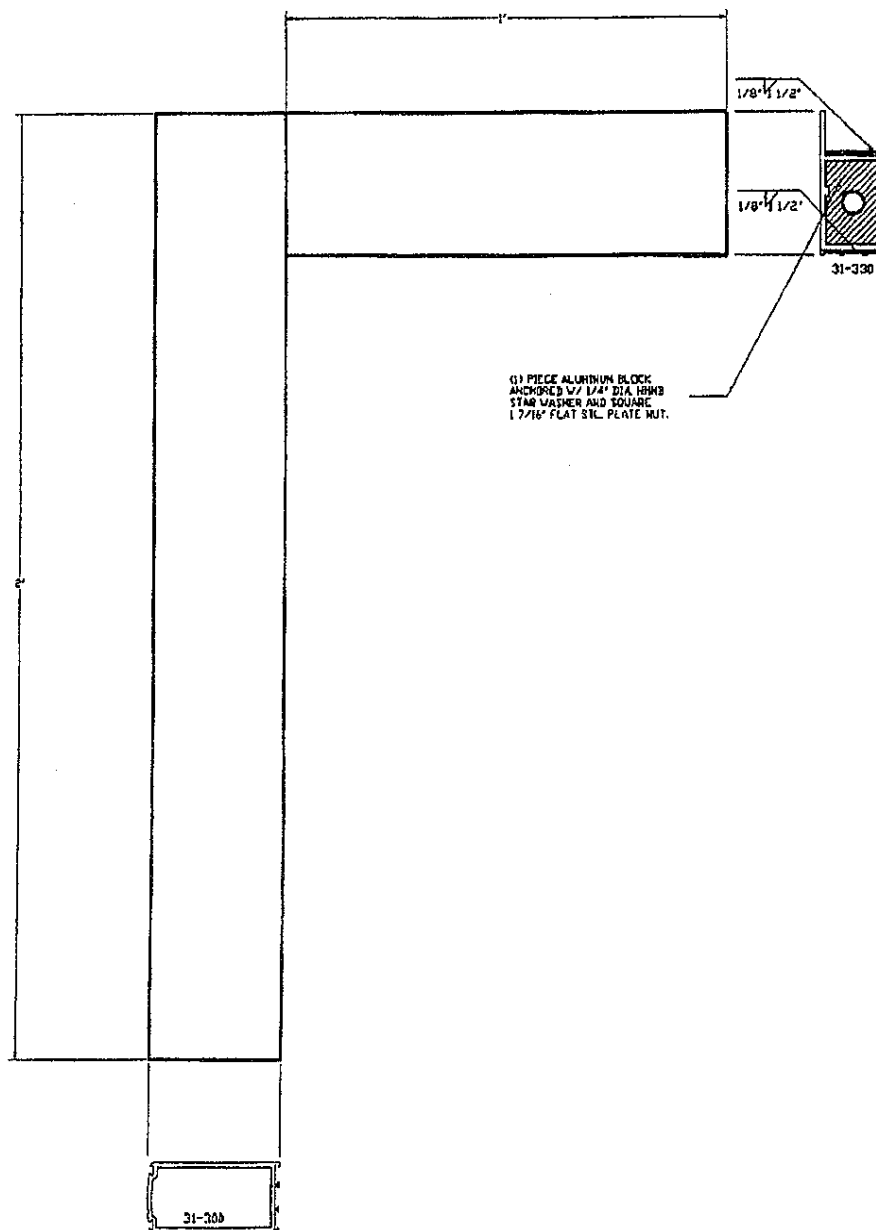
**ARCADIA[®] INC.**

3225 E. Washington Blvd. California, 90023 (213) 259-7800

MEDIUM STILEDRAWN BY:
CM.G.DATE:
MAY 22, 1997TESTED BY:
F.T.L.

DATE:

SHEET 1 OF 1



(1) PIECE ALUMINUM BLOCK
ANCHORED 1/2\"/>

MEDIUM STILE DOOR CORNER JOINT STRENGTH TEST



ARCADIA[®] INC. 3225 E. Washington Blvd. California, 90023 (213) 269-7300

WIDE STILE

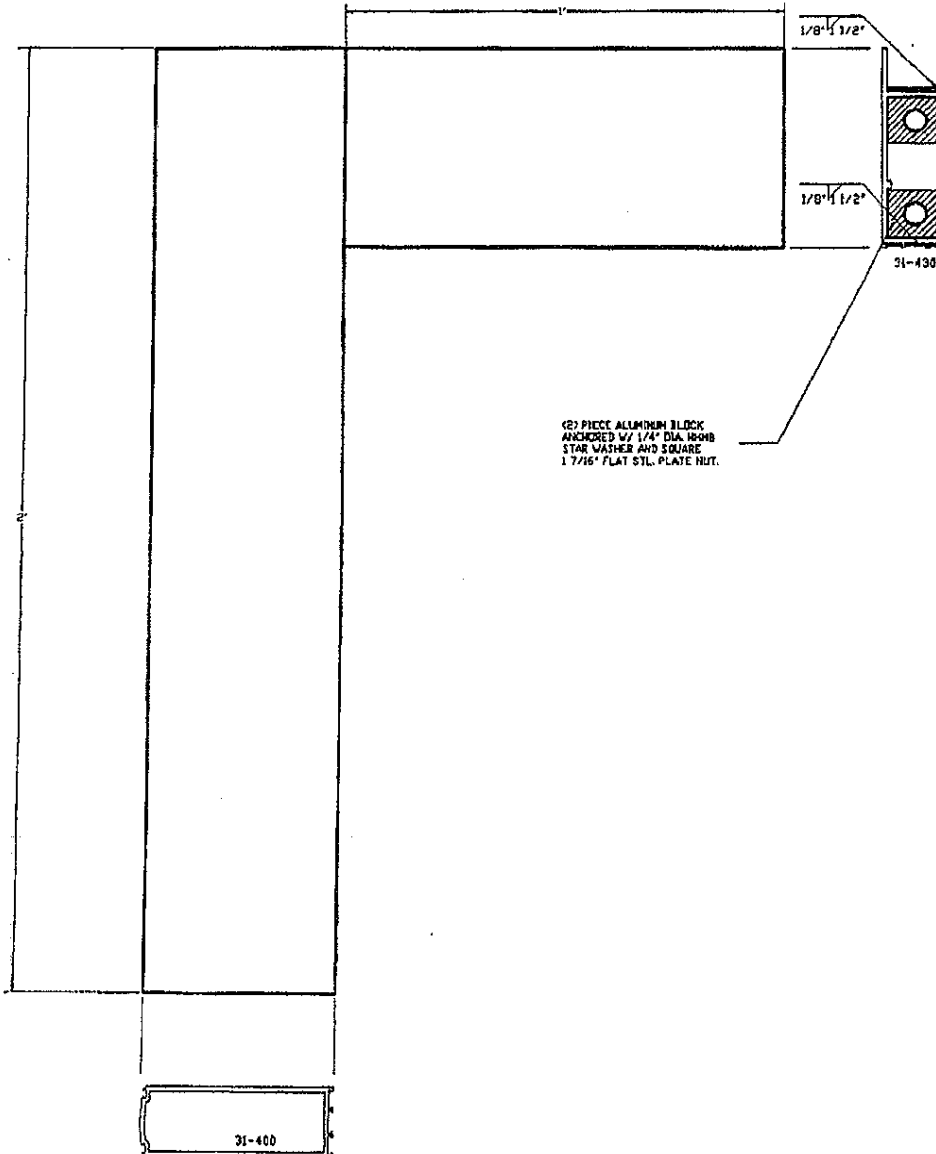
DRAWN BY:
C.M.G.

DATE:
MAY 22, 1997

TESTED BY:
F.T.L.

DATE:

SHEET 1 OF 1



WIDE STILE DOOR CORNER JOINT STRENGTH TEST



ARCADIA[®] INC. 8225 E. Washington Blvd. California, 90023 (213) 269-7300

HEAVY MEDIUM STILE

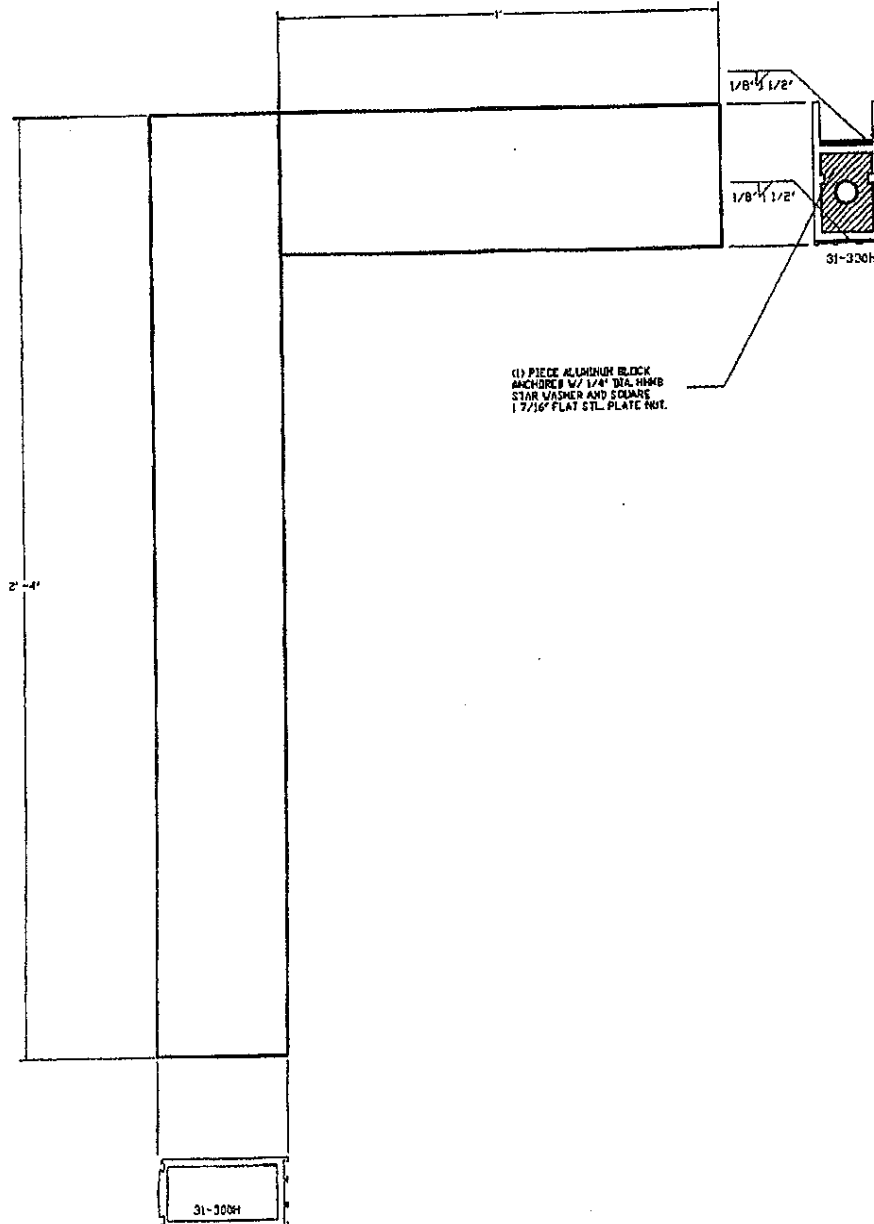
DRAWN BY:
C.M.G.

DATE
MAY 22, 1997

TESTED BY:
F.T.L.

DATE:

SHEET 1 OF 1



HEAVY MEDIUM STILE DOOR CORNER JOINT STRENGTH TEST



SUBSTITUTION REQUEST

(During the Bidding Phase)

Project: New Fire Station #10, Midland, TX

Substitution Request Number: For Architect to fill in

From: Arcadia Inc. - Nancy M. Lomax

To: Chris Upton - Parkhill Smith & Cooper, Inc.

Date: 4/29/13

Re: Substitution Request - Windows

A/E Project Number: _____

Contract For: Aluminum Windows

Specification Title: Aluminum Windows

Description: Projected Windows

Section: 08520 Page: 4

Article/Paragraph: 2.1

Proposed Substitution: Arcadia's 200 Series

Manufacturer: Arcadia Inc. Address: 4705 McLeod Rd NE, ABQ, NM

Phone: (505) 341-4222

Trade Name: Projected Aluminum Window

Model No.: 200 Series

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: Nancy M. Lomax, RA, NCARB, AIA, CSI

Signed by: _____

Firm: Arcadia Inc.

Address: 4705 McLeod Rd NE, Albuquerque, NM 87106

Telephone: (505) 341-4222

A/E's REVIEW AND ACTION

- ☐ Substitution approved - Make submittals in accordance with Specification Section 01330.
- ☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
- ☐ Substitution rejected - Use specified materials.
- ☐ Substitution Request received too late - Use specified materials.

Signed by: _____

Date: _____

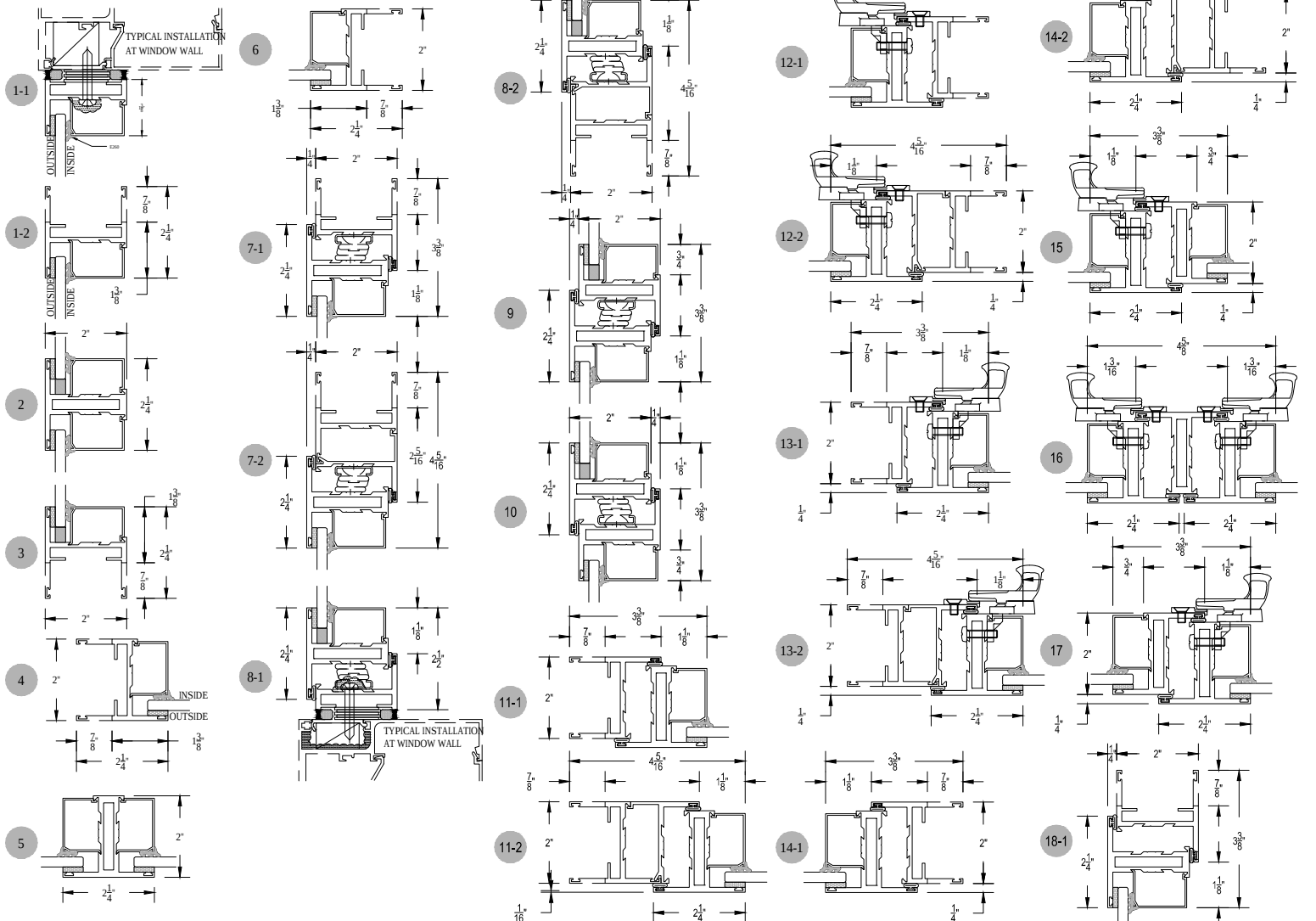
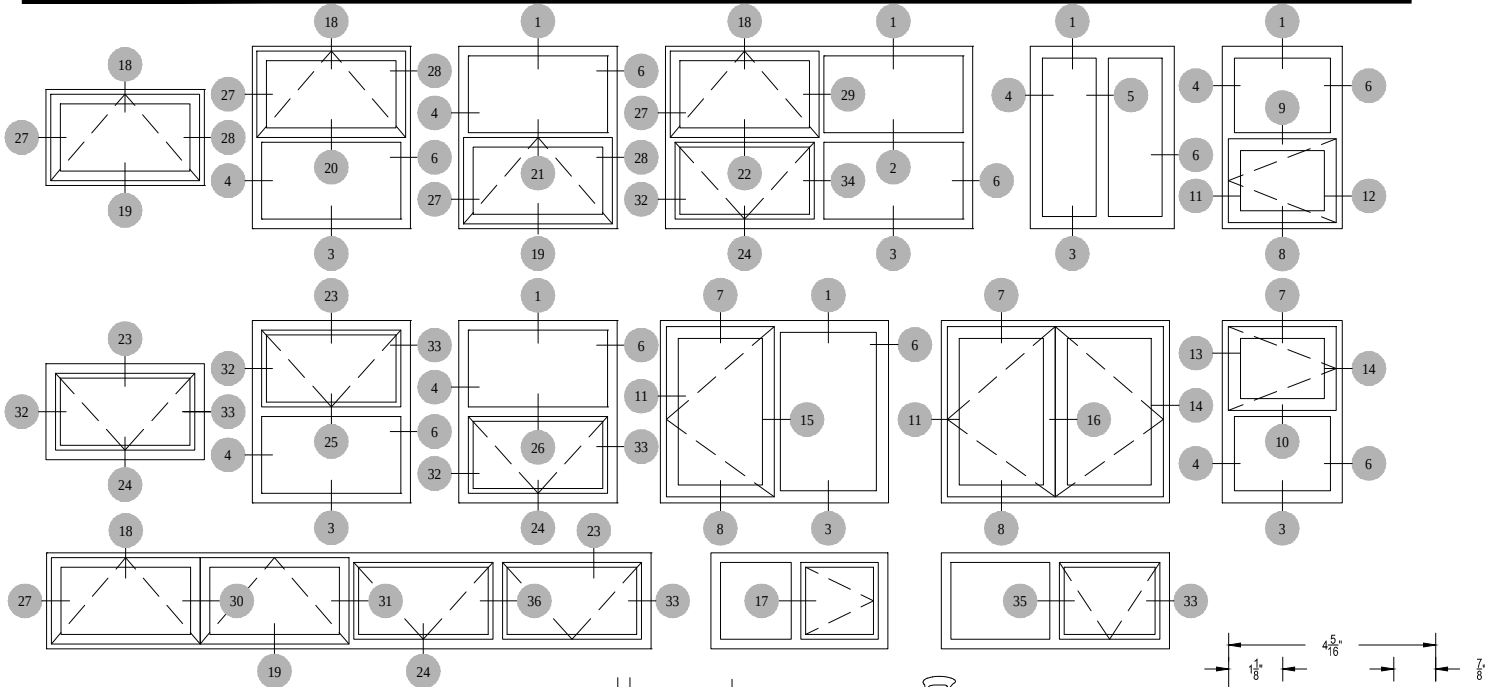
Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____



Product Comparison Chart

200 Series by Arcadia vs 8225 Isolock by Kawneer

<u>Line by Line Comparison</u>	<u>Arcadia 200 Series</u>	<u>Kawneer 8225 Isolock</u>
Profile	2 ½" x 2"	2 ¼" x 2"
Material Aluminum (Domestic)	6063 T6	6063 T6
Glazing (Front Plane)	1" or ¼" with pocket reducer	1" or ¼" with pocket reducer
Gasket	EPDM	EPDM
Air Infiltration	ASTM E283	ASTM E283
Water Penetration	ASTM E331	ASTME 331
Uniform Load	ASTM E 330	ASTM E 330
Thermal Break Option	Yes	Yes
Thermal Testing	Yes	Yes
CRF Testing	Yes	Yes
NFRC Rated	Yes	Not Available
Seismic Testing	Yes	Not Available
Finish	70% PVDF	70% PVDF
Finish	Anodized Class 1, 2	Anodized Class 1, 2
Recycled Content	Yes	Yes
Plant Location	Albuquerque, NM	Visalia, CA
Year Established	1930	1908





200 Series

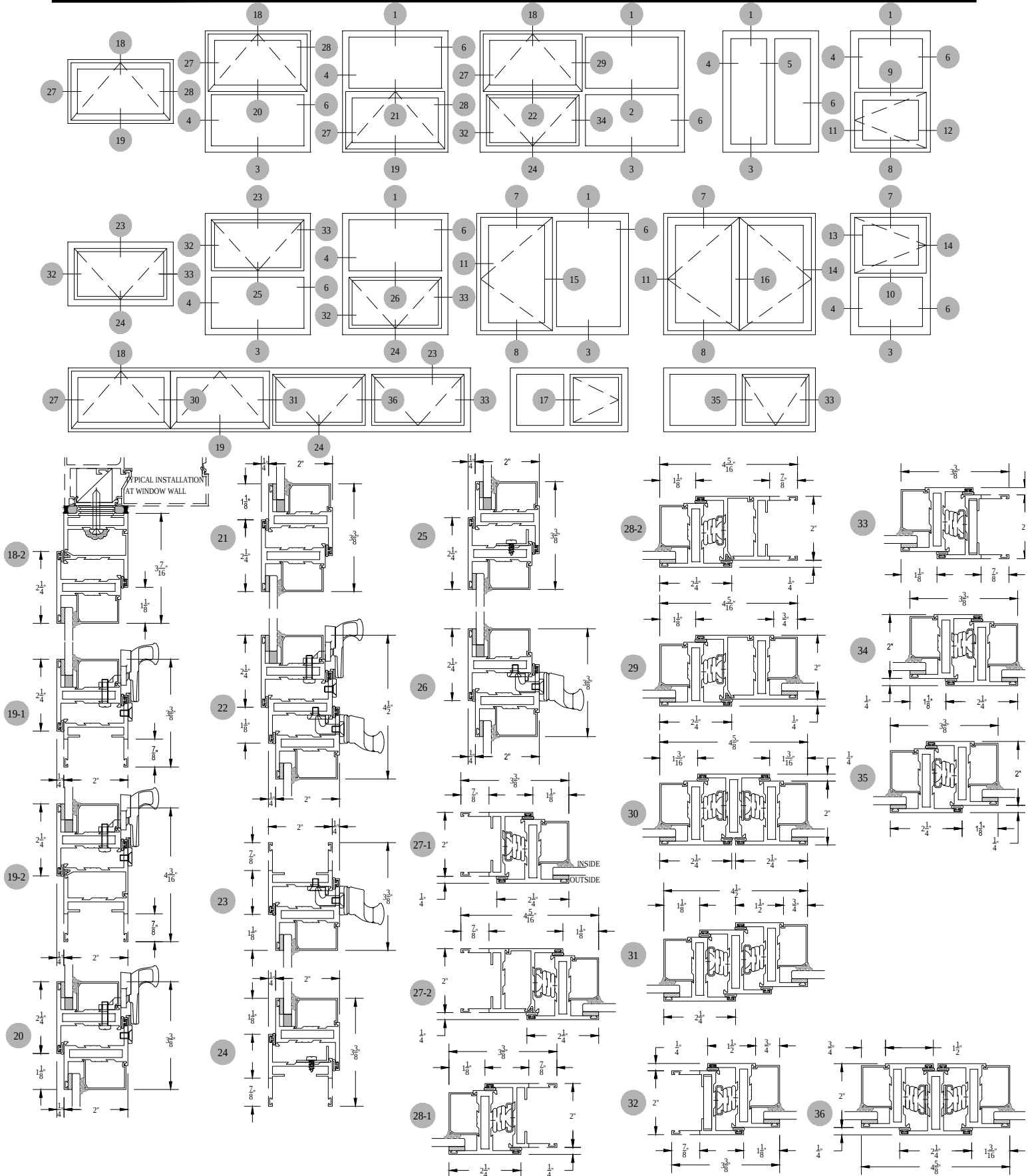
Description: Heavy Commercial window (Inside Set)

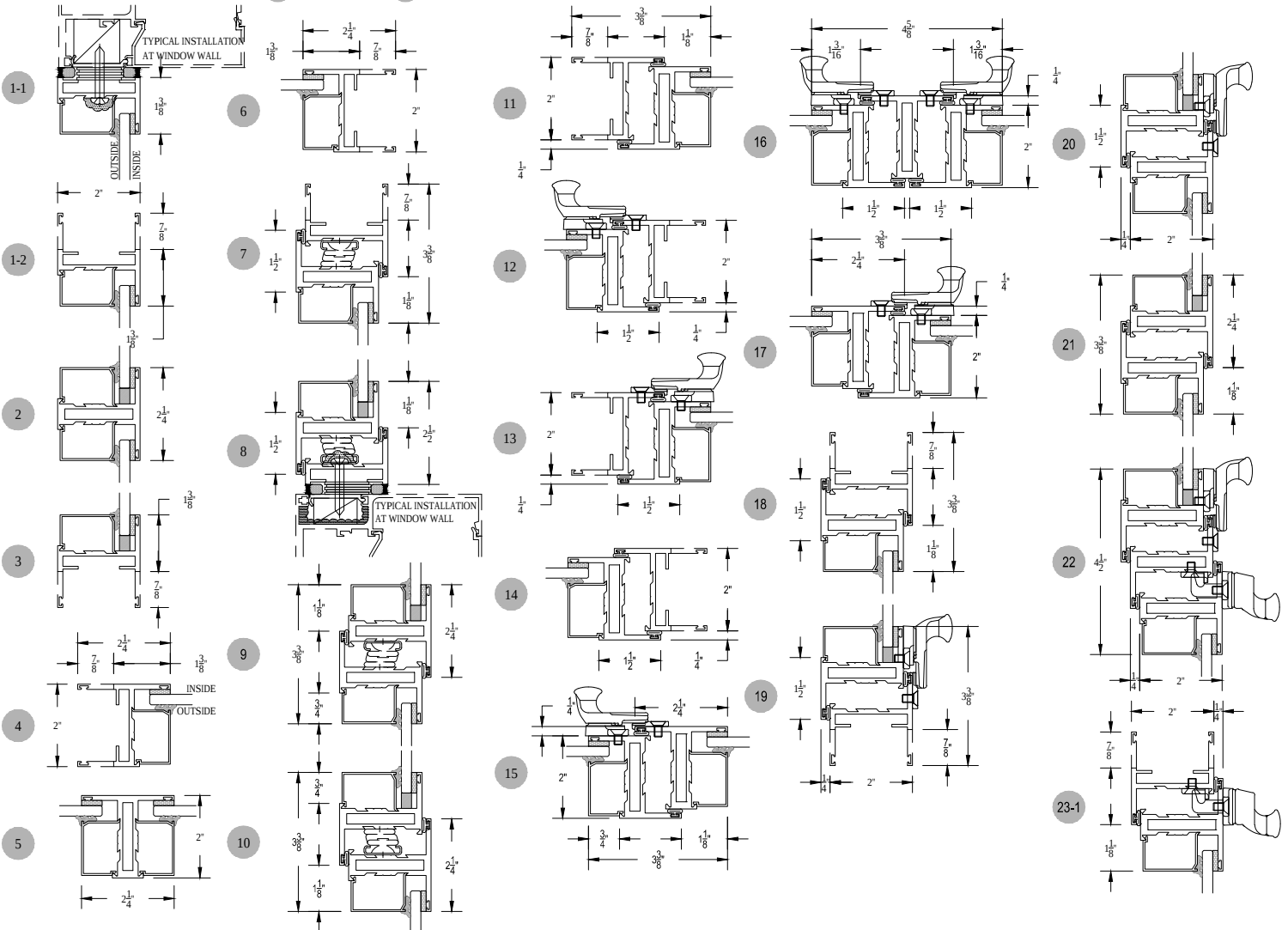
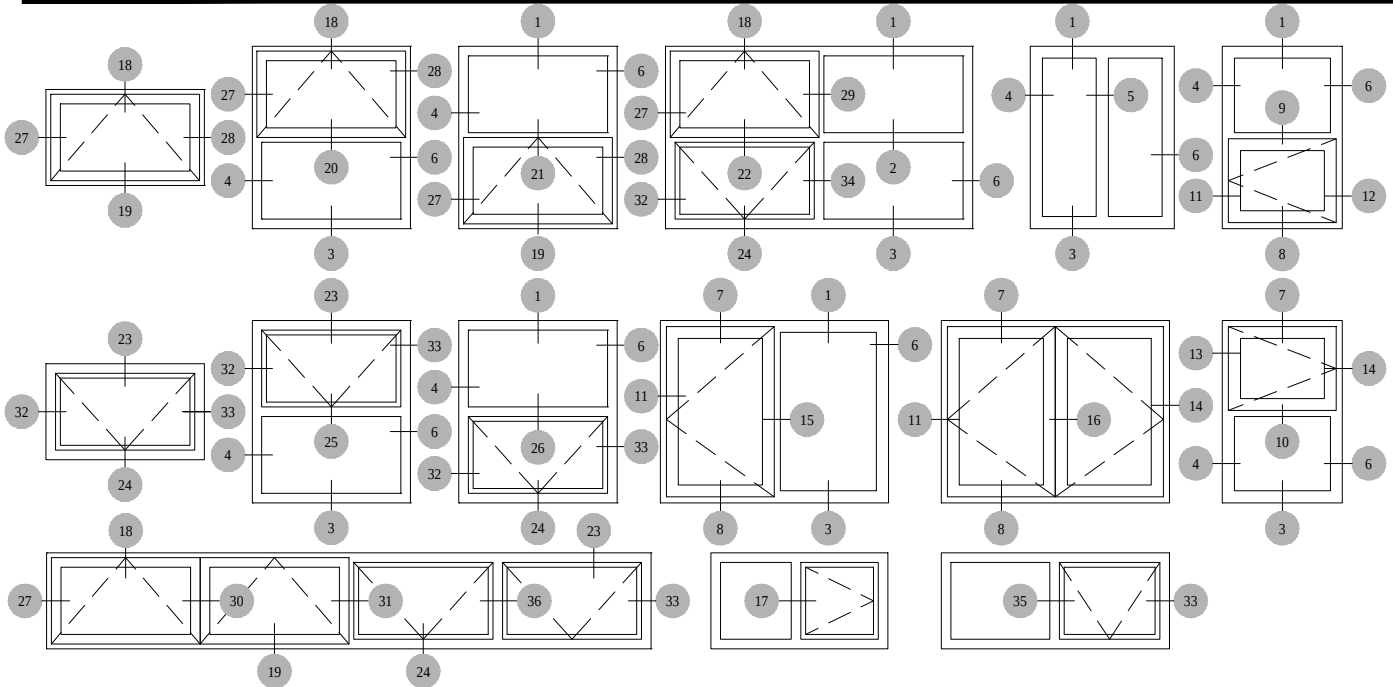
Function: Window

Detail: Fixed, Casement, Awning, Hopper

Scale: 3" = 1'-0"

SHEET 2 OF 2







200 Series

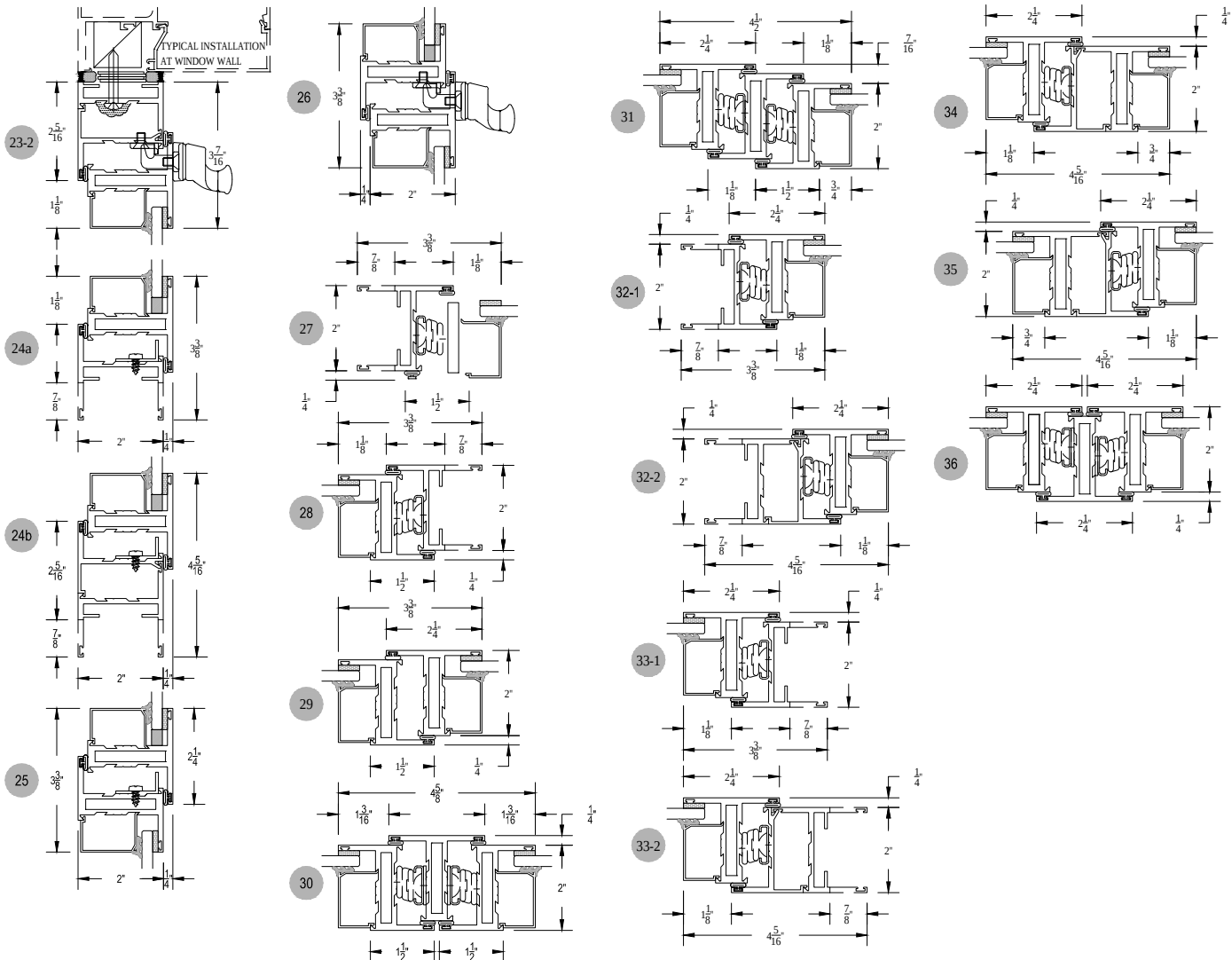
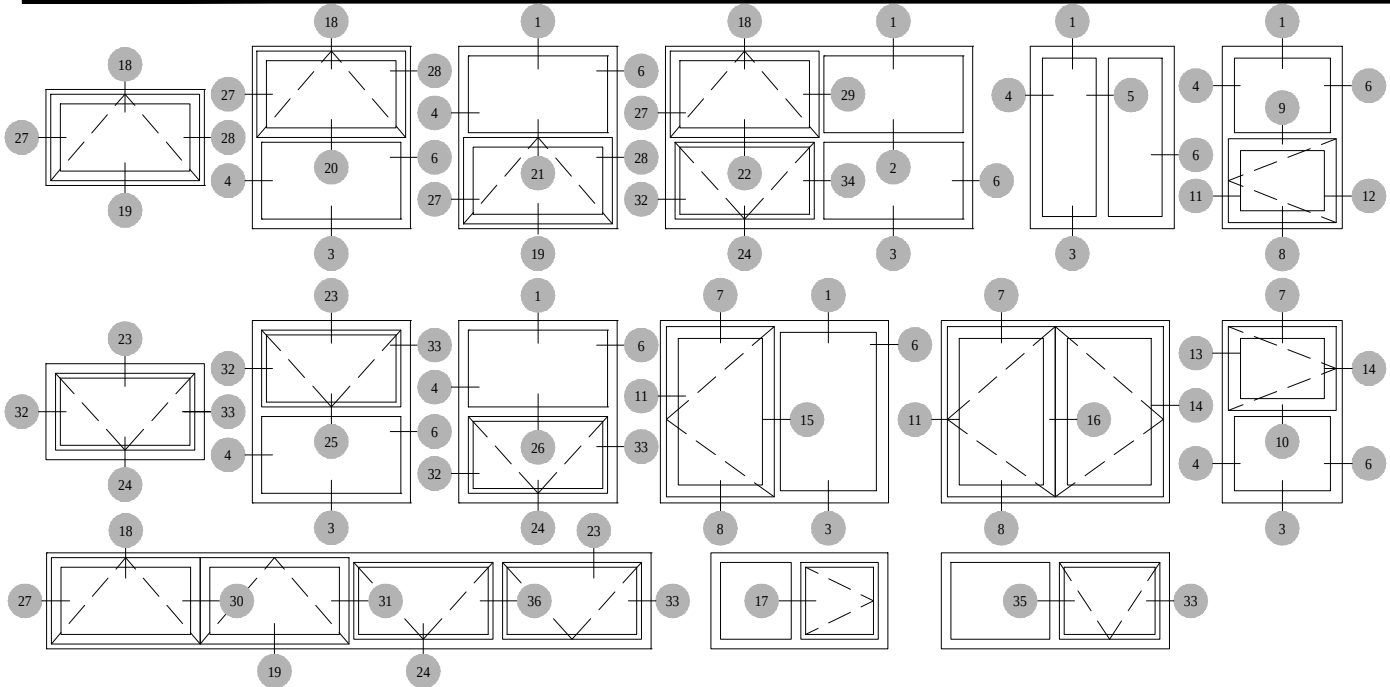
Description: Heavy Commercial window (Outside Set)

Function: Window

Detail: Fixed, Casement, Awning, Hopper

Scale: 3" = 1'-0"

SHEET 2 OF 2





1995 CSI SECTION 08520 Aluminum Windows
2004 CSI SECTION 08 51 13 Aluminum Windows

Part 1 – General

1.01 Summary

- A. Section includes:
 - 1. Aluminum Windows
 - a. Arcadia Inc., 200 Series (nonthermal) Heavy Commercial Fixed, Casement, Awning, Hopper Windows, 2-inch depth.
- B. Related Sections:

1.02 References

- A. American Architectural Manufacturers Association (AAMA)
- B. American Society for Testing and Materials (ASTM)
- C. Aluminum Association (AA)
- D. National Wood Window & Door Association (NWWDA)
- E. California Association of Window Manufacturers (CAWM)

1.03 System Description

- A. General: In addition to requirements shown or specified, comply with:
 - 1. Applicable provisions of AAMA Windows and Sliding Glass Doors Manual for design, materials, fabrication and installation of component parts.
- B. Design Requirements: Arcadia 200 Series (non-thermal) Heavy Commercial Fixed, Casement Awning, Hopper Windows 2-inch depth. Hinged compression sealed aluminum windows, suitable for outside or inside glazing.
- C. Performance Requirements: Each assembly shall be tested by a recognized testing laboratory or agency in accordance with specified test methods.
 - 1. Conformance to F-AW55, C-AW80, AP-AW80 specifications in AAMA/NWWDA 101/I.S.2/ A440-08.
 - a. Air Infiltration: Accordance with ASTM E 283 at a static air pressure difference of 6.24 psf. Air infiltration shall not exceed .30 cfm per square foot.
 - b. Water Resistance: Accordance with ASTM E 331/ASTM E 547 at a static air pressure difference of 12 psf). No water leakage.
 - c. Uniform Load Structural Test: Aluminum window systems comply with AAMA/WDMA/CSA 101/I.S.2/A440-08, Voluntary specifications for aluminum windows. Guidelines for specified AW rated product.
 - d. Component testing: Accordance with procedures described in AAMA/NWWDA 101/I.S. 2/A440-8.
 - e. Forced Entry Resistance: Conform to CAWM 301-90.
 - f. Thermal Movements: Allow thermal movement resulting from the following maximum change (range) in ambient temperature.
 - (a) 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.04 Quality Assurance

- A. Single Source Responsibility:
 - 1. Obtain entrances, storefronts, ribbon walls, window walls, curtain walls, window systems, and finish through one source from a single manufacturer.
- B. Provide test reports from AAMA accredited laboratories certifying the performances as specified in 1.03.

1.05 Warranty

- A. Warranted against failure and/or deterioration of metals due to manufacturing process for a period of two (2) years.

Part 2 – Products

2.01 Manufacturers

- A. Acceptable Manufacturers:
 - 1. Arcadia, Inc., 3225 East Washington Blvd., Vernon, CA. Telephone 323/269-7300, Fax 323/269-7390.
- B. Acceptable Products:
 - 1. Arcadia Inc., 200 Series Arcadia Inc., 200 Series

2.02 Materials

- C. Extruded aluminum profiles shall be 6063-T6 alloy and temper (ASTM B221 G.S. 10A-T6).
- D. All framing members .125 minimum wall thickness.
- E. At Casement, Awning, and Hopper windows provide heavy-duty four bar hinges shall be stainless steel only, with asymmetric end caps, and adjustable limit stops. Lock and latches cast white bronze, US-25D finish.
- F. Weatherstrip EPDM bulb type conforming to ASTM D2000 AA515 and keyed into extruded grooves.
- G. Back glazing two-sided adhesive, 15 lbs./ft.³ density, polyethylene tape. Glazing wedges EPDM or Santoprene.
- H. At operable windows provide Screens made of extruded aluminum frame and screened with either 18 x 14 aluminum or fiber mesh.

2.03 Finish

- I. Finish all exposed areas of aluminum and components as indicated.
 - 1. An Architectural Class II or I color anodic coating conforming with AA-M12C22A34/AA-M12C22A44.
 - a. Anodized finish color shall be Colornodic _____. (AB1 Light Champagne, AB2 Champagne, AB3 Light Bronze, AB4 Medium Bronze, AB5 Standard Medium Bronze, AB6 Dark Bronze, AB7 Standard Dark Bronze, AB8 Black, AG2 Gold.)
 - (or) 1. An Architectural Class II or I anodic coating conforming with AA-M12C22A31/AA-M12C22A41.
 - a. Anodize finish color shall be Colornodic _____ (#11 Clear)
 - (or) 1. Fluorocarbon Coating: AAMA 2605.2.
 - a. Resin: 70% PVDF Kynar 500/Hylar 5000.
 - b. Substrate: cleaned and pretreated with chromium phosphate.
 - c. Primer: Manufacturer's standard resin base compatible coating. Dry film thickness.
 - (a) Extrusion: Minimum 0.20 mil.
 - d. Color Coat: 70% PVDF, dry film thickness.
 - (a) Extrusion: 0.20 mil.
 - e. Color: As selected by Architect.
 - f. Acceptable Coatings Manufacturers:
 - (a) PPG Industries, Inc.
 - (b) Valspar Corporation
 - (c) BASF

2.04 Fabrication

- A. Frame components mitered, reinforced extruded corner key, hydraulically crimped, and "cold welded."
- B. All ventilator extrusions tubular, each corner mitered, reinforced extruded corner key, hydraulically crimped, and "cold welded."
- C. All corners weather sealed with an elastomeric sealant.

Part 3 – Execution

3.01 Examinations

- A. Examine conditions and verify substrate conditions are acceptable for product installation.

3.02 Installation

- A. Install in accordance with approved shop drawings and manufacturers installation instructions.

3.03 Field Quality Control

- A. Contractor's responsibility to make all necessary final adjustments to attain normal operation of each window and its mechanical hardware.

END OF SECTION

LPA



Office

Educational



Multi-Family
Dwellings



Government



Hellmuth, Obata, Kassabaum, Inc.

Sports Facilities



Beckett & Associates

DFD Conoyer Hedrick



Retail

Group 70 International, Inc.



Hospitality

Nadel Partnership, Inc.

Health Care



Industrial

Fine Arts

Institutional

The Ratcliff Architects

ARCADIA

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STOREFRONT • CURTAINWALLS • ENTRANCES • WINDOWS • INTERIOR FRAMES • ARCHITECTURAL COATINGS

Tradition of Excellence

arcadia
® 6.596

Monumental Heavy Commercial Windows

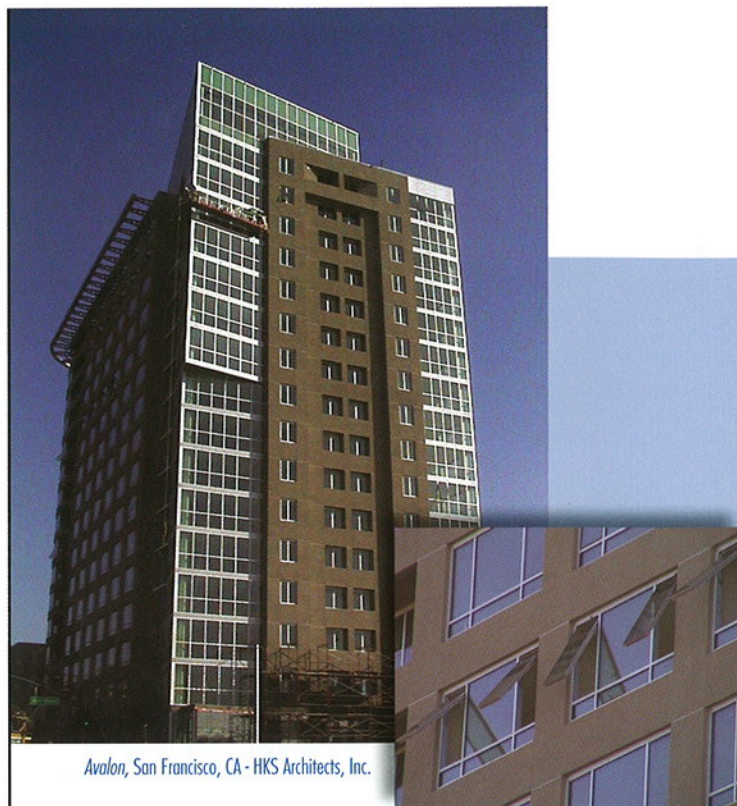
Arcadia Series T200 Thermal and 200 Non Thermal

- Available as Fixed, Awning, Hopper Projected and Casement.
- 2" overall frame depth and 0.125 nominal wall thickness.
- Dual glazing with integral blinds available.
- Wide variety of locking and operating hardware options.
- Test for a High Performance Class and Grade of HC70 and AW 70.
- Abraided pour and debridge thermal break.
- Tubular construction.
- Accommodates glass up to 1" thick.
- Angle reinforced, crimped and epoxy-welded vent construction.
- Concealed 4-bar stainless steel support arms or exposed butt hinges.
- Standard and low profile frame option.
- Rectangular and mitered glazing bead option.
- Outside and inside glazing option.

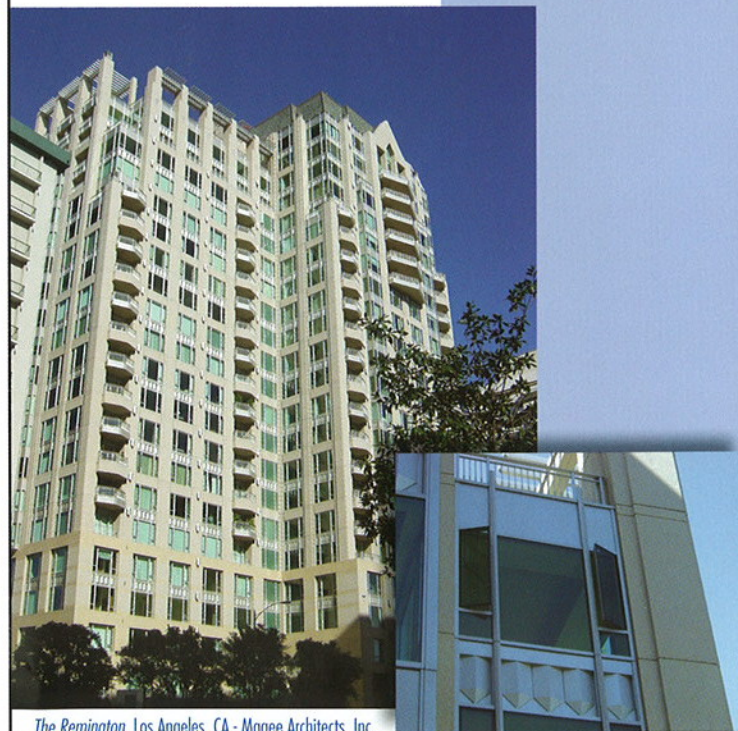
Zero Sightline Vent

Arcadia Series CV200 Non Thermal Concealed Ventilator

- Available as a Project-Out or an Outswing Casement.
- Structural glazed with narrow sightline.
- Eliminates the added exterior sightline of the typical ventilator when installed into a framing system.
- Tested for a High Performance Class and Grade of HC70 and AW70.
- Accommodates glass up to 1" thick.
- Angle reinforced, crimped and epoxy-welded vent construction.
- Concealed 4-bar stainless steel support arms.



Avalon, San Francisco, CA - HKS Architects, Inc.



The Remington, Los Angeles, CA - Magee Architects, Inc.



Staples Center, Los Angeles, CA - NBBJ Architects

Standard Aluminum Entrances: 1-3/4" depth

Arcadia Series NS 212, MS 362, WS 512 (nominal .125 wall thickness)

- NS 212 Narrow Stile Entrance: 2" vertical stile.
- MS 362 Medium Stile Entrance: 3-1/2" vertical stile.
- WS 512 Wide Stile Entrance: 5" vertical stile.
- Integral jointed corner construction.
- Square or Beveled glazing stops.

**Heavy Wall Entrances: 1-3/4" depth
(hardware compatible)**

**Arcadia Series MS 362 HD, WS 512 HD
(3/16" wall thickness)**

- MS 362 HD Heavy Duty Medium Stile Entrance: 3-1/2" vertical stile.
- WS 512 HD Heavy Duty Wide Stile Entrance: 5" vertical stile.
- Integral jointed corner construction.
- Heavy Duty door framing.
- Square or Beveled glazing stops.

Monumental High Abuse Entrance: 2-1/4" depth

**Arcadia Series 450 Arena Entrance System
(3/16" wall thickness)**

- 450 Arena Entrance System: 4-1/2" vertical stile.
- Complete Door and Frame System.

Terrace Door and Framing System: 1-3/4" depth

Arcadia Series TD 300 (nominal .125 wall thickness)

- Single source package of door, door frame and hardware that is engineered for high-rise, loft, condominiums and hotel applications.
- Outswing and Inswing.
- Tested for High Performance Class and Grade of HC 40.
- Accommodates glass up to 1" thick.

Flush Panel Entrance: 1-3/4" depth

Arcadia Series RP 325 Flush Panel Entrance Door

Flush appearance with a face sheet of fiberglass-reinforced polyester (FRP) or aluminum in a variety of colors and captured on four sides by integral extruded reglets.

Multi-Use, Multi-Track Slider: 1-3/4" depth

Arcadia Series 2820 Sliding Mall Front (Pass Through)

- 2", 3-1/2" or 5" vertical stile width.
- Interior/exterior applications.
- Hidden stack options.
- Bi-parting and one-side stacking.
- 2 1/4" track width.



Silverstone Golf Club, Las Vegas, NV - Denzer International



Regatta Seaside,
Marina Del Rey, CA -
GMP Architects



Non Thermal

Center Glaze Systems

- 4", 4-1/2", 6", 7-1/2" frame depths.
- 1-3/4", 2", 2-3/4", 4", 4-1/2" face dimensions.
- Systems may be glazed from the inside or outside.
- Screw spline, shear block, stick construction available.
- Accommodates glass up to 1" thick.



Pittsburg Civic Center, Pittsburg, CA - Hansen Associates



VA Medical Regional Office, Honolulu, HI - Architects Hawaii, LTD.

Non Thermal

Offset Glaze Systems

- 1-3/4", 3", 4", 4-1/2", 6", 7-1/4" frame depths.
- 1-3/4" 2", 2-1/4", 2-1/2", 4" face dimensions.
- Systems may be glazed from inside or outside.
- Screw spline, shear block, stick construction available.
- Front, center, back or multi-plane glass applications.
- Systems provide for captured or silicone glazed vertical.
- Accommodates glass up to 1" thick.
- Variety of face cap profiles.
- Two - color finish option.



Ford Credit Henderson Service Center, Henderson, NV - JMA Architectural



Chandler Gilbert CC Student Center, Gilbert, AZ - Architekton



Novellus, Tualatin, OR - Group McKensie



Consolidated Office Building, Provo, UT - Ken Harris Architects

Thermal

Center Glaze Systems

- 4-1/2", 6" frame depths.
- 2", 4-1/2" face dimension.
- Systems may be glazed from inside or outside.
- Screw spline or shear block construction.
- Accommodates glass up to 1" thick.
- Variable degree mullion.
- Lanced pour and debridge thermal break.
- High - load mullion.



Salem Hospital, Salem, OR - FOR

Thermal

Offset Glaze Systems

- 4-1/2", 5-1/4", 6" frame depths.
- 2-1/4", 2-1/2" face dimensions.
- Systems may be glazed from inside or outside.
- Screw spline, shear block, stick construction.
- Front, Center, back or multi - plane glass applications.
- Systems provide for captured or silicone glazed vertical.
- Accommodates glass up to 1" thick.
- Abraided pour and debridge thermal break.
- Thermal isolator.
- Two - color finish option.



Fox Studio, Denver, CO - Carlson Architects

T• 500

Pressure Plate and Silicone Vertical Glazed System

- 4-3/4", 5-1/2", 6", 7", 8", 10" frame depths.
- 2-1/4", 2-1/2", 3", 4-1/2", 5", 6" face dimension.
- 0.125 Nominal wall thickness.
- Inside and outside glazed.
- Thermally improved.
- Shear block or screw spline construction.
- Accommodates glass up to 1-1/8"
- Wide variety of snap – on face cap profiles.
- Concealed fastener joinery creates a monolithic exterior appearance.
- Filler produces uninterrupted seam lines by snapping on to optional open-back horizontal mullions.
- Two-color finish option.
- System provides for captured or silicone glazed vertical.
- Glazed in zero sightline project – out or inswing casement option.

LCW 2900

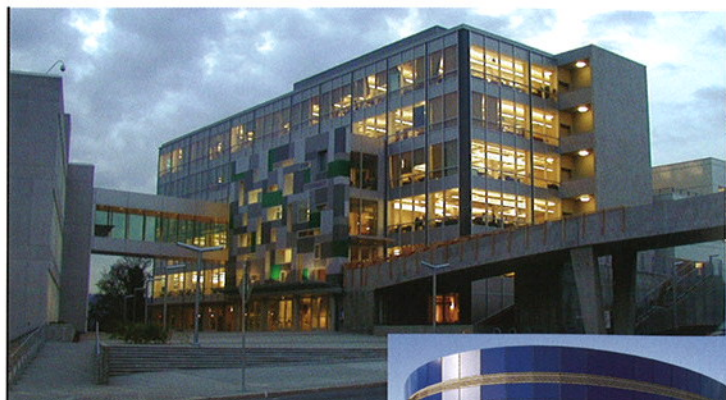
Thermal Clip Wall System

- 7-1/4" frame depth.
- 2-1/2" face dimension.
- Easy economical installation.
- Concealed fastener joinery creates a monolithic exterior appearance.
- System provides for captured or silicone glazed vertical.
- Two-color finish option.
- Accommodates glass up to 1".

Sunshades/Light Shelves

Sun Controls for Function and Architecture

- Produced to your custom design and specification.
- Integrates easily into Pressure Plate and Unitized Wall Systems.
- Economical, and easy to install.
- Applications ranging from single-story to multi-story buildings.
- Provides "green" features that compliment your building in both form and function.
- Provides a single-source solution.
- All design and engineering project specific.



Adidas Village, Portland, OR - BORA Architects



4th & Lewis, Las Vegas, NV - JMA Architectural



UCLA Health Science Building, Los Angeles, CA - Perkins & Will

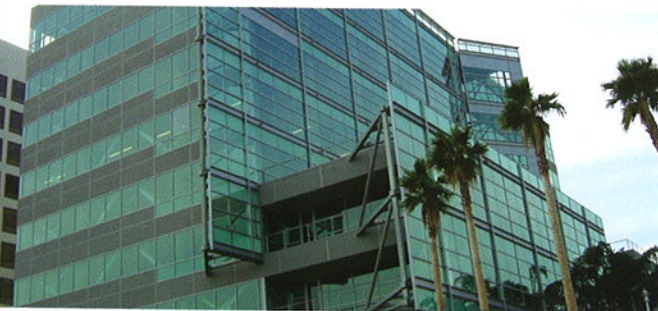


Soka, Santa Monica, CA - WWCOT Architecture Planning

Unitized Curtainwall

Pre-assembled Interlocking Frame Design

- 4-1/2", 5", 5-1/2", 8-1/4" frame depth.
- 2-1/4", 2-1/2", 2-3/4" face dimension.
- Anchor design allows for construction tolerance.
- Accommodates seismic, live load and thermal building movements.
- Two-color finish option.
- Pressure-equalized and compartmentalized.
- Two lines of defense against water and air infiltration.
- Water control/drainage at each unit height.
- Provision for easy hoisting and handling.
- Captured vertical and 4-sided structural glazed.
- Accommodates glass up to 1".



999 Sepulveda, Los Angeles, CA - HKS Architects, Inc.

Spanwall

High span vertical truss wall system

Variable frame depth

- 2-1/4', 3-1/2" face dimension.
- Self-supporting curtain wall.
- Frame by either radius or rectangular cords.
- Custom web design connection.
- Two-color finish option.
- System provides for captured or silicone glazed vertical.
- Accommodates glass up to 1".



Ford Motor Co., Irvine, CA - LPA Architects



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Arcadia Hawaii

94-410 Uke'e Street, Building A • Waipahu, HI 96797
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- Clear Anodize AC-2
- Light Champagne AB-1
- Champagne AB-2
- Light Bronze AB-3
- Medium Bronze AB-4
- Standard Medium Bronze AB-5
- Dark Bronze AB-6
- Standard Dark Bronze AB-7
- Black AB-8



Painted Finishes

- Blending capabilities allows us to quickly create virtually any color.
- Fluorocarbon Coating: AAMA2605.2.
 - Resin: 70% PVDF Kynar 500/Hylar 5000.
 - Substrate: cleaned and pretreated with chromium phosphate.
 - Primer: Manufactured standard resin base compatible coating.
 - Color Coat: 70% PVDF

Architectural Services

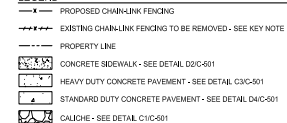
- Structural, Application, Architectural Engineering
- Architectural Design
- Information Systems
- CAD Design
- Research and Development
- Estimating
- Product Samples
- Specification Review

References

- Products are tested in accordance with American Architectural Manufacturers Association (AAMA) and the American National Standards Institute (ANSI).
- California Title 24/N.F.R.C. Certification.
- ADA – Products are designed to comply with the Americans with Disabilities Act.



C-102





Kevin Smith

FIRE STATION 10

100% CONSTRUCTION
DOCUMENTS
APRIL 3, 2013

4501 SINCLAIR AVE
MIDLAND, TEXAS
79707

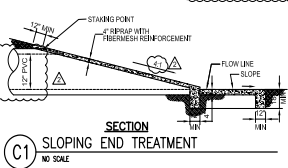
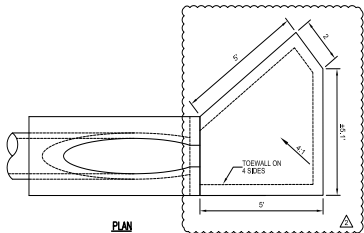
KEY PLAN

NO.	DATE	DESCRIPTION
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2	4/30/2013	100% CONSTRUCTION DRAWINGS
NO.	DATE	DESCRIPTION
1	4/30/2013	100% CONSTRUCTION DRAWINGS

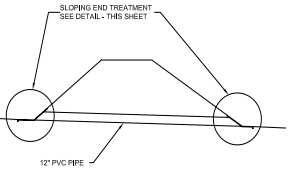
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DETAILS

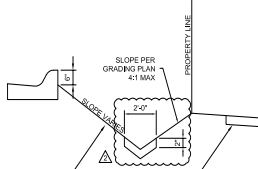
C-502



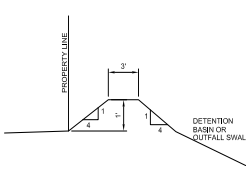
C1 SLOPING END TREATMENT
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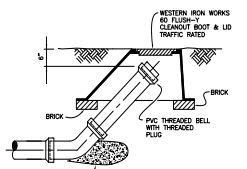
B1 DETENTION OUTFALL
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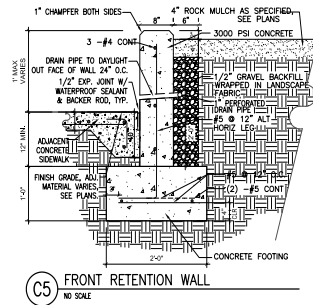
B2 SWALE OUTFALL SECTION
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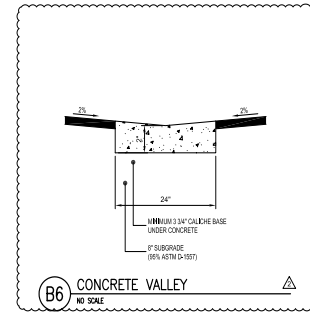
B3 BERM
NO SCALE



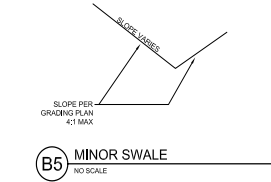
B4 CLEANOUT DETAIL
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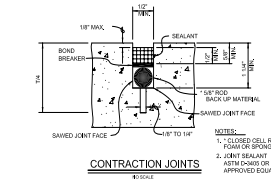
C5 FRONT RETENTION WALL
NO SCALE



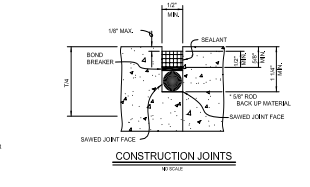
B6 CONCRETE VALLEY
NO SCALE



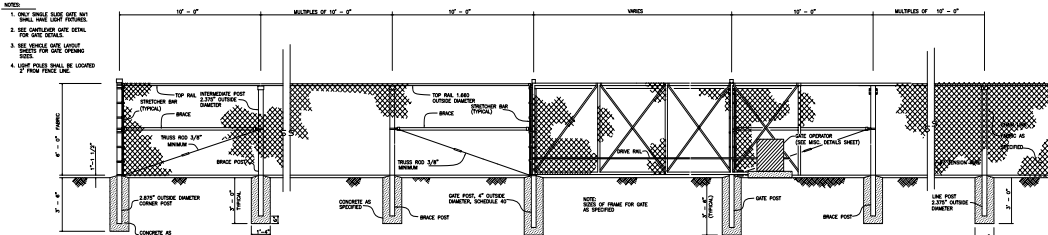
B5 MINOR SWALE
NO SCALE



A5 CONTRACTION JOINT
NO SCALE



A6 CONSTRUCTION JOINT
NO SCALE



A1 SINGLE SLIDE GATE AND SECURITY FENCE
NO SCALE

6.605

E

D

C

B

A

1

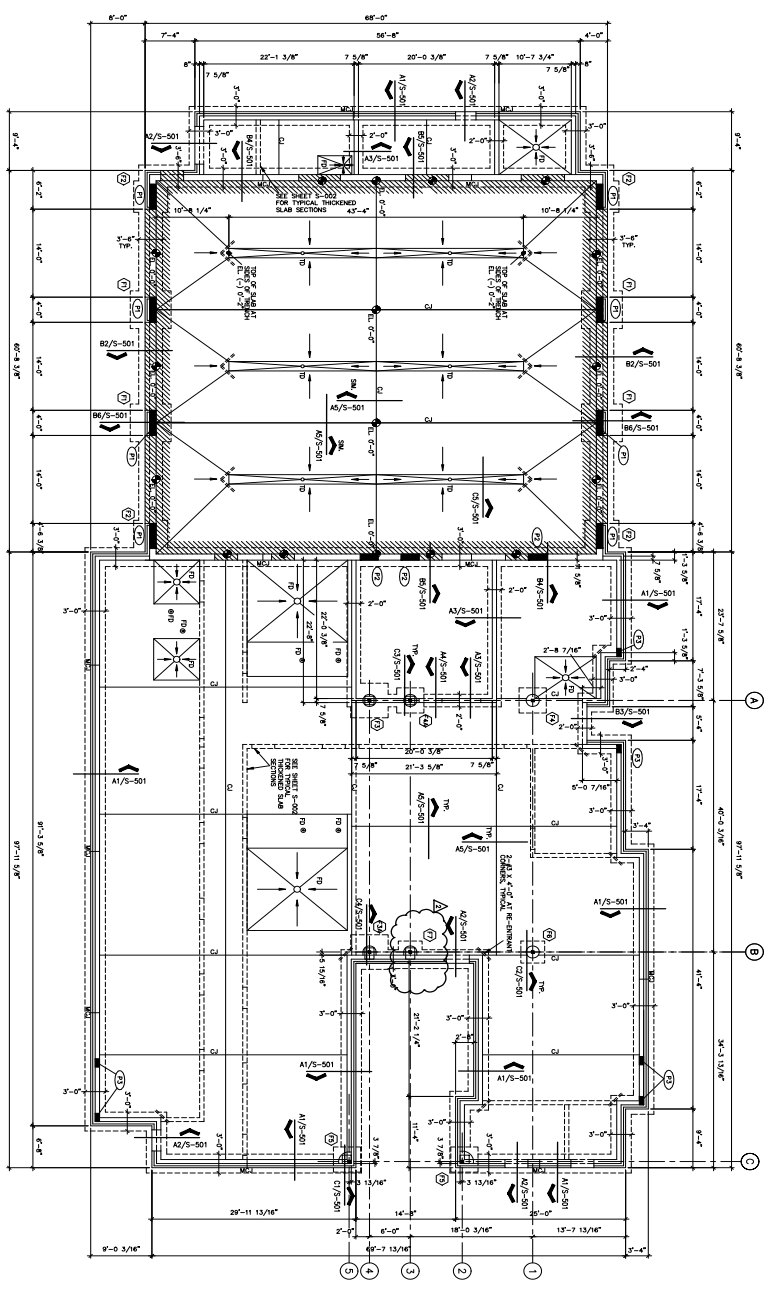
2

3

4

5

6



C2 FOUNDATION PLAN
1/8" = 1' - 0"

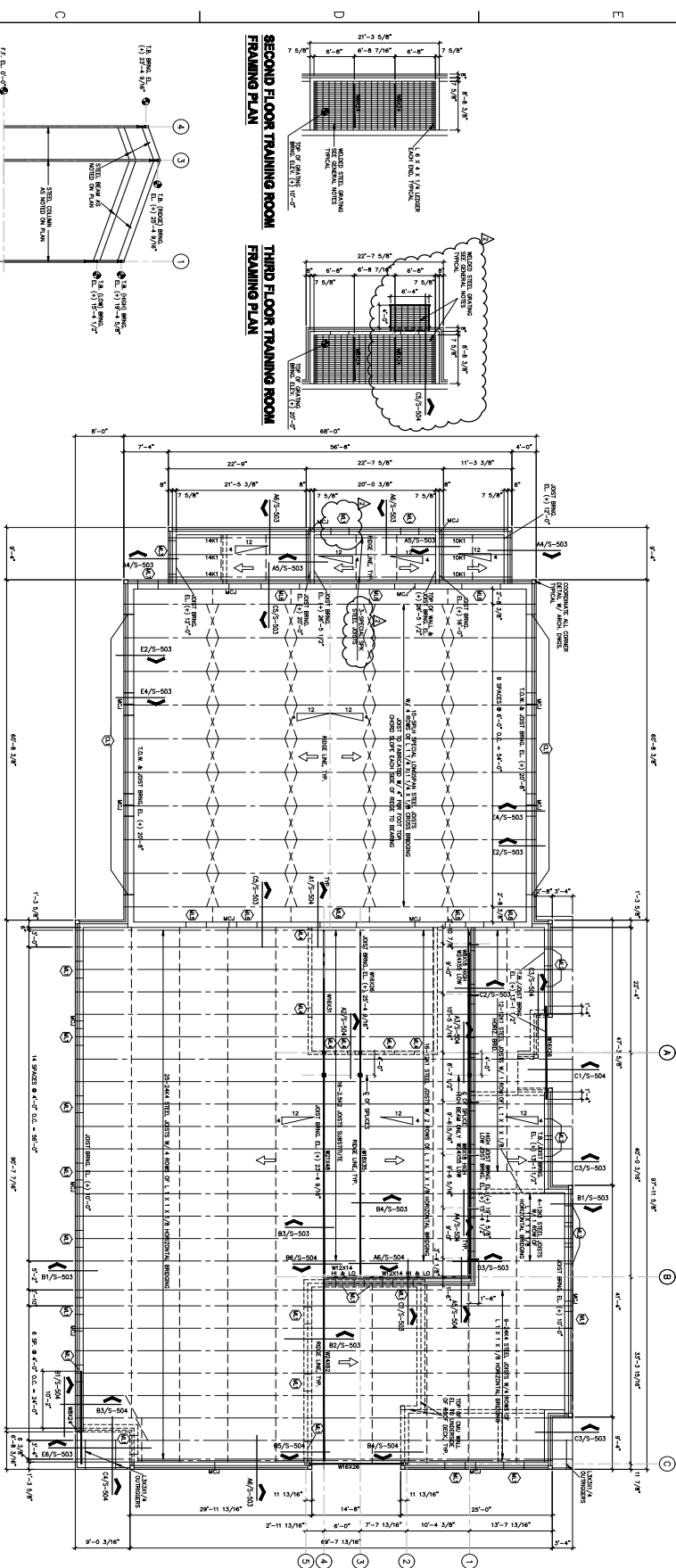
- [illegible]

CMU PILASTER SCHEDULE	
MARK	NOMINAL SIZE
P1	12" X 40"
P2	12" X 32"
P3	8" X 16"

NOTE: REINFORCE PLASTER P1 & P2 WITH 2-#0 AND P3 W/1-#5 EACH CELL FULL HEIGHT AND 1/4" DIA. SMOOTH BAR TIES TIES SET IN EACH CMU JOINT.

[illegible]

DRAINAGE COORDINATION
THE CIVIL, ARCHITECTURAL, STRUCTURAL, MECHANICAL, AND ELECTRICAL ENGINEERS ARE ALL INTERRELATED. THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS SHALL REVIEW AND COORDINATE THE ENTIRE SET OF DRAWINGS, SPECIFICATIONS, AND PROJECT MANUAL.

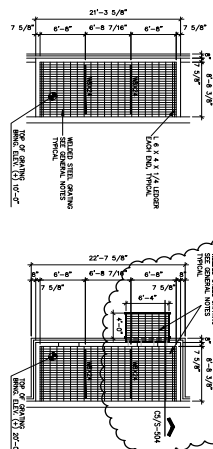


SECOND FLOOR TRAINING ROOM

FRAMING PLAN

THIRD FLOOR TRAINING ROOM

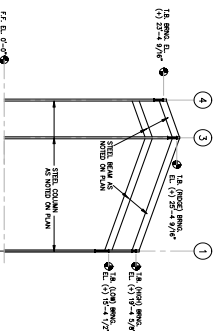
FRAMING PLAN



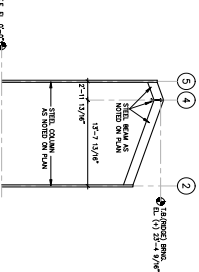
THIRD FLOOR TRAINING ROOM



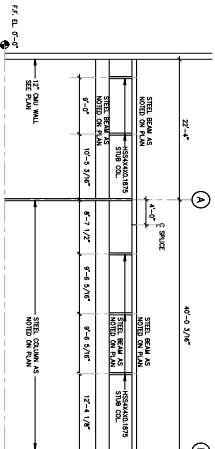
C1 ELEVATION GRID LINE B FRAME
1/8" = 1' - 0"



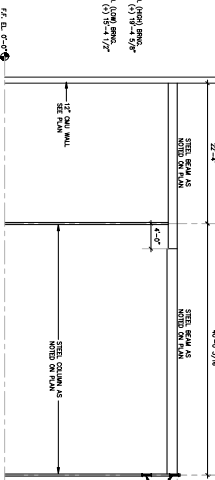
B1 ELEVATION GRID LINE C FRAME
1/8" = 1' - 0"



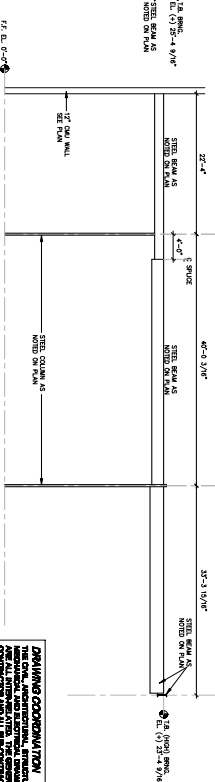
A1 ELEVATION GRID LINE 1 FRAME
1/8" = 1' - 0"



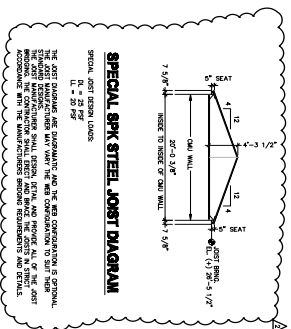
A3 ELEVATION GRID LINE 3 FRAME
1/8" = 1' = 0"



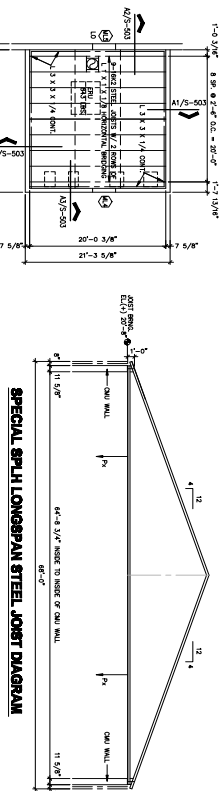
A4 ELEVATION GRID LINE 4 FRAME
1/8" = 1' - 0"



C3 ROOF FRAMING PLAN
1/8" = 1' = 0"



MECHANICAL ROOM



DRAWING COORDINATION
THE CIVIL, ARCHITECTURAL, STRUCTURAL,
MECHANICAL AND ELECTRICAL DRAWINGS
ARE ALL INTERRELATED. THE GENERAL
CONTRACTOR AND ALL SUB-CONTRACTORS
SHALL REVIEW AND COORDINATE THE
ENTIRE SET OF DRAWINGS, SPECIFICATIONS
AND PROJECT MANUAL.



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FIRE STATION 10

100% CONSTRUCTION DOCUMENTS

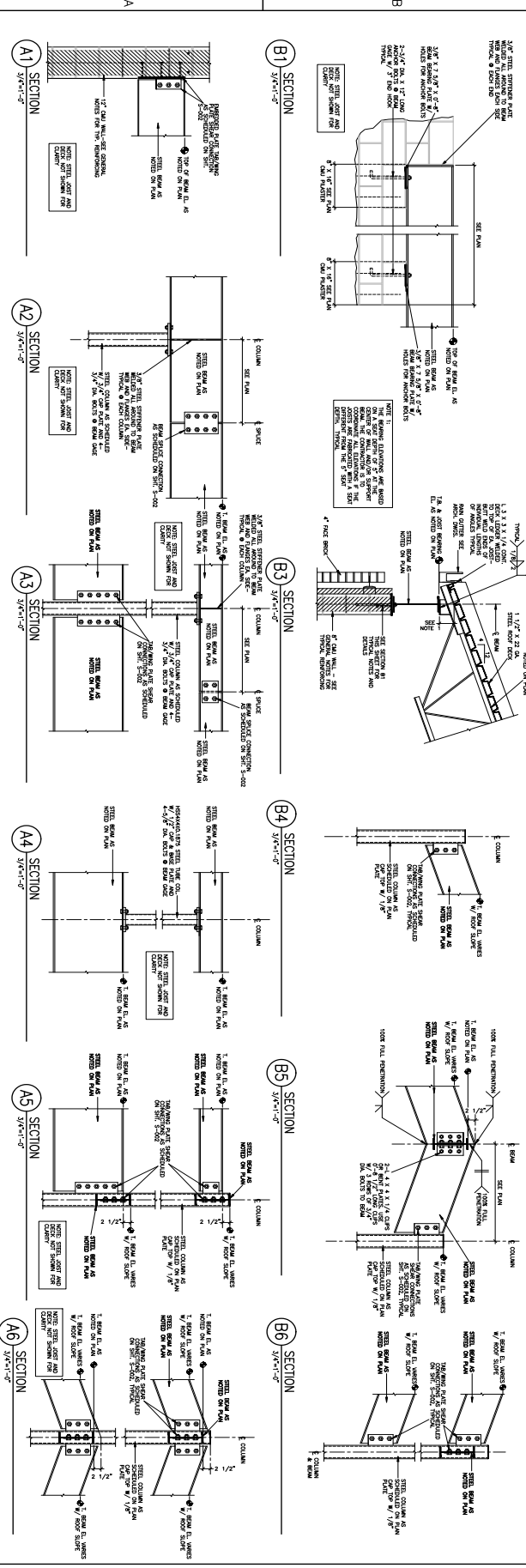
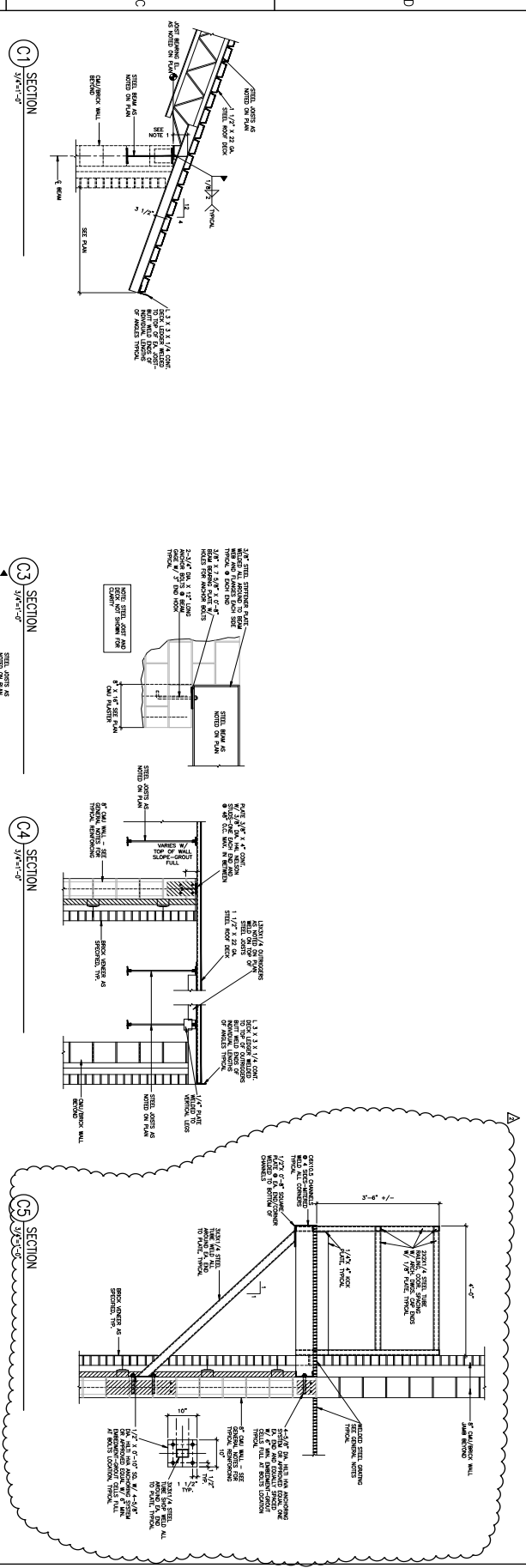
SHED AND PLACE
INDIAN, TOWNSHIP

SEE PLAN

DATE: 11/26/2013
PROJECT: 100% CONSTRUCTION DOCUMENT SET
SHEET: 100% CONSTRUCTION DOCUMENT SET

ROOF FRAMING SECTIONS

S-504



A-305



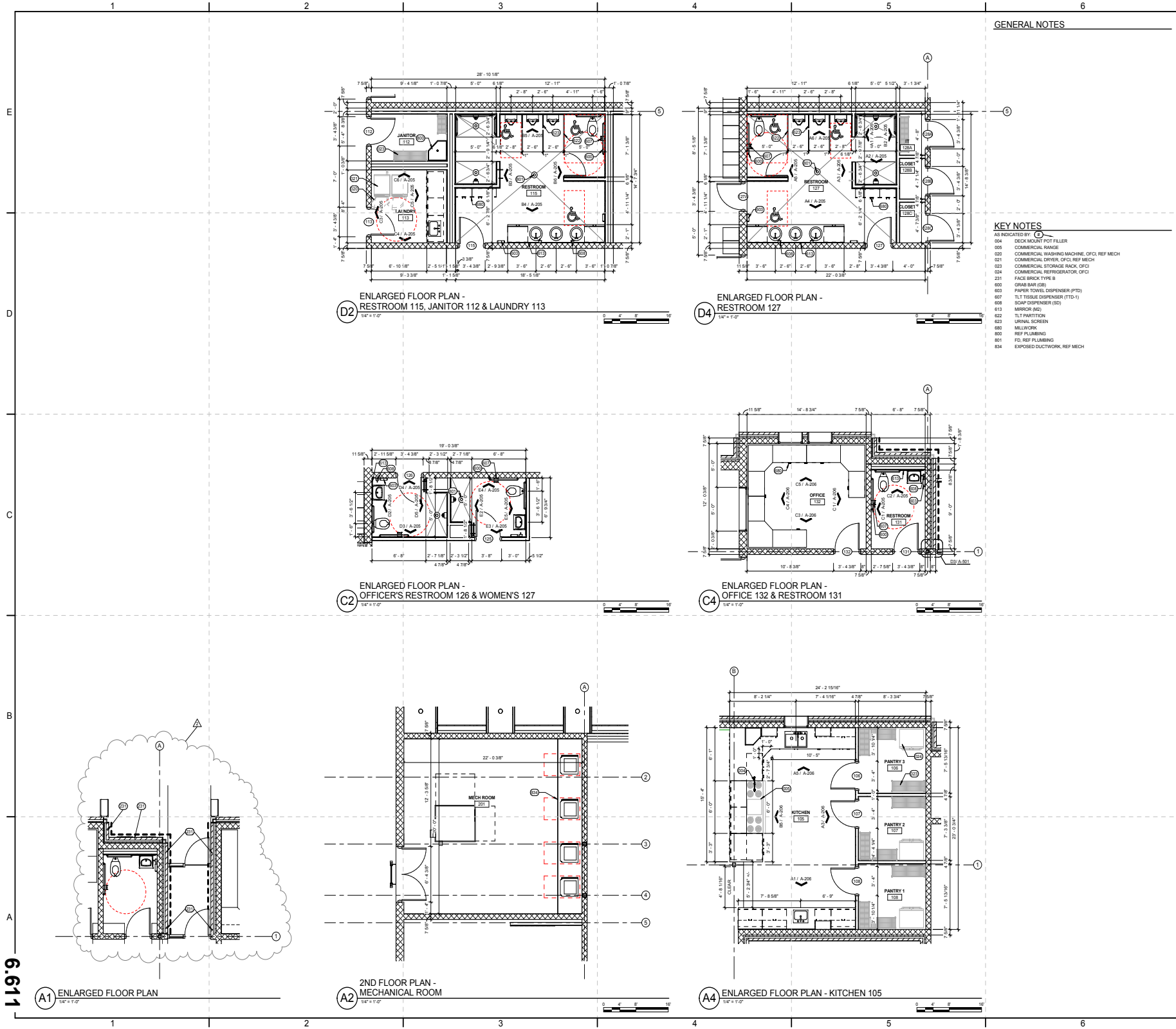
A1 WALL SECTION

A3 WALL SECTION

A4 WALL SECTION

A6 WALL SECTION

4/20/2013 3:45:02 PM



GENERAL NOTES

- KEY NOTES
- AS INDICATED BY (1)
- 004 DECK MOUNT POT FILLER
 - 005 COMMERCIAL RANGE
 - 020 COMMERCIAL WASHING MACHINE, OFCI, REF MECH
 - 021 COMMERCIAL DRYER, OFCI, REF MECH
 - 022 COMMERCIAL STORAGE RACK, OFCI
 - 024 COMMERCIAL REFRIGERATOR, OFCI
 - 231 FACE BRICK TYPE B
 - 600 GRAB BAR (GB)
 - 603 PAPER TOWEL DISPENSER (PTD)
 - 607 TLT TISSUE DISPENSER (TID-1)
 - 608 SOAP DISPENSER (SD)
 - 613 MIRROR (M)
 - 622 TLT PARTITION
 - 623 URINAL SCREEN
 - 680 MELLUWORK
 - 800 REF PLUMBING
 - 801 FGI REF PLUMBING
 - 834 EXPOSED DUCTWORK, REF MECH



FIRE STATION 10

100% CONSTRUCTION DOCUMENTS

4501 SINCLAIR
MIDLAND, TEXAS
79707

KEY PLAN

1	54.28.13	ADDENDUM NO. 2
1	54.23.13	ADDENDUM NO. 1
NO.	DATE	REVISION
DRAWING OFFICE: MIDLAND PROJECT NO: 2008-10		

ENLARGED PLANS

**ATTENDANCE** PROJECT NAME: Midland Fire Station 10

PROJECT NO.: 03.8686.12

DATE: April 29, 2013

TIME:

LOCATION:

NAME	ORGANIZATION	OFFICE	CELL	EMAIL
Kenny Harlagen	RM Rodriguez Construction	254-742-0102	512-749-9104	estimating@rodriguezconstruction.com
Todd Ireland	Journeyman Construction	512-247-7000	512-848-5074	bids@journeymanconstruction.com
Jim D. Hunter	Minnix Commercial	806-798-7335	806-928-5051	jim@minnixcommercial.com
Clint Pool	Systech	432-550-7964		clint@systech-systems.com
Jeremy Gaddis	JC Roberts Construction	432-580-6161	432-553-3552	jg.jcrcci@sbcglobal.net
Tim Wright	TMI Mechanical	432-686-0002	432-687-5439	tmimech@clearwire.net
John King	Mid-Tex of Midland	432-697-2282	432-638-5037	john@midtxofmidland.com
George Johnson	South West Masonry	432-563-2639	559-3446	george.johnson@masonrybiz.com
Robert Patrick	City of Midland	685-7235		
Chris Upton	PSC	697-1447		

[illegible]



ADDENDUM NO: 03

TO: ALL PLANHOLDERS

FROM: PARKHILL, SMITH & COOPER, INC.

PROJECT NAME: MIDLAND FIRE STAION NO 10

PROJECT NO.: 03.8686.12

DATE: May 3, 2013



5/3/13

Attention of all Prospective Bidders/Plan Holders is directed to the following modifications to the referenced Drawings and Project Manual. This Addendum becomes a part of the Contract Documents and modifies the original Bidding Documents dated as noted below:

This Addendum consists of 3 pages and Section 05500.

I. CHANGES TO PROJECT MANUAL:

A. SECTION 05500 – FABRICATED METAL

1. Add section in its entirety.

II. GENERAL/CLARIFICATIONS:

1. Concerning the built up plate lintel angles noted to be ML1, ML2, ML3 and ML7 (All type B Lintels) shown on sheet S-001 and also the same materials shown for Brick Ledger Angles at roof elevation changes, namely sections C1, C5 & E2/S-503...
 - a. Should these lintels be galvanized?
ANSWER: The lintels do not have to be galvanized.
 - b. There is no weld symbol, can they be stitched together or do they require a full seam weld?
ANSWER: They can be stitched.
 - c. Would it be feasible to furnish a bent plate to the same outside dimensions? There would be a bit of a curf radius at the bend, but with these having stiffeners, we are not sure how it would matter.
ANSWER: At the contractors option he can provide bent plates with the same outside dimensions.
2. Also concerning the lintel schedule, mark CL1 shows a note for these lintels to be continuous over the openings. This is for brick support over the Apparatus Bay Overhead Doors. This area would be approximately 50' in length if continuous. This is not feasible for this material to be this length. Can they be individual lintels over the doors or will they have to be Field Welded?
ANSWER: The masonry lintel and its reinforcing must be continuous. The angle angle can be individual lengths, but minimize the number of pieces.
3. Also concerning Galvanizing...Should the embed angles at the trenches be Hot Dip Galvanized? Section C5/S-501.
ANSWER: Galvanized embed angles.
4. Concerning the Bar Grating...Should all Bar Grating be Hot Dip Galvanized? (Please note that the bar grating specified is not rated for any wheel loading, just foot traffic.)
ANSWER: Galvanized Bar Grating – Size as designed.
5. Section D2/A-101 shows a training platform on the exterior of the building at Elevation 120'-0". Sheet A-103, the roof plan, also shows this and calls it out on note 010. Further Architectural Sheets re-direct you to the Structural sheets for details on this platform, but we can find no applicable details.
ANSWER: Platform detail was addressed in Addenda 2.
6. There is not a product listed for the CMU walls scheduled to receive W1 clear sealant, matte finish.
ANSWER: A clear Matte Finished Acrylic Sealer – PPG Perma-Crete or equal.
7. There are 2 products listed for CMU in other areas such as bedrooms and hallways, which product do we base it on? Polomyx or ProMar 200 Zero VOC.
ANSWER: Use the Same Clear Finish on the interior Block walls in the hallways and Bedrooms – PPG Perma-Crete or equal.
8. There 2 products listed for CMU in restrooms, which products do we base it on? Incredicoat or Water Based Catalyzed Epoxy.
ANSWER: Water Based Catalyzed Epoxy – Color as selected by Architect.
9. Are the solid core wood doors factory finished or field finished?
ANSWER: Field Finish will need to match the finish on the Timbersil.
10. There are not exterior control joints shown on the brick. Is this correct or will there be some? If so, how often?
ANSWER: The Control Joints aren't needed in the Brick due to the Timbersil downspout covers.
11. The above also applies to the interior CMU.
ANSWER: Refer to the Foundation and roof framing plans for MCJ.

12. Do we paint the Timbersil on the exterior at the downspout locations and window surrounds?

ANSWER: The Timbersil is to receive a Stained Finish the one designed around is Seal-Once, color Mahogany.

13. What are the finishes in the alternate truck bay?

ANSWER: Same as the Primary Truck Bay

14. There are no bollards shown on the drawings. Is this correct?

ANSWER: Civil is going to add these so you can say "Refer to attached Civil drawings"

15. Does the training platform grate paint?

ANSWER: It will be galvanized.

16. Does the tube in the training room paint?

ANSWER: The tube in the Training room should be galvanized.

A-101 Notes

007 Ice Machine, 008 Gear Extractor, 009 Drying Cabinet – Specs aren't found. Are they furnished by the owner?

ANSWER: A-101 notes 007, 008, 009 are OFCI.

013 36" Training Tunnel – Is this corrugated pipe? Steel Pipe?

ANSWER: 013-TRAINING TUNNEL to be Galvanized Corrugated Pipe.

A-201 Notes

680 Millwork is pointing to the "10". Are these wooden numbers or some type of metal building letters?

ANSWER: These are to be stainless steel letters with standoffs.

012 Training Hatches – What are these? Aluminum access doors, prefinished, lockable, etc.

ANSWER: Lockable access doors.

A-206

019 Flat Screens – Do we provide? If so specs?

ANSWER: OFCI

What are the finishes for the 2nd and 3rd floor areas? For example, is the 2nd floor mechanical room sealed concrete or vct? Do walls paint?

ANSWER: Mechanical Room – W1, F1 B1, Ceiling no paint needed

The training tower area finishes to match apparatus bays.

END OF ADDENDUM NO 3

SECTION 05500

METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Agreement, Supplementary Conditions and Division 1 – General Requirements apply to Work of this Section.

1.2 SECTION INCLUDES

- A. Shop fabricated ferrous metal items, prime painted and galvanized.
- B. Steel floor grating.

1.3 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete: Placement of anchors in concrete.
- B. Section 04200 - Unit Masonry: Placement of anchors in masonry.
- C. Section 05120 - Structural Steel: Structural bearing plates, angles and miscellaneous items, including anchorage.
- D. Section 06100 - Rough Carpentry: Wood blocking for support of accessories.
- E. Section 09900 - Painting: Field preparation and paint finish.

1.4 DESIGN REQUIREMENTS

- A. Gratings
 - 1. General
 - a. Size components using single support design.
 - b. Maximum Allowable Deflection Under Live Load: 1/240.
 - 2. Type I
 - a. Design Wheel Load (Heavy Vehicle): Wheel load of 15,600 lbs. conforming to ASSHTO Grade 15, with 30 percent impact loading.

1.5 QUALITY ASSURANCE

- A. Prepare shop drawings for stairs and gratings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Texas.
- B. Welders' Certificates: Submit certificates certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.

1.6 REFERENCES

- A. AASHTO - Standard Specification for Highway Bridges.
- B. ANSI/NAAMM MBG 532 - Heavy Duty Metal Bar Grating Manual.
- C. ASTM A36 - Structural Steel.
- D. ASTM A53 - Pipe, Steel Black and Hot-Dipped, Zinc-coated Welded and Seamless.
- E. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

- F. ASTM A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- G. ASTM A283 - Carbon Steel Plates, Shapes, and Bars.
- H. ASTM A307 - Carbon Steel Externally Threaded Standard Fasteners.
- I. ASTM A386 - Zinc-Coating (Hot-Dip) on Assembled Steel Products.
- J. AWS A2.0 - Standard Welding Symbols.
- K. AWS D1.1 - Structural Welding Code.
- L. FS-S-325 - Shield, Expansion; Nail Expansion; and Nail, Drive Screw (Devices, Anchoring, Masonry).
- M. SSPC - Steel Structures Painting Council.

1.7 SUBMITTALS

- A. Shop Drawings and Product Data
 - 1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
 - 2. Include erection drawings, elevations, and details where applicable.
 - 3. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.
 - 4. Indicate adjacent construction and required anchorages to be provided by other sections.
 - 5. Submit manufacturer's standard printed descriptive product literature for manufactured items.
- B. Design Data
 - 1. Submit span and deflection tables for specified grating loads.
- C. Certification: Submit Welder's certificate verifying AWS qualification within the previous 12 months.

1.8 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop drawings and as instructed by manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Gratings
 - 1. IKG Industries, Nashville, TN.
 - 2. United Interlock, Columbus, OH.
 - 3. Alhambra Foundry Co., Alhambra, CA.
- B. Substitutions: Under provisions of Section 01600.

2.2 MATERIALS

- A. General
 - 1. Steel Sections: ASTM A36.
 - 2. Steel Plates: ASTM A283.
 - 3. Steel Pipe: ASTM A53, Grade B Schedule 40.
 - 4. Fasteners: FS-S-325, type as required by condition indicated.

-
5. Bolts, Nuts, and Washers: ASTM A307 galvanized to ASTM A153 for galvanized components.
 6. Welding Materials: AWS D1.1; type required for materials being welded.
 7. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.
 8. Touch-Up Primer for Galvanized Surfaces: Zinc rich type.
- B. Gratings
1. ANSI A202.1, Types as specified and/or detailed.
 2. Types I: ASTM A36 steel, rectangular shape.
 3. Fasteners and J-Hooks: Of same material as grating.
 4. Perimeter Closure: Of same material as grating.
- C. Pipe Bollards: ASTM A53, Grade B Schedule 40, 8 inch outside diameter, unless otherwise indicated on the drawings.
- D. Miscellaneous Materials
1. Grout: Nonmetallic, noncorrodible, nonshrink, factory blended and packaged; complying with ASTM C 1107; recommended by manufacturer for exterior use.
 2. Concrete: Normal weight ready-mix concrete as specified in Division 3.
 - a. Compressive strength: 2500 pounds per square inch, minimum, at 28 days, unless otherwise indicated.
 3. Concrete Inserts: Style as required for application.
 4. Fasteners: Use fasteners suitable for the material being fastened and for the type of connection required.
 - a. For exterior use or built into exterior walls: Nonferrous stainless steel, zinc coated or cadmium plated.
 - b. Use fasteners of same material as items being fastened unless otherwise indicated.
 - c. Bolts and studs: ASTM A 307.
 - d. Nuts: ASTM A 563.
 - e. Lag bolts: FS FF-B-561.
 - f. Machine screws: FS FF-S-92.
 - g. Wood screws: FS FF-S-111.
 - h. Plain washers: FS FF-W-92.
 - i. Lock washers: FS FF-W-84.
 - j. Expansion shields: FS FF-S-325.
 - k. Toggle bolts: FS FF-B-588.
 5. Galvanizing Repair Paint: Zinc dust paint complying with SSPC-Paint 20 or MIL P-21035B, Type I or II.
 6. Shop Primer: Rust-inhibitive, lead and chromate free, low VOC primer, complying with FS TT-P-664, or equivalent.

2.3 FABRICATION

- A. General
1. Fit and shop assemble in largest practical sections for delivery to site.
 2. Fabricate items with joints tightly fitted and secured.
 3. Continuously seal joined members by continuous welds.
 4. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
 5. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

6. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- B. Gratings
 1. Fabricate grates to accommodate design loads to sizes indicated and to tolerances specified in ANSI/NAAMM MBG531.
 2. Fabricate steel grates with welded cross bars.
 3. Top Surface: Smooth.
 4. Bearing Bars: 1-3/16 inch on center maximum.
 5. Cross Bars: Spaced 4 inches on center maximum.
 6. Finishes: Galvanized.

2.4 FINISHES

- A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- B. Do not prime surfaces in direct contact with concrete or where field welding is required.
- C. Prepare and prime paint items Specified or Scheduled to be field painted with two coats manufacturer's standard baked on primer.
- D. Galvanize items Specified or Scheduled to be galvanized with 1.25 oz/sq ft zinc coating in accordance with ASTM A386.
- E. Field Painting: Specified in Section 09900.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Beginning of installation means erector accepts existing conditions.

3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply items required to be cast into concrete or embedded in masonry with setting templates, to appropriate sections.

3.3 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components indicated on shop drawings.
- D. Perform field welding in accordance with AWS D1.1.
- E. Obtain Architect approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.
- G. Mechanically cut galvanized finish surfaces. Do not flame cut.
- H. Anchor grating by bolting through flange blocks.

3.4 ERECTION TOLERANCES

- A. General
 - 1. Maximum Variation From Plumb: 1/4 inch in 10 feet.
 - 2. Maximum Offset From True Alignment: 1/4 inch.
- B. Gratings
 - 1. Conform to ANSI/NAAMM MBG 531.
 - 2. Maximum Space Between Adjacent Sections: 1/4 inch.
 - 3. Maximum Variation From Top Surface Plane of Adjacent Sections: 1/16 inch.

3.5 SCHEDULE

- A. The Schedule is a list of principal items only. Refer to Drawing details for items not specifically scheduled.
 - 1. Overhead Coiling Door Frames: 1/4 inch thick bent plate as detailed: prime paint finish for field painting.
 - 2. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; prime paint finish.

END OF SECTION



ADDENDUM NO: 04

TO: ALL PLANHOLDERS

FROM: PARKHILL, SMITH & COOPER, INC.

PROJECT NAME: MIDLAND FIRE STATION NO 10

PROJECT NO.: 03.8686.12

DATE: May 6, 2013



5/6/13

Attention of all Prospective Bidders/Plan Holders is directed to the following modifications to the referenced Drawings and Project Manual. This Addendum becomes a part of the Contract Documents and modifies the original Bidding Documents as noted below:

This Addendum consists of 2 pages, Section 02821 and drawings nos C-102-8686 C-102 (1).pdf and C-502-8686 C-501 (1).pdf.

I. CHANGES TO PROJECT MANUAL:

A. TABLE OF CONTENTS

1. Add the following section under Division 2: 02821

B. SECTION 09300 – TILE

1. Paragraph 2.1.A – ADD subparagraph as noted below:

Ceramic Mosaic Floor Tile

- a. Conformance: ANSI/TCA A137.1.
- b. Type: Vitreous or porcelain with moisture absorption of 0 to 0.5 percent.
- c. Size: 2 x 2 x 1/4 inch.
- d. Pattern: As selected by Architect.
- e. Edge: Cushioned.
- f. Surface Finish: Unglazed.
- g. Color: Blend using a maximum of 3 colors and varying percentages as selected by Architect from manufacturer's Group 1, 2, and 3 colors.
- h. Coefficient of Friction: ASTM C1028; not less than .60 wet and .80 dry.

II. CHANGES TO DRAWINGS:

A. SHEET C-102

1. Refer to revisions on attached drawing.

B. SHEET C-502

1. Refer to revisions on attached drawing.

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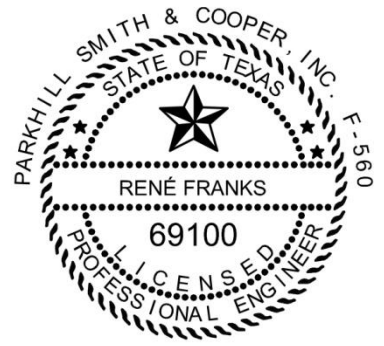
III. GENERAL/CLARIFICATIONS:

1. Three (3) copies of the proposal are required.
2. There is a note for tagging plant material at the nursery. Will travel to Mountain States Nursery be required to tag the material?

ANSWER: Travel to Mountain States will not be required. However, all trees will need to be tagged prior to bringing them to the site or prior to planting for approval. Shrubs can be viewed at growers location, at nursery, at landscape contractors yard or onsite, prior to installation.

END OF ADDENDUM NO 4

SECTION 02821
CHAIN-LINK FENCES AND GATES



René Franks

05-06-13

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract for Construction, Supplementary Conditions (if any) and Division 1 - General Requirements apply to Work of this Section.

1.2 SECTION INCLUDES

- A. Chain-link fences.
- B. Gates: Rolling.

1.3 RELATED SECTIONS

- A. Section 03300- Cast-in-Place Concrete: Cast-in-place concrete and post footings.

1.4 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Chain-link fence and gate framework shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to ASCE/SEI 7-05:
 - 1. Minimum Post Size and Maximum Spacing: Determined according to CLFMI WLG 2445, based on mesh size and pattern specified and on the following:
 - a. Wind Loads: 100 mph.
 - b. Exposure Category: C.
 - c. Fence Height: As indicated on plans.
 - d. Material Group: IA, ASTM F 1043, Schedule 40 steel pipe, or ASTM A53, Grade B.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain-link fences and gates.
 - 1. Fence and gate posts, rails, fittings, latches, drop rods, and finishes.
 - 2. Chain-link fabric, reinforcements, and attachments.
 - 3. Gates and hardware.
 - 4. Privacy slats.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work show accessories, hardware, gate operation, and operational clearances.
- C. Samples for Initial Selection: For components with factory applied finishes.

1.6 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of chain-link fence, and gate, from manufacturer.
- B. Product Test Reports: For framing strength according to ASTM F 1043.
- C. Field quality-control reports.
- D. Warranty: Sample of special warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For the following to include in emergency, operation, and maintenance manuals:
 - 1. Gate hardware.

1.8 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing fence grounding. Member company of NETA or an NRTL.
 - 1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.
- B. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review required testing, inspecting, and certifying procedures.

1.9 PROJECT CONDITIONS

- A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements prior to construction.

1.10 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which Installer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2. Warranty Period: Fifteen (15) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CHAIN-LINK FENCE FABRIC

- A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist. Comply with CLFMI Product Manual and with requirements indicated below:
 - 1. Fabric Height: As indicated on Drawings.
 - 2. Steel Wire Fabric: Wire with a diameter of 0.148 inch.
 - a. Mesh Size: 2 inches.
 - b. Zinc-Coated Fabric: ASTM A 392, Type II, Class 1, 1.2 oz./sq. ft. with zinc coating applied after weaving.

-
- c. Coat selvage ends of fabric that is metallic coated before the weaving process with manufacturer's standard clear protective coating.
 - 3. Selvage: Knuckled at both selvages.

2.2 FENCE FRAMING

- A. Posts and Rails: Comply with ASTM F 1043 for framing, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F 1043 or ASTM A 53 galvanized pipe based on the following:
 - 1. Fence Height: As indicated on Drawings.
 - 2. Heavy Industrial Strength: Material Group IA, round steel pipe, Schedule 40 or ASTM A 53 galvanized pipe.
 - a. Line Post: Size as indicated on drawings.
 - b. End, Corner and Pull Post: Size as indicated on drawings.
 - 3. Horizontal Framework Members: Intermediate, top and bottom rails complying with ASTM F 1043.
 - a. Intermediate, Top and Bottom Rails: Size as indicated on drawings.
 - 4. Brace Rails: Comply with ASTM F 1043.
 - 5. Metallic Coating for Steel Framing:
 - a. Type A, consisting of not less than minimum 2.0-oz./sq. ft. average zinc coating per ASTM A 123/A 123M or 4.0-oz./sq. ft. zinc coating per ASTM A 653/A 653M.

2.3 HORIZONTAL – SLIDE GATES

- A. General: Comply with ASTM F 1184 for gate posts and single or double sliding gate types.
 - 1. Classification: Type I Overhead Slide.
 - a. Gate Leaf Width: As indicated.
 - b. Gate Fabric Height: As indicated.
 - 2. Classification: Type II Cantilever Slide, Class 1 with external roller assemblies.
 - a. Gate Frame Width and Height: As indicated.
- B. Pipe and Tubing:
 - 1. Zinc-Coated Steel: Manufacturer's standard protective coating and finish.
 - 2. Gate Posts: Comply with ASTM F 1184. Provide round tubular steel posts.
 - 3. Gate Frames and Bracing: Aluminum.
- C. Frame Corner Construction: Welded.
- D. Overhead Track Assembly: Manufacturer's standard track, with overhead framing supports, bracing, and accessories, engineered to support size, weight, width, operation, and design of gate and roller assemblies.
- E. Hardware:
 - 1. Latches permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.
 - 2. Hangers, roller assemblies, and stops fabricated from galvanized steel.

2.4 FITTINGS

- A. General: Comply with ASTM F 626.
- B. Post Caps: Provide for each post.
 - 1. Provide line post caps with loop to receive top rail.
- C. Rail and Brace Ends: For each gate, corner, pull, and end post.
- D. Rail Fittings: Provide the following:
 - 1. Top Rail Sleeves: Pressed-steel or round-steel tubing not less than 6 inches long.

-
- 2. Rail Clamps: Line and corner boulevard clamps for connecting intermediate and bottom rails in the fence line-to-line posts.
 - E. Tension and Brace Bands: Pressed steel.
 - F. Tension Bars: Steel, length not less than 2 inches shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.
 - G. Truss Rod Assemblies: Steel, hot-dip galvanized after threading rod and turnbuckle or other means of adjustment.
 - H. Tie Wires, Clips, and Fasteners: According to ASTM F 626.
 - 1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, complying with the following:
 - a. Hot-Dip Galvanized Steel: 0.148-inch- diameter wire; galvanized coating thickness matching coating thickness of chain-link fence fabric.
 - I. Finish:
 - 1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz. /sq. ft. zinc.

2.5 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by manufacturer, for exterior applications.
- B. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended in writing by manufacturer, for exterior applications.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for a verified survey of property lines and legal boundaries, site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.
 - 1. Do not begin installation before final grading is completed unless otherwise permitted by Landscape Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments. Stake locations shall be approved in writing by Owner prior to installation.

3.3 INSTALLATION, GENERAL

- A. Install chain-link fencing to comply with ASTM F 567 and more stringent requirements indicated.
 - 1. Install fencing inside property line.

3.4 CHAIN-LINK FENCE INSTALLATION

- A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- B. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
 - 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
 - 2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
 - a. Exposed Concrete: Extend 2 inches above grade; shape and smooth to shed water.
 - b. Concealed Concrete: Top below grade as indicated on Drawings to allow covering with surface material.
- C. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more.
- D. Line Posts: Space line posts uniformly as indicated on drawings, 10 feet o.c. maximum.
- E. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.
 - 1. Locate horizontal braces at midheight of fabric 72 inches or higher. Install so posts are plumb when diagonal rod is under proper tension.
- F. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.
- G. Intermediate and Bottom Rails: Install and secure to posts with fittings.
- H. Chain-Link Fabric: Apply fabric to inside of enclosing framework. Leave 1 inch between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.
- I. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 15 inches o.c.
- J. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.
 - 1. Maximum Spacing: Tie fabric to line posts at 12 inches o.c. and to braces at 24 inches o.c.
- K. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

3.5 GATE INSTALLATION

- A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

3.6 ADJUSTING

- A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Lubricate hardware and other moving parts.

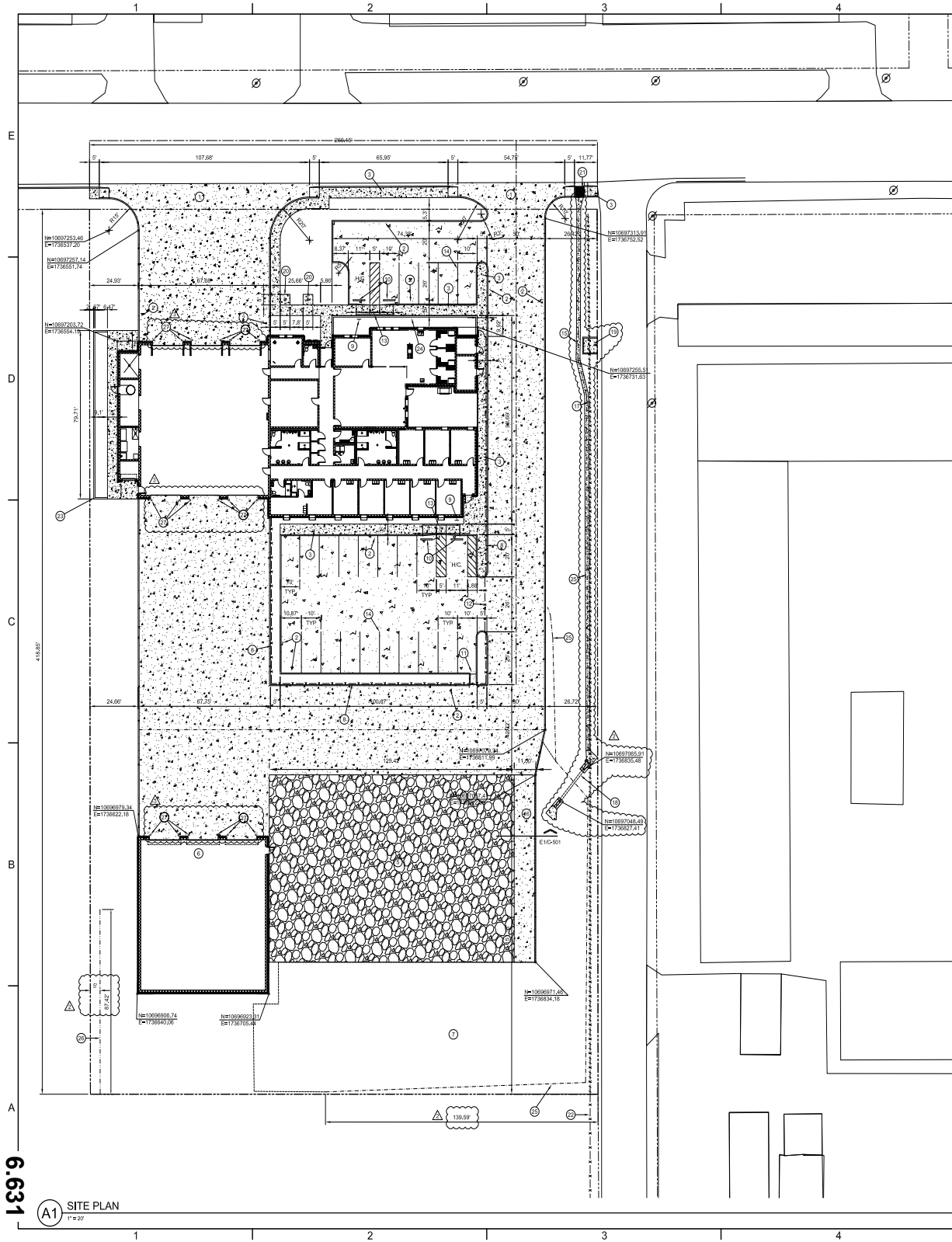
3.7 DEMONSTRATION

- A. Train Owner's personnel to adjust, operate, and maintain chain-link fences and gates.

END OF SECTION



Chris Smith



- KEYED NOTES**
- 1 PROPOSED DRIVEWAY - SEE CITY OF MIDLAND DETAILS
 - 2 PROPOSED 6" CURB - SEE DETAILS C3 & C4/C-501
 - 3 PROPOSED SIDEWALK - SEE CITY OF MIDLAND DETAILS
 - 4 NOT USED
 - 5 PROPOSED CALICHE SURFACE - SEE DETAIL C1/C-501
 - 6 ALTERNATE BUILDING
 - 7 PROPOSED DETENTION BASIN
 - 8 PROPOSED CHAIN LINK FENCE - SEE DETAIL C5/C-501
 - 9 HANDICAP SIGN WITH PLACARD - SEE DETAIL D3/C-501
 - 10 PARKING BLOCK - SEE DETAIL D5/C-501
 - 11 DRAINAGE OUTLET - SEE DETAIL D1/C-501
 - 12 26" WIDE CHAIN LINK GATE - SEE DETAIL A1/C-502
 - 13 LONGITUDINAL HANDICAP RAMP - SEE DETAIL E4/C-501
 - 14 PAVEMENT STRIPING
 - 15 PROPOSED SWALE OUTFALL SECTION WITH CONCRETE VALLEY - SEE DETAILS B3/C-501 AND B5/C-501
 - 16 DRAINAGE FLUME - SEE DETAIL E1/C-501
 - 17 EXISTING CHAIN LINK FENCE TO BE REMOVED. SALVAGED MATERIALS TO BE PROVIDED TO APARTMENT OWNERS UPON REQUEST.
 - 18 12" PVC DETENTION OUTFALL - SEE DETAIL B1/C-502
 - 19 PROPOSED ELECTRIC TRANSFORMER PAD - BY OTHERS
 - 20 FLAG POLES - SEE DETAIL E3/C-501
 - 21 SIDEWALK CHANNEL WITH PLATE COVER - SEE DETAIL B6/C-501
 - 22 EXISTING FENCE TO REMAIN
 - 23 2.5' MAX RETAINING WALL - SEE DETAIL C3/C-502
 - 24 1' MAX RETAINING WALL - SEE DETAIL C5/C-502
 - 25 BERM - SEE DETAIL B3/C-502
 - 26 MINOR SWALE - SEE DETAIL B5/C-502
 - 27 BOLLARD - SEE DETAIL E1/C-501

- NOTES**
1. ALL DIMENSIONS ARE FROM BACK OF CURB TO BACK OF CURB.
 2. ALL STRIPING DIMENSIONS ARE MEASURED FROM THE CENTER OF THE STRIPE UNLESS OTHERWISE NOTED.
 3. STRIPING WIDTH = 4" STRIPE COLOR = WHITE EXCEPT HANDICAP AND MEDIAN ISLAND STRIPES (YELLOW). PLACE DIAGONAL STRIPES (45°) AT 24" ON CENTER.
 4. REFER TO UTILITY PLANS FOR WATER AND SEWER CONSTRUCTION.
 5. SCORE CONCRETE SIDEWALK IN ACCORDANCE WITH THE SPECIFICATIONS. SEE CITY OF MIDLAND DETAILS.
 6. JOINT SPACING SHALL BE LESS THAN 30 TIMES THE CONCRETE SLAB THICKNESS IN FEET, E.G. 4" x 0.37 x 30 = 12
 7. CONCRETE PANELS SHOULD BE SQUARE OR NEARLY SQUARE. THE LENGTH SHOULD NOT EXCEED 1.5 X THE WIDTH. L SHAPED PANELS SHOULD BE AVOIDED.
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 9. FULL DEPTH SAW-CUT ALL EXISTING PAVEMENT SECTIONS WHERE PROPOSED PAVEMENT IS TO BE TIED INTO EXISTING PAVEMENT.
 10. ALL WORK WITHIN CITY OF MIDLAND RIGHT OF WAY SHALL MEET CURRENT CITY OF MIDLAND STANDARDS.
 11. MAINTAIN A MINIMUM 3' WIDTH ON ALL SIDEWALKS FOR HANDICAP ACCESSIBILITY.
 12. WHERE FG BEHIND CURB IS LOWER THAN TOP OF CURB, BACK OF CURB SECTION IS TO BE GROUTED SMOOTH.

- LEGEND**
- 1 PROPOSED CHAIN LINK FENCING
 - 2 EXISTING CHAIN LINK FENCING TO BE REMOVED - SEE KEY NOTE 17
 - 3 PROPERTY LINE
 - 4 CONCRETE SIDEWALK - SEE DETAIL D2/C-501
 - 5 HEAVY DUTY CONCRETE PAVEMENT - SEE DETAIL C3/C-501
 - 6 STANDARD DUTY CONCRETE PAVEMENT - SEE DETAIL D4/C-501
 - 7 CALICHE - SEE DETAIL C1/C-501

FIRE STATION 10

100% CONSTRUCTION DOCUMENTS
APRIL 3, 2013

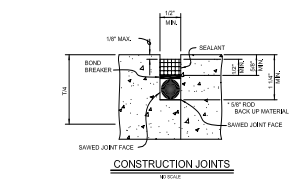
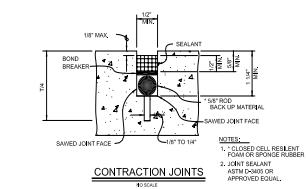
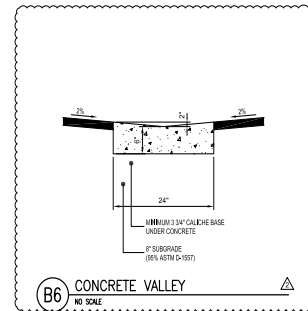
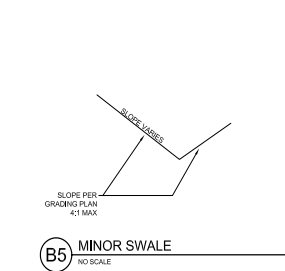
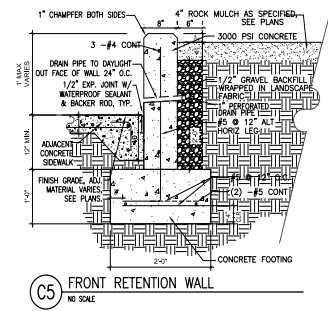
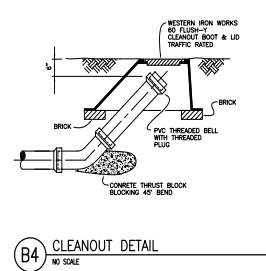
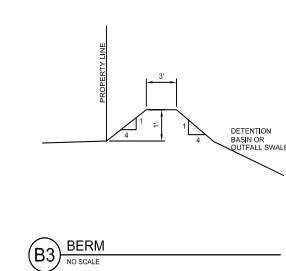
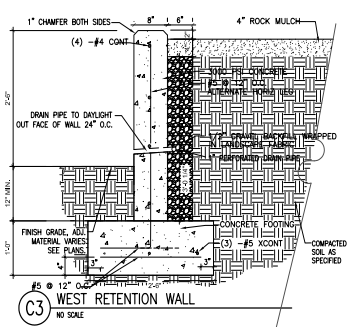
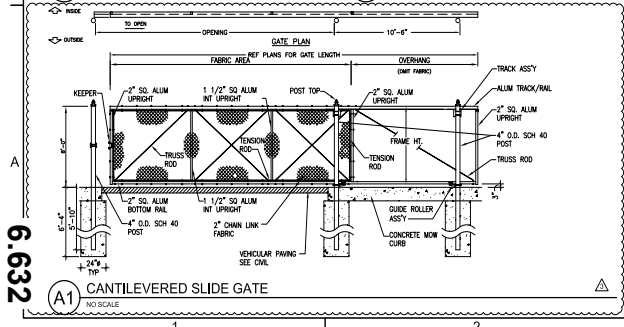
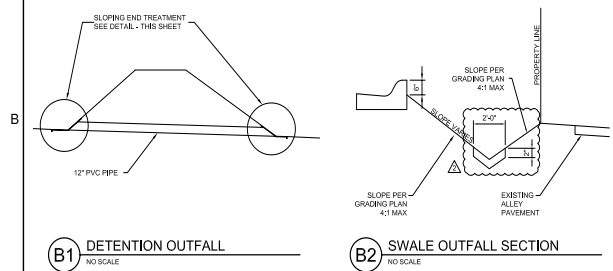
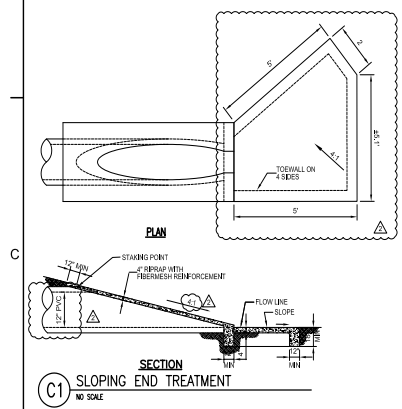
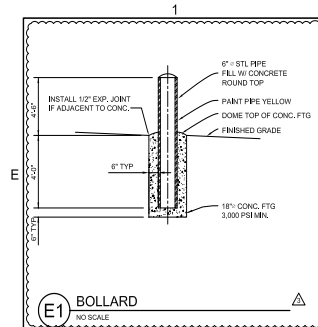
4501 SINCLAIR AVE
MIDLAND, TEXAS
79707

KEY PLAN

0 20 40'

NO.	DATE	DESCRIPTION	DESIGNED BY	CHECKED BY
1	4/25/13	100% CONSTRUCTION DRAWINGS		
2	4/25/13	ADDENDUM NO. 1		
3	4/25/13	ADDENDUM NO. 2		
4	4/25/13	ADDENDUM NO. 3		

SITE PLAN



FIRE STATION 10

100% CONSTRUCTION DOCUMENTS
APRIL 3, 2013

4501 SINCLAIR AVE
MIDLAND, TEXAS
79707

KEY PLAN

1	4/20/13	ADD/REMOVE/REV	1
2	4/20/13	ADD/REMOVE/REV	2
3	4/20/13	100% CONSTRUCTION DRAWINGS	3
4	4/20/13	DESCRIPTION	4
5	4/20/13	DESCRIPTION	5

DETAILS



ADDENDUM NO: 04R

TO: ALL PLANHOLDERS

FROM: PARKHILL, SMITH & COOPER, INC.

PROJECT NAME: MIDLAND FIRE STATION NO 10

PROJECT NO.: 03.8686.12

DATE: May 7, 2013



5/7/13

Attention of all Prospective Bidders/Plan Holders is directed to the following modifications to the referenced Drawings and Project Manual. This Addendum becomes a part of the Contract Documents and modifies the original Bidding Documents as noted below:

This Addendum consists of 2 pages, Section 02821 and drawings nos C-102-8686 C-102 (1).pdf and C-502-8686 C-501 (1).pdf.

I. CHANGES TO PROJECT MANUAL:

A. TABLE OF CONTENTS

1. ADD the following section Under Division 2: 02821

B. SECTION 02821 CHAIN-LINK FENCES AND GATES

1. ADD this section in its entirety as attached to this Addendum

C. SECTION 09300 – TILE

1. Paragraph 2.1.A. – ADD subparagraph as noted below:

“8. Ceramic Mosaic Floor Tile

- a. Conformance: ANSI/TCA A137.1.
- b. Type: Vitreous or porcelain with moisture absorption of 0 to 0.5 percent.
- c. Size: 2 x 2 x 1/4 inch.
- d. Pattern: As selected by Architect.
- e. Edge: Cushioned.
- f. Surface Finish: Unglazed.
- g. Color: Blend using a maximum of 3 colors and varying percentages as selected by Architect from manufacturer's Group 1, 2, and 3 colors.
- h. Coefficient of Friction: ASTM C1028; not less than .60 wet and .80 dry.
- i. All restrooms are to receive floor tile.”

II. CHANGES TO DRAWINGS:

A. SHEET C-102

1. Refer to revisions on attached drawing.

B. SHEET C-502

1. Refer to revisions on attached drawing.

\\Data1\Projects\2012\8686.12\BID-PROPOSAL PHASE\Addendum No 04R\Addendum No. 4R.docm

III. GENERAL/CLARIFICATIONS:

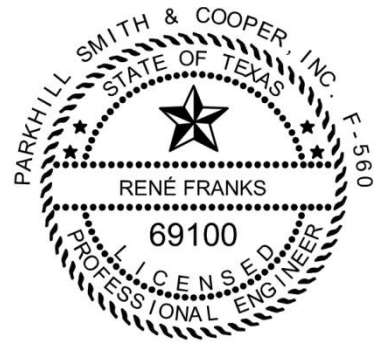
1. Three (3) copies of the proposal are required.
2. There is a note for tagging plant material at the nursery. Will travel to Mountain States Nursery be required to tag the material?

ANSWER: Travel to Mountain States will not be required. However, all trees will need to be tagged prior to bringing them to the site or prior to planting for approval. Shrubs can be viewed at growers location, at nursery, at landscape contractors yard or onsite, prior to installation.

END OF ADDENDUM NO 4R

SECTION 02821

CHAIN-LINK FENCES AND GATES



René Franks

05-06-13

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Conditions of the Contract for Construction, Supplementary Conditions (if any) and Division 1 - General Requirements apply to Work of this Section.

1.2 SECTION INCLUDES

- A. Chain-link fences.
- B. Gates: Rolling.

1.3 RELATED SECTIONS

- A. Section 03300- Cast-in-Place Concrete: Cast-in-place concrete and post footings.

1.4 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Chain-link fence and gate framework shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to ASCE/SEI 7-05:
 - 1. Minimum Post Size and Maximum Spacing: Determined according to CLFMI WLG 2445, based on mesh size and pattern specified and on the following:
 - a. Wind Loads: 100 mph.
 - b. Exposure Category: C.
 - c. Fence Height: As indicated on plans.
 - d. Material Group: IA, ASTM F 1043, Schedule 40 steel pipe, or ASTM A53, Grade B.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain-link fences and gates.
 - 1. Fence and gate posts, rails, fittings, latches, drop rods, and finishes.
 - 2. Chain-link fabric, reinforcements, and attachments.
 - 3. Gates and hardware.
 - 4. Privacy slats.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work show accessories, hardware, gate operation, and operational clearances.
- C. Samples for Initial Selection: For components with factory applied finishes.

1.6 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of chain-link fence, and gate, from manufacturer.
- B. Product Test Reports: For framing strength according to ASTM F 1043.
- C. Field quality-control reports.
- D. Warranty: Sample of special warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For the following to include in emergency, operation, and maintenance manuals:
 - 1. Gate hardware.

1.8 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing fence grounding. Member company of NETA or an NRTL.
 - 1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.
- B. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review required testing, inspecting, and certifying procedures.

1.9 PROJECT CONDITIONS

- A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements prior to construction.

1.10 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which Installer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2. Warranty Period: Fifteen (15) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CHAIN-LINK FENCE FABRIC

- A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist. Comply with CLFMI Product Manual and with requirements indicated below:
 - 1. Fabric Height: As indicated on Drawings.
 - 2. Steel Wire Fabric: Wire with a diameter of 0.148 inch.
 - a. Mesh Size: 2 inches.
 - b. Zinc-Coated Fabric: ASTM A 392, Type II, Class 1, 1.2 oz./sq. ft. with zinc coating applied after weaving.

-
- c. Coat selvage ends of fabric that is metallic coated before the weaving process with manufacturer's standard clear protective coating.
 - 3. Selvage: Knuckled at both selvages.

2.2 FENCE FRAMING

- A. Posts and Rails: Comply with ASTM F 1043 for framing, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F 1043 or ASTM A 53 galvanized pipe based on the following:
 - 1. Fence Height: As indicated on Drawings.
 - 2. Heavy Industrial Strength: Material Group IA, round steel pipe, Schedule 40 or ASTM A 53 galvanized pipe.
 - a. Line Post: Size as indicated on drawings.
 - b. End, Corner and Pull Post: Size as indicated on drawings.
 - 3. Horizontal Framework Members: Intermediate, top and bottom rails complying with ASTM F 1043.
 - a. Intermediate, Top and Bottom Rails: Size as indicated on drawings.
 - 4. Brace Rails: Comply with ASTM F 1043.
 - 5. Metallic Coating for Steel Framing:
 - a. Type A, consisting of not less than minimum 2.0-oz./sq. ft. average zinc coating per ASTM A 123/A 123M or 4.0-oz./sq. ft. zinc coating per ASTM A 653/A 653M.

2.3 HORIZONTAL – SLIDE GATES

- A. General: Comply with ASTM F 1184 for gate posts and single or double sliding gate types.
 - 1. Classification: Type I Overhead Slide.
 - a. Gate Leaf Width: As indicated.
 - b. Gate Fabric Height: As indicated.
 - 2. Classification: Type II Cantilever Slide, Class 1 with external roller assemblies.
 - a. Gate Frame Width and Height: As indicated.
- B. Pipe and Tubing:
 - 1. Zinc-Coated Steel: Manufacturer's standard protective coating and finish.
 - 2. Gate Posts: Comply with ASTM F 1184. Provide round tubular steel posts.
 - 3. Gate Frames and Bracing: Aluminum.
- C. Frame Corner Construction: Welded.
- D. Overhead Track Assembly: Manufacturer's standard track, with overhead framing supports, bracing, and accessories, engineered to support size, weight, width, operation, and design of gate and roller assemblies.
- E. Hardware:
 - 1. Latches permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.
 - 2. Hangers, roller assemblies, and stops fabricated from galvanized steel.

2.4 FITTINGS

- A. General: Comply with ASTM F 626.
- B. Post Caps: Provide for each post.
 - 1. Provide line post caps with loop to receive top rail.
- C. Rail and Brace Ends: For each gate, corner, pull, and end post.
- D. Rail Fittings: Provide the following:
 - 1. Top Rail Sleeves: Pressed-steel or round-steel tubing not less than 6 inches long.

-
- 2. Rail Clamps: Line and corner boulevard clamps for connecting intermediate and bottom rails in the fence line-to-line posts.
 - E. Tension and Brace Bands: Pressed steel.
 - F. Tension Bars: Steel, length not less than 2 inches shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.
 - G. Truss Rod Assemblies: Steel, hot-dip galvanized after threading rod and turnbuckle or other means of adjustment.
 - H. Tie Wires, Clips, and Fasteners: According to ASTM F 626.
 - 1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, complying with the following:
 - a. Hot-Dip Galvanized Steel: 0.148-inch- diameter wire; galvanized coating thickness matching coating thickness of chain-link fence fabric.
 - I. Finish:
 - 1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz. /sq. ft. zinc.

2.5 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by manufacturer, for exterior applications.
- B. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended in writing by manufacturer, for exterior applications.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for a verified survey of property lines and legal boundaries, site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.
 - 1. Do not begin installation before final grading is completed unless otherwise permitted by Landscape Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments. Stake locations shall be approved in writing by Owner prior to installation.

3.3 INSTALLATION, GENERAL

- A. Install chain-link fencing to comply with ASTM F 567 and more stringent requirements indicated.
 - 1. Install fencing inside property line.

3.4 CHAIN-LINK FENCE INSTALLATION

- A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- B. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
 - 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
 - 2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
 - a. Exposed Concrete: Extend 2 inches above grade; shape and smooth to shed water.
 - b. Concealed Concrete: Top below grade as indicated on Drawings to allow covering with surface material.
- C. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more.
- D. Line Posts: Space line posts uniformly as indicated on drawings, 10 feet o.c. maximum.
- E. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.
 - 1. Locate horizontal braces at midheight of fabric 72 inches or higher. Install so posts are plumb when diagonal rod is under proper tension.
- F. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.
- G. Intermediate and Bottom Rails: Install and secure to posts with fittings.
- H. Chain-Link Fabric: Apply fabric to inside of enclosing framework. Leave 1 inch between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.
- I. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 15 inches o.c.
- J. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.
 - 1. Maximum Spacing: Tie fabric to line posts at 12 inches o.c. and to braces at 24 inches o.c.
- K. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

3.5 GATE INSTALLATION

- A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

3.6 ADJUSTING

- A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Lubricate hardware and other moving parts.

3.7 DEMONSTRATION

- A. Train Owner's personnel to adjust, operate, and maintain chain-link fences and gates.

END OF SECTION



FIRE STATION 10

100% CONSTRUCTION
DOCUMENTS
APRIL 3, 2013

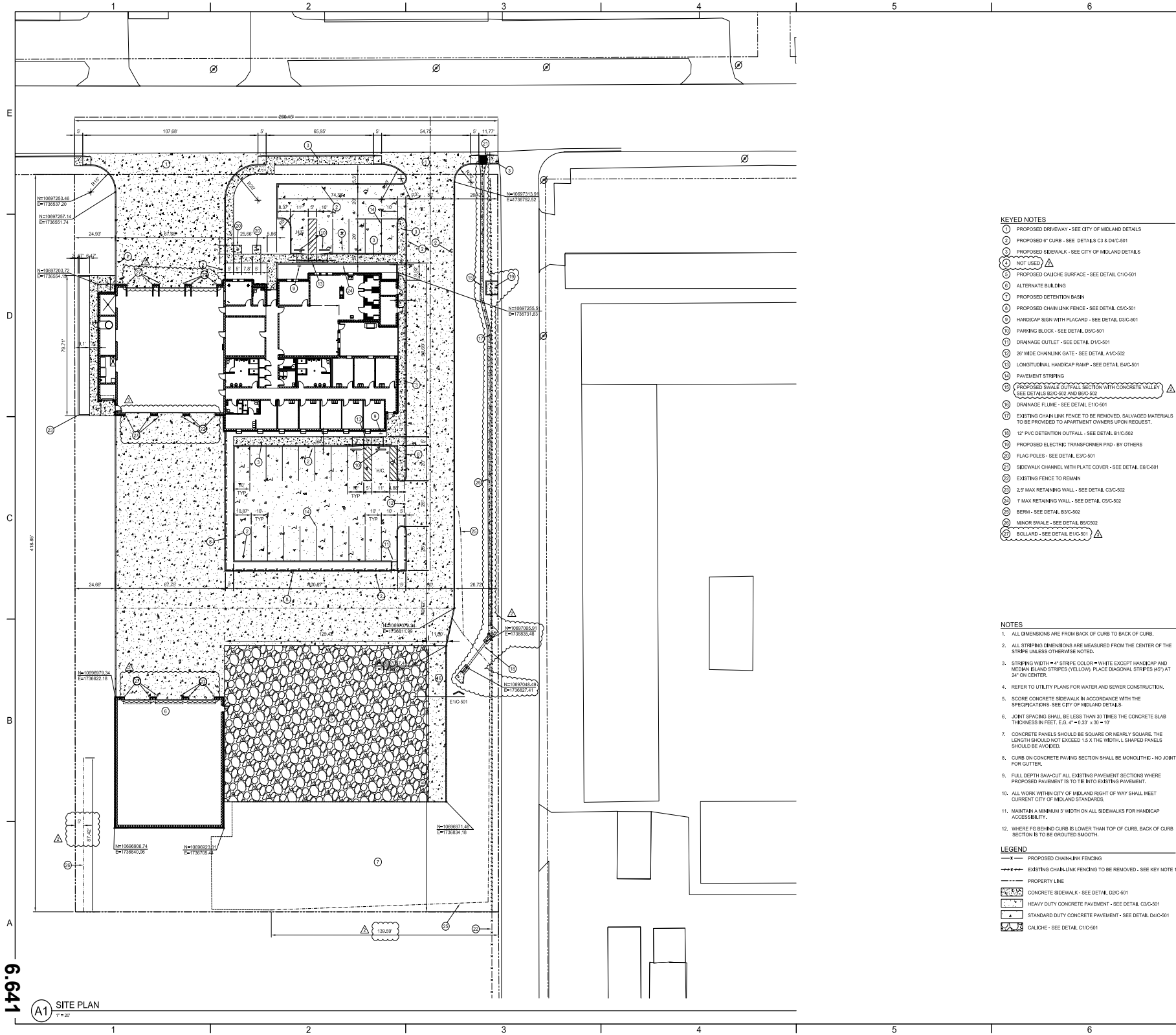
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MIDLAND, TEXAS
79707

KEY PLAN

NO.	DATE	DESCRIPTION	PROJECT NO.	SHEET NO.
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2	03/05/13	ADD/REMOVE		
3	04/02/13	100% CONSTRUCTION DRAWINGS		

NO DATE DESCRIPTION PROJECT NO. SHEET NO.

SITE PLAN



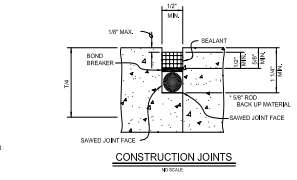
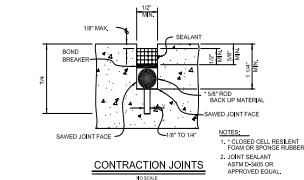
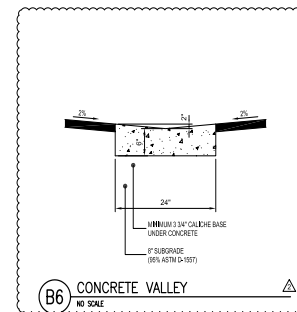
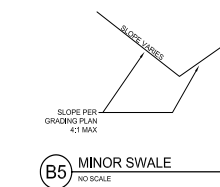
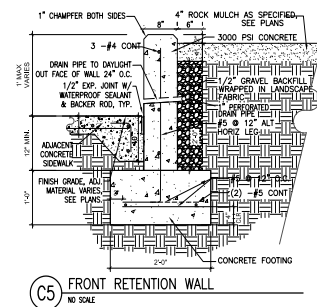
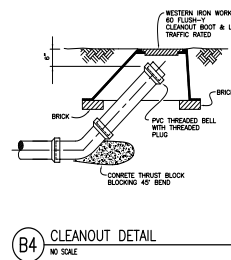
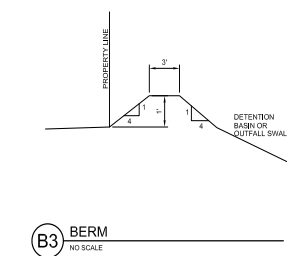
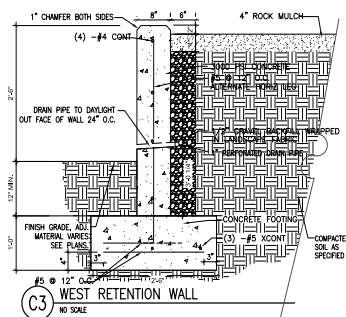
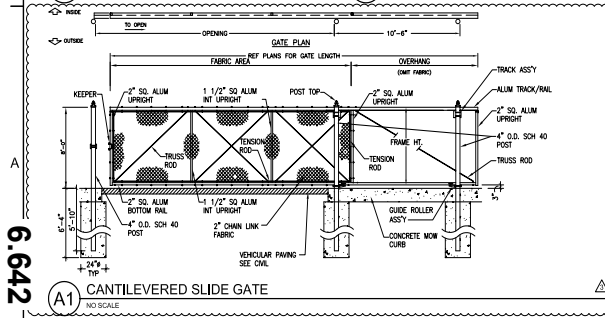
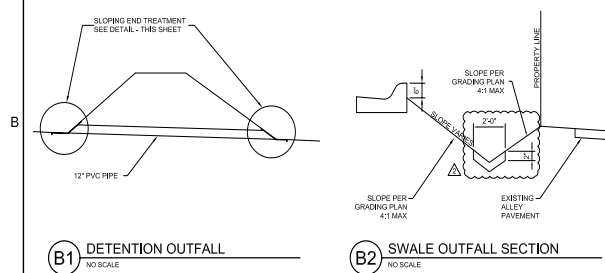
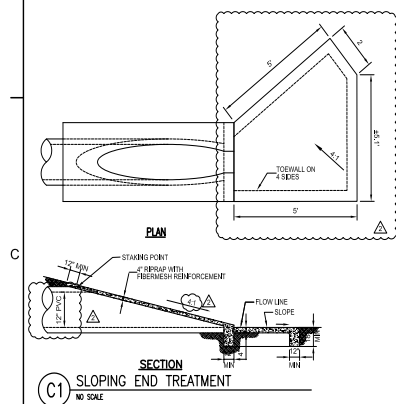
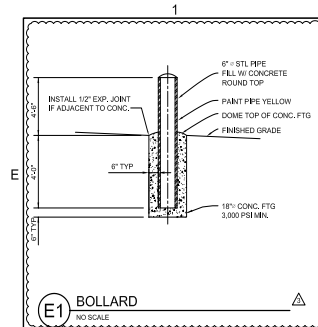
- KEYED NOTES**
- 1 PROPOSED DRIVEWAY - SEE CITY OF MIDLAND DETAILS
 - 2 PROPOSED 6" CURB - SEE DETAILS C3 & C4/C-501
 - 3 PROPOSED SIDEWALK - SEE CITY OF MIDLAND DETAILS
 - 4 NOT USED
 - 5 PROPOSED CALICHE SURFACE - SEE DETAIL C1/C-501
 - 6 ALTERNATE BUILDING
 - 7 PROPOSED DETENTION BASIN
 - 8 PROPOSED CHAIN LINK FENCE - SEE DETAIL C5/C-501
 - 9 HANDICAP SIGN WITH PLACARD - SEE DETAIL D3/C-501
 - 10 PARKING BLOCK - SEE DETAIL D5/C-501
 - 11 DRAINAGE OUTLET - SEE DETAIL D1/C-501
 - 12 26" WIDE CHAIN LINK GATE - SEE DETAIL A1/C-502
 - 13 LONGITUDINAL HANDICAP RAMP - SEE DETAIL E4/C-501
 - 14 PAVEMENT STRIPING
 - 15 PROPOSED SWALE OUTFALL SECTION WITH CONCRETE VALLEY - SEE DETAILS B3/C-501 AND B5/C-501
 - 16 DRAINAGE FLUME - SEE DETAIL E1/C-501
 - 17 EXISTING CHAIN LINK FENCE TO BE REMOVED. SALVAGED MATERIALS TO BE PROVIDED TO APARTMENT OWNERS UPON REQUEST.
 - 18 12" PVC DETENTION OUTFALL - SEE DETAIL B1/C-502
 - 19 PROPOSED ELECTRIC TRANSFORMER PAD - BY OTHERS
 - 20 FLAG POLES - SEE DETAIL E3/C-501
 - 21 SIDEWALK CHANNEL WITH PLATE COVER - SEE DETAIL B6/C-501
 - 22 EXISTING FENCE TO REMAIN
 - 23 2.5' MAX RETAINING WALL - SEE DETAIL C3/C-502
 - 24 1' MAX RETAINING WALL - SEE DETAIL C5/C-502
 - 25 BERM - SEE DETAIL B3/C-502
 - 26 MINOR SWALE - SEE DETAIL B5/C-502
 - 27 BOLLARD - SEE DETAIL E1/C-501

- NOTES**
1. ALL DIMENSIONS ARE FROM BACK OF CURB TO BACK OF CURB.
 2. ALL STRIPING DIMENSIONS ARE MEASURED FROM THE CENTER OF THE STRIPE UNLESS OTHERWISE NOTED.
 3. STRIPING WIDTH = 4" STRIPE COLOR = WHITE EXCEPT HANDICAP AND MEDIAN ISLAND STRIPES (YELLOW). PLACE DIAGONAL STRIPES (45°) AT 24" ON CENTER.
 4. REFER TO UTILITY PLANS FOR WATER AND SEWER CONSTRUCTION.
 5. SCORE CONCRETE SIDEWALK IN ACCORDANCE WITH THE SPECIFICATIONS. SEE CITY OF MIDLAND DETAILS.
 6. JOINT SPACING SHALL BE LESS THAN 30 TIMES THE CONCRETE SLAB THICKNESS IN FEET, E.G. 4" x 0.37 x 30 = 12
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 - 4 CONCRETE SIDEWALK - SEE DETAIL D2/C-501
 - 5 HEAVY DUTY CONCRETE PAVEMENT - SEE DETAIL C3/C-501
 - 6 STANDARD DUTY CONCRETE PAVEMENT - SEE DETAIL D4/C-501
 - 7 CALICHE - SEE DETAIL C1/C-501

A1 SITE PLAN
1" = 20'

6.641





City Council Agenda

Approved for Agenda:
thudson
City Manager's Office

MEETING DATE: 5/28/2013

TO: City Council / City Manager

FROM: Regina Stephenson, Purchasing Manager

SUBJECT: Consider a resolution authorizing a professional services agreement for the design, development and project management of the Doug Russell Outdoor Pool Renovation Project for the Community Services Department.

Purpose:

Approval of a resolution authorizing a professional services agreement for the design, development and project management of the Doug Russell Outdoor Pool Renovation Project for the Community Services Department and appropriating funds therefore.

Recommended City Council Action

☒ Approve ☐ Deny ☐ Directional / Informational

Fiscal Impact:

\$30,000.00 2012 GPCO Park Improvements Bond Fund

Discussion:

Please consider approval of a resolution authorizing the City Manager to execute a professional services agreement with Kimley-Horn and Associates, Inc. for Phase I of the project. Four firms responded to our advertisement for Request for Qualifications. The Community Services staff recommends entering into an agreement with Kimley-Horn and Associates, Inc. The professional services expenditures shall not exceed \$30,000.00. Please see the attached memo from Tina Jauz, Community Services Director for more information.

Therefore, please consider approval of a resolution authorizing the execution of a professional services agreement with Kimley-Horn and Associates, Inc. of Irving, Texas for Phase I of the project in an amount not to exceed \$30,000.00.

RESOLUTION NO. _____

RESOLUTION AUTHORIZING THE EXECUTION OF A PROFESSIONAL SERVICES AGREEMENT WITH KIMLEY-HORN AND ASSOCIATES, INCORPORATED, OF IRVING, TEXAS, FOR PROFESSIONAL DESIGN, DEVELOPMENT AND PROJECT MANAGEMENT SERVICES FOR THE DOUG RUSSELL OUTDOOR POOL RENOVATION PROJECT; AND APPROPRIATING \$30,000.00 FOR SAID PROFESSIONAL SERVICES

WHEREAS, the City Council finds it to be in the public interest to employ the services of a design firm to provide professional design, development and project management services for the Doug Russell Outdoor Pool Renovation Project (“Professional Services”); and

WHEREAS, Kimley-Horn and Associates, Inc., proposes to perform said Professional Services for a fee not to exceed \$30,000.00; and

WHEREAS, the Council finds the fees proposed by Kimley-Horn and Associates, Inc., for said Professional Services to be fair and reasonable; and

WHEREAS, the Council finds Kimley-Horn and Associates, Inc., to be the most highly qualified provider for such Professional Services based on demonstrated competence, knowledge, and qualifications; and

WHEREAS, the Council finds it to be in the public interest to select Kimley-Horn and Associates, Inc., to provide said Professional Services; and

WHEREAS, the Council authorizes the City Manager to execute a professional services agreement with Kimley-Horn and Associates, Inc., for the performance of said professional services, said agreement being substantially in the form as is on file in the office of the City Secretary, referenced by the date and number of this Resolution;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MIDLAND, TEXAS:

SECTION ONE. That the City Manager and City Secretary are hereby authorized and directed to execute and attest, respectively, on behalf of the City of Midland, a professional services agreement with Kimley-Horn and Associates, Inc., for performance of

said Professional Services.

SECTION TWO. That the sum of \$30,000.00 is hereby appropriated from the 2012 GPCO Park Improvements Bond Fund (162) Unappropriated Fund Balance (5650) to the Doug Russell Pool Renovations Project (9037).

SECTION THREE. That the City Treasurer is hereby authorized and directed to make payments to Kimley-Horn and Associates, Inc., pursuant to the terms of said professional services agreement from funds appropriated herein upon receipt of proper invoice(s) approved by the City Manager.

On motion of Council member _____, seconded by Council member _____, the above and foregoing resolution was adopted by the City Council of the City of Midland at a regular meeting on the _____ day of _____, A.D., 2013, by the following vote:

Council members voting "AYE":

Council members voting "NAY":

W. Wesley Perry, Mayor

ATTEST:

Amy M. Turner, City Secretary

RECOMMENDED AND APPROVED:

Courtney Sharp, City Manager

APPROVED AS TO CONTENT
AND COMPLETENESS:

Robert Patrick, General Services Director

APPROVED AS TO FORM:

Keith Stretcher, City Attorney

PROFESSIONAL SERVICES AGREEMENT
FOR CONSULTING SERVICES

THIS AGREEMENT is made and effective the 29th day of May 2013, by and between the CITY OF MIDLAND, TEXAS, a municipal corporation, hereinafter called "CITY," and, Kimley-Horn and Associates, Inc. hereinafter referred to as "CONSULTANT."

ARTICLE I. PURPOSE

The purpose of this Agreement is to state the terms and conditions under which CONSULTANT shall perform design, development and project management of the Doug Russell Pool Renovation Project for the City of Midland.

ARTICLE II. SERVICES TO BE PERFORMED

1. CONSULTANT shall provide those services described in Exhibit "A."
2. CONSULTANT shall perform all the services under this Agreement consistent with the same level of skill and care as other professionals in approximately the same region at approximately the same point in time and for the same types of projects. CONSULTANT represents that any employee who performs services under this Agreement shall be fully qualified and competent to perform the services described in Exhibit "A".

ARTICLE III. FINANCIAL CONSIDERATIONS

CITY agrees to pay CONSULTANT according to the schedule set forth in Exhibit "A" upon presentation of a monthly invoice. The invoice shall set out service fees for the month and those Additional Expenses and Reimbursable Expenses described in Exhibit "A" incurred during the previous month which have received advance written approval from the City Manager. The City Manager must approve all additional expenses and reimbursable expenses in advance. CONSULTANT shall perform professional services as outlined in the "Services to be Performed" for a fee of \$30,000.00 (breakdown of fees is located in Exhibit "A".) which fee for basic services shall in no event exceed \$30,000.00, excluding Additional Services and Reimbursable Expenses. Within 30 days of the date CONSULTANT's invoice is received by CITY, CITY shall pay the full amount of such invoice; provided, however, that if CITY objects to any portion

of an invoice, CITY shall notify CONSULTANT of CITY's objection and the grounds therefor within 15 days of the date of receipt of the invoice, and the parties immediately shall make every effort to settle the disputed portion of the invoice. CITY in any event shall pay every portion of the invoice that is not in dispute within the 30-day period for payment.

ARTICLE IV. TERM

The term of this Agreement shall be from May 29, 2013 until May 29, 2016, unless the project is completed sooner or the Agreement is terminated as provided below.

ARTICLE V. TERMINATION AT WILL

The CITY may terminate this Agreement at will for no or any reason upon giving at least one hundred eighty (180) days written notice to the Consultant. The parties to this Agreement understand and agree that it is in the CITY's sole discretion to cancel the Agreement during the term of the Agreement without penalty to the CITY. The Consultant has no expectation and has received no guarantees that this Agreement will not be terminated before the end of the Agreement term. The parties have bargained for the flexibility of terminating this Agreement upon tender of the requisite notice at any time during the term of the Agreement. All work and services under the Agreement shall be suspended upon termination of the Agreement becoming effective.

ARTICLE VI. ASSIGNMENT

Consultant shall not, either directly or indirectly, assign all or any part of this Agreement or any interest, right or privilege herein, without the prior written consent of the CITY. The issue on whether or not to grant consent to an assignment is in the sole discretion of the CITY.

ARTICLE VII. OWNERSHIP AND CONFIDENTIALITY OF DOCUMENTS AND OTHER WORK PRODUCT

All reports, information and other data ("instruments of service"), given to, prepared or assembled by CONSULTANT under this Agreement, and any other related documents or items shall become the sole property of CITY and shall be delivered to CITY, without restriction, except that CONSULTANT may make copies of any and all instruments of service for its files. The CITY

shall not make any modification to the plans and specifications or make them available for use by third parties without the prior written authorization of CONSULTANT, which consent shall not be unreasonably withheld.

ARTICLE VIII. INDEPENDENT CONTRACTOR

It is expressly understood and agreed that Consultant shall perform all work and services described herein as an independent Consultant and not as an officer, agent, servant or employee of the CITY; that Consultant shall have exclusive control of and the exclusive right to control the details of the services and work performed hereunder, and all persons performing the same; and shall be solely responsible for the acts and omissions of its officers, agents, employees, contractors and subcontractors; that the doctrine of respondeat superior shall not apply as between CITY and Consultant, its officers, agents, employees, contractors and subcontractors; and that nothing herein shall be construed as creating a partnership or joint enterprise between CITY and Consultant. No person performing any of the work and services described hereunder by Consultant shall be considered an officer, agent, servant or employee of the CITY. Further, it is specifically understood and agreed that nothing in this Agreement is intended or shall be construed as creating a "Community of Pecuniary Interest" or "An Equal Right of Control" which would give rise to vicarious liability. Consultant shall be an independent contractor under this Agreement and shall assume all of the rights, obligations and liabilities, applicable to it as such independent contractor hereunder. The CITY does not have the power to direct the order in which the work is done. The CITY shall not have the right to control the means, methods or details of the Consultant's work. Consultant shall assume exclusive responsibility for the work. Consultant is entirely free to do the work in its own way.

ARTICLE IX. INSURANCE

1. Insurance

Consultant shall at all times during the term of this Contract maintain and keep in full force and effect insurance in the following types and minimum amounts with companies authorized to do business in the State of Texas:

Commercial General Liability (including Contractual liability):

-Personal Injury: \$1,000,000.00 per person

	\$1,000,000.00 per occurrence
-Property Damage:	\$500,000.00 per occurrence
Business Automobile Liability:	\$250,000.00 combined single limit - Personal Injury and Property Damage
Worker's Compensation:	Statutory limits
Employers' Liability:	\$500,000.00 per accident or occurrence

The Commercial General Liability shall be on a per project aggregate, including completed operations, and shall be on an occurrence basis.

The Business Automobile Liability insurance provided by Consultant shall cover any auto for bodily injury and property damage, including owned vehicles, hired and non-CITY vehicles, and employee non-ownership, and the amount of such policy shall be a minimum of \$250,000.00 covering any vehicle used for the execution of the work that is the subject of this Contract.

The Workers' Compensation coverage provided by Consultant shall inure to the benefit of employees injured during the course and scope of their employment by Consultant pursuant to this Contract.

All insurance required pursuant to this Contract shall provide for a waiver of subrogation in favor of the City. All insurance required pursuant to this Contract, except for Worker's Compensation Insurance, shall name the City as an additional insured on a claims occurred basis. City shall be provided the notice by Consultant's insurance provider not later than thirty (30) days prior to any reduction or termination of such coverage.

Consultant shall contractually require all contractors, subcontractors, and sub-subcontractors that work on any portion of the work that is the subject of this Contract to obtain insurance coverage that meets or exceeds the policy requirements and minimum amounts specified herein. All contractors, subcontractors, and sub-subcontractors shall obtain insurance policies that provide blanket waivers of subrogation in favor of the City of Midland and policies that name the City of Midland as an additional insured on a claims occurred basis (except workers compensation).

The parties agree that, prior to the execution of the Contract, Consultant shall provide one or more certificates of insurance specifically stating that these requirements have been met and subject to the approval of the City. The City shall not be required to provide any insurance

whatsoever pursuant to this Contract.

The Consultant certifies that the certificate of insurance provided as required herein complies with the requirements of Senate Bill 425, passed during the 82nd regular session of the Texas Legislature, and effective January 1, 2012.

ARTICLE X. ATTORNEY FEES

BY EXECUTING THIS AGREEMENT, CONSULTANT AGREES TO WAIVE AND DOES HEREBY KNOWINGLY, CONCLUSIVELY, VOLUNTARILY AND INTENTIONALLY WAIVE ANY CLAIM IT HAS OR MAY HAVE IN THE FUTURE AGAINST THE CITY, REGARDING THE AWARD OF ATTORNEY'S FEES, WHICH ARE IN ANY WAY RELATED TO THE AGREEMENT, OR THE CONSTRUCTION, INTERPRETATION OR BREACH OF THE AGREEMENT. THE CONSULTANT SPECIFICALLY AGREES THAT IF THE CONSULTANT BRINGS OR COMMENCES ANY LEGAL ACTION OR PROCEEDING RELATED TO THIS AGREEMENT, THE CONSTRUCTION, INTERPRETATION, VALIDITY OR BREACH OF THIS AGREEMENT, INCLUDING BUT NOT LIMITED TO ANY ACTION PURSUANT TO THE PROVISIONS OF THE TEXAS UNIFORM DECLARATORY JUDGMENTS ACT (TEXAS CIVIL PRACTICE AND REMEDIES CODE SECTION 37.001, ET. SEQ., AS AMENDED), OR CHAPTER 271 OF THE TEXAS LOCAL GOVERNMENT CODE, THE CONSULTANT AGREES TO ABANDON, WAIVE AND RELINQUISH ANY AND ALL RIGHTS TO THE RECOVERY OF ATTORNEY'S FEES TO WHICH CONSULTANT MIGHT OTHERWISE BE ENTITLED.

CONSULTANT AGREES THAT THIS IS THE VOLUNTARY AND INTENTIONAL RELINQUISHMENT AND ABANDONMENT OF A PRESENTLY EXISTING KNOWN RIGHT. THE CONSULTANT ACKNOWLEDGES THAT IT UNDERSTANDS ALL TERMS AND CONDITIONS OF THE AGREEMENT. THE CONSULTANT FURTHER ACKNOWLEDGES AND AGREES THAT THERE WAS AND IS NO DISPARITY OF BARGAINING POWER BETWEEN THE CITY AND THE CONSULTANT. THIS SECTION SHALL NOT BE CONSTRUED OR INTERPRETED AS A WAIVER OF SOVEREIGN IMMUNITY.

THE CONSULTANT AND CITY ARE RELYING ON THEIR OWN JUDGMENT. EACH PARTY HAD THE OPPORTUNITY TO DISCUSS THIS AGREEMENT WITH COMPETENT LEGAL COUNSEL PRIOR TO ITS EXECUTION.

ARTICLE XI. SOVEREIGN IMMUNITY

By executing this agreement the CITY is not waiving its right of sovereign immunity. The CITY is retaining its immunity from suit. The CITY is not granting consent to be sued by legislative resolution or action.

THERE IS NO WAIVER OF SOVEREIGN IMMUNITY.

ARTICLE XII. NO THIRD PARTY BENEFICIARIES

The CITY's approval of this agreement does not create a third party beneficiary. There is no third party beneficiary to this Agreement. No person or entity who is not a party to this Agreement shall have any third party beneficiary or other rights hereunder.

ARTICLE XIII. RELEASE

NOTWITHSTANDING ANY OTHER PROVISIONS, CONSULTANT HEREBY RELEASES, ACQUITS, RELINQUISHES AND FOREVER DISCHARGES CITY, CITY'S EMPLOYEES AND OFFICERS, FROM ANY AND ALL DEMANDS, CLAIMS, DAMAGES, OR CAUSES OF ACTION OF ANY KIND WHATSOEVER WHICH CONSULTANT HAS OR MIGHT HAVE IN THE FUTURE, INCLUDING BUT NOT LIMITED TO BREACH OF CONTRACT, QUANTUM MERUIT, CLAIMS UNDER THE DUE PROCESS AND TAKINGS CLAUSES OF THE TEXAS AND UNITED STATES CONSTITUTIONS, TORT CLAIMS, OR CITY'S NEGLIGENCE.

ARTICLE XIV. GENERAL PROVISIONS

A. Waiver. No waiver by CITY of a breach of any covenant, condition, or restriction of this Agreement shall be construed or held to be a waiver of any succeeding or preceding breach of the same or any other covenant, condition, or restriction contained in this Agreement.

B. Governing Law and Venue. This Agreement shall be governed by the laws of the State of Texas. All performance and payment made pursuant to this Agreement shall be deemed to have occurred in Midland County, Texas. Exclusive venue for any claims, suits or any other action arising from or connected in any way to this Agreement or the performance of this Agreement shall be in Midland County, Texas. The obligations and undertakings of each of the parties to this Agreement shall be deemed to have occurred in Midland County, Texas.

D. Notice. Any notice or demand that shall be made regarding this Agreement, shall be made in writing and delivered either in person or by certified or registered mail. Notice by mail shall be complete upon deposit of the paper, postage prepaid, in a post office or official depository under the care and custody of the United States Postal Service addressed as follows:

If to CITY: City Manager's Office
 P.O. Box 1152
 Midland, Texas 79702

If to CONSULTANT: Kimley-Horn and Associates, Inc.
 Attn: Mark C. Hatchel
 2201 West Royal Lane
 Irving, TX 75063

The parties hereto may change the above-designated addresses by giving notice pursuant to the terms of this Section.

E. Severability. In case any one or more of the provisions contained in this Agreement shall for any reason be held to be invalid, illegal, or unenforceable in any respect, this invalidity, illegality, or unenforceability shall not affect any other provision of the Agreement, and this Agreement shall be construed as if the invalid, illegal, or unenforceable provision had never been contained herein.

F. Use of Language. Words in the singular shall be held to include the plural, unless the context otherwise requires.

G. Amendments, Modifications, Alterations. No amendment, modification, or alteration of the terms of this Agreement shall be binding unless it is in writing, dated subsequent to the date of this Agreement, and duly executed by the parties to this Agreement.

H. Counterparts. This Agreement may be executed in multiple counterparts, each of which shall be deemed as original, and all of which shall constitute one and the same instrument.

I. Federal Wage Requirements. If applicable, the Davis-Bacon Act, 29 CFR 5.5, and any related acts or regulations are hereby incorporated by reference and made a part of this Contract, and all terms and requirements under said laws, by such incorporation, are made terms and requirements of this Contract, to which the parties to this Contract have agreed to be bound.

J. Notice of Alleged Breach; Statutory Prerequisites. As a condition precedent to filing suit for alleged damages incurred by an alleged breach of an express or implied provision of this Agreement, Consultant or his legal representative, shall give the City Manager, or any other reasonable official of the CITY, notice in writing (consisting of one original and seven copies of notice attached to a copy of this Agreement) of such damages, duly verified, within one-hundred twenty (120) days after the same has been sustained. The discovery rule does not apply to the giving of this notice. The notice shall include when, where and how the damages occurred, the apparent extent thereof, the amount of damages sustained, the amount for which the Consultant will settle, the physical and mailing addresses of Consultant at the time and date the claim was presented and the physical and mailing addresses of Consultant for the six months immediately preceding the occurrence of such damages, and the names and addresses of the witnesses upon whom the Consultant relies to establish its claim; and a failure to so notify the City Manager within the time and manner provided herein shall exonerate, excuse and except the CITY from any liability whatsoever. The CITY is under no obligation to provide notice to Consultant that Consultant's notice is insufficient. CITY reserves the right to request reasonable additional information regarding the claim. Said additional information shall be supplied within thirty (30) days after receipt of notice.

The statutory prerequisites outlined herein constitute jurisdictional requirements pursuant

to Section 271.154 of the Texas Local Government Code and Section 311.034 of the Texas Government Code. Notwithstanding any other provision, Consultant's failure to comply with the requirements herein shall perpetually bar Consultant's claim for damages under Chapter 271 of the Texas Local Government Code, and Section 311.034 of the Texas Government Code, regardless if CITY has actual or constructive notice or knowledge of said claim or alleged damages. Consultant agrees that the requirements of this entire Agreement are reasonable.

K. **PROMPT PAY ACT** - The City and Consultant agree that Texas Government Code, Chapter 2251, Payment for Goods and Services (the "Prompt Pay Act") does not waive governmental immunity.

EXECUTED IN DUPLICATE the day and year first above mentioned.

THE CITY OF MIDLAND, TEXAS

CONSULTANT:

By: _____
Courtney B. Sharp, City Manager

By: _____

Name: _____

Title: _____

APPROVED AS TO FORM

Keith Stretcher, City Attorney

ATTEST

Amy M. Turner, City Secretary

STATE OF TEXAS §
 §
COUNTY OF MIDLAND §

BEFORE ME, the undersigned authority, on this day personally appeared _____,
an officer of Kimley-Horn and Associates, Inc., known to me to be the person and official
whose name is subscribed to the forgoing instrument, and acknowledged to me that he executed
the same as the act and deed of said corporation, for the purposes and consideration therein
expressed, and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this the ____ day of _____,
2013.

Notary Public, State of Texas



Kimley-Horn
and Associates, Inc.

EXHIBIT "A"

Project Understanding

Kimley-Horn and Associates, Inc. (the "Consultant") understands that the City of Midland, Texas (the "Client") intends to prepare a Conceptual Design and Feasibility analysis for the Doug Russell Outdoor Pool Renovation.

The following scope of services and associated fees are based on our recent discussions:

Task I Conceptual Design (Trip One and Trip Two)

Evaluate Existing Pool Facility and Site

The Consultant will meet with the Client representatives ("Staff") and perform a visual inspection of the existing outdoor pool, bathhouse, and site to document and discuss utility service locations and options; ADA accessibility requirements; parking availability, requirements, and options; and pool renovation needs. The findings of this discussion will be documented for consideration in preparing conceptual design options for the renovation and/or replacement of the Doug Russell Outdoor Pool.

Finalize the Conceptual Design

A. Programming Work Session:

Meet with the Client representatives (Park Board, Staff, and/or Aquatic User Group Representatives) involved in the project, to verify and finalize the needs and objectives and design features.

The initial list of desired features from the Client may include a new leisure pool and lap lane swimming, aquatic play structures, water slides, play features, diving board, office/bathhouse, filtration enclosure, concrete decks, fencing, sun bathing areas, pipes and plumbing, filters, lockers, shade structures, and pool furniture.

Other related site improvements may include parking and sidewalks and other items of work required to complete the project.

The Consultant will lead a discussion including images and /or video presentations with commentary on features of other new similar outdoor family aquatic centers, background information on historic and contemporary issues in the industry, costs, and an open-forum question-and-answer session

to discuss priorities and needs of the representatives attending the meeting. From this discussion, a matrix of program activities will be developed and discussed to prioritize programming and facility features.

B. Community Meeting:

The Consultant will participate in early evening meeting with the public to present the initial findings in a PowerPoint presentation format from the design programming sessions and to solicit and document public comments and support. Following the meeting, the Consultant will verify with the Client any modifications to the final design program prior to preparing conceptual design options and opinions of probable cost.

C. Conceptual Design

Following then Programming Work Session and Community Meeting, the Consultant will develop three or four conceptual designs of the new outdoor family aquatic facility with features identified through the needs analysis and programming of budgets from approximately \$1.M to \$5M. The purpose of these plans will be to illustrate ways to organize the spaces in a functional arrangement and to confirm that the facility footprint will contain the areas proposed in the design program.

The quantity, size, and type of features from the design program matrix will influence the different budget amounts. (For example: combining a leisure pool with a competitive pool in the same body of water will impact the budget differently when compared to planning these two areas in separate bodies of water.)

The concepts will be presented to the Client in an in-person meeting. The pros and cons of each option will be discussed as well as generic budget considerations for construction, operations, and potential revenue. The Client will then select the concept that appears the most suitable to meet the needs and objectives of the community so that a final conceptual design plan and opinion of probable cost can be prepared.

Meetings: One Trip w/ Three In-Person Meetings and One Trip with One In-Person Meeting

Task II Feasibility Analysis

Once the concept is set, a financial feasibility analysis will be developed as an opinion of the facility financial performance and an opinion of suggested operations for the planned facility. The study will include the following elements:

A. Economic Impact:

- 1) This part of the study incorporates an analysis of the economic impact of the facility to the City. In this segment of the study the following will be researched, analyzed, and reported:

- a. Demographic research will be completed to appropriately evaluate the proposed facility. Analysis will include population and age distribution, income, weather analysis, and local economic considerations that could affect the project's viability.
- b. An opinion of probable expenses will be developed and it will include demands on labor, contract services, supplies, utilities, maintenance, and funds needed for future repair.
- c. An opinion of revenue will be developed. Market area demographics for population, age, and income will be analyzed to understand the economics of the region and the level of discretionary income that may be used for leisure and competitive aquatic activity.
- d. Revenue projections will be derived from the likely market penetration, special user groups through creative programming, and the potential of income. The analysis may include a study of the influence of the tourism. This analysis will incorporate an opinion of attendance and offer recommendations of a competitive fee structure for all facilities.

B. Operational Impact

- 1) This part of the study incorporates an analysis of the operational impact of the facility to the City. In this segment of the study the following will be researched, analyzed, and reported:
 - a. A facility management outline will be completed that includes a facility operating schedule, facility capacity limits, staffing requirements, and a wage structure for all employees.
 - b. User groups (lessons, lap lane users, recreational swimmers, and group party rentals) will be identified and contribute to filling available capacity in the facility.

The Feasibility Analysis findings will be presented to the Client in an internet meeting for comments. Following the meeting, any final modifications to the will made and inserted into a final presentation.

Meetings: One Internet Meeting

Task III *Final Presentation (Trip Three)*

Once the above items are complete, the Consultant will make a final formal presentation to the Client at a City Council Meeting of the final conclusions of the conceptual design and feasibility study findings.

The information will be presented in PowerPoint presentation to the City Council so that the Council members can decide how they want to move forward on the project...

The Consultant will deliver one electronic copy of the presentation and ten (10) printed and bound copies.

Meetings: One Trip with One In-Person Meeting

Task IV *Construction Documents*

When the Client is successful in finalizing the funding amount and mechanism for the project, the Consultant will develop a scope and fee with the Client for the construction documents and proceed (upon authorization) with that portion of the work.

Exclusions

Any items requested by the Client that are not outlined in the above scope will be considered excluded from this contract and may be provided only if requested and authorized in writing by the Client.

Client Responsibilities

Services to be provided by the Client will primarily consist of furnishing all available data for the proposed site and any existing City aquatic facilities (if available), including:

- A. Any previous aquatics studies.
- B. A verbal report on existing construction or equipment problems and on-going maintenance problems with the existing pool.
- C. Any existing operating and maintenance manuals (if available).
- D. A verbal report on recent work completed on the pool or spray station.
- E. A verbal report of the loss of pool water in a 24 hour period at the pool.
- F. A copy of any accident reports at the existing facility (by the Staff) or a list of perceived safety hazards to the user or staff.
- G. A summary of attendance at the existing pool.

May 16, 2013

- H. A copy of the current City of Midland, Texas Parks and Recreation Master Plan (if available).
- I. Any existing surveys, plans, and geo-technical investigations of the pool site.



Kimley-Horn
and Associates, Inc.

PROFESSIONAL FEES AND EXPENSES

City of Midland – Doug Russell Outdoor Pool Renovation

Basic Services

Task I	Concept Development and Costs	\$12,500
Task II	Financial Impact Study	\$12,500
Task III	Final Presentation	<u>\$3,000</u>
	Sub Total (Fee Only)	\$28,000

Expenses

Expenses will be billed on a lump sum basis. \$2,000

Total Lump Sum Fee (Including Basic Services and Expenses) \$30,000

Note: Expenses include three (3) one or two day trips for two or three team members including travel costs, miscellaneous phone, fax, delivery, and printing..

The Consultant shall submit monthly invoices based upon the services completed at the time of billing.

Deliverables shall include 10 bound copies of the final presentation; and one complete electronic copy.

Additional Services

The following hourly rates, or a negotiated fee may be utilized as the basis for additional services should they be authorized by the Client:

Associate / Principal	\$175 / Hour
Analyst / Park Planner	\$125 / Hour
Secretarial	\$75 / Hour

The following additional site visit rates will be utilized as the basis for additional site visits should they be authorized by the Client:

Senior Associate / Principal	\$1,500.00 / Day plus Travel Expenses
Analyst / Park Planner	\$1,000.00 / Day plus Travel Expenses



PROJECT SCHEDULE

City of Midland, Texas – Doug Russell Outdoor Pool Renovation

Phase One – Conceptual Design and Feasibility Study

May 2013	Signed Contract and Notice to Proceed
June 2013	Task I (Trip One) and In-Person Meetings
July 2013	Task I (Conceptual Design-Trip Two) and In-Person Meeting
July 2013	Task II (Feasibility Study) Internet Meeting
August 2013	Task III (Trip Three) and In-Person Meeting

Note: This schedule is tentative and may have to be adjusted to meet the availability of the meeting participants or due to other factors beyond the Consultant's reasonable control.

Phase Two – Construction Documents

T.B.D	Only Upon Authorization by City at Future Date
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CITY OF MIDLAND
Community Services Department
Interoffice Memorandum

Date: May 16, 2013
To: Tommy Hudson, Deputy City Manager
From: Tina Jauz, Community Services Director
Subject: Professional Services Agreement – Doug Russell Pool Renovation

The City of Midland closed a Request for Qualifications for Professional Design Services for the Doug Russell Pool Renovation project on April 26, 2013. On May 7, the Capital Improvement Committee of the Parks and Recreation Advisory Board and City staff reviewed the RFQ submittals and Kimley-Horn and Associates, Inc. was selected as the consultant to provide professional design services for the project. During the process of reviewing the RFQs, the Committee discussed the possibility of expanding the scope of the original project and voted to recommend to City Council that consideration be given to create a new recreational aquatics facility in the current location of the Doug Russell facility, and to obtain additional funding.

Kimley-Horn and Associates, Inc. has submitted a scope of services for Phase I of the Doug Russell Pool Renovation which would include the following work:

PHASE I

Task I	Concept Development and Costs to include analyzing the existing facility and developing options for renovation. In addition, options for creating a new recreational aquatic center will be developed.	\$12,500
Task II	Financial Impact Study	\$12,500
Task III	Final Presentation	<u>\$3,000</u>
	Sub Total (Fee Only)	\$28,000

Expenses will be billed on a lump sum basis.	\$2,000
--	---------

Total Lump Sum Fee (Including Basic Services and Expenses)	\$30,000
--	----------

Phase I of the project is anticipated to be completed by the end of August 2013. After the completion of Phase I, Phase II of the project will be negotiated with Kimley-Horn.

That the sum of \$30,000 is hereby appropriated from the 2012 GPCO Park Improvements Bond Fund (162) Unappropriated Fund Balance (5650) to the Doug Russell Pool Renovations Project (9037).



City Council Agenda

Approved for Agenda:
csharp
City Manager's Office

MEETING DATE: 5/28/2013

TO: City Council / City Manager

FROM: Courtney Sharp, City Manager

SUBJECT: Consider a resolution approving a special event permit for the Juneteenth Celebration on June 15, 2013.

Purpose:

Consider a resolution approving a special event permit for the Juneteenth Celebration on June 15, 2013.

Recommended City Council Action

☒ Approve ☐ Deny ☐ Directional / Informational

Fiscal Impact:

N/A

Discussion:

The parade route for this special event does go over the railroad tracks. The attached email indicates that Union Pacific has been notified of the parade.

RESOLUTION NO. _____

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MIDLAND, TEXAS APPROVING THE JUNETEENTH CELEBRATION PARADE TO BE HELD ON JUNE 15, 2013; AND THE COUNCIL FINDS THAT THE PARADE WILL CROSS BUSINESS INTERSTATE 20 AND THE TEXAS DEPARTMENT OF TRANSPORTATION HAS APPROVED THE ROUTE; AND THE PARADE ROUTE WILL CROSS THE UNION PACIFIC RAILROAD AND THE COUNCIL FINDS THAT THE UNION PACIFIC RAILROAD HAS APPROVED THE ROUTE AND THE CROSSING OF THE RAILROAD TRACKS; AND WAIVING THE APPLICATION AND CLEAN-UP FEE

WHEREAS, the Tall City Lions Club has requested that the City of Midland issue a City of Midland Special Event Permit for the Juneteenth Celebration Parade; and

WHEREAS, the City Council finds it to be in the public interest to approve said special event to be held on June 15, 2013;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MIDLAND, TEXAS:

SECTION ONE. That the special event named the Juneteenth Celebration Parade is hereby approved to be held on June 15, 2013.

SECTION TWO. That the Tall City Lions Club shall be required to file an application with the City Manager for a Special Event Permit.

SECTION THREE. That the Tall City Lions Club shall be required to obtain a Special Event Permit issued by the City Manager prior to said special event.

SECTION FOUR. That the City Council hereby waives the \$50.00 application fee and the \$250.00 clean-up and damage fee for said special event.

SECTION FIVE. That the City Council finds that the State of Texas and the Union Pacific Railroad Company have approved the route.

On motion of Council member _____, seconded by Council member _____, the above and foregoing resolution was adopted by the City Council of the City of Midland at a regular meeting on the _____ day of _____, A.D., 2013, by

the following vote:

Council members voting “AYE”:

Council members voting “NAY”:

W. Wesley Perry, Mayor

ATTEST:

Amy M. Turner, City Secretary

RECOMMENDED AND APPROVED:

Courtney Sharp, City Manager

APPROVED AS TO FORM:

Keith Stretcher, City Attorney

RECEIVED

MAY 16 2013

CITY OF MIDLAND
TRANSPORTATION

CITY OF MIDLAND
SPECIAL EVENT APPLICATION

Before any Special Event (The term "Special Event" means any Parade, Race, Block Party, Festival or any event requiring the temporary closing or blocking of any public street, alley or sidewalk, or any combination thereof) may be considered, this Special Event Application must be completed. Before a request can be considered for approval, the City Manager must:

1. Verify with the Planning Division (685-7400) if a Temporary Land Use Permit or other permit is also required. (y)___ (n)___ Planning Division signature: _____
Date: _____
2. Secure clearances and have authorized signatures in all designated areas of this Application prior to executing a Special Event Permit.
3. Complete or require an event map indicating the location or route of the Special Event and other event logistics, as listed below.
4. The applicant must submit the completed Application and event map to the City Manager's Office at least 15 DAYS prior to the scheduled time for the Special Event. The applicant may mail the completed application form to the City Manager, PO Box 1152, Midland, Texas, 79702, or return the Application to Room 310, City Hall, 300 N. Loraine Street, Midland, Texas, 79701.
5. The City Manager shall collect a refundable \$250.00 deposit for damages or the cleaning of any streets, alleys or sidewalks, before processing this Application.
6. The City Manager shall collect a non-refundable \$50.00 application fee before processing this application

Contact the City Manager at 685-7200 with any questions.

EVENT NAME: Juneteenth Celebration Est. # of Participants: Unknown

SPONSORING ORGANIZATION (PERMITTEE): Tall City Lions Club

CONTACT PERSON: Morris Williams Jr. ADDRESS: P.O. Box 1102, 79702
Phone No.: (h) 432-352-6603 (w) 432-685-7275 (m) 432-413-3211

Event Date(s): June 13-16, 2013 Hours: 10 a.m. - Midnight

(List approximate times when the event will assemble: _____)

start: 10 a.m. and terminate: midnight.)

LOCATION: Washington Park - 1803 E. Indiana Ave.

(Attach map of event area showing parking, dumpsters, tents, booths, stages, fences, barricades, etc. Applicant shall show proposed assembly area, route, disbanding area, the number and type of vehicles and or animals, the number of persons expected to participate, a general description of the organization of the Special Event and any other information the City Manager may deem reasonably necessary for the safety of event participants and the general public.)

Will the event be held on Midland County grounds? (y)___ (n)___

If yes, please be aware that the use of Midland County property requires written permission from the County Commissioner's Court, the use of Sheriff Deputies for security on Midland County property, and may require additional clean-up and damage deposit fees.

DESCRIPTION OF ANY TENT, TEMPORARY STRUCTURES OR FENCING: _____

NO. OF RESTROOMS OR PORTABLE TOILETS PROVIDED: _____

CLEAN-UP/DAMAGE DEPOSIT: A \$250.00 clean-up or damage deposit is required for all Special Events; the total amount or a portion of which may be refunded following City inspection of the site of the Special Event. Also see above note regarding use of Midland County property.

SECURITY PLAN (No. Of City and/or County security officers): _____

PARKING PLAN: _____
(Attach written approval from the landowners, as needed)

.....
THE FOLLOWING SECTIONS MUST BE SIGNED BY AUTHORIZED STAFF.
.....

I. DEPT. OF ENGINEERING SERVICES

REQUESTED STREET CLOSING: _____

REQUIRED BARRICADES, CONES, OR OTHER CONTROLS: _____

COMMENTS or RECOMMENDATIONS: _____

_____ **DATE:** _____

Authorized Signature

Title

II. POLICE DEPARTMENT

ARE OFF-DUTY POLICE OFFICERS NEEDED? (y)___(n)___

If yes, how many? _____ Location? _____

COMMENTS or RECOMMENDATIONS: _____

_____ **DATE:** _____

Authorized Signature

Title

III. COMMUNITY SERVICES DEPARTMENT (Complete this section if a City Park will be used)

PARK PROPERTY LOCATION: Washington Park

FENCING IS AVAILABLE FOR RENT TO USE IN PUBLIC PARKS.

REQUESTED?(y)✓(n)___

COMMENTS or RECOMMENDATIONS: _____

DATE: 5.20.13

Jana Jaurz Dir. of Comm Serv
Authorized Signature Title

IV. HEALTH DEPARTMENT

WILL FOOD BE SERVED?(y)___(n)___ WILL PUBLIC RESTROOMS BE AVAILABLE
(y)___(n)___ AMOUNT? _____ WILL PORT-A-POTTIES BE PROVIDED? (y)___(n)___

AMOUNT? _____

COMMENTS or RECOMMENDATIONS: _____

DATE: _____

Authorized Signature Title

V. FIRE DEPARTMENT

IS AN OPEN FLAME, TENT, OR OTHER FLAMMABLE ITEM PLANNED?(y) ☒ (n)___

IS A SITE INSPECTION REQUIRED PRIOR TO EVENT?(y) ☒ (n)___

ARE CROWD MANAGERS/FIRE WATCH PERSONNEL REQUIRED?(y)___(n) ☒
If yes, How many? _____ Location? _____

ARE PARAMEDICS NEEDED?(y)___(n) ☒

If yes, how many? _____ Location? _____

COMMENTS or RECOMMENDATIONS: Provide fire extinguishers where open flame
cooking is performed. Call 685-7323 to schedule inspection DATE: 5-21-13

Robert M. Anderson Interim Fire Marshal
Authorized Signature Title

VI. SOLID WASTE DEPARTMENT

HAS CITY PICK-UP OF REFUSE BEEN SCHEDULED?(y)___(n)___

COMMENTS or RECOMMENDATIONS: _____

DATE: _____

Authorized Signature Title

SUMMARY OF THE SPECIAL EVENTS APPLICATION REQUIREMENTS

- () Have you attached a map of the Special Event, particularly relating to closing of streets for a Parade, Race, party or assembly of a crowd in the street?
- () Have you verified with the Planning Division whether or not a Temporary Land Use Permit or other permit is also required?
- () Have you contacted the City of Midland Traffic, Police, and Legal representatives to determine proper barricade, security and insurance requirements? Such representatives of the City must sign this application.
- () Have you contacted a private barricade company to determine when and where the barricades will be set, along with necessary traffic markings?
- () If alcoholic beverages are to be sold, have you acquired a temporary permit as is required from the Texas Alcoholic Beverages Commission (TABC)?
- () Have you received and included Midland County approval as needed if any portion of your event will take place on County property?
- () If you need assistance contacting the State of Texas or the railroad company, please contact the Traffic Engineer.
- () Have you mailed or returned this application - completed and including a map - to the City Manager, PO Box 1152, Midland, Texas, 79702, at least 15 days prior to the Special Event?

E. Form of Permit

The Permit for the Special Event, if granted, shall be made in writing, on a form provided by the City Manager, as follows:

CITY OF MIDLAND
SPECIAL EVENT PERMIT

Permittee: TALL CITY LIONS CLUB
sponsoring organization

By: JUNETEENTH CELEBRATION
title

Type of special event: ANNUAL COMMUNITY CELEBRATION/PARADE

Does the Special Event include the consumption of alcoholic beverages? (y) (n) X

The City of Midland hereby extends this Permit to the above named Permittee to hold the Special Event described above on City of Midland right of way at the location as shown on the site plan, attached hereto as exhibit "A" and on the following dates and times:

DEMANDS, CLAIMS, DAMAGES, OR CAUSES OF ACTION OF ANY KIND WHATSOEVER WHICH PERMITTEE HAS OR MIGHT HAVE IN THE FUTURE, INCLUDING BUT NOT LIMITED TO BREACH OF CONTRACT, QUANTUM MERUIT, CLAIMS UNDER THE DUE PROCESS AND TAKINGS CLAUSES OF THE TEXAS AND UNITED STATES CONSTITUTIONS, TORT CLAIMS, OR THE CITY OF MIDLAND'S NEGLIGENCE.

6. CONSIDERATION - The Permittee and the City of Midland acknowledge that this Permit is supported by good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged.

7. CONTRACT - The Permittee acknowledges and agrees that this Permit shall constitute a written contract between the City and the Permittee.

8. NOT A CONTRACT FOR GOODS OR SERVICES - The Permittee and the City agree that this Special Event Permit is not and shall not be construed as being a written contract for providing goods or services to the City of Midland as defined in Chapter 271 of the Texas Local Government Code.

9. Applicant and all participants shall be subject to the following conditions:

- (A) All materials used in the construction of any floats shall be subject to requirements concerning fire safety as may be determined by the City Manager or his designee;
- (B) The Permittee shall advise all participants in the Special Event, either orally or by written notice, of the terms and conditions of the Permit prior to the commencement of the Special Event;
- (C) No participant in the Special Event may deviate from the Special Event route as it is described in the permit application;
- (D) The Parade shall continue to move at a fixed rate of speed not exceeding ten miles per hour and any delay or stopping by any participant in the Parade, except when reasonably required for the safe and orderly conduct of the Parade, shall constitute a violation of the permit; and
- (E) Any other requirements found by the chief of police to be reasonably necessary for the protection of persons or property.

10. OTHER PROVISIONS -

This Permit does not relieve the Permittee from the obligation of observing all applicable ordinances of the City of Midland, Texas.

SIGNED AND ISSUED this ____ day of _____, 20__.

CITY OF MIDLAND, TEXAS

By: _____
City Manager

Permittee acknowledges that the City of Midland may unilaterally revoke this Permit at any time. In consideration herefor, the Permittee agrees to the following conditions:

1. **INDEMNITY** - PERMITTEE WILL INDEMNIFY AND HOLD HARMLESS AND DEFEND CITY AND ALL OF CITY'S OFFICERS, AGENTS AND EMPLOYEES FROM ALL SUITS, ACTIONS, CLAIMS, DAMAGES, PERSONAL INJURIES, LOSSES, PROPERTY DAMAGE AND EXPENSES OF ANY CHARACTER WHATSOEVER, INCLUDING ATTORNEY'S FEES, BROUGHT FOR OR ON ACCOUNT OF ANY NEGLIGENT ACT OF PERMITTEE, ITS AGENTS OR EMPLOYEES, IN THE EXECUTION, SUPERVISION AND OPERATIONS GROWING OUT OF OR IN ANY WAY CONNECTED WITH THE SPECIAL EVENT DESCRIBED ABOVE, AND PERMITTEE WILL BE REQUIRED TO PAY ANY JUDGMENT WITH COSTS WHICH MAY BE OBTAINED AGAINST CITY OR ANY OF ITS OFFICERS, AGENTS OR EMPLOYEES, INCLUDING ATTORNEY'S FEES.

PERMITTEE SHALL INDEMNIFY AND HOLD HARMLESS AND DEFEND THE CITY OF MIDLAND, TEXAS, AND ALL OF CITY'S OFFICERS, AGENTS AND EMPLOYEES FROM ALL SUITS, ACTIONS, CLAIMS, DAMAGES, PERSONAL INJURIES, PROPERTY DAMAGE, LOSSES, AND EXPENSE OF ANY CHARACTER WHATSOEVER INCLUDING ATTORNEY'S FEES, BROUGHT FOR OR ON ACCOUNT OF ANY PERSONAL INJURIES, ACCIDENTAL DEATH OR DAMAGES RECEIVED OR SUSTAINED BY ANY PERSON OR PERSONS OR PROPERTY, ON ACCOUNT OF ANY NEGLIGENT ACT OF THE CITY OF MIDLAND, CITY'S OFFICERS, AGENTS, AND EMPLOYEES, WHETHER SUCH NEGLIGENT ACT WAS THE SOLE PROXIMATE CAUSE OF THE INJURY OR DAMAGE OR A PROXIMATE CAUSE JOINTLY AND CONCURRENTLY WITH PERMITTEE OR PERMITTEES EMPLOYEES, OR AGENTS NEGLIGENCE, IN THE EXECUTION, SUPERVISION AND OPERATIONS GROWING OUT OF OR IN ANY WAY CONNECTED WITH THE SPECIAL EVENT DESCRIBED ABOVE AND PERMITTEE WILL BE REQUIRED TO PAY ANY JUDGMENT WITH COSTS WHICH MAY BE OBTAINED AGAINST CITY OR ANY OF ITS OFFICERS, AGENTS OR EMPLOYEES INCLUDING ATTORNEY'S FEES.

2. **BARRICADES** - To properly barricade the right of way described in exhibit "A" in accordance with the requirements set forth in the Texas Manual on Uniform Traffic Control Devices and any instructions issued by the City's Traffic Engineer.

3. **SECURITY** - To provide ____ number of certified peace officers at the special event during all hours the special event is being held.

4. **COMPLIANCE WITH APPLICABLE LAWS** - Permittee shall, at all times during the Special Event contemplated herein, comply with applicable federal, state, and local laws regarding Licensee's activities pursuant to this Agreement, including but not limited to all applicable sections of the Municipal Code of Midland, Texas, as may be amended, said sections being hereby incorporated by reference and made a part of this Agreement for all legal purposes. Failure to abide by any such law mentioned herein constitutes grounds for the immediate termination of this Agreement.

5. **RELEASE** - NOTWITHSTANDING ANY OTHER PROVISIONS, PERMITTEE HEREBY RELEASES, ACQUITS, RELINQUISHES AND FOREVER DISCHARGES THE CITY OF MIDLAND, ITS EMPLOYEES AND OFFICERS, FROM ANY AND ALL

NOTARY AFFIDAVIT

STATE OF TEXAS §
 §
COUNTY OF MIDLAND §

BEFORE ME, the undersigned authority, personally appeared _____, known to me, and on oath stated that he executed the foregoing document for the purpose and considerations therein expressed as an act and deed of the City of Midland, Texas.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this ____ day of _____, 20____.

Notary Public, State of Texas

PERMITTEE: TALL CITY LIONS CLUB
(Name of Organization)

By: Morris Williams Jr.
(Signature)

MORRIS WILLIAMS JR.
(Print Name)

EVENT COORDINATOR
(Office held in Organization)

NOTARY AFFIDAVIT

STATE OF TEXAS §
 §
COUNTY OF MIDLAND §

BEFORE ME, the undersigned authority, personally appeared Morris Williams Jr., known to me, and on oath stated that s/he executed the foregoing document for the purpose and considerations therein expressed as an act and deed of Tall City Lions Club.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this 16th day of May, 2013.

Kara Michelle Laborde
Notary Public, State of Texas





CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

01/14/2013

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Willis of Illinois, Inc. 425 N. Martingale Road, Suite 1100 Schaumburg, IL 60173	CONTACT NAME: John Adams	
	PHONE (A/C, No, Ext): 1-800-316-6705	FAX (A/C, No): 1-888-467-2378
INSURED Tall City Lions Midland Texas	E-MAIL ADDRESS: lionsclubs@willis.com	
	INSURER(S) AFFORDING COVERAGE	
	INSURER A: ACE American Insurance Company	
	INSURER B:	
	INSURER C:	
	INSURER D:	
INSURER E:		
INSURER F:		

COVERAGES**CERTIFICATE NUMBER:****REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	GENERAL LIABILITY						
	☒ COMMERCIAL GENERAL LIABILITY	X		HDOG27012784	09/01/2012	09/01/2013	EACH OCCURRENCE \$ 1,000,000
	☐ CLAIMS-MADE ☒ OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 1,000,000
	☒ Agg. Per Named Insured is \$2,000,000						MED EXP (Any one person) \$ 1,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						PERSONAL & ADV INJURY \$ 1,000,000
	☒ POLICY ☐ PRO-JECT ☐ LOC						GENERAL AGGREGATE \$ 10,000,000
							PRODUCTS - COMPROP AGG \$ 2,000,000
							\$
A	AUTOMOBILE LIABILITY			ISAH08711392	09/01/2012	09/01/2013	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000
	☐ ANY AUTO						BODILY INJURY (Per person) \$
	☐ ALL OWNED AUTOS						BODILY INJURY (Per accident) \$
	☒ HIRED AUTOS						PROPERTY DAMAGE (Per accident) \$
	☐ SCHEDULED AUTOS						\$
	☒ NON-OWNED AUTOS						
	UMBRELLA LIAB						EACH OCCURRENCE \$
	EXCESS LIAB						AGGREGATE \$
	DED						\$
	RETENTION \$						
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY						WC STATUTORY LIMITS
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH)						OTH-ER
	If yes, describe under DESCRIPTION OF OPERATIONS below		N/A				E.L. EACH ACCIDENT \$
							E.L. DISEASE - EA EMPLOYEE \$
							E.L. DISEASE - POLICY LIMIT \$

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

Provisions of the policy apply to the named insured's participation in the following activity during the policy period shown above: Juneteenth Celebration 6/14/13
PROVISIONS OF THE POLICY DO NOT APPLY TO THE SALE OR SERVING OF ALCOHOLIC BEVERAGES.

CERTIFICATE HOLDER**CANCELLATION**City of Midland
Midland Texas

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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Google

[illegible]

Date: 3/25/2013 Author: Bobby Bowers Project: Juneteenth

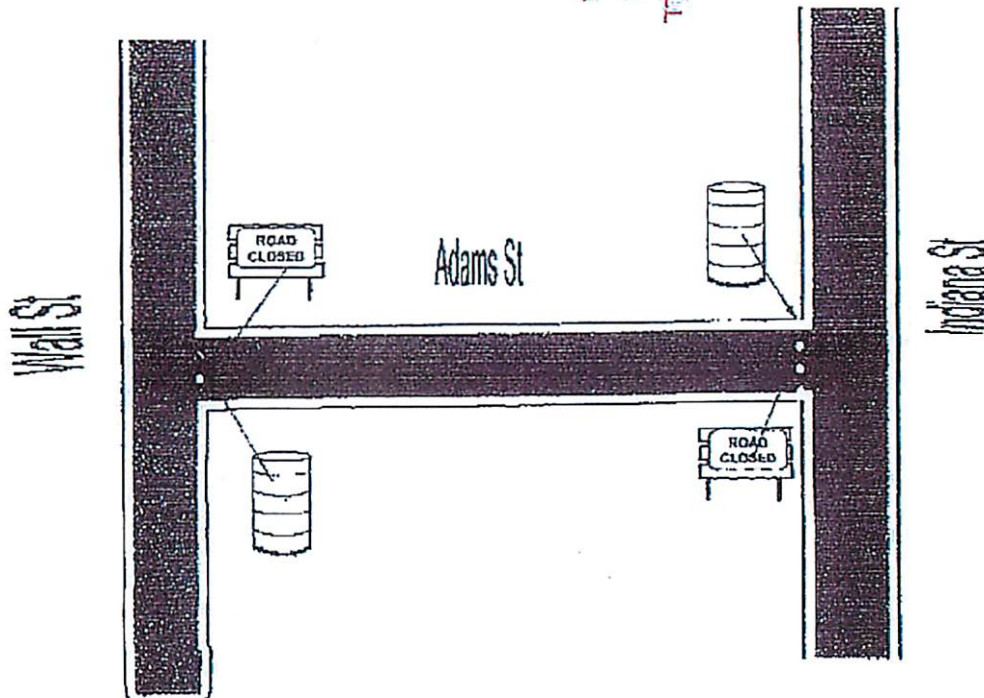
Comments:

Juneteenth
Road Closure
Adams / Indiana
6/15/13 Approx. 1 Day
Morris 685-7278

ALL BARRICADING SHALL
BE IN CONFORMANCE
WITH TEXAS M.U.T.C.D.

APPROVED

Gary Saunders 3/25/13



Date: 3/25/2013 Author: Bobby Bowers Project: Juneteenth

Comments:

To: Gary Saunders	From: Celia Ledbetter
COM Transportation	Star Lite Barricade
685-7280 Fax 683-1786	520-0600 Fax 697-7237



Texas Department of Transportation

**3901 East Highway 80
Odessa, TX 79761-3522**

May 21, 2013

Morris Williams Jr.
City of Midland
Director of Solid Waste
mwilliams@midlandtexas.gov
432-685-7275

Re: Lions Club Parade Lamesa Road June 15, 2013

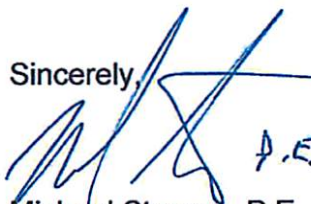
Mr. Williams:

The Odessa District office of TxDOT has reviewed your route for the Lions Club Parade scheduled for June 15, 2013. Based on the description of the route and your application for a parade permit from the City of Midland, TxDOT has approved your route crossing BI-20.

Please forward a copy of your parade permit upon receipt from the City of Midland for our records.

If you have any questions or concerns, please feel free to contact me at 432-498-4745.

Sincerely,



Michael Stroope, P.E.
District Maintenance Engineer

CC: Chad Windham, P.E., Midland Area Engineer
Eric Lopez, Midland Maintenance Supervisor
File

Shellie Mitchell

From: Morris Williams
Sent: Tuesday, May 21, 2013 4:18 PM
To: Shellie Mitchell
Subject: FW: Emailing: Lamesa Road 2013.pdf
Attachments: Lamesa Road 2013.pdf

Hey Shellie,

I did not speak with Thomas Price with Union Pacific Railroad but I did speak with Penny in the Union Pacific Police Dispatch. She informed me that there was a **Incident number (2013-05-16357DJM)** generated for the Juneteenth Parade. **The route, date, and time are all file with the railroad and she was unaware of any permission letters that are generated from the railroad.** She also informed me that the majority of Mr. Price's time is spent in the field as he is over track maintenance. Therefore, it may be difficult to get in touch with him. Penny assured me that all steps have been taken and the railroad is aware there will be a parade on June 15, 2013 at 10 a.m.

Thanks,

Morris Williams Jr.
City of Midland
Director of Solid Waste
432-685-7275 office
432-685-7450 fax
432-685-7278 Solid Waste
432-685-3431 Landfill

-----Original Message-----

From: Mike Stroope [<mailto:Mike.Stroope@txdot.gov>]
Sent: Tuesday, May 21, 2013 4:11 PM
To: Morris Williams
Cc: Shellie Mitchell
Subject: Emailing: Lamesa Road 2013.pdf

Your message is ready to be sent with the following file or link attachments:

Lamesa Road 2013.pdf

Note: To protect against computer viruses, e-mail programs may prevent sending or receiving certain types of file attachments. Check your e-mail security settings to determine how attachments are handled.

[Click It or Ticket]<<http://www.txdot.gov/inside-txdot/division/traffic/safety/laws/clickit.html>>



City Council Agenda

Approved for Agenda:
csharp
City Manager's Office

MEETING DATE: 5/28/2013

TO: City Council / City Manager

FROM: Courtney Sharp, City Manager

SUBJECT: Consider a Resolution appointing Fire Chief Robert Isbell to the Midland Emergency Communication District.

Purpose:

Consider a Resolution appointing Fire Chief Robert Isbell to the Midland Emergency Communication District.

Recommended City Council Action

☐ Approve ☐ Deny ☐ Directional / Informational

Fiscal Impact:

N/A

Discussion:

Health Safety Code 772 states two members of the Board of Managers for the Midland Emergency Communication District will be appointed by the City Council of Midland. A vacancy has been created by the retirement of Fire Marshall Jeff Meiner.

RESOLUTION NO. _____

**RESOLUTION APPOINTING ROBERT ISBELL TO THE
BOARD OF MANAGERS OF THE MIDLAND
EMERGENCY COMMUNICATION DISTRICT**

WHEREAS, pursuant to the provisions of § 772.306 of the Texas Health and Safety Code, the City Council finds it to be in the public interest to appoint Robert Isbell to the Board of Managers of the Midland Emergency Communication District;

**NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE
CITY OF MIDLAND, TEXAS:**

THAT the City Council of the City of Midland, Texas, pursuant to the provisions of § 772.306 of the Texas Health and Safety Code, hereby appoints Robert Isbell to the Board of Managers of the Midland Emergency Communication District, for a term commencing May 29, 2013, and ending November 1, 2014.

On motion of Council member _____, seconded by Council member _____, the above and foregoing resolution was adopted by the City Council of the City of Midland at a regular meeting on the _____ day of _____, A.D., 2013, by the following vote:

Council members voting "AYE":

Council members voting "NAY":

W. Wesley Perry, Mayor

ATTEST:

Amy M. Turner, City Secretary

RECOMMENDED AND APPROVED:

Courtney Sharp, City Manager

APPROVED AS TO FORM:

Keith Stretcher, City Attorney



City Council Agenda

Approved for Agenda:
JNichols
City Manager's Office

MEETING DATE: 5/28/2013

TO: City Council / City Manager

FROM: David Beard,

SUBJECT: Consider a resolution to approve a Professional Service Agreement with AMD Engineering in the amount of \$479,477 for design surveying, design, and construction administration services in connection with the extension of Tradewinds Blvd. from Thomason Dr. to the Gateway Plaza Addition. (District #4 – Trost)

Purpose:

Consider a resolution to approve a Professional Service Agreement with AMD Engineering in the amount of \$479,477 for design surveying, design, and construction administration services in connection with the extension of Tradewinds Blvd. from Thomason Dr. to the Gateway Plaza Addition. (District #4 – Trost)

Recommended City Council Action

☒ Approve ☐ Deny ☐ Directional / Informational

Fiscal Impact:

Funds are available in the Tradewinds Street and Sewer project (9016).

Discussion:

The intent of this project is to construct Tradewinds Blvd. from Thomason Dr. to the Gateway Plaza Addition. Improvements include the extension of Tradewinds Blvd. (full width) to the City of Midland collector standard and the associated utility and drainage enhancements.

During the scoping of this project, Staff has had several discussions with AMD regarding the design and construction schedule. Based on these discussions, it is anticipated that a 30% set of review pavement construction drawings will be submitted by the the of September and final construction drawings will be complete by the end of the year. The construction of Tradewinds Blvd. will begin in the Spring of 2014.

In addition, we have had several discussions regarding incentive/disincentive for construction in order to expedite construction process.

Attached is the project layout map.

RESOLUTION NO. _____

RESOLUTION AUTHORIZING THE EXECUTION OF A PROFESSIONAL SERVICES AGREEMENT WITH AMD ENGINEERING, LLC FOR SURVEYING, DESIGN AND CONSTRUCTION ADMINISTRATION SERVICES IN CONNECTION WITH THE EXTENSION OF TRADEWINDS BOULEVARD FROM THOMASON DRIVE TO THE GATEWAY PLAZA ADDITION; AND AUTHORIZING PAYMENT THEREFOR IN THE AMOUNT OF \$479,477.00

WHEREAS, the City of Midland advertised a Request for Qualifications for professional services for surveying, design and construction administration services in connection with the extension of Tradewinds Boulevard from Thomason Drive to the Gateway Plaza Addition; and

WHEREAS, AMD Engineering, LLC has agreed to perform said professional services for an estimated \$479,477.00; and

WHEREAS, the City Council finds that AMD Engineering, LLC is qualified to perform said professional services; and

WHEREAS, the City Council finds that the professional fees proposed by AMD Engineering, LLC are consistent with and not higher than the recommended practices and fees published by the applicable professional associations and do not exceed any maximum provided by law; and

WHEREAS, the City Council finds that AMD Engineering, LLC provides professional services for a fair and reasonable price; and

WHEREAS, the City Council finds it to be in the public interest to execute a professional services agreement with AMD Engineering, LLC as the most highly qualified provider of said professional services based on demonstrated competence, knowledge, and qualifications and on the reasonableness of the proposed fee for the services;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MIDLAND, TEXAS:

SECTION ONE. That the City Manager and City Secretary are hereby authorized and directed to execute and attest, respectively, on behalf of the City of Midland, a

professional services agreement with AMD Engineering, LLC for said professional services. A copy said agreement is attached hereto as Exhibit "A" and incorporated herein for all legal purposes.

SECTION TWO. That the City Treasurer is hereby authorized and directed to make payment to AMD Engineering, LLC, pursuant to the terms of said agreement, in an amount not to exceed \$479,477.00, from funds available in the Tradewinds Street and Sewer Project (9016) budget account upon receipt of proper invoice or statement approved by the City Manager.

On motion of Council member _____, seconded by Council member _____, the above and foregoing resolution was adopted by the City Council of the City of Midland at a regular meeting on the _____ day of _____, A.D., 2013, by the following vote:

Council members voting "AYE":

Council members voting "NAY":

W. Wesley Perry, Mayor

ATTEST:

Amy M. Turner, City Secretary

RECOMMENDED AND APPROVED:

Courtney Sharp, City Manager

APPROVED AS TO CONTENT
AND COMPLETENESS:

Jose Ortiz, Engineering Services Director

APPROVED AS TO FORM:

Keith Stretcher, City Attorney

PROFESSIONAL SERVICES AGREEMENT

THIS AGREEMENT is made and effective the 29th day of May, 2013, by and between the CITY OF MIDLAND, TEXAS, a municipal corporation, hereinafter called “City,” and AMD ENGINEERING, LLC, hereinafter referred to as “Company.”

ARTICLE I. PURPOSE

The purpose of this Agreement is to state the terms and conditions under which Company shall provide engineering services (also referred to as the “services”) in connection with the extension of Tradewinds Boulevard from Thomason Drive to the Gateway Plaza Addition.

ARTICLE II. SERVICES TO BE PERFORMED

1. Company shall provide those services described in Exhibit “A”, which is attached hereto and incorporated herein for all legal purposes.
2. Company shall perform all the services under this Agreement consistent with the same level of skill and care as other professionals in approximately the same location at approximately the same point in time and for the same types of projects. Company represents that any employee who performs services under this Agreement shall be fully qualified and competent to perform the services described in Exhibit “A.”

ARTICLE III. FINANCIAL CONSIDERATIONS

City agrees to pay Company in an amount not to exceed **\$479,477.00** for the professional services described in Exhibit “A.” City agrees to pay Company in accordance with the Fee Schedule set forth in Exhibit “B”, which is attached hereto and incorporated herein for all legal purposes, upon presentation of a monthly invoice. The monthly invoice shall set forth all fees and costs. The City Manager must approve all additional expenses and reimbursable expenses in advance. Within 30 days of receipt of the monthly invoice, City shall pay the full amount of such invoice; provided, however, that if City objects to any portion of an invoice, City shall notify Company of City’s objection and the grounds therefor within 30 days of the date of receipt of the invoice, and the parties immediately shall make every effort to settle the disputed portion of the invoice. The City in any event shall pay every portion of the invoice that is not in dispute within the 30-day period for payment.

ARTICLE IV. TERM

The term of this Agreement shall be from May 29, 2013, until the project is completed, unless the Agreement is terminated earlier as provided in Article V below.

ARTICLE V. TERMINATION

Either party may terminate this Agreement at will, for no or any reason, upon giving the other party sixty (60) days written notice. The parties to this Agreement understand and agree that it is in either party's sole discretion to cancel the Agreement during the term of the Agreement without penalty to the other party. All work and services under this Agreement shall be suspended immediately upon termination of the Agreement becoming effective. The parties have bargained for the flexibility to terminate the Agreement upon giving the requisite notice. In the event of termination of the Agreement under this Article, the Company shall be paid for all services performed up to the termination date.

ARTICLE VI. CONTRACT PERSONAL

This Agreement provides for personal or professional services, and the Company shall not assign this Agreement, in whole or in part, without the prior written consent of City. It is understood that any necessary engineering services shall be either self-performed or subcontracted by the Company.

ARTICLE VII. OWNERSHIP AND CONFIDENTIALITY OF DOCUMENTS AND OTHER WORK PRODUCT

All reports, information and other data ("instruments of service"), given to, prepared or assembled by Company under this Agreement, and any other related documents or items shall become the sole property of City and shall be delivered to City, without restriction, except that Company may make copies of any and all instruments of service for its files. The City shall not make any modification to the plans and specifications or make them available for use by third parties without the prior written authorization of Company, which consent shall not be unreasonably withheld.

ARTICLE VIII.

INDEPENDENT CONTRACTOR

It is expressly understood and agreed that Company shall perform all work and services described herein as an independent contractor and not as an officer, agent, servant or employee of the City; that Company shall have exclusive control of and the exclusive right to control the details of the services and work performed hereunder, and all persons performing the same; and shall be solely responsible for the acts and omissions of its officers, agents, employees, contractors and subcontractors; that the doctrine of respondeat superior shall not apply as between City and Company, its officers, agents, employees, contractors and subcontractors; and that nothing herein shall be construed as creating a partnership or joint enterprise between City and Company. No person performing any of the work and services described hereunder by Company shall be considered an officer, agent, servant or employee of the City. Further, it is specifically understood and agreed that nothing in this Agreement is intended or shall be construed as creating a "Community of Pecuniary Interest" or "An Equal Right of Control" which would give rise to vicarious liability. Company shall be an independent contractor under this Agreement and shall assume all of the rights, obligations and liabilities, applicable to it as such independent contractor hereunder. The City does not have the power to direct the order in which the work is done. The City shall not have the right to control the means, methods or details of the Company's work. Company shall assume exclusive responsibility for the work. Company is entirely free to do the work in its own way.

ARTICLE IX. INSURANCE

Company shall at all times during the term of this Agreement maintain and keep in full force and effect insurance in the following types and minimum amounts with companies authorized to do business in the State of Texas:

Comprehensive General Liability (including Contractual liability):

-Personal Injury:	\$1,000,000.00 per person \$1,000,000.00 per occurrence
-Property Damage:	\$500,000.00 per occurrence

<u>Business Automobile Liability:</u>	\$250,000.00 combined single limit - Personal Injury and Property Damage
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<u>Worker's Compensation:</u>	Statutory limits
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<u>Employers' Liability:</u>	\$500,000.00 per accident or occurrence
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The Workers' Compensation coverage provided by Company shall inure to the benefit of employees injured during the course and scope of their employment by Company pursuant to this Agreement.

The Business Automobile Liability insurance provided by Company shall cover any auto for bodily injury and property damage, including owned vehicles, hired and non-owner vehicles, and employee non-ownership, and the amount of such policy shall be a minimum of \$250,000.00 covering any vehicle used for the execution of the work that is the subject of this Agreement.

All insurance required pursuant to this Agreement, except for Worker's Compensation Insurance, shall name the City as an additional insured. All insurance required pursuant to this Agreement, including Worker's Compensation Insurance, shall provide for a waiver of subrogation as to the City.

The parties agree that, prior to the execution of the Agreement, Company shall provide one or more certificates of insurance showing that the requirements of this article have been met, and specifically containing, without limitations, the following endorsement:

"The City of Midland is included as an additional insured on all policies except for Worker's Compensation. The Company and Insurer hereby waive all rights of subrogation with respect to claims against the City of Midland, its agents, employees and officers, on all policies of insurance."

City shall be provided the notice by Company's insurance provider not later than thirty (30) days prior to any reduction or termination of such coverage. City shall not be required to provide any insurance whatsoever pursuant to this Agreement.

Company shall contractually require all contractors, subcontractors, and sub-subcontractors that work on any portion of the work that is the subject of this Agreement to obtain insurance coverage that meets or exceeds the minimum amounts specified herein. All contractors, subcontractors, and sub-subcontractors shall obtain insurance policies that provide blanket waivers of subrogation in favor of the City of Midland and policies that name the City of Midland as an additional insured (except workers compensation).

ARTICLE X. ATTORNEY FEES

BY EXECUTING THIS AGREEMENT, COMPANY AGREES TO WAIVE AND DOES HEREBY KNOWINGLY, CONCLUSIVELY, VOLUNTARILY AND INTENTIONALLY WAIVE ANY CLAIM IT HAS OR MAY HAVE IN THE FUTURE AGAINST THE CITY, REGARDING THE AWARD OF ATTORNEY'S FEES, WHICH ARE IN ANY WAY RELATED TO THE AGREEMENT, OR THE CONSTRUCTION, INTERPRETATION OR BREACH OF THE AGREEMENT. THE COMPANY SPECIFICALLY AGREES THAT IF THE COMPANY BRINGS OR COMMENCES ANY LEGAL ACTION OR PROCEEDING RELATED TO THIS AGREEMENT, THE CONSTRUCTION, INTERPRETATION, VALIDITY OR BREACH OF THIS AGREEMENT, INCLUDING BUT NOT LIMITED TO ANY ACTION PURSUANT TO THE PROVISIONS OF THE TEXAS UNIFORM DECLARATORY JUDGMENTS ACT (TEXAS CIVIL PRACTICE AND REMEDIES CODE SECTION 37.001, ET. SEQ., AS AMENDED), OR CHAPTER 271 OF THE TEXAS LOCAL GOVERNMENT CODE, THE COMPANY AGREES TO ABANDON, WAIVE AND RELINQUISH ANY AND ALL RIGHTS TO THE RECOVERY OF ATTORNEY'S FEES TO WHICH COMPANY MIGHT OTHERWISE BE ENTITLED.

COMPANY AGREES THAT THIS IS THE VOLUNTARY AND INTENTIONAL RELINQUISHMENT AND ABANDONMENT OF A PRESENTLY EXISTING KNOWN RIGHT. COMPANY ACKNOWLEDGES THAT IT UNDERSTANDS ALL TERMS AND CONDITIONS OF THE AGREEMENT. THE COMPANY FURTHER ACKNOWLEDGES AND AGREES THAT THERE WAS AND IS NO DISPARITY OF BARGAINING POWER BETWEEN THE CITY AND THE COMPANY. THIS SECTION SHALL NOT BE CONSTRUED OR INTERPRETED AS A WAIVER OF SOVEREIGN IMMUNITY.

THE COMPANY AND CITY ARE RELYING ON THEIR OWN JUDGMENT. EACH PARTY HAD THE OPPORTUNITY TO DISCUSS THIS AGREEMENT WITH LEGAL COUNSEL PRIOR TO ITS EXECUTION.

ARTICLE XI. SOVEREIGN IMMUNITY

By executing this Agreement the City is not waiving its sovereign immunity and retains all immunity from suit. The City is not granting consent to be sued by legislative resolution or action. **THERE IS NO WAIVER OF SOVEREIGN IMMUNITY.**

ARTICLE XII. NO THIRD PARTY BENEFICIARIES

The City's approval of this Agreement does not create a third party beneficiary. There is no third party beneficiary to this Agreement. No person or entity who is not a party to this Agreement shall have any third party beneficiary or other rights hereunder.

ARTICLE XIII.
RELEASE

NOTWITHSTANDING ANY OTHER PROVISIONS, COMPANY HEREBY RELEASES, ACQUITS, RELINQUISHES AND FOREVER DISCHARGES CITY, CITY'S EMPLOYEES AND OFFICERS, FROM ANY AND ALL DEMANDS, CLAIMS, DAMAGES, OR CAUSES OF ACTION OF ANY KIND WHATSOEVER WHICH COMPANY HAS OR MIGHT HAVE IN THE FUTURE, INCLUDING BUT NOT LIMITED TO BREACH OF CONTRACT, QUANTUM MERUIT, CLAIMS UNDER THE DUE PROCESS AND TAKINGS CLAUSES OF THE TEXAS AND UNITED STATES CONSTITUTIONS, TORT CLAIMS, OR CITY'S NEGLIGENCE.

ARTICLE XIV.
GENERAL PROVISIONS

A. Waiver. No waiver by City of a breach of any covenant, condition, or restriction of this Agreement shall be construed or held to be a waiver of any succeeding or preceding breach of the same or any other covenant, condition, or restriction contained in this Agreement.

B. Governing Law and Venue. This Agreement shall be governed by the laws of the State of Texas. All performance and payment made pursuant to this Agreement shall be deemed to have occurred in Midland County, Texas. Exclusive venue for any claims, suits or any other action arising from or connected in any way to this Agreement or the performance of this Agreement shall be in Midland County, Texas. The obligations and undertakings of each of the parties to this Agreement shall be deemed to have occurred in Midland County, Texas.

C. Notice. Any notice or demand that shall be made regarding this Agreement, shall be made in writing and delivered either in person or by certified or registered mail. Notice by mail shall be complete upon deposit of the paper, postage prepaid, in a post office or official depository under the care and custody of the United States Postal Service addressed as follows:

If to City:	City Manager's Office P.O. Box 1152 Midland, Texas 79702
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If to Company: AMD Engineering, LLC
411 Commerce St.
Childress, Texas 79201

The parties hereto may change the above designated addresses by giving notice pursuant to the terms of this Section.

D. Severability. In case any one or more of the provisions contained in this Agreement shall for any reason be held to be invalid, illegal, or unenforceable in any respect, this invalidity, illegality, or unenforceability shall not affect any other provision of the Agreement, and this Agreement shall be construed as if the invalid, illegal, or unenforceable provision had never been contained herein.

E. Use of Language. Words in the singular shall be held to include the plural, unless the context otherwise requires.

F. Amendments, Modifications, Alterations. No amendment, modification, or alteration of the terms of this Agreement shall be binding unless it is in writing, dated subsequent to the date of this Agreement, and duly executed by the parties to this Agreement.

G. Counterparts. This Agreement may be executed in multiple counterparts, each of which shall be deemed as original, and all of which shall constitute one and the same instrument.

**ARTICLE XV.
NOTICE OF ALLEGED BREACH:
STATUTORY PREREQUISITES**

As a condition precedent to filing suit for alleged damages incurred by an alleged breach of an express or implied provision of this Agreement, Company or his legal representative, shall give the City Manager, or any other reasonable official of the City, notice in writing (consisting of one original and seven copies of notice attached to a copy of this Agreement) of such damages, duly verified, within one hundred twenty (120) days after the same has been sustained. The discovery rule does not apply to the giving of this notice. The notice shall include when, where and how the damages occurred, the apparent extent thereof, the amount of damages sustained, the amount for which the Company will settle, the physical and mailing addresses of Company at the time and date the claim was presented and the physical and mailing addresses of Company for the six months immediately preceding the occurrence of such damages, and the names and addresses of the witnesses upon whom the Company relies to establish its claim; and a failure to so notify the City Manager within

the time and manner provided herein shall exonerate, excuse and except the City from any liability whatsoever. The City is under no obligation to provide notice to Company that Company's notice is insufficient. City reserves the right to request reasonable additional information regarding the claim. Said additional information shall be supplied within thirty (30) days after receipt of notice.

The statutory prerequisites outlined herein constitute jurisdictional requirements pursuant to Section 271.154 of the Texas Local Government Code and Section 311.034 of the Texas Government Code. Notwithstanding any other provision, Company's failure to comply with the requirements herein shall perpetually bar Company's claim for damages under Chapter 271 of the Texas Local Government Code, and Section 311.034 of the Texas Government Code, regardless if City has actual or constructive notice or knowledge of said claim or alleged damages. Company agrees that the requirements of this entire Agreement are reasonable.

ARTICLE XVI. ASSIGNMENT

Company shall not, either directly or indirectly, assign all or any part of this Agreement or any interest, right or privilege herein, without the prior written consent of the City. The issue on whether or not to grant consent to an assignment is in the sole discretion of the City.

EXECUTED IN DUPLICATE the day and year first above mentioned.

THE CITY OF MIDLAND, TEXAS

By: _____
Courtney Sharp, City Manager

ATTEST:

Amy M. Turner, City Secretary

APPROVED AS TO FORM:

Keith Stretcher, City Attorney

Company :
AMD ENGINEERING, LLC

By: _____

Title: _____

STATE OF TEXAS §
 §
COUNTY OF MIDLAND §

BEFORE ME, the undersigned authority, on this day personally appeared _____
_____ known to me to be the person whose name is subscribed to the foregoing
instrument and acknowledged to me that he executed the same for the purposes and
consideration therein expressed on behalf of AMD ENGINEERING, LLC.

GIVEN UNDER MY HAND AND SEAL OF OFFICE THIS _____ day of
_____, A.D., 2013.

Notary Public, State of Texas

Printed Name

My Commission Expires: _____

Scope of Services – Exhibit A
Tradewinds Boulevard from Thomason Dr to Gateway Plaza Addition
City of Midland

Project Understanding

The Project includes the design and preparation of construction documents for Tradewinds Blvd. from Thomason Drive to the Gateway Plaza Addition and a collector street between Tradewinds Blvd. and Loop 250 Frontage Road. Tradewinds Blvd. will be extended from its existing north and south terminus points to create a 4 lane, through roadway section. The alignment of Tradewinds Blvd. will follow the existing water line and utility easement through this undeveloped location. This project also includes the preliminary design of the future arterial street Avalon Drive between its existing south terminus and Business IH 20. It also includes the preliminary design of a collector street between Tradewinds Blvd. and Avalon Drive along the approximate north property line of the Gateway Plaza Addition.

The Project will include field surveying, preparation of ROW and easement documents, hydrology and hydraulics study for storm drainage design, roadway design, water line expansion and sanitary sewer main extension, illumination design, and bidding phase services. This project will be designed in accordance with City of Midland design and construction standards as well as TxDOT design and construction standards for the improvements within State ROW at Loop 250 and Business IH 20.

1. Survey

1.1. Data Collection and Property Research

- 1.1.1. Gather existing plat information
- 1.1.2. Collect property owner and record information
- 1.1.3. Gather existing right-of-way and easement information
- 1.1.4. Prepare and distribute right-of-entry letter to adjacent landowners
 - Right-of-entry letter will be printed on City of Midland letterhead (provided by City)
- 1.1.5. Prepare Boundary Plat of existing property within project limits

1.2. Preliminary Design Survey

- 1.2.1. Survey Limits
 - Along proposed Tradewinds Blvd. from 200-ft north of Thomason Drive to 200-ft south of the Gateway Plaza Addition terminus of Tradewinds Blvd.
 - At the assumed Avalon Drive intersection with Business IH 20 on the south and at the current Avalon Drive terminus to the north.
 - Along southbound frontage road of Loop 250 running parallel to future limits of Tradewinds Blvd.
- 1.2.2. Establish control monuments (6 per mile) with aluminum caps set using concrete in static GPS along the future approximate alignment of Tradewinds Blvd.
- 1.2.3. Establish a vertical control for monuments using digital level and City of Midland control on NGVD 29/NAD 83

- 1.2.4. Coordinate with City and Design Team regarding field survey necessary
- 1.2.5. Perform a field survey to identify and locate existing topographic elements within the roadway corridor including, but not limited to the following:
 - Property corner monumentation
 - Existing pavement, curbs, sidewalks, barrier free ramps, etc.
 - Roadway and lane striping
 - Driveways
 - Existing driveways and swales
 - Utility manholes, vaults, water valves, water meters, utility poles, utility markers, other public utilities, and franchise utilities above ground, and any underground utilities marked by Dig-Tess
 - Signs (excluding temporary signs)
 - Building and permanent structures
 - Oil field pad sites and appurtenances
 - Private petroleum transmission lines
 - Fence limits and material types (excluding temporary fences)
 - Other applicable physical features that could impact design
- 1.2.6. Perform cross-sections throughout project limits at 50-foot intervals, at grade breaks, and at additional locations as required along the approximate alignment of Tradewinds Blvd. Cross sections will extend beyond the future right of way limits up to 10' (proposed Tradewinds Blvd. right of way of 80'). No cross-sections will be surveyed for Avalon Drive, the connecting street between Tradewinds Blvd. and Avalon Drive, and the two connecting streets between Tradewinds Blvd. and southbound frontage road of Loop 250.
- 1.2.7. Prepare a final topographic drawing in digital format (including contours and breaklines) showing the features located in the field as well as right-of-way strip map information, an ASCII coordinate file of the points located in the field, and a hard copy of the coordinates and feature descriptions.
- 1.3. Final Design Survey
 - 1.3.1. During the preliminary design phase, future alignments will be set for Avalon Drive, a connecting street between Tradewinds Blvd. and Avalon Drive, and up to two (2) connecting streets between Tradewinds Blvd. and the southbound frontage road of Loop 250. In addition, drainage patterns will be established during the preliminary design. Due to the unknown locations of these improvements during the initial preliminary design stages, detailed survey will not be performed until approved alignments and locations are identified later in the preliminary design phase. Once the locations of these improvements is approved by the City of Midland, more detailed survey will be performed to acquire the detail needed to complete the preliminary designs of these proposed improvements.

1.3.2. Survey Limits

- Along City of Midland approved future alignment of Avalon Drive from existing north terminus to intersection at southern limits along Business IH 20
- Along City of Midland approved future alignment of connecting street between Tradewinds Blvd. and Avalon Drive
- Along City of Midland approved future alignment of two (2) connecting streets between Tradewinds Blvd. and southbound frontage road of Loop 250
- Along proposed drainage channel as identified during preliminary design phase (assume up to 1 drainage channel will be required).

1.3.3. Coordinate with City and Design Team regarding field survey necessary

1.3.4. Perform a field survey to identify and locate existing topographic elements within the roadway corridor including, but not limited to the following:

- Property corner monumentation
- Existing pavement, curbs, sidewalks, barrier free ramps, etc.
- Roadway and lane striping
- Existing driveways and swales
- Utility manholes, vaults, water valves, water meters, utility poles, utility markers, other public utilities, and franchise utilities visible above ground, and any underground utilities marked by Dig-Tess
- Signs (excluding temporary signs)
- Building and permanent structures
- Oil field pad sites and appurtenances
- Private petroleum transmission lines
- Fence limits and material types (excluding temporary fences)
- Other applicable physical features that could impact design

1.3.5. Perform cross-sections throughout project limits at 100-foot intervals, at grade breaks, and at additional locations as required along the approved alignments of Avalon Drive, connector between Tradewinds Blvd. and Avalon Drive, two (2) connectors between Tradewinds Blvd. and southbound frontage road of Loop 250, and proposed drainage channel alignment. Cross sections will extend beyond the future right of way limits up to 10'.

1.3.6. Prepare a final topographic drawing in digital format (including contours and breaklines) showing the features located in the field as well as right-of-way strip map information, an ASCII coordinate file of the points located in the field, and a hard copy of the coordinates and feature descriptions.

1.4. No Subsurface Utility Engineering (SUE) will performed under this contract

2. Right-of-Way / Easement Instruments of Conveyance

2.1. Right of Way Strip Map (for Tradewinds Blvd. only)

2.1.1. Prepare a right-of-way strip map for Tradewinds Blvd. and up to two (2) connector streets

- The right-of-way strip map shall be contained on plan sheets (11"x17") at a scale not smaller than 1" = 50', shall be sealed, dated, and signed by a Registered Professional Land Surveyor and shall contain the following:
 - Summary sheet listing all parcels to be acquired, property owners, gross area of property, square footage and type of easement, net area of property after acquisition, a column for volume and page of filing, and current volume and page
 - Corner of all parcels tied to the centerline
 - Location of all existing property pins, including station and offset to the centerline
 - Location of all new property pins, including station and offset to the centerline
 - Parcel number
 - Area required
 - Current owner
 - Any existing platted easements or easements filed by separate instrument including easements provided by utility companies

2.2. Prepare right-of-way instruments (narrative and graphic exhibits or right-of-way takes) and setting new property corners in the field for property along Tradewinds Blvd.

2.2.1. Up to 4 parcels are anticipated

2.3. Prepare easement instruments (narrative and graphic exhibits of easements required for drainage, City utilities, temporary construction, etc.)

2.3.1. Up to 4 parcels are anticipated

2.4. Individual parcel exhibits shall be on 8 ½" x 11" paper, shall be sealed, dated, and signed by a Registered Professional Land Surveyor and shall contain the following:

- 2.4.1. Parcel number
- 2.4.2. Area required
- 2.4.3. Legal description
- 2.4.4. Current owner
- 2.4.5. Any existing platted easements or easement filed by separate instrument including easements provided by utility companies
- 2.4.6. All physical features
- 2.4.7. Metes and bounds description of parcel to be acquired. The description shall be provided on separate sheet from the exhibit. Each type of easement shall be described separately

2.5. Upon written notification by the City of acceptance of the right-of-way strip map, exhibits and instruments, and as directed by the City, the surveyor shall set all corners and points of curvature for the proposed right-of-way and submit final sealed plans and exhibits, including location of control points and their NGVD 29/NAD 83 reference.

2.6. The City of Midland will be responsible for final acquisition of right of way.

3. TxDOT Coordination

3.1. Preliminary Design Coordination

3.1.1. Schedule, prepare for, attend and document up to two (2) Coordination Meeting with TxDOT and City staff to discuss:

- Design issues associated with the connector street intersections with the southbound frontage road of Loop 250, including drainage and TCP within the State right of way.
- Design issues associated with the Avalon Drive intersection at Business IH 20

3.2. Final Design Coordination

3.2.1. Schedule, prepare for, attend and document up to two (2) Coordination Meeting with TxDOT and City staff to discuss:

- Final design of connector street intersections with southbound frontage road of Loop 250

4. Preliminary Design

4.1. Project Limits

4.1.1. The preliminary design will include Tradewinds Blvd., Avalon Drive, collector street between Tradewinds Blvd. and Avalon Drive, and two (2) collector streets between Tradewinds Blvd. and Loop 250.

4.1.2. A drainage plan will be developed to accommodate the improvements developed in the preliminary roadway plans.

4.2. Project Management

4.2.1. Develop project contact list

4.2.2. Progress and Review Meetings:

- Schedule, prepare for, attend, and conduct monthly progress meetings to monitor the development of the project.
 - Project Kickoff Meeting – one (1) kickoff meeting in Midland
 - Progress Meetings (up to six (6) Progress Meetings in Midland)
 - Review Meeting (one (1) Review Meeting: 30% review).

4.2.3. Coordinate with subconsultants (survey and illumination)

4.2.4. Prepare and e-mail weekly progress reports to the project team (City, subconsultants (as necessary), and AMD staff)

4.2.5. Site Visits – Attend up to three (3) site visits during the preliminary phase.

4.2.6. Develop Project Production Plan

- Document design criteria chart (coordinate with City staff at the project kick-off meeting)
 - Design speed
 - Existing utility design criteria
 - Pavement design parameters
 - Horizontal alignment design criteria

- Vertical alignment design criteria
 - Typical section requirements (lane, median, sidewalk, and parkway widths, etc.)
 - Intersection design criteria
 - Driveway design guidelines (commercial and residential)
 - Develop role and assignment definitions (coordinate with City staff at the project kick-off meeting)
 - Develop project schedule and interim milestones (coordinate with City staff at the project kick-off meeting)
- 4.2.7. QC/QA
- Perform an internal review of the preliminary designs in accordance with quality assurance standards established for this project.
 - QC/QA comments will be collected from each reviewer, documented, and comments addressed prior to the 30% review meeting with the City.
- 4.2.8. Project Administration
- Prepare monthly progress report and invoice
- 4.3. Roadway
- 4.3.1. Data Collection (City to provide hard copy and electronic format if available)
- City design criteria (Consultant is aware that the selected project design criteria could change due to limitations of actual conditions and/or geographic constraints. Variances to design criteria will be provided only upon approval of the City.)
 - City standard details
 - Other applicable City ordinances
 - Construction contract document standards
 - City infrastructure and master thoroughfare plan (MTP) requirements
 - Proposed / existing development plats and traffic impact analysis reports for properties adjacent to the project
 - Barrier free ramp standard details
- 4.3.2. Electronic File Setup
- Establish working base files and distribute to project team
 - Verify the existing ground surface once completed
 - Incorporate utility line work in design files
- 4.3.3. Prepare the Preliminary Roadway Alignment for Tradewinds Boulevard
- Prepare typical sections –proposed
 - Typical section to include subgrade and pavement design specification provided by the City
 - Prepare preliminary plan and profile (electronic roll plot format, 1"=50' scale). Item to be included:

Plan:

- Control data
- Existing / proposed right-of-way
- Existing topography
- Existing pavement
- Proposed centerline alignment and horizontal curve data
- Proposed face of curb
- Proposed transition pavement tie-ins to existing pavement
- Proposed drainage system alignments and sizes
- Existing trees
- Existing driveway locations (if requested by City)
- Proposed commercial and residential driveways (if requested by City)
- Existing storm drain and culvert locations.
- Existing and proposed water line locations
- Existing and proposed sewer line locations
- Existing pump jacks and petroleum transmission lines

Profile:

- Existing ground profiles at the proposed ROW lines
- Proposed vertical alignment
- Proposed grade line (PGL).
- Superelevation data (if applicable)

4.3.4. Prepare the Preliminary Roadway Alignment for Avalon and Connector

- Prepare typical sections –proposed
- Typical section to include subgrade and pavement design specification provided by the City
- Prepare preliminary plan schematic (electronic roll plot format, 1"=50' scale). Item to be included:

Plan:

- Control data
- Existing / proposed right-of-way
- Existing topography
- Proposed centerline alignment and horizontal curve data
- Proposed face of curb
- Proposed transition pavement tie-ins to existing pavement
- Proposed drainage system alignments and sizes
- Existing trees
- Existing water line locations
- Existing sewer line locations
- Existing pump jacks and petroleum transmission lines

- 4.3.5. Develop preliminary design cross-sections for Tradewinds Boulevard
 - Develop on 50' station intervals
 - Show pavement and subgrade, right-of-way limits, side slopes, and pavement cross slopes, curbs, and sidewalks
- 4.3.6. Traffic
 - Traffic Signal Conduit
 - Traffic signals will not be included as part of this project, but can be provided as *Additional Services*.
 - Traffic signal conduit will be shown in the roadway and intersection design plans.
- 4.4. Drainage
 - 4.4.1. Data Collection and Property Research
 - Assemble USGS topographic maps
 - Gather approved drainage analysis reports for developments within the drainage areas.
 - Research any existing drainage easements
 - Coordinate with City staff to obtain any preliminary plats and preliminary drainage maps for developments within the drainage areas of the system to be studied and any comprehensive land-use maps
 - Meet with City staff to review researched data to confirm that all data necessary has been obtained and assumptions are acceptable.
 - 4.4.2. Offsite and Local Drainage Analysis
 - Delineate the watersheds contributing to the project limits right-of-way
 - Use any filed plats/drainage maps or land-use maps to determine "C" coefficients, times of concentration, and drainage areas.
 - Use rational method for areas under 200-acres to determine the storm water runoff to all points where storm water currently crosses or is proposed to cross the project limits.
 - Use ICPR for areas greater than 200-acres to determine the storm water runoff to all points where storm water currently crosses or is proposed to cross the project limits.
 - Using ICPR or Manning's Equation spreadsheets, calculate the water surface elevations at critical points along the roadway and in any potential storm sewer or drainage channel.
 - Coordinate results with City Staff and Roadway Design
 - 4.4.3. Master Planning for Avalon Drive, the collector street between Avalon Drive and Tradewinds Blvd., and overall site drainage needs.
 - Plan storm water conveyance from Tradewinds Blvd. to the playa lake system located to the west.
 - Study design alternatives for channelization using various easement widths and geometric configurations.
 - Study alternatives for storm sewer usage.

- Coordinate any such drainage channels, additional drainage easements, and potential storm sewer with the roadway design for Tradewinds Blvd.
- 4.4.4. We do not anticipate the project impacting the U.S. Army Corps of Engineers' jurisdiction. However, if required we will provide a jurisdictional determination as *Additional Services*.
- 4.5. Utilities
- 4.5.1. Data Collection (City to provide hard copy and electronic format if available)
- Existing water line locations / record drawings
 - Water master plan requirements
 - Existing sanitary sewer line locations / record drawings
 - Sanitary sewer master plan requirements
 - City utility relocation requirements (if applicable)
- 4.5.2. Public Utilities Design
- Establish the location of existing public utilities based upon information provided by the City and filed survey information
 - Preliminary plan of new stub-outs and fire hydrants for existing 16" water line
 - The existing 16" water line runs along the approximate proposed alignment of Tradewinds Blvd. The water line will be located within the proposed roadway right-of-way.
 - We anticipate twelve (12) 8" stub-outs to the west and east. The stub-outs will be located along Tradewinds Blvd. to the proposed right-of-way limits.
 - Preliminary plan on new 18" sanitary sewer line
 - The proposed 18" sanitary sewer line will extend the existing main approximately 6,250-ft. from Thomason Drive to the Gateway Plaza Addition.
- 4.5.3. Petroleum Transmission line adjustment coordination
- Data Collection and Research
 - Gather existing infrastructure information from owner
 - Coordination
 - Coordinate possible conflicts with the roadway design
 - Coordinate utility relocation.
- 4.6. Preliminary Design Submittal (30%)
- 4.6.1. Consultant will attend a review meeting with the City reviewing staff. Reviewing comments will be recorded during this meeting and distributed to members of the design team and the City. This review shall include the following:
- Preliminary roadway alignment (plan and profile)
 - Preliminary storm drainage and culvert design (plan only, no profile) and drainage area map
 - Preliminary utilities design
 - Overview of the drainage analysis
 - Provide a Preliminary Design Schematic Roll of Tradewinds Blvd.

- Provide a Preliminary Roadway Exhibit of Avalon and Connector Streets
- Preliminary opinion of probable construction cost
 - Compile and prepare a preliminary opinion of probably construction cost for the entire project using recent average unit bid prices which are representative of similar types of construction in the local area

Upon approval of the preliminary (30%) design of Tradewinds Blvd. and the master plan alignments of Avalon and respective collector streets, we will commence with Final Design tasks for Tradewinds Blvd. as outlined in Section 5.

5. Final Design

5.1. Project Management

5.1.1. Progress and Review Meetings:

- Schedule, prepare for, attend, and conduct monthly progress meetings to monitor the development of the project.
 - Progress Meetings (up to six (6) Progress Meeting in Midland)
 - Review Meeting (two (2) Review Meetings: 60% and 90% reviews).

5.1.2. Coordinate with subconsultants (survey and illumination)

5.1.3. Prepare and e-mail weekly progress reports to the project team (City, subconsultants (as necessary), and AMD staff)

5.1.4. Site Visits – Attend up to three (3) site visits during the preliminary phase.

5.1.5. QA/QC

- Perform an internal review of 60%, 90%, and 100% designs in accordance with quality assurance standards established for this project.
- QC/QA comments will be collected from each reviewer, documented, and comments addressed prior to the each review meeting with the City.

5.1.6. Project Administration

- Prepare project correspondence and invoice documents

5.2. Roadway

5.2.1. Incorporate the Preliminary Design (30%) review comments

5.2.2. Prepare plan / profile sheets (11"x17" plan sheets at a scale of 1"=100' horizontal, and 1"=4' vertical).

- Include the following items in addition to those included in the preliminary design submittal:
 - Proposed easement locations (if any)
 - Proposed sidewalk locations
 - Proposed residential and commercial driveways
 - Horizontal alignment data
 - Barrier free ramps

5.2.3. Prepare the following plan sheets:

- Title Sheet
- Index Sheet
- Horizontal and Vertical Control Sheet
- Horizontal Alignment Data
- Typical Sections
- Demolition plans
- Intersection Layouts
- Small sign summary
- TxDOT standards (as necessary)

5.2.4. Develop design cross-sections

- Develop on 50' station intervals and at driveway centerlines
- Show pavement and subgrade, right-of-way limits, side slopes, and pavement cross slopes, curbs, and sidewalks
- Cross-sections will not be provided in the bid documents but will be made available to prospective bidders

5.2.5. Prepare roadway details to clarify intent of design

5.2.6. Compile applicable City standard details. Modify standard details as needed.

5.2.7. Pavement Markers and Marking Plans

- Prepare pavement markers and marking layouts in accordance with City design standards and the Texas Manual of Uniform Traffic Control Devices (TMUTCD)
- Prepare details to clarify intent of design
- Signing layout and design will not be provided
- List the signs on the TxDOT standard summary sheets together with total for each mount type.
- No large signs are anticipated but can be prepared and summarized as *Additional Services*

5.3. Drainage

5.3.1. Plan Production

- Provide Drainage Area Map complete with time of concentration routes, curve numbers for each drainage area, drainage area denoted in acres, and all necessary points of interest labeled
- Provide summary sheets showing all of the necessary hydrologic and hydraulic calculations and assumptions
- Provide a drainage easement/channel grading plan for each drainage easement/channel proposed
- Provide erosion control plans, details, and SWPPP

- 5.3.2. Technical Specifications
 - Provide technical specifications for erosion control methods and any off-site earthwork
- 5.4. Utilities
 - 5.4.1. Water
 - Adjustments to existing water valve boxes, etc. will be specified in the plans
 - Prepare final plan for the 16" water line stub out design as approved by the City's review of the 30% design submittal
 - 5.4.2. Sewer
 - Prepare final plans and profile for the 18" sanitary sewer line design as approved by the City's review of the 30% design submittal.
 - 5.4.3. Petroleum Transmission Line
 - Coordinate with the private utility line owner for any relocations as required
 - Attend one (1) meeting with utility owner prior to start of any relocations, if required
 - No petroleum line designs will be performed by the Consultant
 - 5.4.4. Prepare utility details to clarify intent of design
 - 5.4.5. Compile applicable City standard details. Modify standard details as needed.
- 5.5. Illumination
 - 5.5.1. Design of pavement illumination systems to provide lighting levels in accordance with applicable local codes and IESNA recommended practices
 - 5.5.2. Prepare a photometric layout from Thomason Drive to Gateway Plaza Addition along Tradewinds Blvd. and perform one (1) iteration of the photometric layout based on the City's review.
 - 5.5.3. Prepare illumination construction plans as needed for inclusion in the civil construction documents. The illumination plans will include light pole location data, foundation details, conduit routing, conductor sizing, and electrical service locations.
 - 5.5.4. Provide supporting calculations
 - 5.5.5. Provide technical specifications for the light poles and fixtures.
 - 5.5.6. Coordinate with local electric service providers for electrical service locations
 - 5.5.7. One (1) meeting shall take place with the Consultant and the local electric service provider(s) along with the City to discuss design of illumination system.
- 5.6. Final Design Submittal (60%)
 - 5.6.1. Submit three (3) 11"x17" paper copies and one (1) PDF file to the City for review and comment
 - 5.6.2. Submittal shall include the following:
 - Design plans
 - Opinion of probable construction cost
 - 5.6.3. Consultant will attend a review meeting with the City reviewing staff. Reviewing comments will be recorded during this meeting and distributed to members of the design team and the City.

5.7. Final Design Submittal (90%)

5.7.1. Incorporate Final Design Submittal (60%) review comments

5.7.2. Submit three (3) 11"x17" paper copies and one PDF file to the City for review and comment.

5.7.3. Submittal shall include the following:

- Final design Plans
- Contract documents including the following:
 - Special provisions (based on General Conditions provided by City)
 - Technical specification
- Opinion of probable construction cost
- Provide completed application for the City to submit to the Texas Department of Licensing and regulation (along with one of the plan sets) for review in accordance with the Elimination of Architectural Barriers Act. The application fees will be paid directly by the City.

5.7.4. AMD will attend a review meeting with the City reviewing staff. Reviewing comments will be recorded during this meeting and distributed to members of the design team and the City.

5.8. Final Design submittal (100%)

5.8.1. Incorporate Final Design Submittal (90%) review comments

5.8.2. Submit three (3) sets of 11"x17" plans, one PDF plan file, and specifications to the City.

5.8.3. Submit the final opinion of probable construction cost

5.8.4. Prepare a construction duration estimate using anticipated production rates applicable to the local area

6. Public Involvement

6.1. Attend up to one (1) stakeholder information meeting presenting the City-approved 90% plans during the final design phase of the project.

6.1.1. Prepare two (2) preliminary schematic exhibits for the meeting

6.1.2. City will schedule and coordinate meeting location

6.1.3. City will be responsible for distribution stakeholder invitations and meeting announcements

7. Bidding Phase Services

7.1. All necessary bid documents will be provided to prospective bidders by means of the City bidding process

7.2. Attend one (1) pre-bid meeting with prospective bidders

7.3. Prepare and submit addenda to City to issue as appropriate to interpret, clarify, or expand the bidding documents

7.4. Attend one (1) Bid Opening in Midland

- 7.5. Tabulate the bids received and evaluate the compliance of the bids received with the bid documents
- 7.6. Prepare a written summary of this tabulation and evaluation together with a letter addressing the award of the construction contract

8. Additional Services

Services not specifically identified in the Scope of Services above shall be considered additional and shall be performed on an individual basis upon authorization by the City. Such services shall include, but are not limited to, the following:

- 8.1. Construction Staking
- 8.2. City Limits Annexation Documents
- 8.3. Pavement Design
- 8.4. Environmental Services
- 8.5. Landscape design
- 8.6. Irrigation Design
- 8.7. Construction Contract Administration
- 8.8. Design of retaining walls, specialized inlets, or other structural design elements.
- 8.9. Furnish additional copies of review documents and/or bidding documents in excess of the number identified in the scope above.
- 8.10. Assist the City as an expert witness in litigation in connection with the project or in hearings before approving and regulatory agencies.
- 8.11. Redesign to reflect project scope changes requested by the City, required to address changed conditions or change in direction previously approved by the City, mandated by changing governmental laws, or necessitated by the City's acceptance of substitutions proposed by the contractor.

---- End of Scope of Services ----

EXHIBIT B
FEE SCHEDULE
METHOD OF PAYMENT: HOURLY NOT TO EXCEED

PRIME PROVIDER NAME: AMD Engineering, LLC
PROJECT NAME: Tradewinds Blvd.
AMD PROJECT: 13034

TASK DESCRIPTION	PRINCIPAL	PROJECT MANAGER	RPLS	SENIOR SURVEY TECH	SURVEY TECH	2-MAN SURVEY CREW	CLERICAL	TOTAL LABOR HRS.	TOTAL LABOR COST	NO OF DWGS	LABOR HRS PER SHEET
1. Topographic Survey											
1.1. Data Collection	2		4	16			4	26	\$ 2,300.00		
1.2. Preliminary Design Survey	8		8	60		144		220	\$ 33,100.00		
1.3. Final Design Survey	8		8	40		72		128	\$ 18,440.00		
HOURS SUB-TOTALS	18	0	20	116	0	216	4	374		0	
CONTRACT RATE PER HOUR	\$ 150.00	\$ 135.00	\$ 110.00	\$ 85.00	\$ 75.00	\$ 180.00	\$ 50.00				
TOTAL LABOR COSTS	\$2,700.00	\$0.00	\$2,200.00	\$9,860.00	\$0.00	\$38,880.00	\$200.00		\$53,840.00		
SUBTOTAL: Topographic Survey									\$53,840.00		

TASK DESCRIPTION	PRINCIPAL	PROJECT MANAGER	SENIOR ENGINEER	EIT	ENGINEER TECH	SR. CADD TECH	ADMIN/ CLERICAL	TOTAL LABOR HRS.	TOTAL LABOR COST	NO OF DWGS	LABOR HRS PER SHEET
3. TxDOT Coordination											
3.1. Preliminary Design Coordination											
3.1.1. Attend up to two (2) Coordination Meetings		16	12	12				40	\$ 4,800.00		
3.2. Final Design Coordination											
3.2.1. Attend up to two (2) Coordination Meetings		16	12	12				40	\$ 4,800.00		
HOURS SUB-TOTALS	0	32	24	24	0	0	0	80		0	
CONTRACT RATE PER HOUR	\$ 150.00	\$ 135.00	\$ 125.00	\$ 95.00	\$ 65.00	\$ 75.00	\$ 50.00				
TOTAL LABOR COSTS	\$0.00	\$4,320.00	\$3,000.00	\$2,280.00	\$0.00	\$0.00	\$0.00		\$9,600.00		
SUBTOTAL: TxDOT Coordination									\$9,600.00		

EXHIBIT B
FEE SCHEDULE
METHOD OF PAYMENT: HOURLY NOT TO EXCEED

PRIME PROVIDER NAME: AMD Engineering, LLC
PROJECT NAME: Tradewinds Blvd.
AMD PROJECT: 13034

TASK DESCRIPTION	PRINCIPAL	PROJECT MANAGER	SENIOR ENGINEER	EIT	ENGINEER TECH	SR. CADD TECH	ADMIN/ CLERICAL	TOTAL LABOR HRS.	TOTAL LABOR COST	NO OF DWGS	LABOR HRS PER SHEET
4.2 Preliminary Design - Project Management											
4.2.1. Develop Project Contact List		2						2	\$ 270.00		
4.2.2. Progress Review Meetings											
Project Kickoff Meeting (one (1) meeting)		12	8	8				28	\$ 3,380.00		
Progress Meetings (up to (6) meetings)		72	16	48				136	\$ 16,280.00		
Review Meeting - 30% (one (1) meeting)		12	8	8				28	\$ 3,380.00		
4.2.3. Subconsultant Coordination (survey and illumination)		6		4				10	\$ 1,190.00		
4.2.4. Prepare Weekly Progress Reports		8	8	8				24	\$ 2,840.00		
4.2.5. Project Site Visits (up to three (3) site visits)		3		3				6	\$ 690.00		
4.2.6. Develop Production Plan											
Document Design Criteria (Tradewinds, Avalon, Connectors)		2	4	4				10	\$ 1,150.00		
Develop Project Schedule		4	2	1				7	\$ 885.00		
4.2.7. QC/QA											
Perform QC/QA internal 30% review	4							4	\$ 600.00		
Address QC/QA review comments			2	2				4	\$ 440.00		
4.2.8. Project Administration											
Prepare Monthly Progress Report and Invoice		6				6		12	\$ 1,260.00		
HOURS SUB-TOTALS	4	127	48	86	0	6	0	271		0	
CONTRACT RATE PER HOUR	\$ 150.00	\$ 135.00	\$ 125.00	\$ 95.00	\$ 65.00	\$ 75.00	\$ 50.00				
TOTAL LABOR COSTS	\$600.00	\$17,145.00	\$6,000.00	\$8,170.00	\$0.00	\$450.00	\$0.00		\$32,365.00		
SUBTOTAL: Preliminary Design - Project Management									\$32,365.00		

EXHIBIT B
FEE SCHEDULE
METHOD OF PAYMENT: HOURLY NOT TO EXCEED

PRIME PROVIDER NAME: AMD Engineering, LLC
PROJECT NAME: Tradewinds Blvd.
AMD PROJECT: 13034

TASK DESCRIPTION	PRINCIPAL	PROJECT MANAGER	SENIOR ENGINEER	EIT	ENGINEER TECH	SR. CADD TECH	ADMIN/ CLERICAL	TOTAL LABOR HRS.	TOTAL LABOR COST	NO OF DWGS	LABOR HRS PER SHEET
4.3 Preliminary Design - Roadway											
4.3.1. Data Collection			8	20				28	\$ 2,900.00		
4.3.2. Electronic File Setup			2	4	4			10	\$ 890.00		
4.3.3. Prepare Preliminary Roadway Alignment for Tradewinds Blvd.											
Prepare Typical Sections (Tradewinds)		2	2	8	2			14	\$ 1,410.00		
Prepare Preliminary Plan and Profile schematic		12	60	80	60			212	\$ 20,620.00		
4.3.3. Prepare Preliminary Roadway Alignment for Avalon and Connector											
Prepare Typical Sections (Avalon, Three (3) Connectors)		4	16	16	16			52	\$ 5,100.00		
Prepare Preliminary Plan schematic		4	40	60	30			134	\$ 13,190.00		
4.3.4. Develop Preliminary Design Cross-Sections for Tradewinds Blvd.		2	20	30	10			62	\$ 6,270.00		
4.3.4. Traffic											
Locate future traffic signal conduit		1	2	6				9	\$ 955.00		
HOURS SUB-TOTALS	0	25	150	224	122	0	0	521		0	
CONTRACT RATE PER HOUR	\$ 150.00	\$ 135.00	\$ 125.00	\$ 95.00	\$ 65.00	\$ 75.00	\$ 50.00				
TOTAL LABOR COSTS	\$0.00	\$3,375.00	\$18,750.00	\$21,280.00	\$7,930.00	\$0.00	\$0.00		\$51,335.00		
SUBTOTAL: Preliminary Design - Roadway									\$51,335.00		

TASK DESCRIPTION	PRINCIPAL	PROJECT MANAGER	SENIOR ENGINEER	EIT	ENGINEER TECH	SR. CADD TECH	ADMIN/ CLERICAL	TOTAL LABOR HRS.	TOTAL LABOR COST	NO OF DWGS	LABOR HRS PER SHEET
4.4 Preliminary Design - Drainage											
4.4.1. Data Collection		8	12	24	4		8	56	\$ 5,520.00		
Meet with City Staff to review researched data		8						8	\$ 1,080.00		
4.4.2. Offsite and Local Drainage Analysis		32	60	40	8		4	144	\$ 16,340.00		
Coordinate results with City Staff		4	8	8				20	\$ 2,300.00		
4.4.3. Master Drainage Plan		8	60	80	16		1	165	\$ 17,270.00		
HOURS SUB-TOTALS	0	60	140	152	28	0	13	393		0	
CONTRACT RATE PER HOUR	\$ 150.00	\$ 135.00	\$ 125.00	\$ 95.00	\$ 65.00	\$ 75.00	\$ 50.00				
TOTAL LABOR COSTS	\$0.00	\$8,100.00	\$17,500.00	\$14,440.00	\$1,820.00	\$0.00	\$650.00		\$42,510.00		
SUBTOTAL: Preliminary Design - Drainage									\$42,510.00		

EXHIBIT B
FEE SCHEDULE
METHOD OF PAYMENT: HOURLY NOT TO EXCEED

PRIME PROVIDER NAME: AMD Engineering, LLC
PROJECT NAME: Tradewinds Blvd.
AMD PROJECT: 13034

TASK DESCRIPTION	PRINCIPAL	PROJECT MANAGER	SENIOR ENGINEER	EIT	ENGINEER TECH	SR. CADD TECH	ADMIN/ CLERICAL	TOTAL LABOR HRS.	TOTAL LABOR COST	NO OF DWGS	LABOR HRS PER SHEET
4.5 Preliminary Design - Utilities											
4.5.1. Data Collection		1	1	6	2			10	\$ 960.00		
4.5.2. Public Utilities Design											
Preliminary Design of Water Line Improvements		2	4	16	8			30	\$ 2,810.00		
Preliminary Design of Sanitary Sewer Line Extension		2	24	60	24			110	\$ 10,530.00		
4.5.3. Petroleum Transmission Line Coordination		4	2	6				12	\$ 1,360.00		
HOURS SUB-TOTALS	0	9	31	88	34	0	0	162		0	
CONTRACT RATE PER HOUR	\$ 150.00	\$ 135.00	\$ 125.00	\$ 95.00	\$ 65.00	\$ 75.00	\$ 50.00				
TOTAL LABOR COSTS	\$0.00	\$1,215.00	\$3,875.00	\$8,360.00	\$2,210.00	\$0.00	\$0.00		\$15,660.00		
SUBTOTAL: Preliminary Design - Utilities									\$15,660.00		

TASK DESCRIPTION	PRINCIPAL	PROJECT MANAGER	SENIOR ENGINEER	EIT	ENGINEER TECH	SR. CADD TECH	ADMIN/ CLERICAL	TOTAL LABOR HRS.	TOTAL LABOR COST	NO OF DWGS	LABOR HRS PER SHEET
4.6 Preliminary Design Submittal											
4.6.1. Prepare Preliminary Design Schematic Roll for Tradewinds Blvd.											
Prepare Preliminary Roadway Exhibit of Avalon and Connector Roads		4	8	20	16			48	\$ 4,480.00		
Prepare Preliminary Opinion of Probable Construction Cost		6	4	4	4			18	\$ 1,950.00		
HOURS SUB-TOTALS	0	10	12	24	20	0	0	66		0	
CONTRACT RATE PER HOUR	\$ 150.00	\$ 135.00	\$ 125.00	\$ 95.00	\$ 65.00	\$ 75.00	\$ 50.00				
TOTAL LABOR COSTS	\$0.00	\$1,350.00	\$1,500.00	\$2,280.00	\$1,300.00	\$0.00	\$0.00		\$6,430.00		
SUBTOTAL: Preliminary Design Submittal									\$6,430.00		

EXHIBIT B
FEE SCHEDULE
METHOD OF PAYMENT: HOURLY NOT TO EXCEED

PRIME PROVIDER NAME: AMD Engineering, LLC
PROJECT NAME: Tradewinds Blvd.
AMD PROJECT: 13034

TASK DESCRIPTION	PRINCIPAL	PROJECT MANAGER	SENIOR ENGINEER	EIT	ENGINEER TECH	SR. CADD TECH	ADMIN/ CLERICAL	TOTAL LABOR HRS.	TOTAL LABOR COST	NO OF DWGS	LABOR HRS PER SHEET
5.1 Final Design - Project Management											
5.1.1. Progress Review Meetings											
Progress Meetings (up to (6) meetings)		72	48	48				168	\$ 20,280.00		
Review Meeting - 60% and 90% (two (2) meetings)		24	16	16				56	\$ 6,760.00		
5.1.2. Subconsultant Coordination (survey and illumination)		24	12	4				40	\$ 5,120.00		
5.1.3. Prepare Weekly Progress Reports		8	4	12				24	\$ 2,720.00		
5.1.4. Project Site Visits (up to three (3) site visits)		3	3	3				9	\$ 1,065.00		
5.1.5. QC/QA											
Perform QC/QA internal 60%,90%, and 100% review	16							16	\$ 2,400.00		
Address QC/QA review comments		8	20	20	10			58	\$ 6,130.00		
5.1.6. Project Administration											
Prepare Monthly Progress Report and Invoice		6				6		12	\$ 1,260.00		
HOURS SUB-TOTALS	16	145	103	103	10	6	0	383		0	
CONTRACT RATE PER HOUR	\$ 150.00	\$ 135.00	\$ 125.00	\$ 95.00	\$ 65.00	\$ 75.00	\$ 50.00				
TOTAL LABOR COSTS	\$2,400.00	\$19,575.00	\$12,875.00	\$9,785.00	\$650.00	\$450.00	\$0.00		\$45,735.00		
SUBTOTAL: Final Design - Project Management									\$45,735.00		

EXHIBIT B
FEE SCHEDULE
METHOD OF PAYMENT: HOURLY NOT TO EXCEED

PRIME PROVIDER NAME: AMD Engineering, LLC
PROJECT NAME: Tradewinds Blvd.
AMD PROJECT: 13034

TASK DESCRIPTION	PRINCIPAL	PROJECT MANAGER	SENIOR ENGINEER	EIT	ENGINEER TECH	SR. CADD TECH	ADMIN/ CLERICAL	TOTAL LABOR HRS.	TOTAL LABOR COST	NO OF DWGS	LABOR HRS PER SHEET
5.2 Final Design - Roadway											
5.2.1. Incorporate 30% review comments		1	6	8				15	\$ 1,645.00		
5.2.2. Prepare Plan/Profile Sheets											
Tradewinds Blvd.		1	32	44	30			107	\$ 10,265.00	6	17.8
Connector Streets (2 Connectors)		1	12	20	16			49	\$ 4,575.00	2	24.5
5.2.3. Prepare Plan Sheets											
Title Sheet		1		2	2			5	\$ 455.00	1	5.0
Index Sheet		1		2	2			5	\$ 455.00	1	5.0
Horizontal and Vertical Control Sheet			4	6	4			14	\$ 1,330.00	2	7.0
Horizontal Alignment Data			4	6	2			12	\$ 1,200.00	1	12.0
Typical Sections			2	8				10	\$ 1,010.00	2	5.0
Demolitions Plans			1	4	4			9	\$ 765.00	1	9.0
Intersection Layouts			6	32	8			46	\$ 4,310.00	4	11.5
Small Sign Summary			1	4	4			9	\$ 765.00	1	9.0
TxDOT Standards			1	12	4			17	\$ 1,525.00	14	1.2
5.2.4. Develop design cross-sections			20	60	32			112	\$ 10,280.00	30	3.7
5.2.5. Prepare roadway details			4	6	6			16	\$ 1,460.00	4	4.0
5.2.6. Compile applicable City Standards and Details		2	6	12	8			28	\$ 2,680.00	4	7.0
5.2.7. Pavement Marking Plans			12	40	20			72	\$ 6,600.00		
HOURS SUB-TOTALS	0	7	111	266	142	0	0	526		73	
CONTRACT RATE PER HOUR	\$ 150.00	\$ 135.00	\$ 125.00	\$ 95.00	\$ 65.00	\$ 75.00	\$ 50.00				
TOTAL LABOR COSTS	\$0.00	\$945.00	\$13,875.00	\$25,270.00	\$9,230.00	\$0.00	\$0.00		\$49,320.00		
SUBTOTAL: Final Design - Roadway									\$49,320.00		

EXHIBIT B
FEE SCHEDULE
METHOD OF PAYMENT: HOURLY NOT TO EXCEED

PRIME PROVIDER NAME: AMD Engineering, LLC
PROJECT NAME: Tradewinds Blvd.
AMD PROJECT: 13034

TASK DESCRIPTION	PRINCIPAL	PROJECT MANAGER	SENIOR ENGINEER	EIT	ENGINEER TECH	SR. CADD TECH	ADMIN/ CLERICAL	TOTAL LABOR HRS.	TOTAL LABOR COST	NO OF DWGS	LABOR HRS PER SHEET
5.3 Final Design - Drainage											
5.3.1. Plan Production											
Drainage Area Map		1	8	8	16			33	\$ 2,935.00	2	16.5
Drainage Summary Sheets		2	6	12	16			36	\$ 3,200.00	2	18.0
Drainage Channel Design and Plan		2	8	24	24			58	\$ 5,110.00	5	11.6
Erosion Control Plans, Details, SWPPP		1	4	16	24		4	49	\$ 3,915.00	7	7.0
5.3.2. Technical Specifications											
Technical Specifications for Erosion Control and off-site earthwork		2	8	20	8		12	50	\$ 4,290.00		
HOURS SUB-TOTALS	0	8	34	80	88	0	16	226		16	
CONTRACT RATE PER HOUR	\$ 150.00	\$ 135.00	\$ 125.00	\$ 95.00	\$ 65.00	\$ 75.00	\$ 50.00				
TOTAL LABOR COSTS	\$0.00	\$1,080.00	\$4,250.00	\$7,600.00	\$5,720.00	\$0.00	\$800.00		\$19,450.00		
SUBTOTAL: Final Design - Drainage									\$19,450.00		

TASK DESCRIPTION	PRINCIPAL	PROJECT MANAGER	SENIOR ENGINEER	EIT	ENGINEER TECH	SR. CADD TECH	ADMIN/ CLERICAL	TOTAL LABOR HRS.	TOTAL LABOR COST	NO OF DWGS	LABOR HRS PER SHEET
5.4 Final Design - Utilities											
5.4.1. & 5.4.2. Water and Sewer Plans (combined in one plan sheet)		6	24	60	100			190	\$ 16,010.00	6	31.7
5.4.3. Petroleum Transmission Line											
Coordinate any location and conflicts		12	4	16				32	\$ 3,640.00		
5.4.4. Prepare Water and Sewer Details		2	16	24	30			72	\$ 6,500.00	8	9.0
5.4.5. Compile Water and Sewer City Standards		2	8	14	16			40	\$ 3,640.00	6	6.7
HOURS SUB-TOTALS	0	22	52	114	146	0	0	334		20	
CONTRACT RATE PER HOUR	\$ 150.00	\$ 135.00	\$ 125.00	\$ 95.00	\$ 65.00	\$ 75.00	\$ 50.00				
TOTAL LABOR COSTS	\$0.00	\$2,970.00	\$6,500.00	\$10,830.00	\$9,490.00	\$0.00	\$0.00		\$29,790.00		
SUBTOTAL: Final Design - Utilities									\$29,790.00		

EXHIBIT B
FEE SCHEDULE
METHOD OF PAYMENT: HOURLY NOT TO EXCEED

PRIME PROVIDER NAME: AMD Engineering, LLC
PROJECT NAME: Tradewinds Blvd.
AMD PROJECT: 13034

TASK DESCRIPTION	PRINCIPAL	PROJECT MANAGER	SENIOR ENGINEER	EIT	ENGINEER TECH	SR. CADD TECH	ADMIN/ CLERICAL	TOTAL LABOR HRS.	TOTAL LABOR COST	NO OF DWGS	LABOR HRS PER SHEET
5.6 Final Design Submittal (60%)											
5.6.1. Submit three Plan Sets for Review		1	8	8	4			21	\$ 2,155.00		
5.6.2. Submission Items											
Opinion of Probable Construction Cost		6	4	8	4			22	\$ 2,330.00		
HOURS SUB-TOTALS	0	7	12	16	8	0	0	43		0	
CONTRACT RATE PER HOUR	\$ 150.00	\$ 135.00	\$ 125.00	\$ 95.00	\$ 65.00	\$ 75.00	\$ 50.00				
TOTAL LABOR COSTS	\$0.00	\$945.00	\$1,500.00	\$1,520.00	\$520.00	\$0.00	\$0.00		\$4,485.00		
SUBTOTAL: Final Design Design Submittal (60%)									\$4,485.00		

TASK DESCRIPTION	PRINCIPAL	PROJECT MANAGER	SENIOR ENGINEER	EIT	ENGINEER TECH	SR. CADD TECH	ADMIN/ CLERICAL	TOTAL LABOR HRS.	TOTAL LABOR COST	NO OF DWGS	LABOR HRS PER SHEET
5.7 Final Design Submittal (90%)											
5.7.1. Incorporate 60% Review Comments		2	8	20	16			46	\$ 4,210.00		
5.7.2. Submit three Plan Sets for Review		1	2	8	4			15	\$ 1,405.00		
5.7.3 Submission Items											
Contract Documents		8		6	2			16	\$ 1,780.00		
Special Provisions		8		4				12	\$ 1,460.00		
Technical Specifications		20		20				40	\$ 4,600.00		
Opinion of Probable Construction Cost		3	2	4	2			11	\$ 1,165.00		
Prepare TDLR Application for City of Midland		1		1				2	\$ 230.00		
HOURS SUB-TOTALS	0	43	12	63	24	0	0	142		0	
CONTRACT RATE PER HOUR	\$ 150.00	\$ 135.00	\$ 125.00	\$ 95.00	\$ 65.00	\$ 75.00	\$ 50.00				
TOTAL LABOR COSTS	\$0.00	\$5,805.00	\$1,500.00	\$5,985.00	\$1,560.00	\$0.00	\$0.00		\$14,850.00		
SUBTOTAL: Final Design Design Submittal (90%)									\$14,850.00		

EXHIBIT B
FEE SCHEDULE
METHOD OF PAYMENT: HOURLY NOT TO EXCEED

PRIME PROVIDER NAME: AMD Engineering, LLC
PROJECT NAME: Tradewinds Blvd.
AMD PROJECT: 13034

TASK DESCRIPTION	PRINCIPAL	PROJECT MANAGER	SENIOR ENGINEER	EIT	ENGINEER TECH	SR. CADD TECH	ADMIN/ CLERICAL	TOTAL LABOR HRS.	TOTAL LABOR COST	NO OF DWGS	LABOR HRS PER SHEET
5.8 Final Design Submittal (100%)											
5.8.1. Incorporate 90% Review Comments		2	8	20	16			46	\$ 4,210.00		
5.8.2. Submit three Plan Sets for Review		1	2	8	4			15	\$ 1,405.00		
5.8.3. Opinion of Probable Construction Cost		2	1	1	1			5	\$ 555.00		
5.8.4. Construction Duration Time Estimate		2	1	4				7	\$ 775.00		
HOURS SUB-TOTALS	0	7	12	33	21	0	0	73		0	
CONTRACT RATE PER HOUR	\$ 150.00	\$ 135.00	\$ 125.00	\$ 95.00	\$ 65.00	\$ 75.00	\$ 50.00				
TOTAL LABOR COSTS	\$0.00	\$945.00	\$1,500.00	\$3,135.00	\$1,365.00	\$0.00	\$0.00		\$6,945.00		
SUBTOTAL: Final Design Design Submittal (100%)									\$6,945.00		

TASK DESCRIPTION	PRINCIPAL	PROJECT MANAGER	SENIOR ENGINEER	EIT	ENGINEER TECH	SR. CADD TECH	ADMIN/ CLERICAL	TOTAL LABOR HRS.	TOTAL LABOR COST	NO OF DWGS	LABOR HRS PER SHEET
6. Public Involvement											
6.1 Attend up to one (1) Stakeholder Meeting		14	10	10				34	\$ 4,090.00		
6.1.1. Prepare two (2) preliminary schematics exhibits		1	2	4	4			11	\$ 1,025.00		
HOURS SUB-TOTALS	0	15	12	14	4	0	0	45		0	
CONTRACT RATE PER HOUR	\$ 150.00	\$ 135.00	\$ 125.00	\$ 95.00	\$ 65.00	\$ 75.00	\$ 50.00				
TOTAL LABOR COSTS	\$0.00	\$2,025.00	\$1,500.00	\$1,330.00	\$260.00	\$0.00	\$0.00		\$5,115.00		
SUBTOTAL: Final Design Design Submittal (100%)									\$5,115.00		

EXHIBIT B
FEE SCHEDULE
METHOD OF PAYMENT: HOURLY NOT TO EXCEED

PRIME PROVIDER NAME: AMD Engineering, LLC
PROJECT NAME: Tradewinds Blvd.
AMD PROJECT: 13034

TASK DESCRIPTION	PRINCIPAL	PROJECT MANAGER	SENIOR ENGINEER	EIT	ENGINEER TECH	SR. CADD TECH	ADMIN/ CLERICAL	TOTAL LABOR HRS.	TOTAL LABOR COST	NO OF DWGS	LABOR HRS PER SHEET
7. Bidding Phase Services											
7.2. Attend one (1) Pre-Bid Meeting with Prosepective Bidders		12	8	8				28	\$ 3,380.00		
7.3. Preapre and Submit Addenda		2	4	8				14	\$ 1,530.00		
7.4. Attend one (1) Bid Opening		12		8				20	\$ 2,380.00		
7.5. Tabulate Bid Received and Evaluate Compliance with Bid Documents		1		1				2	\$ 230.00		
7.6. Prepare Bid Evaluation Letter to City of Midland		1						1	\$ 135.00		
HOURS SUB-TOTALS	0	28	12	25	0	0	0	65		0	
CONTRACT RATE PER HOUR	\$ 150.00	\$ 135.00	\$ 125.00	\$ 95.00	\$ 65.00	\$ 75.00	\$ 50.00				
TOTAL LABOR COSTS	\$0.00	\$3,780.00	\$1,500.00	\$2,375.00	\$0.00	\$0.00	\$0.00		\$7,655.00		
SUBTOTAL: Final Design Design Submittal (100%)									\$7,655.00		

EXHIBIT B
FEE SCHEDULE
METHOD OF PAYMENT: HOURLY NOT TO EXCEED

PRIME PROVIDER NAME: AMD Engineering, LLC
PROJECT NAME: Tradewinds Blvd.
AMD PROJECT: 13034

DESCRIPTION					TOTAL LABOR HRS. BY TASK	TOTAL COSTS BY TASK
1. Topographic Survey					374	\$53,840.00
3. TxDOT Coordination					80	\$9,600.00
4.2 Preliminary Design - Project Management					271	\$32,365.00
4.3 Preliminary Design - Roadway					521	\$51,335.00
4.4 Preliminary Design - Drainage					393	\$42,510.00
4.5 Preliminary Design - Utilities					162	\$15,660.00
4.6 Preliminary Design Submittal					66	\$6,430.00
5.1 Final Design - Project Management					383	\$45,735.00
5.2 Final Design - Roadway					526	\$49,320.00
5.3 Final Design - Drainage					226	\$19,450.00
5.4 Final Design - Utilities					334	\$29,790.00
5.6 Final Design Submittal (60%)					43	\$4,485.00
5.7 Final Design Submittal (90%)					142	\$14,850.00
5.8 Final Design Submittal (100%)					73	\$6,945.00
6. Public Involvement					45	\$5,115.00
7. Bidding Phase Services					65	\$7,655.00
SUBTOTAL LABOR EXPENSES					3704	\$395,085.00
ESTIMATED DIRECT EXPENSES	QUANTITY	RATE	UNIT			
Lodging/Hotel (Taxes/fess not included)	26	\$120.000	DAY/PERSON			\$3,120.00
Meals	84	\$30.000	DAY/PERSON			\$2,520.00
Rental Car(Taxes/fees not included; Insurance costs will not be reimbursed)	5	\$85.00	DAY			\$425.00
Mileage	4192	\$0.75	MILES			\$3,144.00
Air Travel - Private	6	\$800.00	RD TRIP/PERSON			\$4,800.00
Photocopies B/W (11"X17")	2100	\$0.20	EACH			\$420.00
Photocopies B/W (8 1/2"X11")	50	\$0.10	EACH			\$5.00
Plots (Color on Bond)	120	\$3.50	SQ FT			\$420.00
CDs	1	\$5.00	EACH			\$5.00
Overnight Mail - Letter size	3	\$25.00	EACH			\$75.00
Overnight Mail - Oversized Box	4	\$35.00	EACH			\$140.00
Standard Postage		\$0.46	LETTER			\$0.00
SUBTOTAL ESTIMATED DIRECT EXPENSES						\$15,074.00
SUBCONTRACTS:						
					COST	MARKUP
						TOTAL
						COST
KIMLEY-HORN & ASSOCIATES, INC.					\$29,501.21	10%
STANFORD SURVEYING CO.					\$33,515.00	10%
SUBCONTRACT SUB-TOTAL						\$69,317.83

SUMMARY	
TOTAL COSTS FOR PRIME ONLY	\$395,085.00
NON-SALARY (OTHER DIRECT EXPENSES) FOR PRIME ONLY	\$15,074.00
SUBCONTRACTS (includes labor costs and direct expenses)	\$69,317.83
GRAND TOTAL	\$479,476.83

EXHIBIT B
FEE SCHEDULE
METHOD OF PAYMENT: HOURLY NOT TO EXCEED

SUB PROVIDER NAME: KIMLEY-HORN AND ASSOCIATES, INC.
PROJECT NAME: Tradewinds Blvd.
AMD PROJECT: 13034

TASK DESCRIPTION	SENIOR ENGINEER	SENIOR ELECTRICAL ENGINEER	PROJECT ENGINEER	SENIOR ENGINEERING DESIGNER	ENGINEERING INTERN	SENIOR CADD OPERATOR	ADMIN/ CLERICAL	TOTAL LABOR HRS.	TOTAL LABOR COST	NO OF DWGS	LABOR HRS PER SHEET
5.5. Final Design - Illumination											
Meet w/City and Service Provider to verify design rqmts; coord. service locations.			8					8	\$ 1,249.84		
Compile Base Maps and Design Information			2	2		4		8	\$ 995.76		
Prepare Conceptual Illumination Plan (preliminary AGI32 model)		1	2	8				11	\$ 1,577.83		
Update AGI32 Model for 3 Phase Submittals (90% & 100%)			2	2				4	\$ 579.12		
Calculate/summarize Illuminance Values for All Submittals		2	2					4	\$ 709.92		
Design and Locate Ground Boxes and Conduit Routing			2	10				12	\$ 1,645.76		
Prepare Layout Item Summary Tables			1		4			5	\$ 546.83		
Modify Pole, Ground Box, and Conduit Layouts (90% & 100% Submittals)			2	4				6	\$ 845.78		
Design Branch Circuit Diagrams			1	8				9	\$ 1,222.87		
Calculate Branch Circuit Voltage Drops (60% Submittal)			1	10				11	\$ 1,489.53		
Recalculate Branch Circuit Voltage Drops (90% & 100% Submittals)		1	2	5				8	\$ 1,177.84		
Calculate Branch Circuit Conductor Wire Size (60% Submittal)			1	4				5	\$ 689.55		
Recalculate Branch Circuit Conductor Wire Size (90% & 100% Submittals)		1	2	2				5	\$ 777.85		
Calculate Conduit Fill Ratios (60% Submittal)			1	1	6			8	\$ 875.46		
Recalculate Conduit Fill Ratios (90% & 100% Submittals)			2	2	4			8	\$ 969.72		
Calculate Main Disconnect and Branch Circuit Breaker Sizes (60% Submittal)			1	2				3	\$ 422.89		
Recalculate Main Disconnect & Branch Circuit Breaker Sizes (90% & 100% Submittals)		1	2	1				4	\$ 644.52		
Develop Electrical Service Summary Table (60% Submittal)			1	2				3	\$ 422.89		
Update Electrical Service Summary Table (90% & 100% Submittals)		1	2	1				4	\$ 644.52		
Prepare Projectwide Quantity Summary Tables (60% Submittal)			1		4			5	\$ 546.83		
Update Projectwide Quantity Summary Tables (90% & 100% Submittals)			1		2			3	\$ 351.53		
Prepare Illumination Estimate (60% Submittal)	1		1		2			4	\$ 556.59		
Update Illumination Estimate (90% & 100% Submittals)	1		1		2			4	\$ 556.59		
Develop General Notes and Specification Data (60% Submittal)		1	2	6			2	11	\$ 1,486.93		
Update General Notes and Specification Data (90% & 100% Submittal)		1	1	2			2	6	\$ 797.38		

EXHIBIT B
FEE SCHEDULE
METHOD OF PAYMENT: HOURLY NOT TO EXCEED

SUB PROVIDER NAME: KIMLEY-HORN AND ASSOCIATES, INC.
PROJECT NAME: Tradewinds Blvd.
AMD PROJECT: 13034

TASK DESCRIPTION	SENIOR ENGINEER	SENIOR ELECTRICAL ENGINEER	PROJECT ENGINEER	SENIOR ENGINEERING DESIGNER	ENGINEERING INTERN	SENIOR CADD OPERATOR	ADMIN/ CLERICAL	TOTAL LABOR HRS.	TOTAL LABOR COST	NO OF DWGS	LABOR HRS PER SHEET
Prepare 60% Plans Package			2		2	2	2	8	\$ 891.84		
Provide QAQC on 60% Plans Package	2							2	\$ 410.12		
Meet w/ City to Address Comments on 60% Plans Package			8					8	\$ 1,249.84		
Prepare 90% Plans Package			2			2	2	6	\$ 696.54		
Provide QAQC on 90% Plans Package	2							2	\$ 410.12		
Address City Comments on 90% Plans Package			2	4	2			8	\$ 1,041.08		
Prepare 100% Plans Package			2			2	2	6	\$ 696.54		
Provide QAQC on 100% Plans Package	1							1	\$ 205.06		
Address City Comments on 100% Plans Package			2	2	2	2		8	\$ 982.74		
HOOURS SUB-TOTALS	7	9	62	78	30	12	10	208		0	
CONTRACT RATE PER HOUR	\$ 205.06	\$ 198.73	\$ 156.23	\$ 133.33	\$ 97.65	\$ 104.16	\$ 87.88				
TOTAL LABOR COSTS	\$1,435.42	\$1,788.57	\$9,686.26	\$10,399.74	\$2,929.50	\$1,249.92	\$878.80		\$28,368.21		
SUBTOTAL: Final Design - Illumination									\$28,368.21		

DESCRIPTION					TOTAL LABOR HRS. BY TASK	TOTAL COSTS BY TASK
5.5. Final Design - Illumination					208	\$28,368.21
SUBTOTAL LABOR EXPENSES					208	\$28,368.21
ESTIMATED DIRECT EXPENSES	QUANTITY	RATE	UNIT			
Meals	2	\$35.000	DAY/PERSON			\$70.00
Rental Car (Taxes/fees not included; Insurance costs will not be reimbursed)	2	\$80.00	DAY			\$160.00
Air Travel - In State - Short Notice (Coach)	2	\$300.00	RD TRIP/PERSON			\$600.00
Mylar 11"x17"	20	\$3.00	SHEET			\$60.00
Photocopies B/W (11"x17")	120	\$0.20	EACH			\$24.00
Photocopies B/W (8 1/2"x11")	60	\$0.10	EACH			\$6.00
Plots (Color on Bond)	32	\$1.50	SQ FT			\$48.00
Overnight Mail - Oversized Box	3	\$55.00	EACH			\$165.00
SUBTOTAL DIRECT EXPENSES						\$1,133.00
SUBCONTRACT KIMLEY-HORN SUB-TOTAL						\$29,501.21

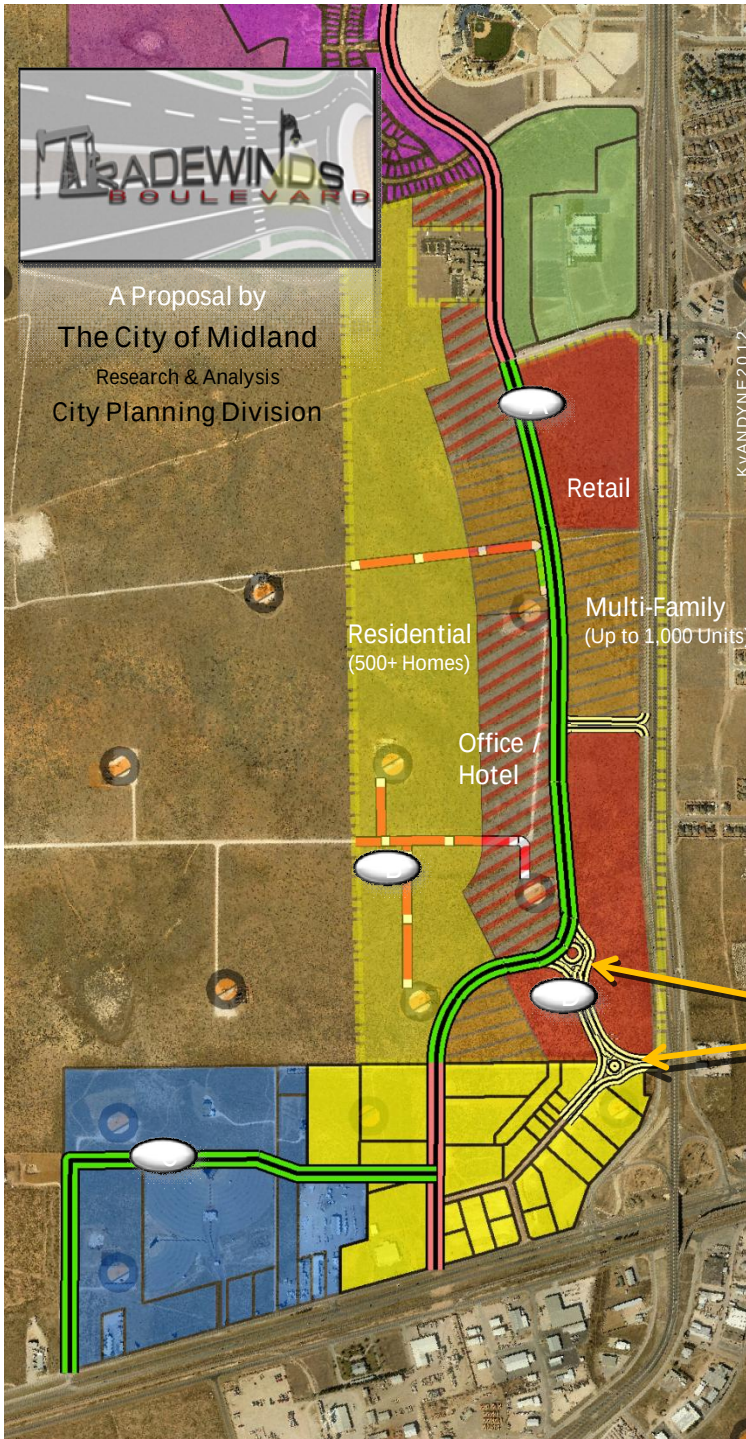
EXHIBIT B
FEE SCHEDULE
METHOD OF PAYMENT: HOURLY NOT TO EXCEED

SUB PROVIDER NAME: STANFORD SURVEYING CO.
PROJECT NAME: Tradewinds Blvd.
AMD PROJECT: 13034

TASK DESCRIPTION	PRINCIPAL	PROJECT MANAGER	RPLS	SENIOR SURVEY TECH	SURVEY TECH	2-MAN SURVEY CREW	CLERICAL	TOTAL LABOR HRS.	TOTAL LABOR COST	NO OF DWGS	LABOR HRS PER SHEET
2. Right-of-Way / Easement Instruments of Conveyance											
2.1. Right-of-Way Strip Map (for Tradewinds Blvd.)			16	32	40	80		168	\$ 21,880.00		
2.2. Prepare Right-of-Way Instruments			12	12	24			48	\$ 4,140.00		
2.3. Prepare Easement Instruments			10	12	24			46	\$ 3,920.00		
2.5. Set Proposed Right-of-Way/Easement Corners				8		16		24	\$ 3,560.00		
HOURLS SUB-TOTALS	0	0	38	64	88	96	0	286		0	
CONTRACT RATE PER HOUR	\$ 150.00	\$ 135.00	\$ 110.00	\$ 85.00	\$ 75.00	\$ 180.00	\$ 50.00				
TOTAL LABOR COSTS	\$0.00	\$0.00	\$4,180.00	\$5,440.00	\$6,600.00	\$17,280.00	\$0.00		\$33,500.00		
SUBTOTAL: Right-of-Way / easement Instruments of Conveyance									\$33,500.00		

DESCRIPTION					TOTAL LABOR HRS. BY TASK	TOTAL COSTS BY TASK
2. Right-of-Way / Easement Instruments of Conveyance					286	\$33,500.00
SUBTOTAL LABOR EXPENSES					286	\$33,500.00
ESTIMATED DIRECT EXPENSES	QUANTITY	RATE	UNIT			
Photocopies B/W (11"x17")	50	\$0.20	EACH			\$10.00
Photocopies B/W (8 1/2"x11")	50	\$0.10	EACH			\$5.00
SUBTOTAL DIRECT EXPENSES						\$15.00
SUBCONTRACT SANFORD SUB-TOTAL						\$33,515.00

Tradewinds Boulevard Connection



*A & C Exact Arterial/Collector Routings TBD
Zoning examples are based upon observed Midland capacities





City Council Agenda

Approved for Agenda:
csharp
City Manager's Office

MEETING DATE: 5/28/2013

TO: City Council / City Manager

FROM: Robert Isbell, Fire Chief

SUBJECT: Consider a resolution to accept an Assistance to Firefighters Grant for \$50,000

Purpose:

Consider a resolution to accept an Assistance to Firefighters Grant for \$50,000 with a 20% matching contribution.

Recommended City Council Action

☒ Approve ☐ Deny ☐ Directional / Informational

Fiscal Impact:

The grant is a 20% matching fund obligation. The department has budgeted funds to meet the requirement.

Discussion:

The Midland Fire Department has been awarded a grant for breathing air equipment for firefighting. The airpacks are used in firefighting operations and have a life span of approximately 15 years. The equipment to be replaced is within 2 years of this end of life service.

RESOLUTION NO. _____

RESOLUTION ACCEPTING A GRANT AWARD FROM THE 2012 ASSISTANCE TO FIREFIGHTERS GRANT IN THE AMOUNT OF \$50,000.00, GRANT NUMBER EMW-2012-FO-06522, THIS GRANT WILL ALLOW THE CITY OF MIDLAND TO PURCHASE BREATHING AIR EQUIPMENT FOR FIREFIGHTING; THIS GRANT IS AN 80% FEDERAL GRANT WITH THE CITY OF MIDLAND PROVIDING 20% OF THE COSTS; THE FEDERAL GRANT PORTION IS \$50,000.00 AND THE CITY'S PORTION WILL BE \$10,000.00 TOTALING \$60,000.00

WHEREAS, the City of Midland has been awarded a federal grant, number EMW-2012-FO-06522, in the amount of \$50,000.00 through the Assistance to Firefighters Grant; and

WHEREAS, the City of Midland will be responsible for providing 20% of the cost in the amount of \$10,000.00; and

WHEREAS, the Council finds it to be in the public interest to accept the grant award;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MIDLAND, TEXAS:

SECTION ONE. That the City of Midland, Texas, acting through its Mayor and City Council, hereby accepts the grant award of \$50,000.00 as made by the Assistance to Firefighters Grant to be used by the Midland Fire Department to purchase breathing air equipment for firefighting.

SECTION TWO. That the Mayor, Director of Finance and Fire Chief of the City of Midland, Texas, are hereby authorized and directed to evidence the City of Midland's acceptance by executing all necessary documents in order to accept the grant.

SECTION THREE. That the sum of \$50,000 is hereby appropriated from the General Fund (001) Unappropriated Fund Balance (5650) to the Assistance to Firefighters Grant Project (7111).

SECTION FOUR. That the sum of \$10,000 is hereby allocated from the General Fund (001) Nondepartmental (150) Interfund Transfer (0199) General Construction Fund

(6299) to Assistance to Firefighters Grant Project (7111).

On motion of Council member _____, seconded by Council member _____, the above and foregoing resolution was adopted by the City Council of the City of Midland at a regular meeting on the _____ day of _____, A.D., 2013, by the following vote:

Council members voting "AYE":

Council members voting "NAY":

W. Wesley Perry, Mayor

ATTEST:

Amy M. Turner, City Secretary

RECOMMENDED AND APPROVED:

Courtney Sharp, City Manager

Robert McNaughton, Director of Finance

APPROVED AS TO CONTENT
AND COMPLETENESS:

Robert Isbell, Fire Chief

APPROVED AS TO FORM:

Keith Stretcher, City Attorney



City Council Agenda

Approved for Agenda:
csharp
City Manager's Office

MEETING DATE: 5/28/2013

TO: City Council / City Manager

FROM: Price Robinson, Chief of Police

SUBJECT: Consider a resolution to apply for the FY2014-2015 Victim Coordinator and Liaison Grant offered through the Office of the Attorney General

Purpose:

Consider a resolution to apply for the FY2014-2015 Victim Coordinator and Liaison Grant offered through the Office of the Attorney General

Recommended City Council Action

☒ Approve ☐ Deny ☐ Directional / Informational

Fiscal Impact:

The City will receive grant funding to maintain one civilian Victim Assistance Liaison position

Discussion:

The Texas Crime Victims' Grant Program was created by Texas Code of Criminal Procedure, Articles 56.54 and 56.541. The Texas Code of Criminal Procedure, Article 56.33, designates the Office of the Attorney General as the administering agency. The source of the funds is a biennial appropriation by the Texas Legislature from a fund collected from court costs and fees. These funds are constitutionally dedicated by Article I, Section 31, of the Texas Constitution. In the latter part of 1989, State law mandated that all local law enforcement agencies designate an individual to serve as a representative to consult with the Texas Attorney General, to ensure that victims, guardians of victims, or relatives of deceased victims were afforded the rights granted to them.

RESOLUTION NO. _____

RESOLUTION AUTHORIZING THE SUBMISSION OF AN APPLICATION TO THE OFFICE OF THE TEXAS ATTORNEY GENERAL FOR FISCAL YEAR 2014-2015 VICTIM COORDINATOR AND LIAISON GRANT PROGRAM FUNDING; THIS GRANT WILL DESIGNATE AN INDIVIDUAL TO SERVE AS A REPRESENTATIVE TO CONSULT WITH THE TEXAS ATTORNEY GENERAL IN ORDER TO ENSURE THAT VICTIMS, GUARDIANS OF VICTIMS, OR RELATIVES OF DECEASED VICTIMS ARE AFFORDED THE RIGHTS GRANTED TO THEM

WHEREAS, the Office of the Texas Attorney General has announced the availability of funds through the Victim Coordinator and Liaison Grant Program; and

WHEREAS, the Midland Police Department wishes to submit an application for funding to maintain a victim assistance liaison position; and

WHEREAS, the City Council finds it to be in the public interest to authorize the submission of an application for said funds and to designate the City Manager as the City of Midland's authorized signatory; and

WHEREAS, the City of Midland will not use the existence of an Office of the Texas Attorney General grant award to offset or decrease total salaries, expenses and allowances that the applicant receives from the governing body at or after the time the grant is awarded; and

WHEREAS, in the event of loss or misuse of Office of the Texas Attorney General funds, the City of Midland assures that the funds will be returned to the Office of the Texas Attorney General in full;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MIDLAND, TEXAS:

SECTION ONE. That the City of Midland is hereby authorized to submit an application to the Office of the Texas Attorney General for Victim Coordinator and Liaison Grant funds in order to maintain a victim assistance liaison position.

SECTION TWO. That the City of Midland will not use the existence of an Office

of the Texas Attorney General grant award to offset or decrease total salaries, expenses and allowances that the applicant receives from the governing body at or after the time the grant is awarded.

SECTION THREE. That in the event of loss or misuse of Office of the Texas Attorney General funds, the City of Midland assures that the funds will be returned to the Office of the Texas Attorney General in full.

SECTION FOUR. That the City Manager is designated as the City of Midland's authorized signatory and is hereby authorized to apply, accept, reject, alter or terminate the grant on behalf of the City of Midland.

On motion of Council member _____, seconded by Council member _____, the above and foregoing resolution was adopted by the City Council of the City of Midland at a regular meeting on the _____ day of _____, A.D., 2013, by the following vote:

Council members voting "AYE":

Council members voting "NAY":

W. Wesley Perry, Mayor

ATTEST:

Amy M. Turner, City Secretary

RECOMMENDED AND APPROVED:

Courtney Sharp, City Manager

Robert McNaughton, Director of Finance

APPROVED AS TO CONTENT
AND COMPLETENESS:

Price Robinson, Police Chief

APPROVED AS TO FORM:

Keith Stretcher, City Attorney



City Council Agenda

Approved for Agenda:
JNichols
City Manager's Office

MEETING DATE: 5/28/2013

TO: City Council / City Manager

FROM: Ken VanDyne, Acting Planning Division Manager

SUBJECT: Consider an ordinance on second reading on a request by Michael Postar for a zone change from MF-1, Multi-Family Dwelling District, and LR-1, Local Retail District, to PD, Planned District for a Shopping Center. (Generally located on the southwest corner of the intersection of E. Scharbauer Drive and N. Fairgrounds Road.)

Purpose:

Consider an ordinance on second reading on a request by Michael Postar for a zone change from MF-1, Multi-Family Dwelling District, and LR-1, Local Retail District, to PD, Planned District for a Shopping Center. This item was presented at the May 14th Council meeting, and was approved for the proposed development of a storage unit facility. No changes have occurred to this item since its previous hearing.

Recommended City Council Action

☒ Approve ☐ Deny ☐ Directional / Informational

Fiscal Impact:

There is no cost to the City associated with approving this request.

Discussion:

This storage unit facility will be located on the southwest corner of N. Fairgrounds Road and Scharbauer Drive. Entry and exit to the property will be available from both arterial streets. An eight to ten foot masonry screening wall will be constructed along both N. Fairgrounds Road and Scharbauer Drive. An eight foot wood screening fence shall be constructed along the Scharbauer Draw and the western most property boundary. A 30 foot pole sign will be located along N. Fairgrounds Road.

ORDINANCE NO.

AN ORDINANCE CHANGING THE ZONING CLASSIFICATION BY AMENDING CHAPTER ONE, TITLE XI, OF THE CITY CODE OF MIDLAND, TEXAS, BY PERMITTING LOT 1, BLOCK 10, LOT 15, BLOCK 11, AND THE ADJACENT VACATED 0.23-ACRE ALLEY RIGHT-OF-WAY, ALL OUT OF TRUELAND ADDITION, SECTION 2, CITY AND COUNTY OF MIDLAND, TEXAS, WHICH IS PRESENTLY ZONED LR-1, LOCAL RETAIL DISTRICT, IN PART, AND MF-1, MULTIPLE-FAMILY DWELLING DISTRICT, IN PART, TO BE USED AS A PD, PLANNED DISTRICT FOR A SHOPPING CENTER (GENERALLY LOCATED ON THE SOUTHWEST CORNER OF THE INTERSECTION OF EAST SCHARBAUER DRIVE AND NORTH FAIRGROUNDS ROAD); PROVIDING FOR SUCH USE TO BE SUBJECT TO CERTAIN SPECIAL CONDITIONS AND RESTRICTIONS AS SET OUT HEREIN; CONTAINING A CUMULATIVE CLAUSE; CONTAINING A SAVINGS AND SEVERABILITY CLAUSE; PROVIDING FOR A MAXIMUM PENALTY OR FINE OF TWO THOUSAND DOLLARS (\$2,000.00); AND ORDERING PUBLICATION

WHEREAS, the City Planning and Zoning Commission and the Governing Body of the City of Midland, in compliance with the City Charter and the State law with reference to the creation of “Planned Districts” under the zoning ordinance regulations and zoning map, have given the requisite notices by United States mail, publication and otherwise; and after a full and fair hearing to all of the property owners generally and particularly to those interested persons situated in the affected area and in the vicinity thereof, the Governing Body finds that the public health, safety and general welfare will be best served by the creation of a Planned District for a Shopping Center, set out hereinafter and subject to the conditions and restrictions set out hereinafter;

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF MIDLAND, TEXAS:

SECTION ONE. That Chapter 1, Title XI, of the City Code of Midland, Texas, and the official zoning map of the City of Midland, Texas, are hereby amended insofar as the hereinafter described property is concerned, which is presently zoned LR-1, Local Retail District, in part, and MF-1, Multiple-Family Dwelling District, in part, and it shall be used

as a Planned District for a Shopping Center, subject to the special conditions and restrictions hereinafter set out, said property being described as follows:

Lot 1, Block 10, Lot 15, Block 11, and the adjacent vacated 0.23-acre alley right-of-way, all out of Trueland Addition, Section 2, City and County of Midland, Texas.

SECTION TWO. That said property shall be subject to the following special conditions and restrictions:

1. That this planned district shall be subject to the regulations of the LR-2, Local Retail District.
2. That a storage unit facility shall be a permitted use within this planned district.
3. That the development of this planned district shall conform to Exhibits "A", "B" and "C", which are attached hereto and incorporated herein.
4. That the site plan shall meet all requirements of the Fire Marshal.
5. That the development of this planned district shall conform to all applicable Midland City Code regulations, including but not limited to building, landscaping and signage regulations.
6. That any future change(s) to this planned district shall be in the same manner as that required for an amended planned district.

SECTION THREE. That the definitions given in the zoning regulations contained in the City Code of the City of Midland, Texas, shall be applicable to such of those terms as are used herein.

SECTION FOUR. The provisions of this ordinance are to be cumulative of all other ordinances or parts of ordinances governing or regulating the same subject matter as that covered herein; provided, however, that all prior ordinances or parts of ordinances inconsistent with or in conflict with any of the provisions of this ordinance are hereby expressly repealed to the extent of any such inconsistency or conflict.

SECTION FIVE. If any section, subsection, sentence, clause or phrase of this ordinance is, for any reason, held to be unconstitutional or invalid, such holding shall not affect the validity of the remaining portions of this ordinance. The Council of the City of Midland hereby declares that it would have passed this ordinance and each section, subsection, sentence, clause, or phrase hereof irrespective of the fact that any one or more

sections, subsections, sentences, clauses, or phrases be declared unconstitutional or invalid.

SECTION SIX. The penalty for violation of this ordinance shall be in accordance with the general penalty provisions contained in Section 1-3-1 of the City Code of Midland, Texas, which provides for a fine not exceeding two thousand dollars (\$2,000.00).

SECTION SEVEN. The City Secretary is hereby authorized and directed to publish the descriptive caption of this ordinance in the manner and for the length of time prescribed by the law as an alternative method of publication.

The above and foregoing ordinance was duly proposed, read in full and adopted on first reading, the ____ day of _____, A.D., 2013; and passed to second reading on motion of Council member _____, seconded by Council member _____, by the following vote:

Council members voting “AYE”:

Council members voting “NAY”:

The above and foregoing ordinance was read in full and finally adopted by the following vote upon motion of Council member _____, seconded by Council member _____, on the ____ day of _____, A.D., 2013, at a regular meeting of the City Council:

Council members voting “AYE”:

Council members voting “NAY”:

PASSED AND APPROVED THIS ____ day of _____, A.D., 2013.

W. Wesley Perry, Mayor

ATTEST:

Amy M. Turner, City Secretary

APPROVED AS TO CONTENT
AND COMPLETENESS:

James R. Nichols, Assistant City Manager

APPROVED AS TO FORM:

Keith Stretcher, City Attorney

LEGEND

5'-0" WIDE CONCRETE SIDEWALK

DESERT LANDSCAPE AREA

LOW WATER SHRUB/BUSH

FIRE HYDRANT

ENRTY/ EXIT GATE KEYPAD

8'-0" WOOD PICKET FENCE

PRIVATE DUMPSTER

PROPERTY LINE PIN

AIR CONDITIONING UNIT

SITE LAYOUT FOR AFFORDABLE STORAGE SCHARBAUER AND FAIRGROUNDS

DRAWING BY:
GAVIN HYLAND

GARGOYLE STEEL STRUCTURES
3110 FRANKFORD AVENUE
LUBBOCK TEXAS 79407

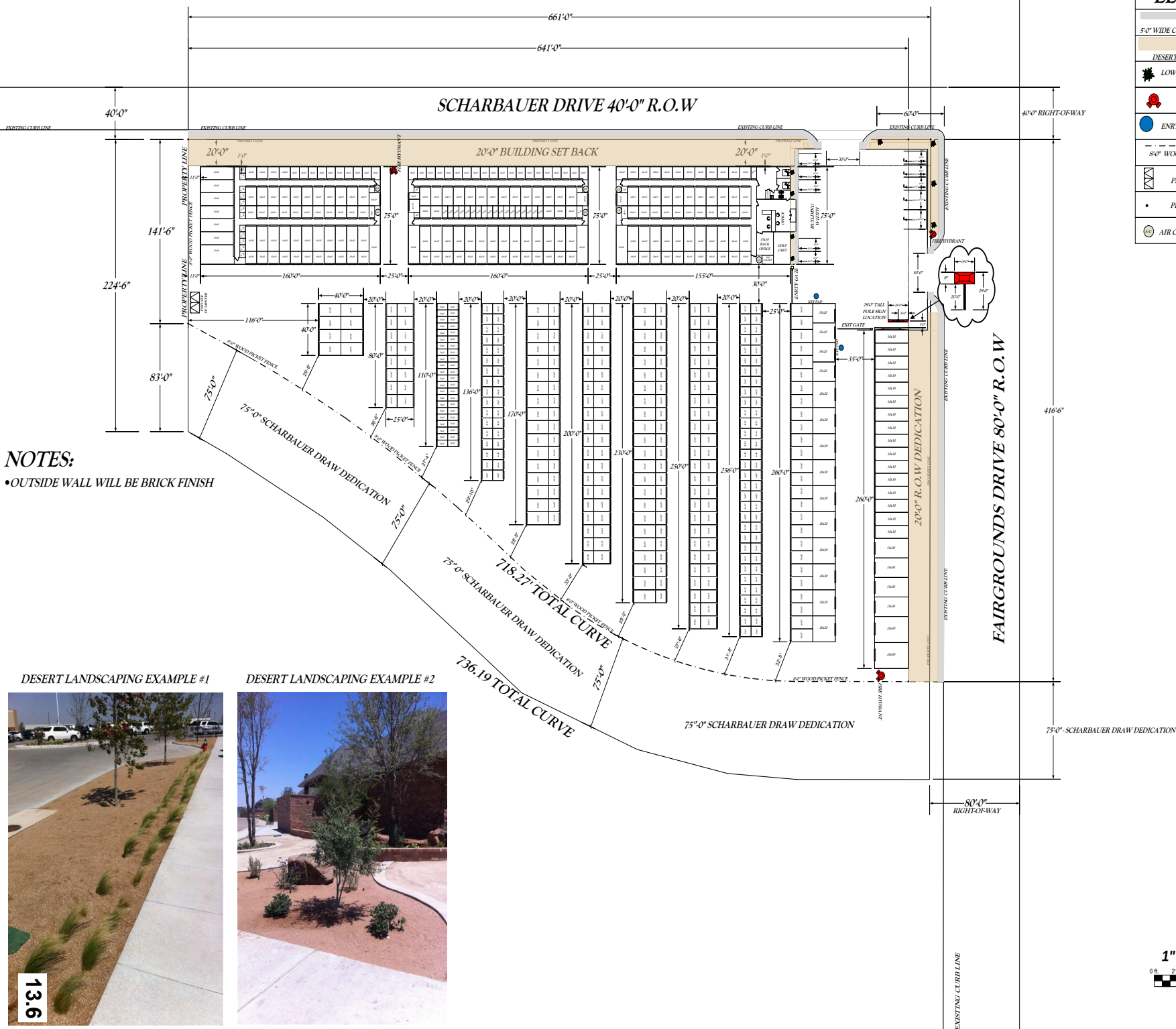


SITE PLAN

REVISIONS:

JOB NUMBER
DESIGN
DATE
03-25-2013

SHEET
S1
OF
1



NOTES:
• OUTSIDE WALL WILL BE BRICK FINISH



1" = 35'-0"
0 ft 21 ft 35 ft 70 ft





PLANNING AND ZONING COMMISSION

April 15, 2013

CASE: Z-12-032

REQUEST: Hold a public hearing and consider a request for a zone change from MF-1, Multi-Family District, and a LR-1, Local Retail District to a PD, Planned District for a Shopping Center.

APPLICANT/OWNER: Michael Postar.

LEGAL DESCRIPTION: Lot 1, Block 10 and Lot 15 Block 11, and the to be vacated 0.23 acre alley right-of-way, all out of Trueland Addition, Section 2, City and County of Midland, Texas.

LOCATION: Generally located on the southwest corner of the intersection of E. Scharbauer Drive and N. Fairgrounds Road.

CURRENT ZONING: MF-1, Multi-Family Dwelling District, LR-1, Local Retail District.

ASSOCIATED CASE: P-12-067.

DETAILS OF REQUEST:

1. The applicant plans to develop a storage unit facility on the above described tract of land. The property is currently zoned MF-1, Multi-Family Dwelling District, and LR-1, Local Retail District. The applicant is requesting to rezone this property to a Planned District for a Shopping Center, with an underlying zoning of LR-2, Local Retail District. The use of a Planned District satisfies the code's requirement for site plan approval and architectural control as required by the Midland City Code.

SURROUNDING ZONING AND LAND USE:

2. This property has frontage along Scharbauer Drive and Fairgrounds Road. Immediately north and west of this property is a large 2F, Two Family Dwelling District, and to the south of this property is a large 1F-2, Single Family Dwelling District. East of this property is a large LR-1, Local Retail District, and to the southeast is a large MF-1, Multi-Family Dwelling District.

ANALYSIS:

3. The applicant's request to rezone this property is to allow for the future development of storage units. The 2F zoned district to the north of this property is separated from this property by approximately 120 feet of right-of-way, and the 1F-2 zone district to the south is separated from this property by Scharbauer Draw (approximately 220 feet of right-of-way). Staff finds the amount of right-of-way buffering the proposed use from the surrounding residential use to be acceptable. The applicant's Exhibit A illustrates a solid wood screen fence on the rear of the property. A 30 foot freestanding sign is also located along Fairgrounds Road. The screening

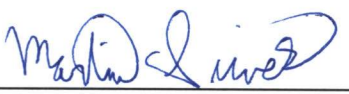
wall along Scharbauer Drive will completely consist of brick finish. Entry and access to the property will be from both Scharbauer Drive and Fairgrounds Road. Landscaping will comply with the City's landscape ordinance.

STAFF RECOMMENDATION:

Staff recommends approval of this request for a zone change from MF-1, Multi-Family Dwelling District and LR-1, Local Retail District, to a PDSC, Planned District for a Shopping Center subject to the below conditions.

1. The Planned District will be subject to regulations of the LR-2 District, except as stated below.
2. That storage units shall be a permitted use with this district
3. That the proposed development significantly conforms to the attached exhibits A, B, and C.
4. That the proposed site plan meet all requirements by the Fire Marshall's Office.
5. The proposed development must meet all building code requirements.
6. The proposed development will meet the requirements of the City of Midland Landscape code.


Ken VanDyne
Acting Planning Division Manager
Department of Development Services


Martin Siwek, City Planner
Department of Development Services

Attachments:

Application
Maps
Exhibits A, B, and C

Case Number: Z-12-032

CITY OF MIDLAND
Planning Division

APPLICATION TO CHANGE ZONING CLASSIFICATION

Michael POSTAR 806-789-6087 POSTAR@DOR.NET
Applicant Name (Phone/e-mail)
3110 FRANK FORD AVE LUBBOCK TX 79407
Address Zip Code
Michael POSTAR - 11 Sand 11 POSTAR@DOR.NET
Property Owner Name (Phone/e-mail)
3110 - FRANK FORD AVE LUBBOCK TX 79407
Address Zip Code
Michael POSTAR 11 Sand 11
Representative Name (Phone/e-mail)

Address Zip Code
Street address and Legal Description of property (complete Lot, Block, and Subdivision Name or if unplatted, attach a Metes and Bounds description with surveyor's seal). Each district must be described separately. 2107 N. FAIRGROVES ROAD
TRINELAND ASSOCIATED SECTION 3
LOT 1, Block 16 and LOT 15 Block 11.

PRESENT ZONE: LR-1 MF-1 REQUESTED ZONE: PD
(List by tracts if more than one district is requested)
Reason for Zone Change Request: Zones for a self storage

Present Use of Property: VACANT LAND

Proposed Use of Property: Self Storage

How will zone change affect the public health, safety and welfare? IT WILL CLEAN UP AND WILL IMPROVE THE NEIGHBORHOOD

Describe how conditions affecting the property have changed since present zoning designation: THE CURRENT LAND HAS HOMELESS PEOPLE & VAGRANTS ON THE LAND. IT WILL HAVE A SECURE STORAGE THAT LOOKS GREAT.

Is a Specific Use Permit with Term for alcoholic beverages sales needed? Yes ☒ No

Already Paid (an that has changes is that we are the current owners.)

APPLICATION FEES:

- Single, standard zone change: **\$400**. Multiple, standard zone change: add **\$100** per additional district.
- Single PD, Planned District zone change: **\$550**. Multiple PD proposal: add **\$100** per district.
- If a Traffic Impact Analysis is required, a fee of up to \$500.00 will be assessed.

SITE PLAN SUBMITTALS (if applicable):

16 copies (FOLDED) of the PD site plan: _____ ✓

Site Plan in digital format .pdf and .jpg: _____

SIGNATURE (by property owner only - authorized agent must sign affidavit below)

Property Owner (signature): _____ Date: 3/3/13

If an Agent is authorized by the property owner to file and execute the application on behalf of the property owner, the Agent must complete the affidavit below.

STATE of TEXAS
COUNTY OF MIDLAND

Before me, the undersigned authority, on this day personally appeared

_____ who, being by me duly sworn, upon oath says: That (s)he is authorized by _____, the owner of the above described property, to fully represent him/her in this application and that (s)he had the legal right, power and authority to sign said owner's name hereto as his/her attorney in fact.

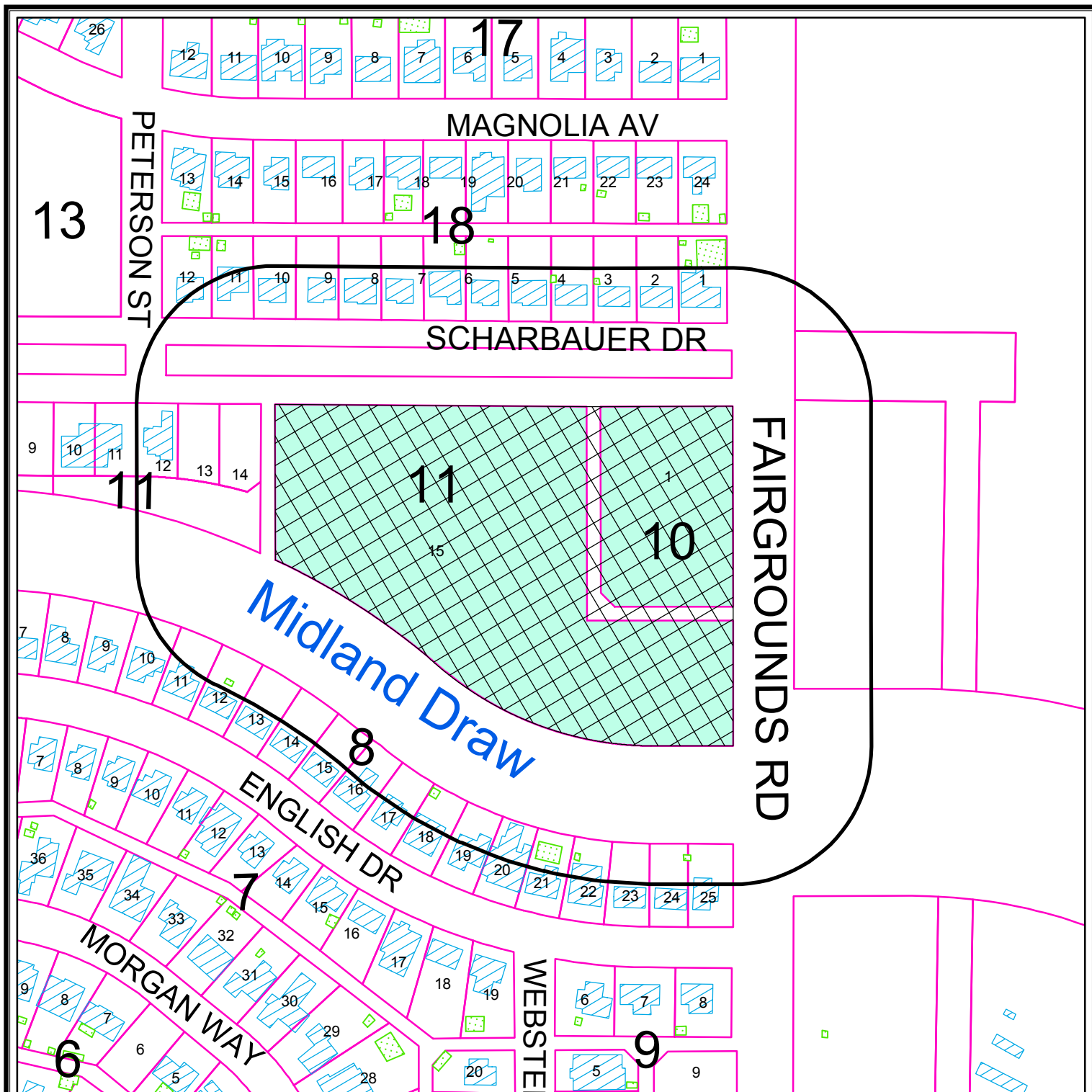
Authorized Agent (signature)

Subscribed and sworn to before me, this _____ day of _____, 20 __, to certify which witness my hand and seal of office.

NOTARY PUBLIC, MIDLAND COUNTY, TEXAS

FOR OFFICE USE ONLY	
Rec'd By: <u>MS/DM</u>	Date: <u>3/5/13</u>
Assigned: <u>MS</u>	
For: <u>4/15/13</u>	On: <u>PRZ</u>

****Application will not be considered for scheduling until reviewed by a planner.****



PROPERTY OWNER NOTIFICATION MAP

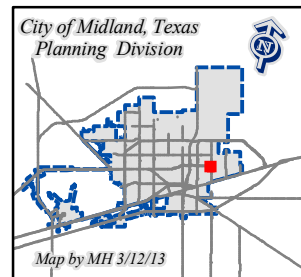
Z - 12 - 032

Scale: 1" = 200'

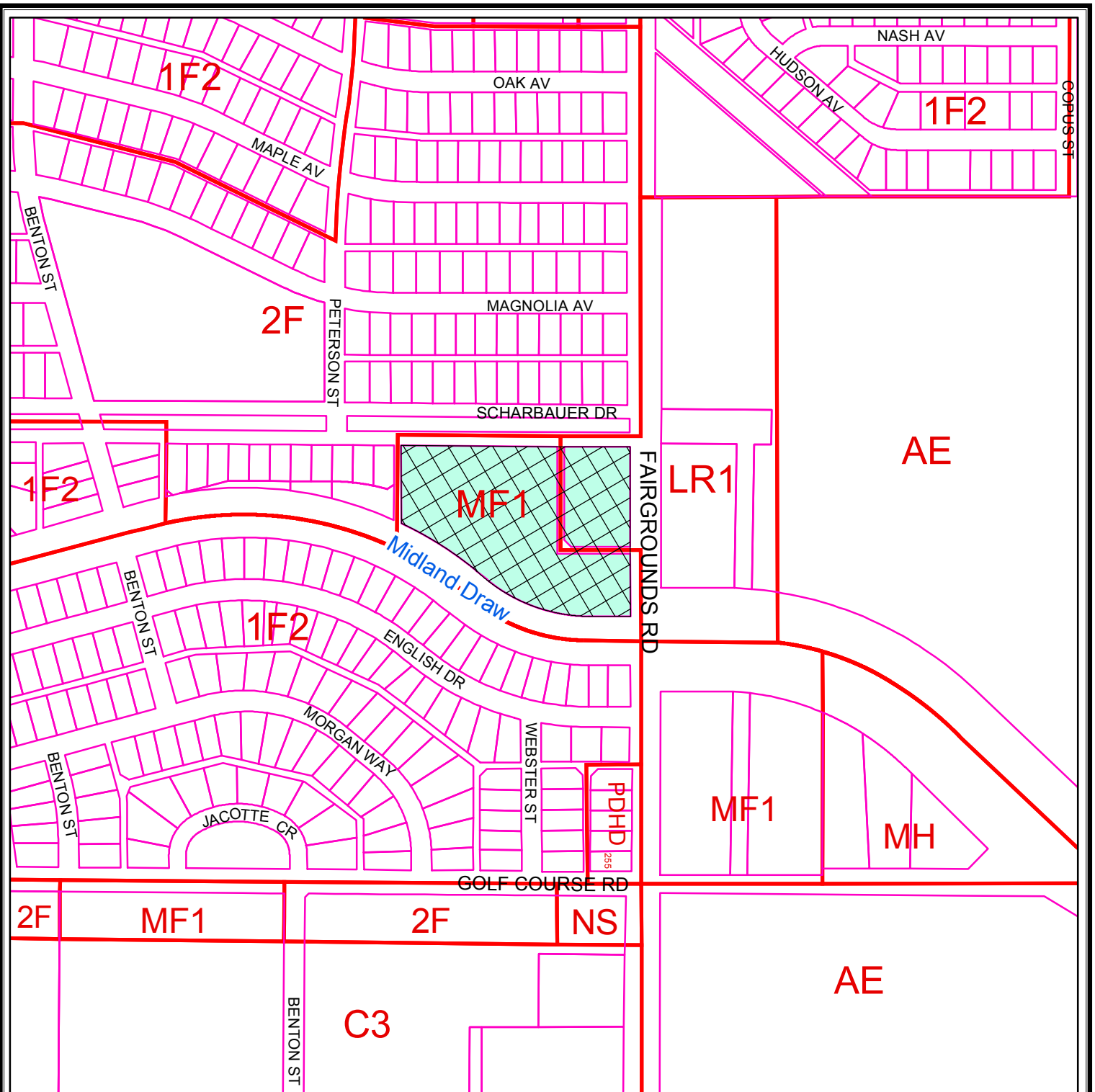
Consider a request for a zone change from LR-1, Local Retail District on Lot 1, Block 10 and from MF-1, Multiple Family Dwelling District on Lot 15, Block 11, and the to be vacated 0.23-acre alley right-of-way, to PD, Planned District for a Shopping Center, all out of Trueland Addition, Section 2, City and County of Midland, Texas.

LEGEND

- CITY LIMITS
- 200 FT. LEGAL NOTICE LIMIT
- PARCEL
- PRIVATE BLDGS
- ACCESSORY BLDGS



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ZONING MAP

Z - 12 - 032

Scale: 1" = 400'

Consider a request for a zone change from LR-1, Local Retail District on Lot 1, Block 10 and from MF-1, Multiple Family Dwelling District on Lot 15, Block 11, and the to be vacated 0.23-acre alley right-of-way, to PD, Planned District for a Shopping Center, all out of Trueland Addition, Section 2, City and County of Midland, Texas.

LEGEND

ZONING PARCELS

ZONING DISTRICTS:

FD	FUTURE DEVELOPMENT	BP	BUSINESS PARK
PD	PLANNED DISTRICT	P	PARKING
AE	AGRICULTURE ESTATE	01, O2	OFFICE
CE	COUNTRY ESTATE	NS	NEIGHBORHOOD SERVICE
1F1, 1F2, 1F3	ONE-FAMILY DWELLING	LR1, LR2, LR3	LOCAL RETAIL
MH	MOBILE HOME DWELLING	C1, C2, C3	COMMERCIAL
TH	TOWNHOUSE DWELLING	IP, IP1, IP2, IP3	INDUSTRIAL PARK
2F	TWO-FAMILY DWELLING	LI	LIGHT INDUSTRY
MF1, MF2	MULTIPLE FAMILY DWELLING	HI	HEAVY INDUSTRY

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City Council Agenda

Approved for Agenda:

City Manager's Office

MEETING DATE: 5/28/2013

TO: City Council / City Manager

FROM: Morris Williams, Solid Waste Director

SUBJECT: Consider an ordinance on second reading amending Title III, Chapter 1, Section 10 of the City Code.

Purpose:

Consider an ordinance on second reading amending Title III, "Department", Chapter 1, "Water Department", Section 10, "Permitted uses of the Optional Litter Abatement and Beautification Fee" to remove the word "optional" throughout the section.

Recommended City Council Action

☒ Approve ☐ Deny ☐ Directional / Informational

Fiscal Impact:

N/A

Discussion:

Title III, Chapter 1, Section 10 of the City Code contains the phrase "Optional Litter Abatement and Beautification Fee" throughout. The phrase shall be changed to reflect the current Ordinance No. 9065 that makes the "Optional Litter Abatement and Beautification Fee" mandatory. Below are the modifications.

3-1-10 Permitted uses of the Optional Litter Abatement and Beautification Fee.

Modify:

3-1-10. - Permitted uses of the Optional Litter Abatement and Beautification Fee.

(A)

All Optional Litter Abatement and Beautification Fees collected shall be designated as such and used only for the purposes provided herein.

(B)

An Optional Litter Abatement and Beautification Fee Revenue and Expense Line Item shall be created to identify revenues and expenses attributable to the Litter Abatement and Beautification Program.

(C)

All Optional Litter Abatement and Beautification Fees shall be allocated to a Litter Abatement and Beautification Revenue Line Item in the Sanitation Fund.

(D)

Funds from sources other than the Optional Litter Abatement and Beautification Fee that are available for the removal of litter and/or beautification of City right-of-way may be allocated to a separate miscellaneous Litter Abatement and Beautification Revenue and Expense Line Item in the Sanitation Fund.

(E)

An expenditure from the Litter Abatement and Beautification Line Item need not specifically relate to the property of a particular utility customer from whom the Optional Litter Abatement and Beautification Fee was collected.

(F)

The Building Official shall provide an annual report to the City Council on the Litter Abatement and Beautification Revenues and Expenses.

(G)

All funds raised through the Optional Litter Abatement and Beautification Fee will be allocated towards the following public purposes:

1.

The removal of litter, including litter abatement, education and enforcement of the litter ordinances and Section 8-6-18 of the Midland City Code;

2.

The beautification of City Council approved sites located within City right-of-way; especially, but not exclusively, those areas that are visible from roadways entering the City of Midland;

3.

The acquisition and planting of trees and vegetation; and

4.

The installation of benches, seats, decorative fencing, ground cover and sidewalks in or near City right-of-way in an area where funds have been spent for beautification purposes.

(H)

As approved by the City Council, the City Manager will have the authority to disperse funds as necessary, including wages and benefits, from the Optional Litter Abatement and Beautification Fee. This shall include the hiring or contracting of sufficient staff or services to carry out the purposes herein. The City Manager shall have the authority to contract with independent contractors to carry out the purposes of this ordinance [Sections 3-19-9 through 3-1-11].

To:

3-1-10. - Permitted uses of the Litter Abatement and Beautification Fee.

- (A)

All Litter Abatement and Beautification Fees collected shall be designated as such and used only for the purposes provided herein.
- (B)

An Litter Abatement and Beautification Fee Revenue and Expense Line Item shall be created to identify revenues and expenses attributable to the Litter Abatement and Beautification Program.
- (C)

All Litter Abatement and Beautification Fees shall be allocated to a Litter Abatement and Beautification Revenue Line Item in the Sanitation Fund.
- (D)

Funds from sources other than the Litter Abatement and Beautification Fee that are available for the removal of litter and/or beautification of City right-of-way may be allocated to a separate miscellaneous Litter Abatement and Beautification Revenue and Expense Line Item in the Sanitation Fund.
- (E)

An expenditure from the Litter Abatement and Beautification Line Item need not specifically relate to the property of a particular utility customer from whom the Litter Abatement and Beautification Fee was collected.
- (F)

The Building Official shall provide an annual report to the City Council on the Litter Abatement and Beautification Revenues and Expenses.
- (G)

All funds raised through the Litter Abatement and Beautification Fee will be allocated towards the following public purposes:

 - 1.

The removal of litter, including litter abatement, education and enforcement of the litter ordinances and Section 8-6-18 of the Midland City Code;
 - 2.

The beautification of City Council approved sites located within City right-of-way; especially, but not exclusively, those areas that are visible from roadways entering the City of Midland;
 - 3.

The acquisition and planting of trees and vegetation; and
 - 4.

The installation of benches, seats, decorative fencing, ground cover and sidewalks in or near City right-of-way in an area where funds have been spent for beautification purposes.

(H)

As approved by the City Council, the City Manager will have the authority to disperse funds as necessary, including wages and benefits, from the Litter Abatement and Beautification Fee. This shall include the hiring or contracting of sufficient staff or services to carry out the purposes herein. The City Manager shall have the authority to contract with independent contractors to carry out the purposes of this ordinance [Sections 3-19-9 through 3-1-11].

ORDINANCE NO. _____

AN ORDINANCE AMENDING TITLE III, "DEPARTMENTS," CHAPTER 1, "WATER DEPARTMENT," SECTION 10, "PERMITTED USES OF THE OPTIONAL LITTER ABATEMENT AND BEAUTIFICATION FEE," OF THE CITY CODE OF MIDLAND, TEXAS, SO AS TO REFLECT THE CURRENT ORDINANCE NO. 9065 WHICH MADE SAID FEE MANDATORY; CONTAINING A CUMULATIVE CLAUSE; CONTAINING A SAVINGS AND SEVERABILITY CLAUSE; AND ORDERING PUBLICATION

WHEREAS, the City Council finds it to be in the public interest to amend Title III, "Departments," Chapter 1, "Water Department," Section 10, "Permitted Uses of the Optional Litter Abatement and Beautification Fee," of the City Code of Midland, Texas, so as to reflect the current Ordinance No. 9065 which made said fee mandatory;

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF MIDLAND, TEXAS:

SECTION ONE. That Title III, "Departments," Chapter 1, "Water Department," Section 10, "Permitted Uses of the Optional Litter Abatement and Beautification Fee," of the City Code of Midland, Texas, shall be amended to read as follows:

3-1-10. Permitted Uses of the Litter Abatement and Beautification Fee.

- (A) All Litter Abatement and Beautification Fees collected shall be designated as such and used only for the purposes provided herein.
- (B) A Litter Abatement and Beautification Fee Revenue and Expense Line Item shall be created to identify revenues and expenses attributable to the Litter Abatement and Beautification Program.
- (C) All Litter Abatement and Beautification Fees shall be allocated to a Litter Abatement and Beautification Revenue Line Item in the Sanitation Fund.
- (D) Funds from sources other than the Litter Abatement and Beautification Fee that are available for the removal of litter and/or beautification of City right-of-way may be allocated to a separate miscellaneous Litter Abatement and Beautification Revenue and Expense Line Item in the Sanitation Fund.

- (E) An expenditure from the Litter Abatement and Beautification Line Item need not specifically relate to the property of a particular utility customer from whom the Litter Abatement and Beautification Fee was collected.
- (F) The Building Official shall provide an annual report to the City Council on the Litter Abatement and Beautification Revenues and Expenses.
- (G) All funds raised through the Litter Abatement and Beautification Fee will be allocated towards the following public purposes:
 - 1. The removal of litter, including litter abatement, education and enforcement of the litter ordinances and Section 8-6-18 of the Midland City Code;
 - 2. The beautification of City Council approved sites located within City right-of-way; especially, but not exclusively, those areas that are visible from roadways entering the City of Midland;
 - 3. The acquisition and planting of trees and vegetation; and
 - 4. The installation of benches, seats, decorative fencing, ground cover and sidewalks in or near City right-of-way in an area where funds have been spent for beautification purposes.
- (H) As approved by the City Council, the City Manager will have the authority to disperse funds as necessary, including wages and benefits, from the Litter Abatement and Beautification Fee. This shall include the hiring or contracting of sufficient staff or services to carry out the purposes herein. The City Manager shall have the authority to contract with independent contractors to carry out the purposes of this ordinance [Sections 3-19-9 through 3-1-11].

SECTION TWO. The provisions of this Ordinance are to be cumulative of all other Ordinances or parts of Ordinances governing or regulating the same subject matter as that covered herein; provided, however, that all prior Ordinances or parts of Ordinances inconsistent with or in conflict with any of the provisions of this Ordinance are hereby expressly repealed to the extent of any such inconsistency or conflict.

SECTION THREE. If any section, subsection, sentence, clause or phrase of this Ordinance is, for any reason, held to be unconstitutional or invalid, such holding shall not affect the validity of the remaining portions of this Ordinance. The Council of the City of Midland hereby declares that it would have passed this Ordinance and each section, subsection, sentence, clause, or phrase hereof irrespective of the fact that any one or more sections, subsections, sentences, clauses, or phrases be declared unconstitutional or invalid.

SECTION FOUR. The effective date of this Ordinance shall be June 1, 2013.

SECTION FIVE. The City Secretary is hereby authorized and directed to publish the descriptive caption of this ordinance in the manner and for the length of time prescribed by law as an alternative method of publication.

The above and foregoing ordinance was duly proposed, read in full and adopted on first reading, the _____ day of _____, A.D., 2013; and passed to second reading on motion of Council member _____, seconded by Council member _____, by the following vote:

Council members voting "AYE":

Council members voting "NAY":

The above and foregoing ordinance was read in full and finally adopted by the following vote upon motion of Council member _____, seconded by Council member _____, on the _____ day of _____, A.D., 2013, at a regular meeting of the City Council:

Council members voting "AYE":

Council members voting "NAY":

PASSED AND APPROVED THIS _____ day of _____, A.D., 2013.

W. Wesley Perry, Mayor

ATTEST:

Amy M. Turner, City Secretary

APPROVED AS TO FORM:

Keith Stretcher, City Attorney



City Council Agenda

Approved for Agenda:

City Manager's Office

MEETING DATE: 5/28/2013

TO: City Council / City Manager

FROM: Morris Williams, Solid Waste Director

SUBJECT: Consider an ordinance on second reading amending Title III, Chapter 1, Section 11 of the City Code.

Purpose:

Consider an ordinance on second reading amending Title III, "Department", Chapter 1, "Water Department", Section 11, "Billing of the Optional Litter Abatement and Beautification Fee" to remove the word optional and changing Director of Utilities to Director of Solid Waste throughout the section.

Recommended City Council Action

☒ Approve ☐ Deny ☐ Directional / Informational

Fiscal Impact:

N/A

Discussion:

Title III, Chapter 1, Section 11 of the City Code contains the word optional and title Director of Utilities. The word optional shall be removed and the title Director of Utilities shall be changed to Director of Solid Waste. Below are the modifications.

3-1-11 Billing of the Optional Litter Abatement and Beautification Fee

Modify:

3-1-11. - Billing of the Optional Litter Abatement and Beautification Fee.

(A)

The Optional Litter Abatement and Beautification Fee shall be billed each month on the City of Midland Combined Billing Statement for each utility customer. The option not to pay the Optional Litter Abatement and Beautification Fee will be

included in the City's Combined Billing Statement. The Director of Utilities is authorized to collect such charges in a manner consistent with the City Charter and State Law. The customer shall have a monthly option to not pay the Optional Litter Abatement and Beautification Fee.

(B)

Payment for the Optional Litter Abatement and Beautification Fee is due when all other charges on the Combined Billing Statement are due.

(C)

The City Manager shall establish a procedure whereby new utility customers are given an option on whether or not to pay the Optional Litter Abatement and Beautification Fee.

To:

3-1-11. - Billing of the Litter Abatement and Beautification Fee.

(A)

The Litter Abatement and Beautification Fee shall be billed each month on the City of Midland Combined Billing Statement for each utility customer. The Director of Solid Waste is authorized to collect such charges in a manner consistent with the City Charter and State Law.

(B)

Payment for the Litter Abatement and Beautification Fee is due when all other charges on the Combined Billing Statement are due.

ORDINANCE NO. _____

AN ORDINANCE AMENDING TITLE III, “DEPARTMENTS,” CHAPTER 1, “WATER DEPARTMENT,” SECTION 11, “BILLING OF THE OPTIONAL LITTER ABATEMENT AND BEAUTIFICATION FEE,” OF THE CITY CODE OF MIDLAND, TEXAS, SO AS TO REFLECT THE CURRENT ORDINANCE NO. 9065 WHICH MADE SAID FEE MANDATORY; CONTAINING A CUMULATIVE CLAUSE; CONTAINING A SAVINGS AND SEVERABILITY CLAUSE; AND ORDERING PUBLICATION

WHEREAS, the City Council finds it to be in the public interest to amend Title III, “Departments,” Chapter 1, “Water Department,” Section 11, “Billing of the Optional Litter Abatement and Beautification Fee,” of the City Code of Midland, Texas, so as to reflect the current Ordinance No. 9065 which made said fee mandatory;

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF MIDLAND, TEXAS:

SECTION ONE. That Title III, “Departments,” Chapter 1, “Water Department,” Section 11, “Billing of the Optional Litter Abatement and Beautification Fee,” of the City Code of Midland, Texas, shall be amended to read as follows:

3-1-11. Billing of the Litter Abatement and Beautification Fee.

- (A) The Litter Abatement and Beautification Fee shall be billed each month on the City of Midland Combined Billing Statement for each utility customer. The Director of Solid Waste is authorized to collect such charges in a manner consistent with the City Charter and State Law.
- (B) Payment for the Litter Abatement and Beautification Fee is due when all other charges on the Combined Billing Statement are due.

SECTION TWO. The provisions of this Ordinance are to be cumulative of all other Ordinances or parts of Ordinances governing or regulating the same subject matter as that covered herein; provided, however, that all prior Ordinances or parts of Ordinances inconsistent with or in conflict with any of the provisions of this Ordinance are hereby expressly repealed to the extent of any such inconsistency or conflict.

SECTION THREE. If any section, subsection, sentence, clause or phrase of this Ordinance is, for any reason, held to be unconstitutional or invalid, such holding shall not affect the validity of the remaining portions of this Ordinance. The Council of the City of Midland hereby declares that it would have passed this Ordinance and each section, subsection, sentence, clause, or phrase hereof irrespective of the fact that any one or more sections, subsections, sentences, clauses, or phrases be declared unconstitutional or invalid.

SECTION FOUR. The effective date of this Ordinance shall be June 1, 2013.

SECTION FIVE. The City Secretary is hereby authorized and directed to publish the descriptive caption of this ordinance in the manner and for the length of time prescribed by law as an alternative method of publication.

The above and foregoing ordinance was duly proposed, read in full and adopted on first reading, the _____ day of _____, A.D., 2013; and passed to second reading on motion of Council member _____, seconded by Council member _____, by the following vote:

Council members voting "AYE":

Council members voting "NAY":

The above and foregoing ordinance was read in full and finally adopted by the following vote upon motion of Council member _____, seconded by Council member _____, on the _____ day of _____, A.D., 2013, at a regular meeting of the City Council:

Council members voting "AYE":

Council members voting "NAY":

PASSED AND APPROVED THIS _____ day of _____, A.D., 2013.

W. Wesley Perry, Mayor

ATTEST:

Amy M. Turner, City Secretary

APPROVED AS TO FORM:

Keith Stretcher, City Attorney



City Council Agenda

Approved for Agenda:
JNichols
City Manager's Office

MEETING DATE: May 28, 2013

TO: CITY COUNCIL/CITY MANAGER

FROM: Ken Van Dyne, Acting Planning Division Manager

SUBJECT: Hold a public hearing at approximately 10:30 a.m. and consider an ordinance on a request by Madura Vista Development for a zone change from PD, Planned District for a Shopping Center to O-1, Office District, on a 0.95-acre portion of Lots 1 and 2, Block 3, Mayfield Place Addition (Generally located on the north side of Mockingbird Lane, 860 feet east of Midkiff Road).

Purpose:

Hold a public hearing at approximately 10:30 a.m. and consider an ordinance on a request by Madura Vista Development for a zone change from PD, Planned District for a Shopping Center to O-1, Office District, on a 0.95-acre portion of Lots 1 and 3, Block 3, Mayfield Place Addition. (Generally located on the north side of Mockingbird Lane, 860 feet east of Midkiff Road.)

Recommended City Council Action

☒ Approve

☐ Deny

☐ Direction/Informational

Fiscal Impact:

There is no cost to the City to process this application.

Discussion:

The preliminary plat and zoning were approved on this property in 2002. The land intended for the retirement center was zoned O-1 District, and the retail center to the west was zoned Planned District for a Shopping Center. When the final plat was submitted, an additional 50 feet of frontage along Mockingbird Lane was added to the retirement lot. This resulted in the western 50 feet of this lot having retail zoning. It is the City's policy to avoid two zoning districts on one lot. Madura Vista has submitted an application to correct this "housekeeping" matter. The Planning and Zoning Commission recommended unanimous approval on May 6, 2013, and there was no opposition.

ORDINANCE NO. _____

AN ORDINANCE CHANGING THE ZONING CLASSIFICATION BY AMENDING CHAPTER ONE, TITLE XI, OF THE CITY CODE OF MIDLAND, TEXAS, BY PERMITTING A 0.95-ACRE TRACT OF LAND OUT OF LOTS 1 AND 2, BLOCK 3, MAYFIELD PLACE ADDITION, SECTION 2, CITY AND COUNTY OF MIDLAND, TEXAS, WHICH IS PRESENTLY ZONED PD, PLANNED DISTRICT FOR A SHOPPING CENTER, TO BE USED AS AN O-1, OFFICE DISTRICT (GENERALLY LOCATED ON THE NORTH SIDE OF MOCKINGBIRD LANE, 860 FEET EAST OF MIDKIFF ROAD); CONTAINING A CUMULATIVE CLAUSE; CONTAINING A SAVINGS AND SEVERABILITY CLAUSE; PROVIDING FOR A MAXIMUM PENALTY OR FINE OF TWO THOUSAND DOLLARS (\$2,000.00); AND ORDERING PUBLICATION

WHEREAS, the City Planning and Zoning Commission and the Governing Body of the City of Midland, in compliance with the City Charter and the State law with reference to the creation of Districts under the zoning ordinance regulations and zoning map, have given the requisite notices by United States mail, publication and otherwise; and after a full and fair hearing to all of the property owners generally and particularly to those interested persons situated in the affected area and in the vicinity thereof, the Governing Body finds that the public health, safety and general welfare will be best served by the creation of an O-1, Office District, as set out hereinafter;

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF MIDLAND, TEXAS:

SECTION ONE. That Chapter 1, Title XI, of the City Code of Midland, Texas, and the official zoning map of the City of Midland, Texas, are hereby amended insofar as the hereinafter described property is concerned, which is presently zoned PD, Planned District for a Shopping Center, and it shall be used as an O-1, Office District, said property being described as follows:

A 0.95-acre tract of land out of Lots 1 and 2, Block 3, Mayfield Place Addition, Section 2, City and County of Midland, Texas, said tract being more specifically described by metes and bounds in Exhibit "A", which is attached hereto and incorporated herein.

SECTION TWO. That the definitions given in the zoning regulations contained in the City Code of the City of Midland, Texas, shall be applicable to such of those terms as are used herein.

SECTION THREE. The provisions of this ordinance are to be cumulative of all other ordinances or parts of ordinances governing or regulating the same subject matter as that covered herein; provided, however, that all prior ordinances or parts of ordinances inconsistent with or in conflict with any of the provisions of this ordinance are hereby expressly repealed to the extent of any such inconsistency or conflict.

SECTION FOUR. If any section, subsection, sentence, clause or phrase of this ordinance is, for any reason, held to be unconstitutional or invalid, such holding shall not affect the validity of the remaining portions of this ordinance. The Council of the City of Midland hereby declares that it would have passed this ordinance and each section, subsection, sentence, clause, or phrase hereof irrespective of the fact that any one or more sections, subsections, sentences, clauses, or phrases be declared unconstitutional or invalid.

SECTION FIVE. The penalty for violation of this ordinance shall be in accordance with the general penalty provisions contained in Section 1-3-1 of the City Code of Midland, Texas, which provides for a fine not exceeding two thousand dollars (\$2,000.00).

SECTION SIX. The City Secretary is hereby authorized and directed to publish the descriptive caption of this ordinance in the manner and for the length of time prescribed by the law as an alternative method of publication.

The above and foregoing ordinance was duly proposed, read in full and adopted on first reading, the _____ day of _____, A.D., 2013; and passed to second reading on motion of Council member _____, seconded by Council member _____, by the following vote:

Council members voting "AYE":

Council members voting "NAY":

The above and foregoing ordinance was read in full and finally adopted by the following vote upon motion of Council member _____, seconded by Council member _____, on the _____ day of _____, A.D., 2013, at a regular meeting of the City Council:

Council members voting "AYE":

Council members voting "NAY":

PASSED AND APPROVED THIS _____ day of _____, A.D., 2013.

W. Wesley Perry, Mayor

ATTEST:

Amy M. Turner, City Secretary

APPROVED AS TO CONTENT
AND COMPLETENESS:

James R. Nichols, Assistant City Manager

APPROVED AS TO FORM:

Keith Stretcher, City Attorney

PD-SC to O1 Zoning

LEGAL DESCRIPTION OF A 0.95 ACRE TRACT
LOCATED IN THE SOUTH HALF OF SECTION 9,
BLOCK X, H. P. HILLIARD SURVEY,
CITY OF MIDLAND, MIDLAND COUNTY, TEXAS

RECEIVED

OCT 1 2012

CITY OF MIDLAND
PLANNING DIVISION OFFICE

Boundary being further described by metes and bounds as follows:

BEGINNING at (N= 10,713,294.84' and E= 1,739,545.89') a point on the centerline of Mockingbird Lane and the Southeast corner of this tract, from whence the Southwest corner of said Section 9 bears S75°32'06"W, a distance of 923.00 feet;

THENCE S75°32'06"W with the centerline of Mockingbird Lane, a distance of 46.95 feet to the Southeast corner of this tract;

THENCE N14°27'49"W at 60.00 feet pass a 1/2" iron rod with plastic cap marked "PLS 1974" found at the Southwest corner of Mayfield Place Addition as recorded in Cabinet "G", Page 153, Plat Records of Midland County, Texas continuing with the West line of said Mayfield Place, at 858.58 feet pass a 1/2" iron rod with plastic cap marked "PLS 1974" found at the Northwest corner of Lot 2, Block 3, said Mayfield Place continuing with a total distance of 890.24 feet to the most Westerly Northwest corner of said Mayfield Place and the Northwest corner of this tract;

THENCE S85°56'30"E with the centerline of Bromley Place, a distance of 49.51 feet to the Northeast corner of this tract;

THENCE S14°27'49"E, a distance of 874.51 feet to the **PLACE OF BEGINNING**. Tract contains 41,423 square feet or 0.95 acres.

Bearings, distances, and coordinates are relative to the Texas State Plane Coordinate System, NAD 1983/86, Central Zone, with a combined grid factor of 0.9999202, and a theta angle equal to 0°54'48.39" at U.S.C. & G. station "MIDLAND" with published values of Y= 10,690,154.70 and X= 1,746,696.78 in U.S. Survey Feet.

I, J. Stan Piper, Registered Professional Land Surveyor, do hereby certify that this legal description is based on an actual survey made by me or under my supervision, and that the same is true and correct to the best of my knowledge and ability as surveyed on the ground on October 11, 2011.



J. Stan Piper
Registered Professional Land Surveyor
August 1, 2012

Prepared for:
Parkhill, Smith, and Cooper, Inc.
1700 W. Wall Street, Suite 100
Midland, TX 79703

PLANNING AND ZONING COMMISSION

May 6, 2013

CASE: Z-12-040.

REQUEST: Hold a public hearing and consider a request for a zone change from PD, Planned District for a Shopping Center to O-1, Office District.

APPLICANT/OWNER: Madura Vista Development.

REPRESENTATIVE: Parkhill, Smith and Cooper.

LEGAL DESCRIPTION: A 0.95-acre tract out of Section 9, Block "X", H. P. Hilliard Survey, Midland County, Texas.

LOCATION: Between Mockingbird Lane and Bromley Place, approximately 865 feet east of Midkiff Road.

DETAILS OF REQUEST:

1. The zoning on the northeast corner of Mockingbird Lane and Midkiff Road was established in 2001, based on an approved preliminary plat. The first construction project for this property is the retirement home located on the northwest corner of Mockingbird Lane and Mayfield Place. When the retirement center acquired the property, the lot line shown on the preliminary plat was moved almost 50 feet to the west, increasing the size of the lot. However, the zoning boundary was not adjusted accordingly. The result is that the west 50 feet of the retirement center is zoned Planned District for a Shopping Center, even though it is not a part of the recently approved Planned District for the Madura Vista development. The purpose of this application is to realign the zoning boundary with the property boundary by rezoning this 50-foot strip from Planned District for a Shopping Center to O-1, Office District, which is the zoning under which the retirement home developed.

ANALYSIS:

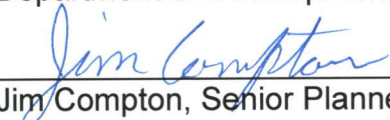
2. The staff views this request as a minor shift in a zoning boundary to align with the actual property boundary established by the approved plat. While this request can be viewed as a "housekeeping" matter, the staff believes that it is important to follow our policy of lining up zoning boundaries with property boundaries. We find this request to be reasonable.

STAFF RECOMMENDATION:

We recommend approval of this request for a zone change from PD, Planned District for a Shopping Center to O-1, Office District.



Ken Van Dyne
Acting Planning Division Manager
Department of Development Services



Jim Compton, Senior Planner
Department of Development Services

Attachments:

Application
Maps

Case Number: 2-12-040

CITY OF MIDLAND
Planning Division

APPLICATION TO CHANGE ZONING CLASSIFICATION

NHP SLL LLC (312) 660-3800
Applicant Name (Phone/e-mail)

353 N. Clark St. Chicago, IL 60654
Address Zip Code

NHP SLL LLC (312) 660-3800
Property Owner Name (Phone/e-mail)

353 N. Clark St. Chicago, IL 60654
Address Zip Code

Thompson & Knight LLP * (214) 968-1700
Representative Name (Phone/e-mail)

1722 Routh St., Ste 1500, Dallas TX 75201
Address Zip Code

Street address and Legal Description of property (complete Lot, Block, and Subdivision Name or if unplatted, attach a Metes and Bounds description with surveyor's seal). Each district must be described separately.

3000 Mockingbird Lane

PRESENT ZONE: PDSC REQUESTED ZONE: D1
(List by tracts if more than one district is requested)

Reason for Zone Change Request: Correction of error from initial zoning of property

Present Use of Property: senior care facility

Proposed Use of Property: senior care facility

How will zone change affect the public health, safety and welfare? N/A

Describe how conditions affecting the property have changed since present zoning designation:
N/A

Is a Specific Use Permit with Term for alcoholic beverages sales needed? Yes ☒ No

* Attn: Ray Khirallah, Esq.

APPLICATION FEES:

- Single, standard zone change: \$400. Multiple, standard zone change: add \$100 per additional district.
- Single PD, Planned District zone change: \$550. Multiple PD proposal: add \$100 per district.
- If a Traffic Impact Analysis is required, a fee of up to \$500.00 will be assessed. *

SITE PLAN SUBMITTALS (if applicable):

16 copies (FOLDED) of the PD site plan;
Site Plan in digital format .pdf and .jpg:

* waived by City

N/A per Jim Compton

SIGNATURE (by property owner only - authorized agent must sign affidavit below)

Property Owner (signature):

By: [Signature]
Authorized Signatory of NHP SCC, LLC

Date: April 3, 2013

If an Agent is authorized by the property owner to file and execute the application on behalf of the property owner, the Agent must complete the affidavit below.

STATE of TEXAS
COUNTY OF MIDLAND

Before me, the undersigned authority, on this day personally appeared

Joseph D. Lambert who, being by me duly sworn, upon oath says: That (s)he is an authorized Signature of authorized by NHP SCC, LLC, the owner of the above described property, to fully represent him/her in this application and that (s)he had the legal right, power and authority to sign said owner's name hereto as his/her attorney in fact.

[Signature]

Authorized Agent (signature)

Subscribed and sworn to before me, this 3rd day of: April, 2013, to certify which witness my hand and seal of office.

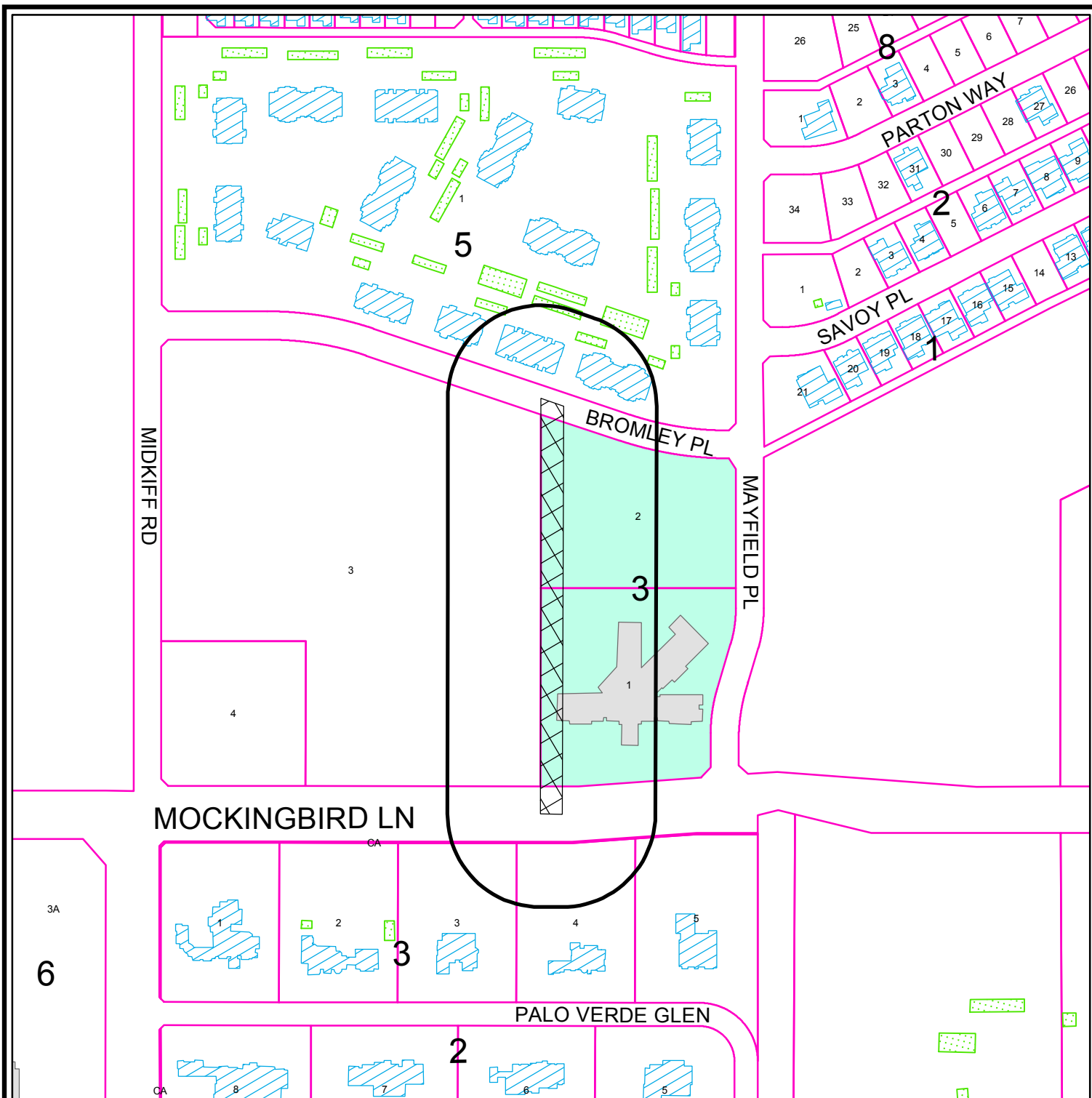
[Signature]

NOTARY PUBLIC, MIDLAND COUNTY, TEXAS

FOR OFFICE USE ONLY	
Rec'd By: <u>JC</u>	Date: <u>10/1/13</u>
Assigned: <u>JC</u>	
For: <u>P+Z</u>	On: <u>5/6/13</u>



****Application will not be considered for scheduling until reviewed by a planner.****



PROPERTY OWNER NOTIFICATION MAP

Z - 12 - 040

Scale: 1" = 300'

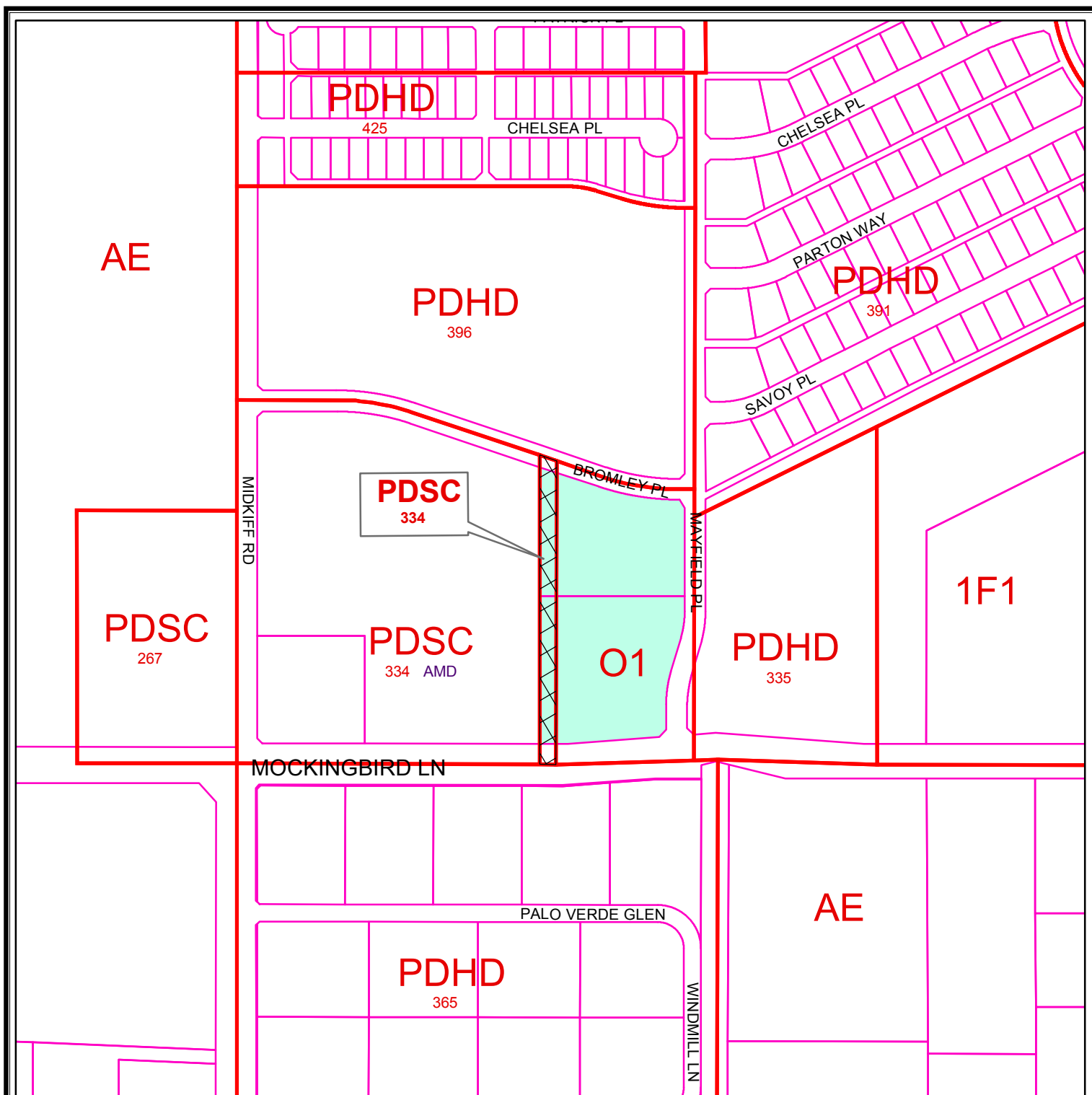
Consider a request for a zone change from PD, Planned District for a Shopping Center, to O-1, Office District on a 0.95-acre tract of land out of Lots 1 and 2, Block 3, Mayfield Place Addition, Section 2, City and County of Midland, Texas.

LEGEND

- CITY LIMITS
- 200 FT. LEGAL NOTICE LIMIT
- PARCEL
- PUBLIC BLDGS
- PRIVATE BLDGS
- ACCESSORY BLDGS



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ZONING MAP

? - 12 - 0??

Scale: 1" = 400'

Consider a request for a zone change from PD, Planned District for a Shopping Center, to O-1, Office District on a 0.95-acre tract of land out of Lots 1 and 2, Block 3, Mayfield Place Addition, Section 2, City and County of Midland, Texas.

LEGEND

ZONING PARCELS

ZONING DISTRICTS:

FD	FUTURE DEVELOPMENT	BP	BUSINESS PARK
PD	PLANNED DISTRICT	P	PARKING
AE	AGRICULTURE ESTATE	O1, O2	OFFICE
CE	COUNTRY ESTATE	NS	NEIGHBORHOOD SERVICE
1F1, 1F2, 1F3	ONE-FAMILY DWELLING	LR1, LR2, LR3	LOCAL RETAIL
MH	MOBILE HOME DWELLING	C1, C2, C3	COMMERCIAL
TH	TOWNHOUSE DWELLING	IP, IP1, IP2, IP3	INDUSTRIAL PARK
2F	TWO-FAMILY DWELLING	LI	LIGHT INDUSTRY
MF1, MF2	MULTIPLE FAMILY DWELLING	HI	HEAVY INDUSTRY

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City Council Agenda

Approved for Agenda:
JNichols
City Manager's Office

MEETING DATE: May 28, 2013

TO: CITY COUNCIL/CITY MANAGER

FROM: Ken Van Dyne, Acting Planning Division Manager

SUBJECT: Hold a public hearing at approximately 10:33 a.m. to receive public comment regarding a proposed voluntary annexation of land. Being the first of three tracts currently proposed for annexation; this Tract 1 being a 40.498-acre tract of land out of Section 37, 38 and 48, Block 40, T-1-S, T&P RR Co. Survey, Midland County, Texas (Generally located at the south extension of Avalon Drive, approximately 700 feet south of Hall of Fame Boulevard).

Purpose:

Hold a public hearing at approximately 10:33 a.m. to receive public comment regarding a proposed voluntary annexation of land. Being the first of three tracts currently proposed for annexation; this Tract 1 being a 40.498-acre tract of land out of Section 37, 38 and 48, Block 40, T-1-S, T&P RR Co. Survey, Midland County, Texas (Generally located at the south extension of Avalon Drive, approximately 700 feet south of Hall of Fame Boulevard).

Recommended City Council Action

☒ Approve

☐ Deny

☐ Direction/Informational

Fiscal Impact:

There is no cost to the City to process the annexation of this property.

Discussion:

This land is located approximately ¼ mile to the southwest of the intersection of Tradewinds Blvd. and Champions Drive and extends westward to meet the future Avalon Drive extension. This land will be developed for residential purposes. This is an owner requested annexation. No City Council action is required at this time.

Attachments:

Map

**SEC 38,
BLK 40,
T-1-S**

**SEC 37,
BLK 40,
T-1-S**

**SEC 47,
BLK 40,
T-1-S**

SEC 48, BLK 40, T-1-S

PROPOSED ANNEXATION MAP

M - 13 - 004

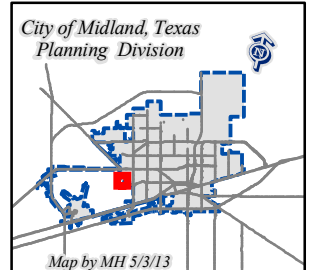
Scale: 1" = 500'

TRACT 1

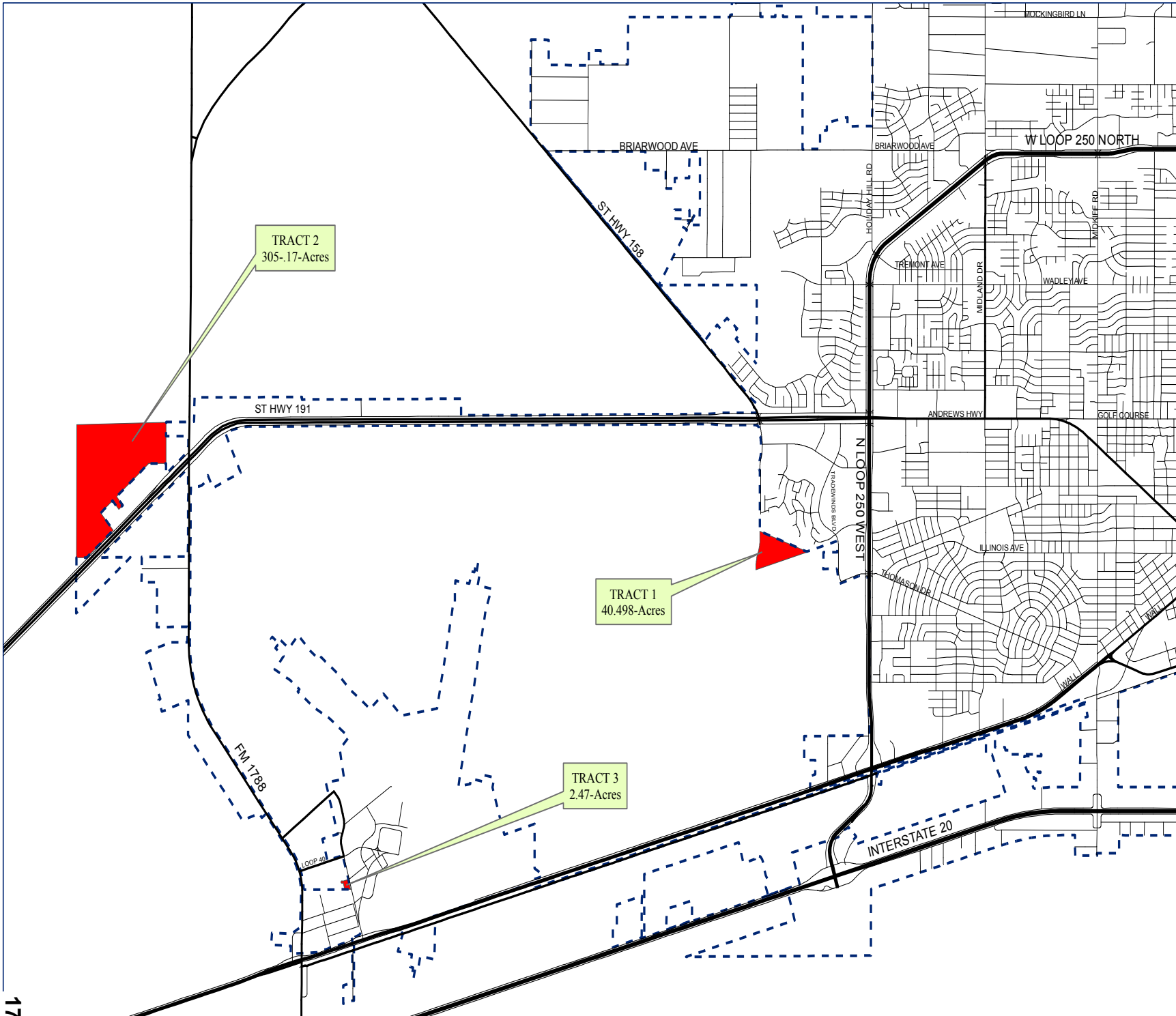
Consider a request for the annexation of a 40.498-acre tract of land out of Sections 37, 38 and 48, Block 40, T-1-S, T & P RR Co. Survey, Midland County, Texas.

LEGEND

-  ANNEXATION BOUNDARY
-  CITY LIMITS
-  SURVEY SECTION
-  CITY PARCEL
-  COUNTY PARCEL
-  PUBLIC BLDGS
-  PRIVATE BLDGS



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Proposed Annexation

May 10, 2013

LEGEND

-  Streets
-  City Limits
-  Annexation Tract



PLANNING DIVISION
Map by MH

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City Council Agenda

Approved for Agenda:
JNichols
City Manager's Office

MEETING DATE: May 28, 2013

TO: CITY COUNCIL/CITY MANAGER

FROM: Ken Van Dyne, Acting Planning Division Manager

SUBJECT: Hold a public hearing at approximately 10:36 a.m. to receive public comment regarding a proposed voluntary annexation of land. Being the second of three tracts currently proposed for annexation; this Tract 2 being a 305.17-acre tract of land out of Section 37, Block 41, T-1-S, T&P RR Co. Survey, Midland County, Texas (Generally located on the north side of State Hwy 191 and the west side of N. FM 1788).

Purpose:

Hold a public hearing at approximately 10:36 a.m. to receive public comment regarding a proposed voluntary annexation of land. Being the second of three tracts currently proposed for annexation; this Tract 2 being a 305.17-acre tract of land out of Section 37, Block 41, T-1-S, T&P RR Co. Survey, Midland County, Texas (Generally located on the north side of State Hwy 191 and the west side of N. FM 1788).

Recommended City Council Action

☒ Approve

☐ Deny

☐ Direction/Informational

Fiscal Impact:

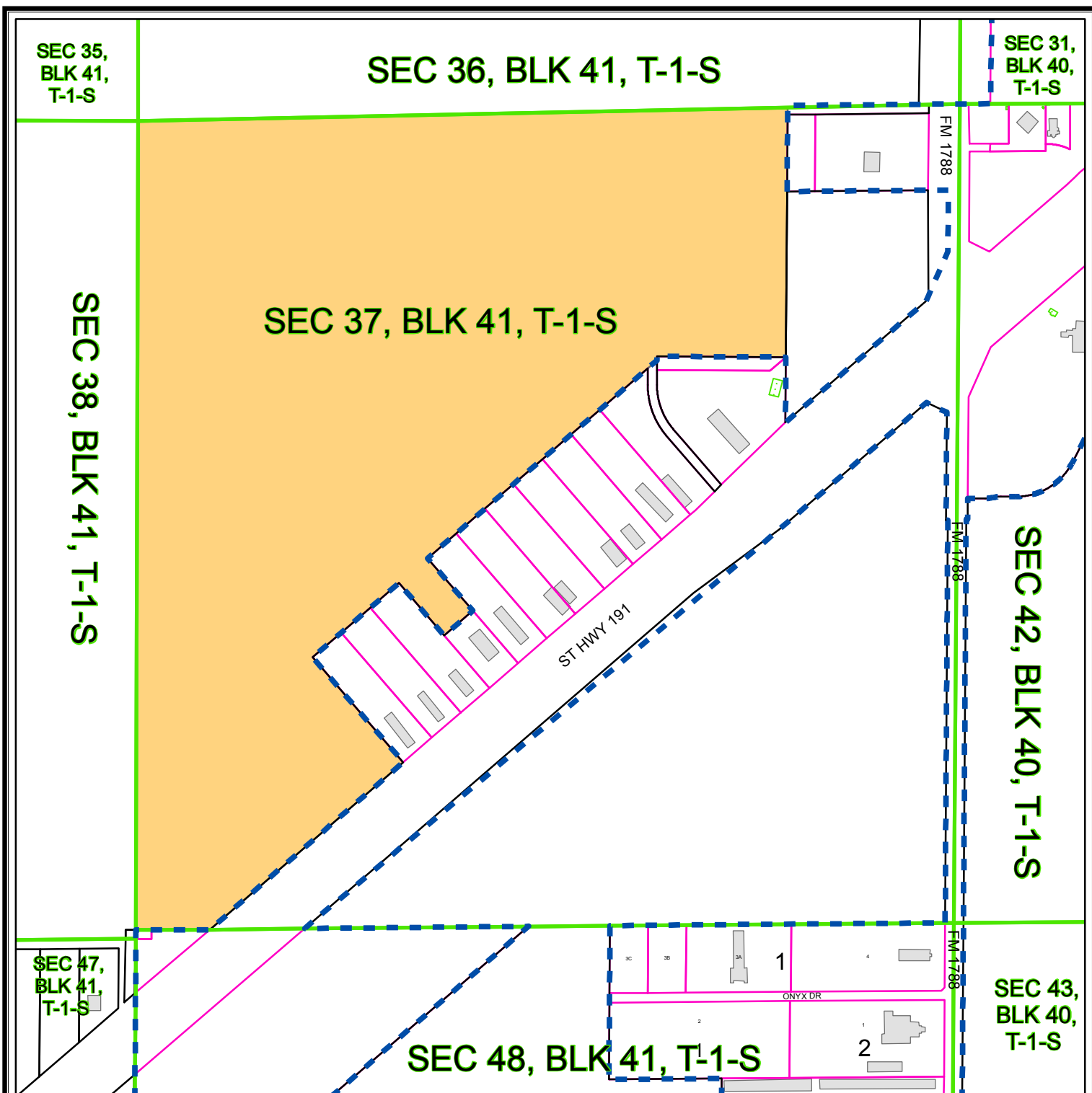
There is no cost to the City to process the annexation of this property.

Discussion:

This land is located to the northwest of of the intersection of FM 1788 and State Hwy 191. Some of the fronting property (not included in this proposed annexation) include industrial/oil services operations with a number of active oil wells within the site. This land is proposed for similar light industrial purposes. This is an owner requested annexation. No City Council action is required at this time.

Attachments:

Map



PROPOSED ANNEXATION MAP

M - 13 - 007

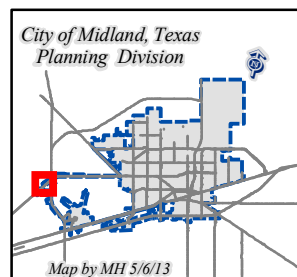
Scale: 1" = 900'

TRACT 2

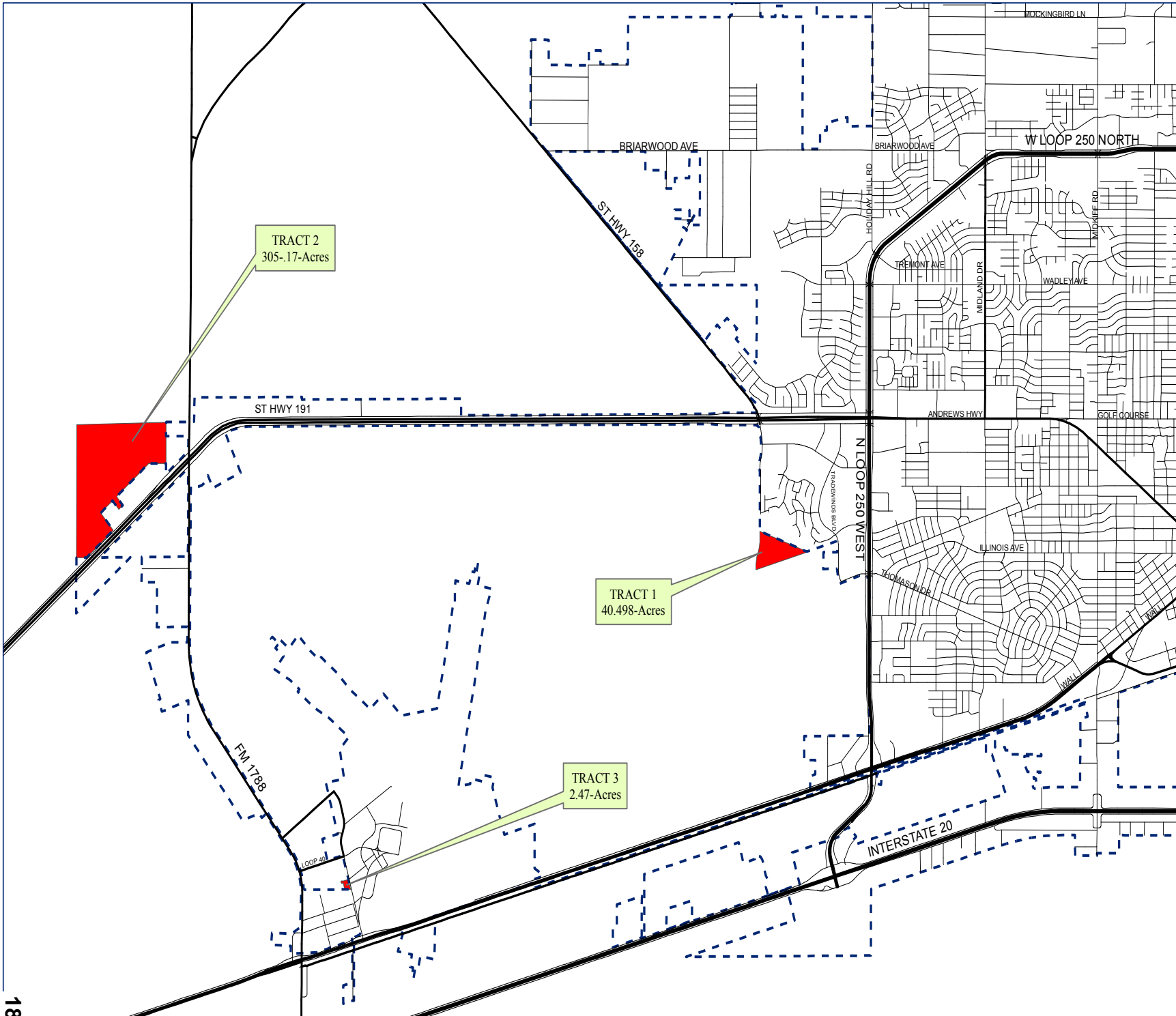
Consider a request for the annexation of a 305.17-acre tract of land out of Section 37, Block 41, T-1-S, T & P RR Co. Survey, Midland County, Texas.

LEGEND

- ANNEXATION BOUNDARY
- CITY LIMITS
- SURVEY SECTION
- COUNTY PARCEL
- CITY PARCEL
- PUBLIC BLDGS
- ACCESSORY BLDGS



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Proposed Annexation

May 10, 2013

LEGEND

- Streets
- City Limits
- Annexation Tract



PLANNING DIVISION
Map by MH

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City Council Agenda

Approved for Agenda:
JNichols
City Manager's Office

MEETING DATE: May 28, 2013

TO: CITY COUNCIL/CITY MANAGER

FROM: Ken Van Dyne, Acting Planning Division Manager

SUBJECT: Hold a public hearing at approximately 10:39 a.m. to receive public comment regarding a proposed voluntary annexation of land. Being the third of three tracts currently proposed for annexation; this Tract 3 being a 2.47-acre tract of land out of Section 8, Block 40, T-2-S, T&P RR Co. Survey, Midland County, Texas (Generally located on the west side of Wright Drive, approximately 850 feet south of Loop 40).

Purpose:

Hold a public hearing at approximately 10:39 a.m. to receive public comment regarding a proposed voluntary annexation of land. Being the third of three tracts currently proposed for annexation; this Tract 3 being a 2.47-acre tract of land out of Section 8, Block 40, T-2-S, T&P RR Co. Survey, Midland County, Texas (Generally located on the west side of Wright Drive, approximately 850 feet south of Loop 40).

Recommended City Council Action

☒ Approve

☐ Deny

☐ Direction/Informational

Fiscal Impact:

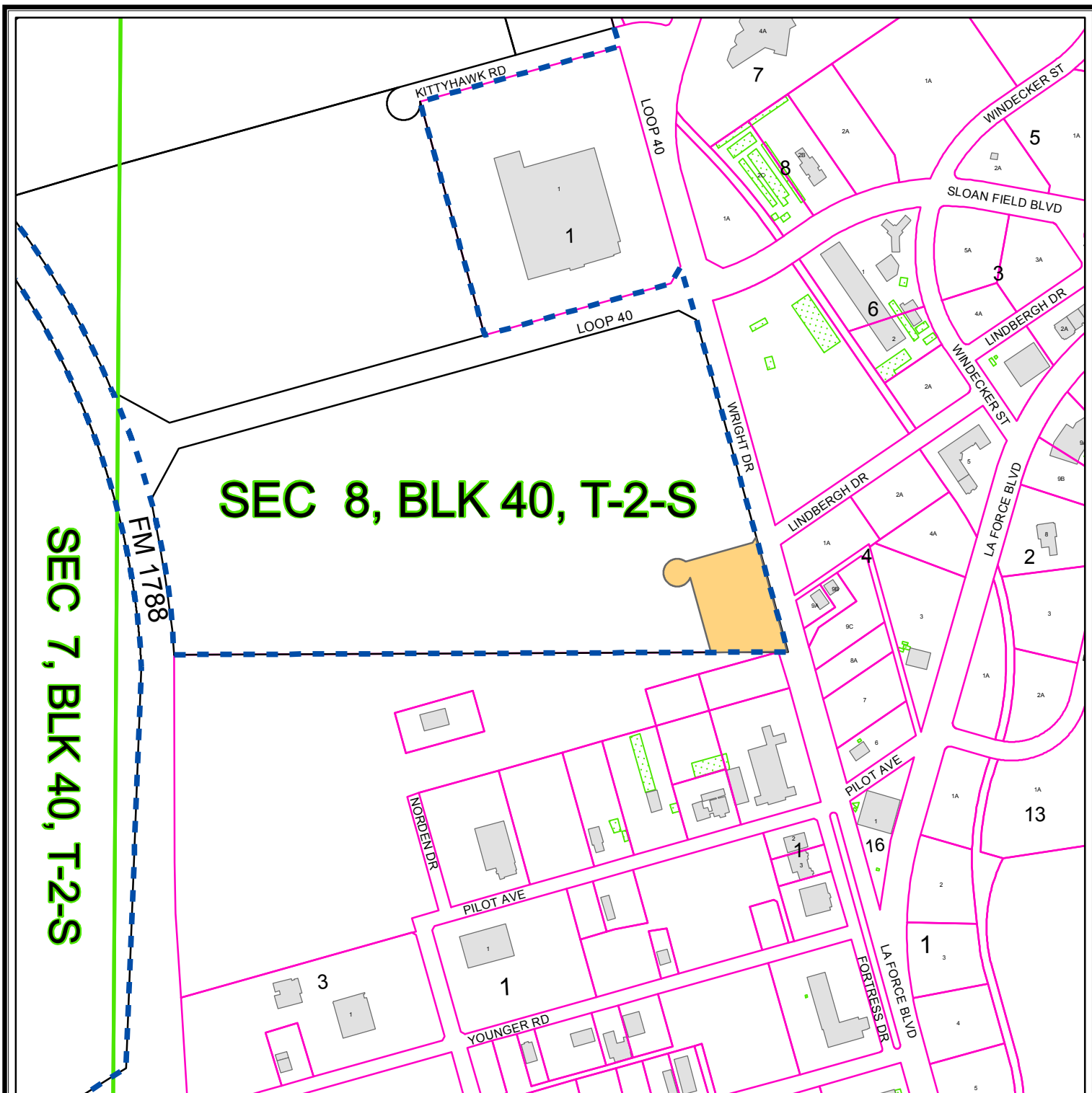
There is no cost to the City to process the annexation of this property.

Discussion:

This land is located south of the U.S. Post Office on the south leg of Loop 40 which serves as the main entrance to Midland International Airport from FM 1788. This land is proposed for industrial park purposes. This is an owner requested annexation. No City Council action is required at this time.

Attachments:

Map



PROPOSED ANNEXATION MAP

M - 13 - 006

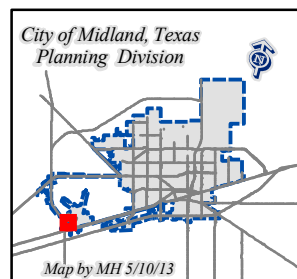
Scale: 1" = 500'

TRACT 3

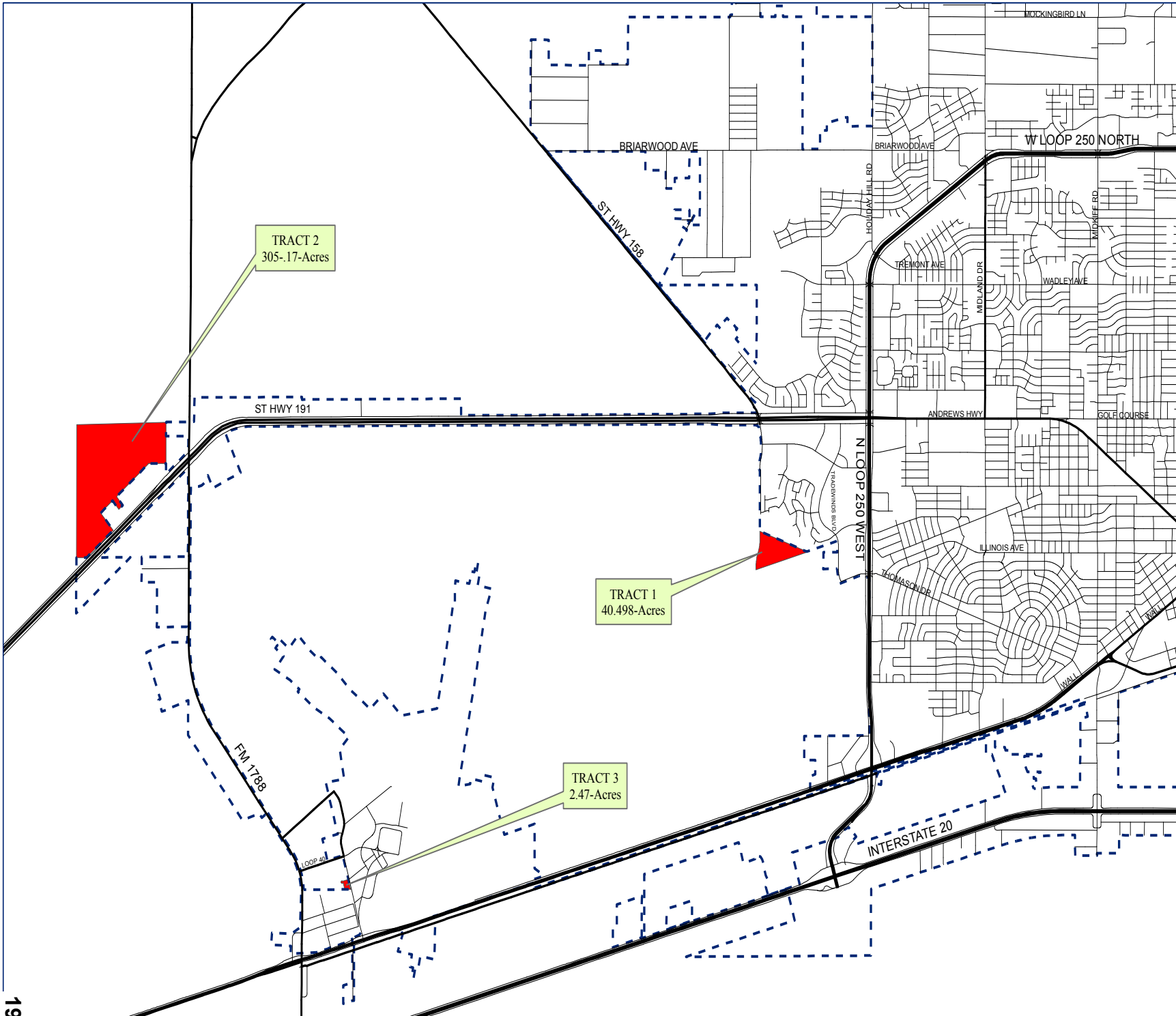
Consider a request for the annexation of a 2.47-acre tract of land out of Section 8, Block 40, T-2-S, T & P RR Co. Survey, Midland County, Texas.

LEGEND

- ANNEXATION BOUNDARY
- CITY LIMITS
- SURVEY SECTION
- COUNTY PARCEL
- CITY PARCEL
- PUBLIC BLDGS
- ACCESSORY BLDGS



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Proposed Annexation

May 10, 2013

LEGEND

- Streets
- City Limits
- Annexation Tract



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City Council Agenda

Approved for Agenda:
JNichols
City Manager's Office

MEETING DATE: May 28, 2013

TO: CITY COUNCIL/CITY MANAGER

FROM: Ken Van Dyne, Acting Planning Division Manager

SUBJECT: Hold a public hearing at 10:42 a.m. and consider a resolution on a request by Midland Restaurants, Inc. dba "The Bar" for approval of a Temporary Land Use Permit for an Outdoor Amusement Function. (Generally located on the northeast corner of W. Missouri Avenue and Carrizo Street.)

Purpose:

Hold a public hearing at 10:42 a.m. and consider a resolution on a request by Midland Restaurants, Inc. dba "The Bar" for approval of a Temporary Land Use Permit for an Outdoor Amusement Function.

Recommended City Council Action

☒ Approve

☐ Deny

☐ Direction/Informational

Fiscal Impact:

No City funds are required to approve this request.

Discussion:

Midland Restaurants, Inc. dba "The Bar" plans to hold an outdoor music event on their property located at 606 W. Missouri Avenue as shown on the Site Plan (Exhibit A). The concert will take place on their parking lot and a portion of Carrizo Street, enclosed in a six-foot chain link fence, on Saturday June 15, 2013 from 5:00 p.m. to 12:00 a.m. (midnight). The section of Carrizo Street abutting The Bar's property will be temporarily closed from June 15, 2013 at 2:00 a.m. to June 16, 2013 at 12:00 p.m.; a traffic control plan for closure has been approved by the Transportation Division through the Special Event Application Form. Closure will not affect the property to the west which is undergoing construction or the properties to the north. The Bar will use adjacent lots to accommodate parking demands. Alcoholic beverages will be sold, and all sales shall conform to state and local laws. A minimum of 10 security guards will be on duty. Police reports from a similar event held by The Bar on June 26, 2004 revealed no significant complaints or disturbances. 30 portable restrooms as well as restrooms inside The Bar will be provided during the operating hours of the concert. Live music will cease at 12:00 a.m. (midnight).

Attachments: Application, Maps, Proposed Resolution, Exhibit A – Site Plan

RESOLUTION NO. _____

**RESOLUTION AUTHORIZING THE TEMPORARY USE
OF LAND FOR AN OUTDOOR AMUSEMENT
FUNCTION ON LOTS 7-9, BLOCK 61, ORIGINAL
TOWN, CITY AND COUNTY OF MIDLAND, TEXAS
(GENERALLY LOCATED ON THE NORTHEAST
CORNER OF WEST MISSOURI AVENUE AND
CARRIZO STREET); AND MAKING SAID PERMIT
SUBJECT TO CERTAIN SPECIAL CONDITIONS AND
RESTRICTIONS CONTAINED HEREIN**

WHEREAS, pursuant to Section 11-1-6(D) of the City Code of Midland, Texas, Midland Restaurants, Inc. has applied for authorization to temporarily use land for an outdoor amusement function on Lots 7-9, Block 61, Original Town, City and County of Midland, Texas; and

WHEREAS, the Council finds and determines that such temporary use shall be allowed;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MIDLAND, TEXAS:

SECTION ONE. That Midland Restaurants, Inc. is hereby authorized by the City Council to have an outdoor amusement function on the following described land:

Lots 7-9, Block 61, Original Town, City and County of Midland, Texas.

SECTION TWO. That said temporary use shall be allowed within the area designated herein, subject to the following conditions and restrictions:

- A. That the day and hours of operations shall be limited to Saturday, June 15, 2013 from 5:00 p.m. to 12:00 a.m. (midnight).
- B. That the section of Carrizo Street abutting The Bar's property shall be closed from June 15, 2013 at 2:00 a.m. to June 16, 2013 at 12:00 p.m., in accordance with the Transportation Division.
- C. That live music shall cease at 12:00 a.m. (midnight).
- D. That alcoholic beverages sales and consumption shall be in compliance with state and local laws.
- E. That the concert site and access arrangements shall conform in all respects to the attached site plan, which is attached hereto and incorporated herein as Exhibit "A".

- F. That a temporary minimum six (6) foot height fence shall be erected as shown on the attached site plan.
- G. That a minimum of ten (10) certified peace officers shall be provided during the operating hours of the event.
- H. That a minimum of thirty (30) portable restrooms and all restrooms in the building shall be provided during all operating hours of the event.
- I. That the event must provide and maintain all requirements of the Fire Code:
 - 1. Gates shall not be locked or secured in any way to prevent immediate access or opening to a public way;
 - 2. Gate leafs shall open in the direction of egress;
 - 3. All staff assigned to gate security shall have working knowledge of the operational features of each gate and emergency evacuation planning specific to this event;
 - 4. Food preparation utilizing open flame shall have a portable fire extinguisher within an acceptable travel distance; and
 - 5. The applicant must call for an inspection by the Fire Marshal prior to commencing operation.
- J. That the temporary fence, stage, food and beverage booths, portable toilets, ice trailer, and any associated litter shall be removed from the event no later than 6:00 p.m. on June 16, 2013.
- K. That the applicant shall obtain approval from the Utilities Department for a refuse collection and clean-up plan prior to the event.
- L. That the Code Administration Division shall be notified no later than 48 hours preceding the event.
- M. That Scott Gunn shall be responsible for ensuring that the conditions of this permit are observed.

SECTION THREE. The City Council reserves at all times the full right and power to revoke said temporary use for violation of any of its terms or any misrepresentations contained in the application, after a hearing of which the holder of said temporary use has been given at least one (1) day notice.

On motion of Council member _____, seconded by Council member _____, the above and foregoing resolution was adopted by the City Council of the City of Midland at a regular meeting on the _____ day of _____, A.D., 2013, by

the following vote:

Council members voting “AYE”:

Council members voting “NAY”:

W. Wesley Perry, Mayor

ATTEST:

Amy M. Turner, City Secretary

RECOMMENDED AND APPROVED:

Courtney Sharp, City Manager

APPROVED AS TO CONTENT
AND COMPLETENESS:

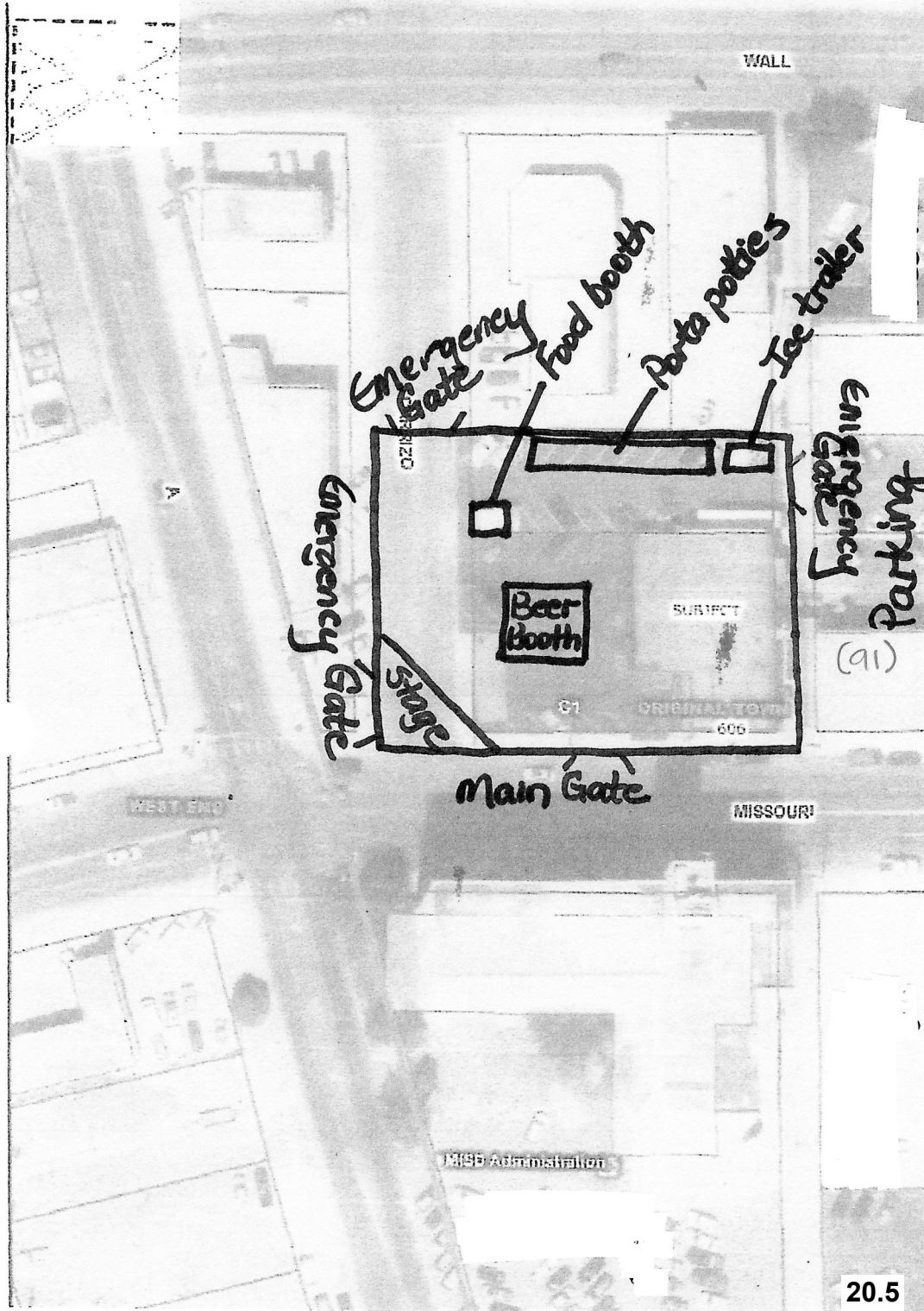
James R. Nichols, Assistant City Manager

APPROVED AS TO FORM:

Keith Stretcher, City Attorney



ZONING MAP



— = fencing

RECEIVED

APR 29 2013

CITY OF MIDLAND
PLANNING DIVISION OFFICE

SITE PLAN

CASE NO. M-13-010

CITY OF MIDLAND, TEXAS
Planning Division

TEMPORARY LAND USE PERMIT APPLICATION

Submission Requirements: Application shall be submitted to the Planning Division not less than eighteen (18) days prior to the City Council meeting at which action is desired.

Application is hereby made to the City Council for a Temporary Land Use Permit:

Name of Applicant: MIDLAND RESTAURANTS INC. ^{DBA The Bar} Phone: 4326851757
Applicant's Address: 606 W. MISSOURI E-mail: texrebel1@gmail.com
Property Owner: Wall St. Joint Ventures Phone: 4326873355
Owner's Address: 206 N. Main 79707 E-mail: _____

Other required information:

1. Street address and legal description of property: 606 W. Missouri
LOTS 7, 8, and 9
BLOCK 61, Original Town, MIDLAND, MIDLAND
COUNTY, TEXAS
2. Zoning District: C-1 COMMERCIAL
3. Type of temporary use requested: LIVE MUSIC w/ ALCOHOL
4. Duration of temporary use: _____
If more than One (1) day and is located within any residential district or is located within 1000 feet of any residential district, then a public hearing is required.
5. Proposed days and hours: SATURDAY JUNE 15th 2013
5:00pm - 12:00am
6. Will alcoholic beverages be sold? ☒ Yes _____ No
7. A detailed Site Plan is required (16 copies needed (FOLDED), plus digital - .jpg and .pdf). Show existing buildings, parking, access arrangements, surrounding streets, activity areas, areas of alcoholic beverage sales, proposed street closures, etc.
Site Plan received: ☒ Yes _____ No

8. Are you requesting the temporary closure of any streets? ☒ Yes ☐ No

If yes, you must:

- A. Obtain and complete the "Special Event and Street Closure Application", available in the Transportation Division office (5th Floor, City Hall).
- B. Provide the City with a **general liability insurance certificate**, naming the **City** as an **Additional Insured**, in the amount of one million dollars (\$1,000,000) for the term of the closure.

9. Other information: Number of security guards provided: 10
Number of restrooms provided: 30
Type of music (carnival, live, etc.): LIVE
Showmobile requested Days and hours

10. A **\$500.00 Clean-up Deposit** and a **\$500.00 Damage Deposit** are required for all events. Checks need to be dated day of event. Inspection of site after the event for trash and damage is a City responsibility. The deposits, or a portion thereof, may be refunded following inspection.

Clean-up Deposit received: ☒ (Y) ☐ (N) **Clean-up Deposit refunded:** ☐ (Y) ☐ (%) ☐ (N)

Damage Deposit received: ☒ (Y) ☐ (N) **Damage Deposit refunded:** ☐ (Y) ☐ (%) ☐ (N)

11. A **\$200 Application Review fee** is required. **Fee received:** ☐ Yes ☐ No
\$25.00 for each additional event date.

Owner or Operator (if other than Applicant) responsible for ensuring that the conditions of this permit will be observed:

Scott Gump 606 W. Missouri 685-1757
Printed Name of Owner/Operator Address Phone

[Signature]
Signature of Owner/Operator

5-8-13
Date

[Signature]
Signature of Applicant

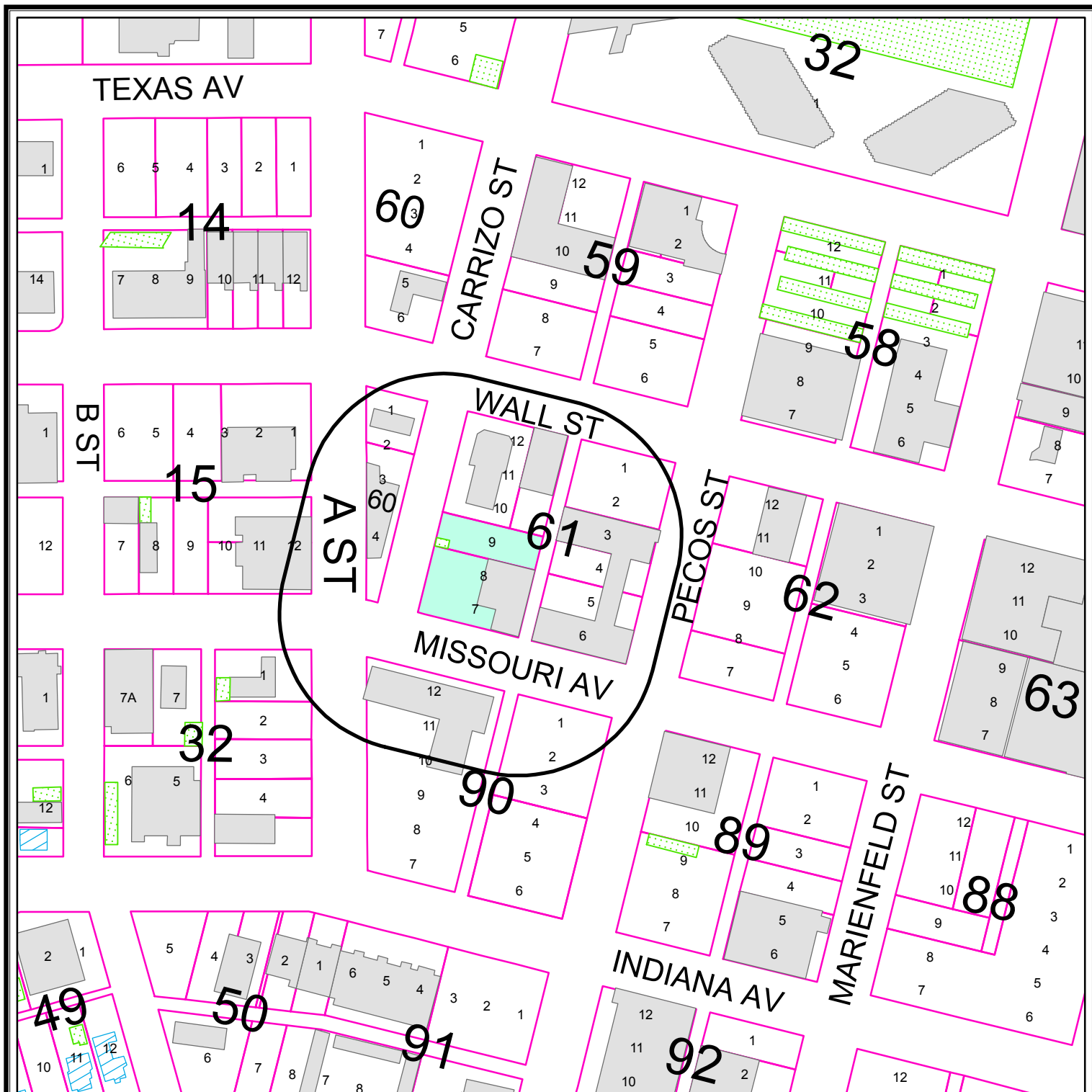
5-8-13
Date

X [Signature]
Signature of Property Owner, if other than Applicant

5-8-13
Date

****Application will not be considered for scheduling until reviewed by a planner.****

FOR OFFICE USE ONLY	
Received By: <u>MK</u>	Date: <u>5/29/13</u>
Assigned: <u>MK</u>	
For: <u>CC</u>	On: <u>5/28/13</u>



PROPERTY OWNER NOTIFICATION MAP

M - 13 - 010

Scale: 1" = 200'

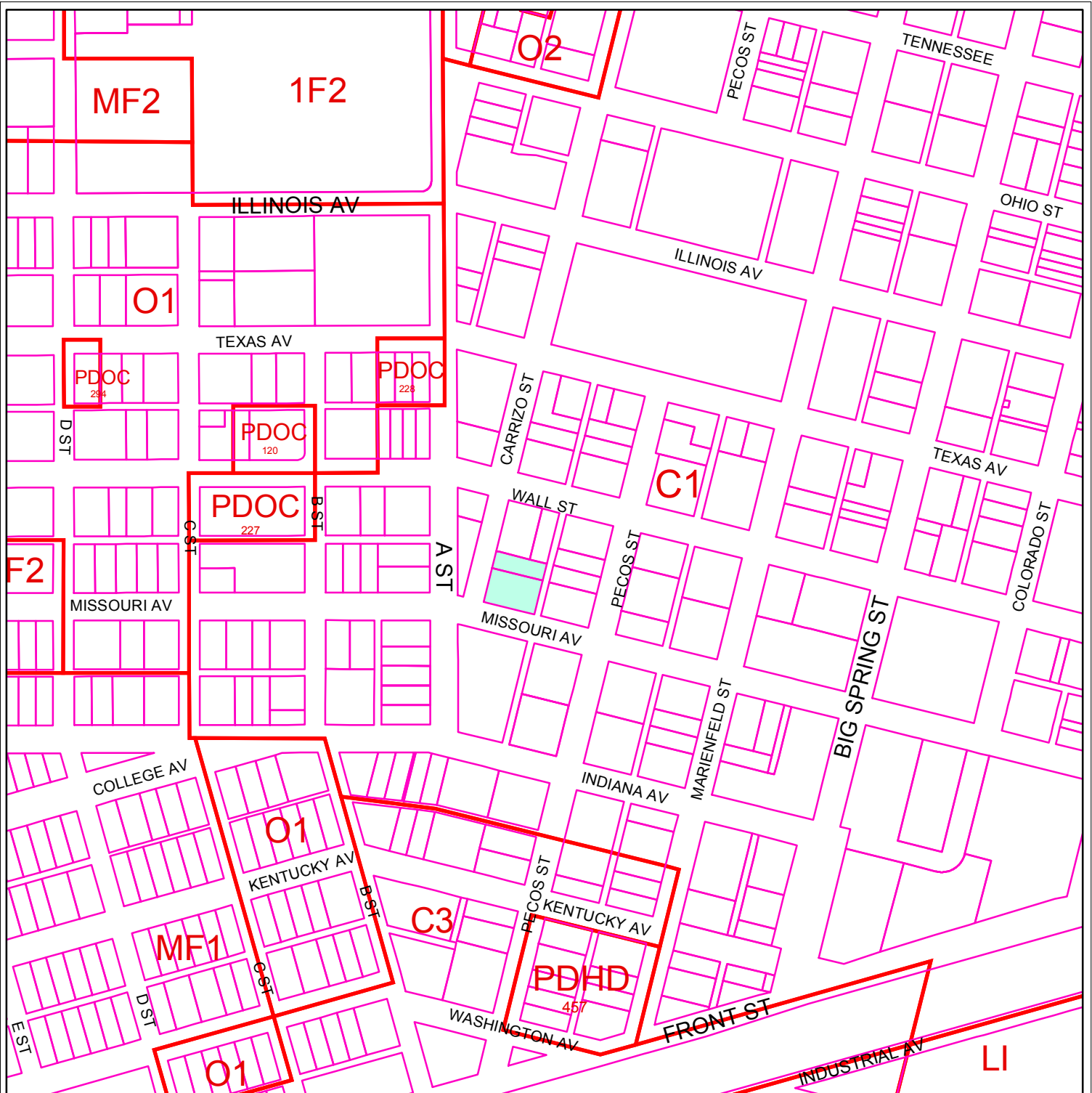
Consider a request for a Temporary Land Use Permit for a Outdoor Amusement Function on Lots 7 -9, Block 61, Original Town, City and County of Midland, Texas.

LEGEND

- CITY LIMITS
- 200 FT. LEGAL NOTICE LIMIT
- PARCEL
- PUBLIC BLDGS
- PRIVATE BLDGS
- ACCESSORY BLDGS



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ZONING MAP

M - 13 - 010

Scale: 1" = 400'

Consider a request for a Temporary Land Use Permit for a Outdoor Amusement Function on Lots 7 -9, Block 61, Original Town, City and County of Midland, Texas.

LEGEND

ZONING PARCELS

ZONING DISTRICTS:

FD	FUTURE DEVELOPMENT	BP	BUSINESS PARK
PD	PLANNED DISTRICT	P	PARKING
AE	AGRICULTURE ESTATE	01, 02	OFFICE
CE	COUNTRY ESTATE	NS	NEIGHBORHOOD SERVICE
1F1, 1F2, 1F3	ONE-FAMILY DWELLING	LR1, LR2, LR3	LOCAL RETAIL
MH	MOBILE HOME DWELLING	C1, C2, C3	COMMERCIAL
TH	TOWNHOUSE DWELLING	IP, IP1, IP2, IP3	INDUSTRIAL PARK
2F	TWO-FAMILY DWELLING	LI	LIGHT INDUSTRY
MF1, MF2	MULTIPLE FAMILY DWELLING	HI	HEAVY INDUSTRY

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City Council Agenda

Approved for Agenda:
JNichols
City Manager's Office

MEETING DATE: May 28, 2013

TO: CITY COUNCIL/CITY MANAGER

FROM: Ken VanDyne, Acting Planning Division Manager

SUBJECT: Hold a public hearing at approximately 10:45 a.m. and consider an ordinance on a request by Saltgrass Inc. for a Specific Use Permit with Term for on-premise consumption of alcoholic beverages in a restaurant on Lot 5, Block 44, Fairmont Park addition, Section 26, City and County of Midland, Texas. (Generally located on the south side of W. Loop 250 North, approximately 450 feet west of N. Midland Drive.)

Purpose:

Hold a public hearing at approximately 10:45 a.m. and consider an ordinance on a request by Saltgrass Inc. for a Specific Use Permit with Term for on-premise consumption of alcoholic beverages in a restaurant on Lot 5, Block 44, Fairmont Park addition, Section 26, City and County of Midland, Texas. (Generally located on the south side of W. Loop 250 North, approximately 450 feet west of N. Midland Drive.)

Recommended City Council Action

☒ Approve

☐ Deny

☐ Direction/Informational

Fiscal Impact:

There is no cost to the City to process this request.

Discussion:

Saltgrass Steakhouse is planning on opening its new location in June, and is requesting a specific use permit with term for the sale of on premise consumption for alcoholic beverages in a restaurant. The restaurant area is approximately 7,439 square feet, and the applicant is requesting occupancy of 392 seats. Hours of the sale and consumption of alcoholic beverages being requested by the applicant include Sunday thru Thursday from 11:00 a.m. until 10:00 p.m., and Friday thru Saturday from 11:00 a.m. until 11:00 p.m. The Building Official has set the seating capacity for this establishment at 375 occupants. To allow flexibility to the owner, staff recommends extending the hours of beverage service until midnight for seven days a week; Monday through Sunday.

Attachments: Exhibit A

ORDINANCE NO. _____

AN ORDINANCE CHANGING THE ZONING USE CLASSIFICATION OF THE PROPERTY DESCRIBED AS LOT 5, BLOCK 44, FAIRMONT PARK ADDITION, SECTION 26, CITY AND COUNTY OF MIDLAND, TEXAS (GENERALLY LOCATED ON THE SOUTH SIDE OF WEST LOOP 250 NORTH, APPROXIMATELY 450 FEET WEST OF NORTH MIDLAND DRIVE), WHICH IS PRESENTLY ZONED PD, PLANNED DISTRICT FOR A SHOPPING CENTER, BY PERMITTING SAID PROPERTY TO BE USED UNDER A SPECIFIC USE PERMIT WITH TERM FOR THE SALE OF ALL ALCOHOLIC BEVERAGES IN A RESTAURANT FOR ON-PREMISES CONSUMPTION; MAKING SAID PERMIT SUBJECT TO CERTAIN CONDITIONS AND RESTRICTIONS CONTAINED HEREIN; CONTAINING A CUMULATIVE CLAUSE; CONTAINING A SAVINGS AND SEVERABILITY CLAUSE; PROVIDING FOR A MAXIMUM PENALTY OR FINE OF TWO THOUSAND DOLLARS (\$2,000.00); AND ORDERING PUBLICATION

WHEREAS, the City Planning and Zoning Commission and the Governing Body of the City of Midland, Texas, in compliance with the City Charter and the State law with reference to the granting of specific use permits under the zoning ordinance regulations and zoning map, have given the requisite notices by United States mail, publication and otherwise; and after holding due hearings affording a full and fair hearing to all of the property owners generally, and particularly to those interested persons situated in the affected area and in the vicinity thereof, the Governing Body of the City of Midland finds that the public convenience will be best served by the granting of a Specific Use Permit With Term, set out hereinafter, on the property described in Section One hereof;

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF MIDLAND, TEXAS:

SECTION ONE. That the zoning use classification of the following described property, which is presently zoned PD, Planned District for a Shopping Center, to-wit:

Lot 5, Block 44, Fairmont Park Addition, Section 26, City and County of Midland, Texas;

is hereby changed to permit said property to be used under a Specific Use Permit With Term for the sale of all alcoholic beverages for on-premises consumption in a restaurant, together

with the uses permitted in the present PD, Planned District for a Shopping Center.

SECTION TWO. That said property shall be subject to the following conditions and restrictions:

- A. That the restaurant shall be limited to 4,780 contiguous square feet.
- B. That the occupancy shall be limited to 375 seats for the restaurant, patio and waiting areas.
- C. That the days and hours of alcoholic beverage sales and consumption shall be limited to the following: Sunday through Thursday from 11:00 a.m. to 12:00 a.m. (Midnight); and Friday and Saturday from 11:00 a.m. to 12:00 a.m. (Midnight).
- D. That the sale and on-premise consumption of alcoholic beverages shall conform to all applicable laws established by the City of Midland and the State of Texas.

SECTION THREE. The provisions of this ordinance are to be cumulative of all other ordinances or parts of ordinances governing or regulating the same subject matter as that covered herein; provided, however, that all prior ordinances or parts of ordinances, inconsistent with or in conflict with any of the provisions of this ordinance are hereby expressly repealed to the extent of any such inconsistency or conflict.

SECTION FOUR. If any section, subsection, sentence, clause or phrase of this ordinance is, for any reason, held to be unconstitutional or invalid, such holding shall not affect the validity of the remaining portions of this ordinance. The Council of the City of Midland hereby declares that it would have passed this ordinance and each section, subsection, sentence, clause, or phrase hereof irrespective of the fact that any one or more sections, subsections, sentences, clauses, or phrases be declared unconstitutional or invalid.

SECTION FIVE. The penalty for violation of this ordinance shall be in accordance with the general penalty provisions contained in Section 1-3-1 of the City Code of Midland, Texas, which provides for a fine not exceeding two thousand dollars (\$2,000.00).

SECTION SIX. The City Secretary is hereby authorized and directed to publish the descriptive caption of this ordinance in the manner and for the length of time prescribed by the law as an alternative method of publication.

The above and foregoing ordinance was duly proposed, read in full and adopted on first reading, the _____ day of _____, A.D., 2013; and passed to second reading on motion of Council member _____, seconded by Council member _____, by the following vote:

Council members voting "AYE":

Council members voting "NAY":

The above and foregoing ordinance was read in full and finally adopted by the following vote upon motion of Council member _____, seconded by Council member _____, on the _____ day of _____, A.D., 2013, at a regular meeting of the City Council:

Council members voting "AYE":

Council members voting "NAY":

PASSED AND APPROVED THIS _____ day of _____, A.D., 2013.

W. Wesley Perry, Mayor

ATTEST:

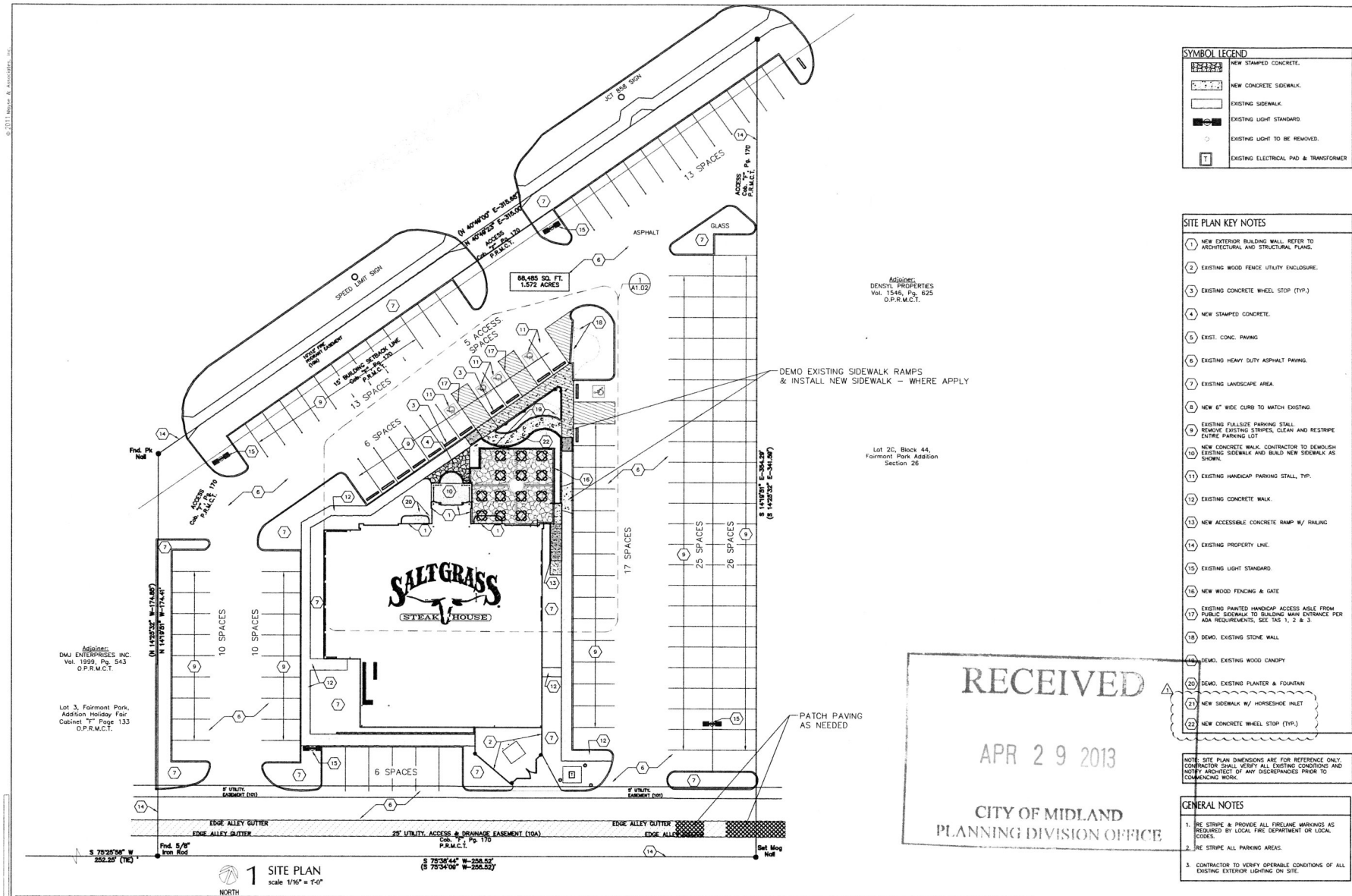
Amy M. Turner, City Secretary

APPROVED AS TO CONTENT
AND COMPLETENESS:

James R. Nichols, Assistant City Attorney

APPROVED AS TO FORM:

Keith Stretcher, City Attorney



SITE & BUILDING DATA		PARKING ANALYSIS		LEGAL DESCRIPTION
ZONE:	P05C	PARKING REQUIRED:		LOT 5, BLOCK 44, FAIRMONT PARK ADDITION, SECT 28, OWNER: LANDRY'S RESTAURANTS, INC., OCCUPANCY GROUP: AS OCCUPANT LOAD: 364 RESTAURANT
LOT AREA:	68,485 SQ. FT. (1.572 ACRES)	RESTAURANT SF	7,825 SF	
RESTAURANT AREA:		7,825 SF/ 100 SF GF/ STALL	78 STALLS	
BUILDING:	7,438 SFT	PARKING PROVIDED:		
COOLING/FREEZER/DRY STO AREA:	406 SFT	STANDARD STALLS (9' X 18')	124 STALLS	PROJECT DESCRIPTION
SEATING:		HANDICAP/VAN STALLS (9' X 20')	5 STALLS	
RESTAURANT:	333 SEATS	STALLS PROVIDED ON-SITE	129 STALLS	
		TOTAL STALLS PROVIDED	129 STALLS	
SINGLE STORY BUILDING WOOD FRAMED				1. CONVERT AN EXISTING RESTAURANT INTO A GRAB-N-GO RESTAURANT.
TYPE VI CONSTRUCTION				
FULLY SPRINKLERED BUILDING				
MIN. LANDSCAPING 15%	(10,291 SF)			
35' MAXIMUM BUILDING HEIGHT				2. MODIFY PARAPET, ENTRANCE TOWER, INTERIOR LAYOUT AND DECOR.
				3. MODIFICATIONS INCLUDE SIDEWALKS, ACCESSIBLE RAMP AND SIGNAGE. SIGNAGE IS UNDER A SEPARATE PERMIT.

NOTE: SITE PLAN DIMENSIONS ARE FOR REFERENCE ONLY.
CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND
NOTIFY ARCHITECT OF ANY DISCREPANCIES PRIOR TO
COMMENCING WORK.

SYMBOL LEGEND	
	NEW STAMPED CONCRETE.
	NEW CONCRETE SIDEWALK.
	EXISTING SIDEWALK.
	EXISTING LIGHT STANDARD.
	EXISTING LIGHT TO BE REMOVED.
	EXISTING ELECTRICAL PAD & TRANSFORMER.

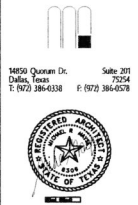
SITE PLAN KEY NOTES

1. NEW EXTERIOR BUILDING WALL. REFER TO ARCHITECTURAL AND STRUCTURAL PLANS.
2. EXISTING WOOD FENCE UTILITY ENCLOSURE.
3. EXISTING CONCRETE WHEEL STOP (TYP.)
4. NEW STAMPED CONCRETE.
5. EXIST. CONC. PAVING.
6. EXISTING HEAVY DUTY ASPHALT PAVING.
7. EXISTING LANDSCAPE AREA.
8. NEW 6" WIDE CURB TO MATCH EXISTING.
9. EXISTING FULL-SIZE PARKING STALL. REMOVE EXISTING STRIPES, CLEAN AND RESTRIPE ENTIRE PARKING LOT.
10. NEW CONCRETE WALK. CONTRACTOR TO DEMOLISH EXISTING SIDEWALK AND BUILD NEW SIDEWALK AS SHOWN.
11. EXISTING HANDICAP PARKING STALL, TYP.
12. EXISTING CONCRETE WALK.
13. NEW ACCESSIBLE CONCRETE RAMP W/ RAILING.
14. EXISTING PROPERTY LINE.
15. EXISTING LIGHT STANDARD.
16. NEW WOOD FENCING & GATE.
17. EXISTING PAINTED HANDICAP ACCESS ASILE FROM PUBLIC SIDEWALK TO BUILDING MAIN ENTRANCE PER ADA REQUIREMENTS, SEE TABS 1, 2 & 3.
18. DEMO. EXISTING STONE WALL.
19. DEMO. EXISTING WOOD CANOPY.
20. DEMO. EXISTING PLANTER & FOUNTAIN.
21. NEW SIDEWALK W/ HORSESHOE INLET.
22. NEW CONCRETE WHEEL STOP (TYP.)

NOTE: SITE PLAN DIMENSIONS ARE FOR REFERENCE ONLY.
CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND
NOTIFY ARCHITECT OF ANY DISCREPANCIES PRIOR TO
COMMENCING WORK.

GENERAL NOTES

1. RE STRIPE & PROVIDE ALL FIRELINE MARKINGS AS REQUIRED BY LOCAL FIRE DEPARTMENT OR LOCAL CODES.
2. RE STRIPE ALL PARKING AREAS.
3. CONTRACTOR TO VERIFY OPERABLE CONDITIONS OF ALL EXISTING EXTERIOR LIGHTING ON SITE.



14550 Quorum Dr. Suite 201
Dallas, Texas 75244
T: (972) 384-4338 F: (972) 384-0578

SALTGRASS
STEAK HOUSE
4511 West Loop 2nd
Midland, Texas



LANDRY'S RESTAURANTS, INC.
1510 W. LOOP SOUTH
HOUSTON, TEXAS 77027
LANDRY'S RESTAURANT, INC.
1510 WEST LOOP SOUTH
HOUSTON, TX 77027

Issue date:
02/25/2013 DEMOLITION PERMIT
02/28/2013 PRELIM. BD. 101
03/13/2013 ISSUE FOR PERMIT
04/09/2013 PERMIT & 345 REVISIONS
04/09/2013 CONSTRUCTION

checked by
project manager: C.C.
date: 02/25/2013
division manager: G.D.
date: 02/25/2013
job no. 12077
sheet no. OVERALL SITE PLAN
sheet no. A1.01

EXHIBIT A

CASE NO. S-13-007

Case Number: 8-13-007

CITY OF MIDLAND
Planning Division

**APPLICATION FOR A SPECIFIC USE PERMIT WITH TERM
FOR THE SALE OF ALCOHOLIC BEVERAGES
FOR ON-PREMISE CONSUMPTION**

Saltgrass Inc. 713-386-7253
Applicant Name Phone/e-mail
4511 West Loop 250 North , Midland , Tx 79707
Address Zip Code

National Retail Properties LP 407-650-3695
Property Owner Name Phone/e-mail
450 South Orange Avenue, Suite 900 32801
Address Zip Code

Operator (if different from Applicant or Property Owner) Phone/e-mail
Address Zip Code

Type of Business: Restaurant
(Restaurant, Bar, Lounge, Nightclub, etc.)

Street address and Legal Description of property on which SUP is desired (complete Lot, Block, and Subdivision, name, or if unplatted, attach a Metes and Bounds description with surveyor's seal.)
4511 West Loop 250 North, Midland, Tx 79707

Lot Five (5), Block Forty Four (44), Fairmont Park Addition, Section 26, an addition to the City of Midland, Midland County, Texas, according to the map or plat thereof, recorded in Cabinet "F", Page 170, Plat Records, Midland County, TX
Current Zoning: PDSC

Max. Floor Area: 7,925 sq. ft. Seating Capacity: 392

Proposed hours and days of alcoholic beverage sales: Sun-Thur 11am-10pm; Fri-Sat 11am-11pm

Reason for request: for convenience of customer

REQUIRED SUBMITTALS

1. Application fee: \$300 ✓

2. Site plan – 16 copies (FOLDED) ☒.
3. On a CD in .pdf and .jpg digital format ☒.

SIGNATURES:

Applicant: [Signature]

Date: 4/25/13

Property Owner: [Signature]

Date: _____

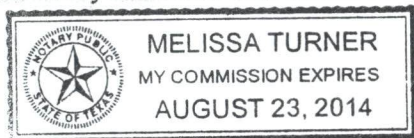
If an Agent is authorized by the property owner to file and execute the application on behalf of the property owner, the Agent must complete the affidavit below.

STATE of TEXAS
COUNTY OF MIDLAND

Before me, the undersigned authority, on this day personally appeared

Jonathan Greene who, being by me duly sworn, upon oath says: That (s)he is authorized by Saltgrass, Inc., the owner of the above described property, to fully represent him/her in this application and that (s)he had the legal right, power and authority to sign said owner's name hereto as his/her attorney in fact.

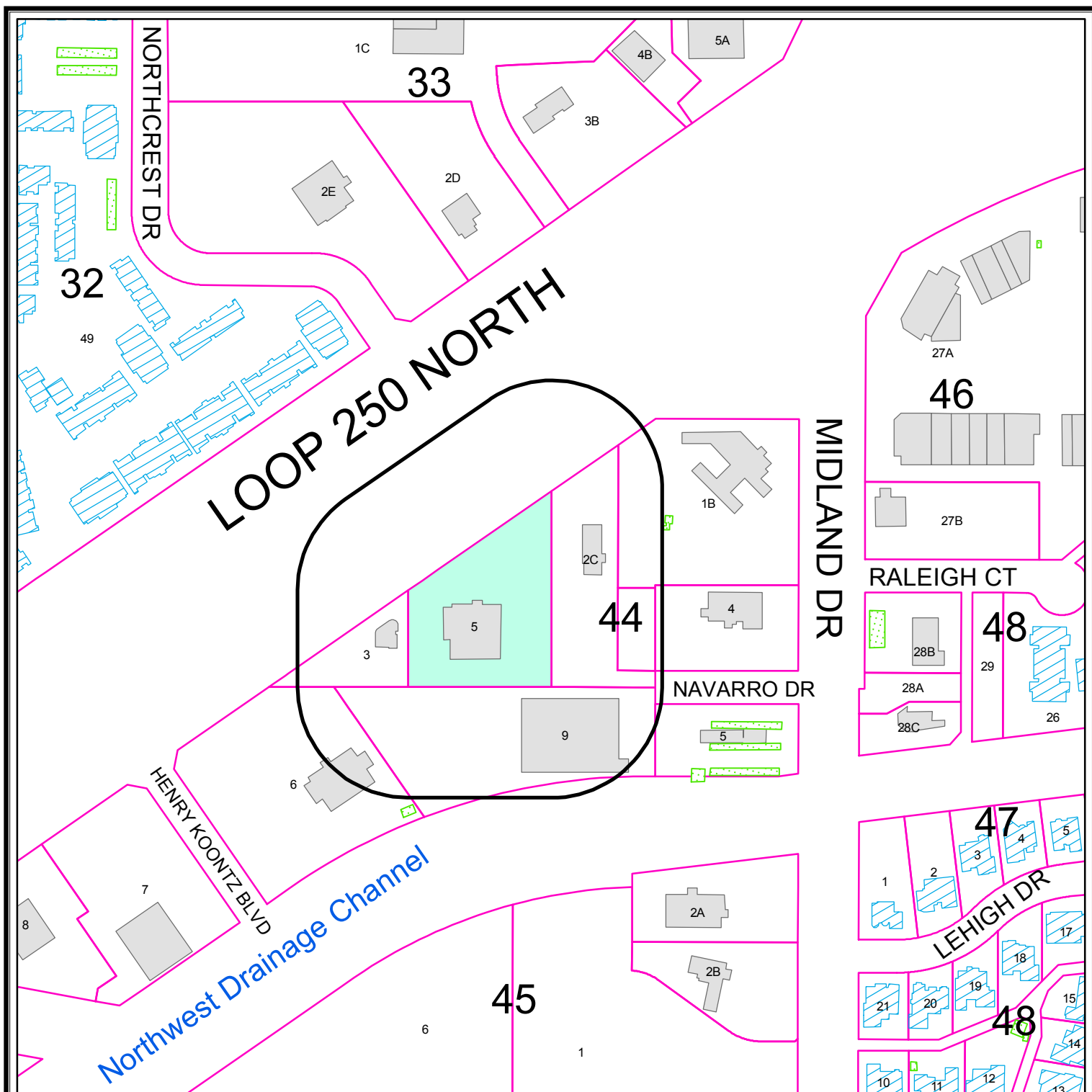
Subscribed and sworn to before me, this 25 day of April, 2013, to certify which witness my hand and seal of office.



Melissa Turner
NOTARY PUBLIC, MIDLAND COUNTY, TEXAS
Harris

FOR OFFICE USE ONLY	
Rec'd By: <u>TS</u>	Date: <u>4/29</u>
Assigned: <u>MS</u>	
For: <u>PtZ</u>	On: _____

****Application will not be considered for scheduling until reviewed by a planner.****



PROPERTY OWNER NOTIFICATION MAP

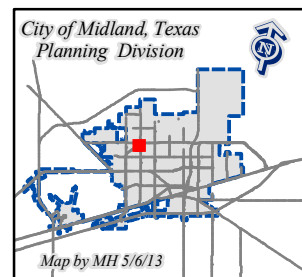
S - 13 - 007

Scale: 1" = 250'

Consider a request for a Specific Use Permit With Term for the sale of all alcoholic beverages, for on-premises consumption, in a restaurant, on Lot 5, Block 44, Fairmont Park Addition, Section 26, City and County of Midland, Texas.

LEGEND

- CITY LIMITS
- PARCEL
- PUBLIC BLDGS
- PRIVATE BLDGS
- ACCESSORY BLDGS



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ZONING MAP

S - 13 - 007

Scale: 1" = 400'

Consider a request for a Specific Use Permit With Term for the sale of all alcoholic beverages, for on-premises consumption, in a restaurant, on Lot 5, Block 44, Fairmont Park Addition, Section 26, City and County of Midland, Texas.

LEGEND

ZONING

PARCELS

ZONING DISTRICTS:

FD	FUTURE DEVELOPMENT	BP	BUSINESS PARK
PD	PLANNED DISTRICT	P	PARKING
AE	AGRICULTURE ESTATE	01, 02	OFFICE
CE	COUNTRY ESTATE	NS	NEIGHBORHOOD SERVICE
1F1, 1F2, 1F3	ONE-FAMILY DWELLING	LR1, LR2, LR3	LOCAL RETAIL
MH	MOBILE HOME DWELLING	C1, C2, C3	COMMERCIAL
TH	TOWNHOUSE DWELLING	IP J1P1, IP2, IP3	INDUSTRIAL PARK
2F	TWO-FAMILY DWELLING	LI	LIGHT INDUSTRY
MF1, MF2	MULTIPLE FAMILY DWELLING	H1	HEAVY INDUSTRY

© THE CITY OF MIDLAND 2013. THE CITY OF MIDLAND SHALL NOT BE RESPONSIBLE FOR ANY DECISIONS BASED UPON THE USE OF THIS DATA. WHILE THIS DATA IS MADE AVAILABLE TO THE PUBLIC, IT WAS CREATED FOR INTERNAL USE BY THE CITY OF MIDLAND WHICH MAKES NO CLAIM AS TO ITS ACCURACY OR COMPLETENESS. THIS DATA IS NOT DESIGNED TO BE USED AS A PRIMARY TOOL. IN PERMITTING, CITING, OR OTHER DECISIONS BASED SOLELY ON THE INFORMATION CONTAINED HEREIN,



City Council Agenda

Approved for Agenda:
JNichols
City Manager's Office

MEETING DATE: May 28, 2013

TO: CITY COUNCIL/CITY MANAGER

FROM: Ron Jenkins, Oil & Gas Compliance Coordinator

SUBJECT: Hold a public hearing at approximately 10:48 a.m. regarding a proposed oil and gas permit to Petroplex Energy, Inc. (Operator), *for a Permit to Drill an Oil & Gas Well within the City Limits*, (Western-T 8 #2) located 1260 feet from the north line and 672 feet from the east line located in Section 8, Block 39, T-1-S, T&P RR Co. Survey, City and County of Midland, Texas. (Generally located on the west side of the extension of North Midkiff Road, approximately 3/4 mile north of the extension of Green Tree Boulevard.)

Purpose:

At approximately 10:48 a.m. hold a public hearing on a request from Petroplex Energy, Inc. (Operator), *for a Permit to Drill an Oil & Gas Well within the City Limits*, (Western-T 8 #2) located 1260 feet from the north line and 672 feet from the east line located in Section 8, Block 39, T-1-S, T&P RR Co. Survey, City and County of Midland, Texas. This is an opportunity for the Council to receive public comment. Council may consider this permit following a 30-day public comment period and at a regularly scheduled meeting. No letters of objection received.

Recommended City Council Action

Approve Deny X Direction/Informational

Fiscal Impact:

There is no cost to the City to process this application.

Discussion:

The Oil and Gas Advisory Committee has reviewed this well site in detail and recommends application with updated tax certificate, updated drainage plan. Petroplex Energy, Inc. has addressed these recommendations and updated the application. The Committee is recommending the requested landscaping and irrigation variance until property changes ownership and at that time be reviewed by City Council. In addition Petroplex Energy is requesting a waiver for a road repair agreement since no city streets will be used.

Attachments: Application; Location map; Exhibit - Drill site map, Exhibit – Flow Line Location.



APPLICATION FOR OIL AND GAS PERMIT

(Pursuant to Midland City Ordinance No. 8769)

I. General Information		
Date 12/31/12	Operator Name (must match W-1) Petroplex Energy, Inc.	Operator Address 110 N. Marienfeld Midland, TX 79702
Representative Name Don Hale	Representative Address (within Midland City Limits) 3011 Garden City Hwy	Rep. Tele. 432-687-2222 Rep. Fax 432-687-2231
Fee: \$4,000.00 Rec'd Yes ___ No ___	NOTE: All attachments need to bound and put in a binder before submitting.	Pages 1-4
Permit Compliance Contact (Choose 1):		
Option A: Don Hale 24/7 Answering Service - No. 1 (Tele.): 432-687-2222 No. 2 (Tele.): 432-687-2231		
Option B: Attached as Exhibit A		
Company Compliance Representative (Name, Address, Local Telephone) (ATTACH STATEMENT AS EXHIBIT A):		
Emergency Contact Representative (Name, Address, 24-Hour Tele. No.):		
Jim McCright 432-853-7900 Greg Russell 432-853-5033		
Other Permitted Wells in City (ATTACH EXHIBIT B [see § J(26)]):		
II. Mineral Ownership		
Name(s) and Address(es) of Mineral Estate Lessors (under applicable lease):		
1. Petroplex Energy, Inc. P.O. Box 3082, Midland, TX 79702		
2. The Jeffrey Family Trust 14812 W. Ravenswood Drive		
3. Sun City West, AZ 85375		
ATTACHED AS EXHIBIT C is (a Title Opinion by John Collins, a licensed Texas Attorney/Title Commitment by Abstract Company/a Take-off from _____, a Certified Petroleum Landman/an opinion letter from _____, a licensed Texas Attorney) indicating that [Operator] has a legal right to develop the mineral estate that is the subject of this Application. [See § J(5)].		
III. Surface Ownership & Use		
General Description of Current Surface Use (within 860 feet of proposed surface location):		
Ranch/Farm		
ATTACHED AS EXHIBIT D is (a Title Opinion by John Collins, a licensed Texas Attorney/a Take-off from _____, a Certified Petroleum Landman/Current Tax Roll from Midland Central Appraisal District), which lists the name(s) and address(es) of all surface owners within 860 feet of the surface well location. [See § J(7)].		

ATTACHED AS EXHIBIT E is a (map/p lat/satellite/aerial photo) depicting all Residences, commercial structures, public buildings, all publicly dedicated Streets and alleys, Rights of Way, and permanent accessory structures surrounding the proposed Drill Site. The (map/p lat/satellite/aerial photo) includes two circles, as required by the Ordinance—one depicting a 500 foot radius and one depicting an 860 foot radius from the proposed well's surface location. [See § J(10)].

ATTACHED AS EXHIBIT F is a copy of the notification letter(s) sent to 100 percent of the surface owners, Certified Mail, Return Receipt Requested. [See § J(36)].

IV. Well & Operations Information

Proposed Well Name: Western-T 8 #2

Proposed Hole Size, Casing Program and Cementing Program (attach Exhibit as Necessary)[See § J(11) and § L(4)]:

See Attached Exhibit V

Legal Description of Proposed Well Site:

1260' FNL & 672' FEL, Sec. 8, Blk. 39, T-1-S, T&P RR Survey

ATTACHED AS EXHIBIT G is the Location Site Plan [See § J(9)].

ATTACHED AS EXHIBIT H is the Map with the proposed transportation route(s) and road(s) for equipment, chemicals, or refuse products used or produced in the proposed oil and gas operations. [See § J(12)].

ATTACHED AS EXHIBIT I is a copy of the approved Texas Railroad Commission permit to drill (Form W-1), together with all attachments (also file copy of W-1 with City Secretary before commencement of drilling operations). [See § J(16) and (20)].

ATTACHED AS EXHIBIT J is a copy of the required TCEQ report as to depth of usable quality ground water. [See § J(17)].

ATTACHED AS EXHIBIT K (if applicable) is the list of alternative locations developed in consultation with the Oil & Gas Advisory Committee. [See § J(27)].

ATTACHED AS EXHIBIT L is the Fencing and Irrigation Plan. [See § J(30)].

ATTACHED AS EXHIBIT M is the Road Repair Agreement and Letter of Credit/Certificate of Deposit/Surety Bond in the amount of at least \$25,000. Option (if applicable): Applicant would further state that no City-owned streets or alleys will be used by the Operator in connection with its oil and gas operations and as a result, requests a waiver from the Council of this requirement. Option B (if applicable): Because Applicant has three Road Repair Agreements in effect that have been approved by the Council, Applicant requests that the Council consolidate all agreements into one and is filing the necessary \$75,000 letter of credit/certificate of deposit/surety bond in conjunction with this request. [See § J(31)]. (No City Streets Will Be Used)

ATTACHED AS EXHIBIT N is the Concept Plan depicting the proposed Operations Site (which includes tanks, roads, power lines, and pipeline routes). [See § J(32)].

Description of Public Utilities required during (1) drilling and (2) operations:

- (1) Drilling: None
- (2) Operations: Sharyland

Description of water source to be used during Drilling: Western-T water wells located in S/2 of Sec. 8, Blk, 39, T-1-S, T&P RR Survey

Description of all electric lines to production facilities (reference exhibits as necessary) [See § L(10)]:
Overhead electric lines

Plan detailing construction, location, and closure of pits used for Drilling and Completion operations (attach exhibit if necessary) [See § J(35)]:

See Exhibit O

V. Additional Required Exhibits

ATTACHED AS EXHIBIT P is the *Letter of Credit/Certificate of Deposit* in accordance with Subsection (K)(2). [See § J(18)].

ATTACHED AS EXHIBIT Q are Tax certificates from Midland Central Appraisal District to be submitted indicating that all taxes on personal and real property, including minerals, owned by Applicant are current. [See § J(29)].

ATTACHED AS EXHIBIT R is the required Insurance Certificate. [See § J(19) and § K(3)].

ATTACHED AS EXHIBIT S (if applicable) is the Drainage Plan approved by the City Engineer relating to Applicant's proposed operations. [See § J(21)].

ATTACHED AS EXHIBIT T is Applicant's Emergency Action Response Plan. [See § J(22)].

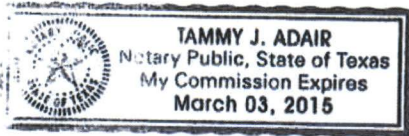
ATTACHED AS EXHIBIT U is Applicant's Hazardous Materials Management Plan, a copy of which has been submitted and is on file with the Midland Fire Department. [See § J(23)].

Petroplex Energy, Inc.
[NAME OF COMPANY]

By Don Hale
Its General Manager, Operations

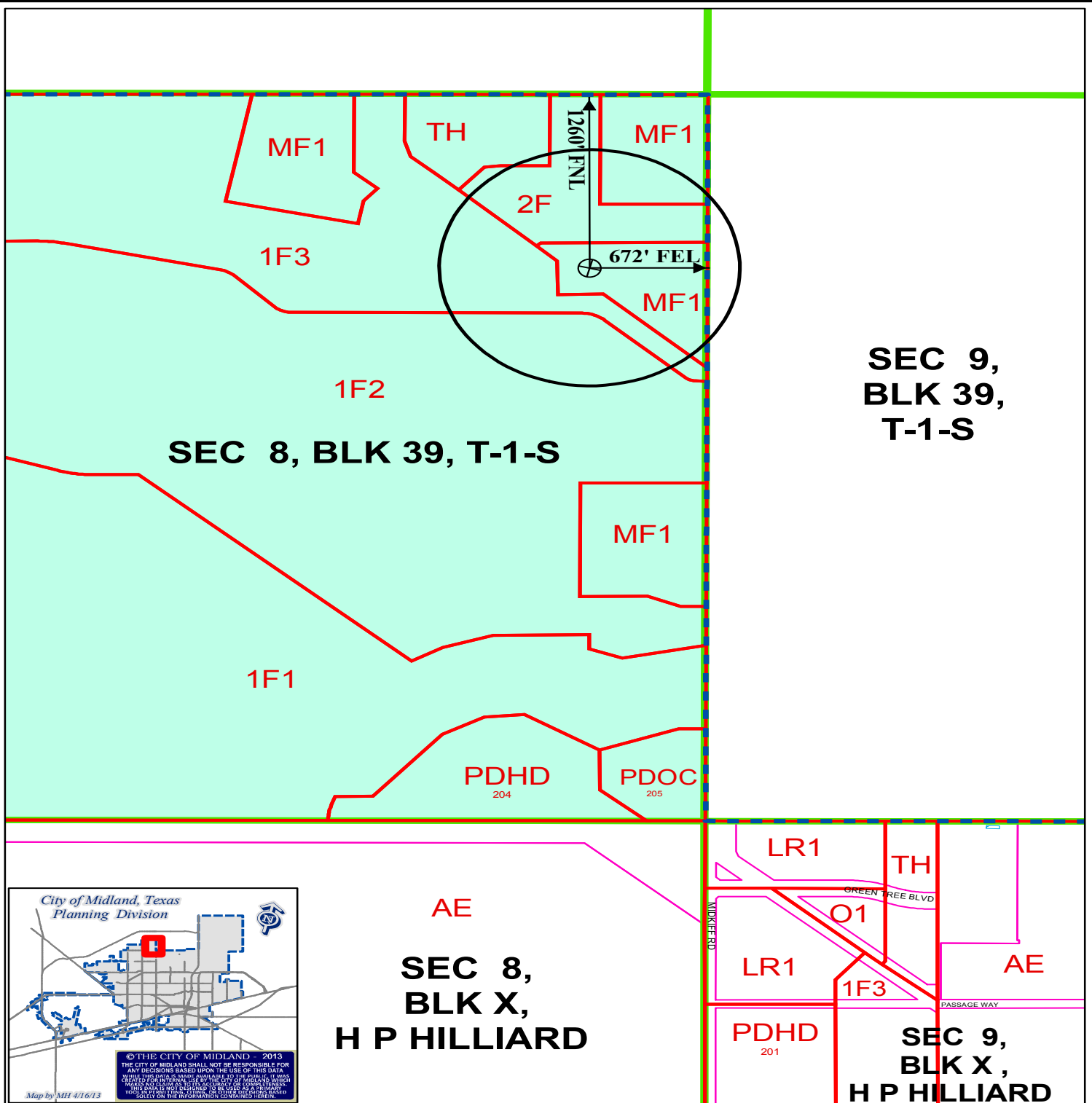
County of Midland) State of Texas)

Don Hale, personally appeared before me, and being first duly sworn declared he/she signed the application in the capacity designated, if any, and further states that he/she has read the above application and attached exhibits and the statements therein are true and correct to the best of their knowledge.



Tammy J. Adair
Notary Public, State of Texas

[SEAL]



LOCATION AND ZONING MAP

O - 13 - 003

Scale: 1" = 800'

Consider a request for a Permit to drill an Oil and Gas Well within the City Limits located 1260' FNL and 672' FEL, Section 8, Block 39, T-1-S, T & P RR Co. Survey, Midland County, Texas.

Western-T 8 #2

LEGEND

	CITY PARCELS		PUBLIC BLDGS		CITY LIMITS
	COUNTY PARCELS		PRIVATE BLDGS		860 FT. BUFFER
	ZONING		ACCESSORY BLDGS		SURVEY SEC.

ZONING DISTRICTS:

FD	FUTURE DEVELOPMENT	BP	BUSINESS PARK
PD	PLANNED DISTRICT	P	PARKING
AE	AGRICULTURE ESTATE	O1, O2	OFFICE
1F1, 1F2, 1F3	ONE-FAMILY DWELLING	NS	NEIGHBORHOOD SERVICE
MH	MOBILE HOME DWELLING	LR1, LR2, LR3	LOCAL RETAIL
TH	TOWNHOUSE DWELLING	C1, C2, C3	COMMERCIAL
2F	TWO-FAMILY DWELLING	IP, JP1, IP2, IP3	INDUSTRIAL PARK
MF1, MF2	MULTIPLE FAMILY DWELLING	LI	LIGHT INDUSTRY
		HI	HEAVY INDUSTRY

GRAPHIC SCALE

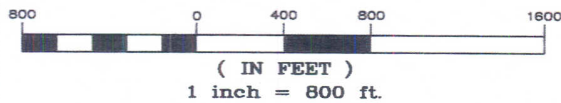
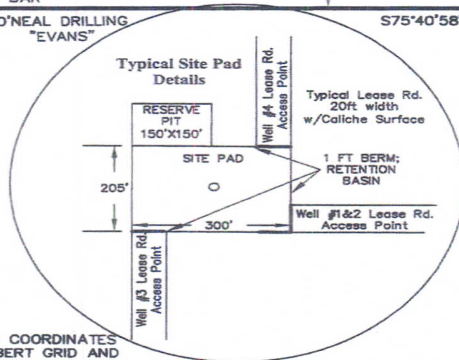
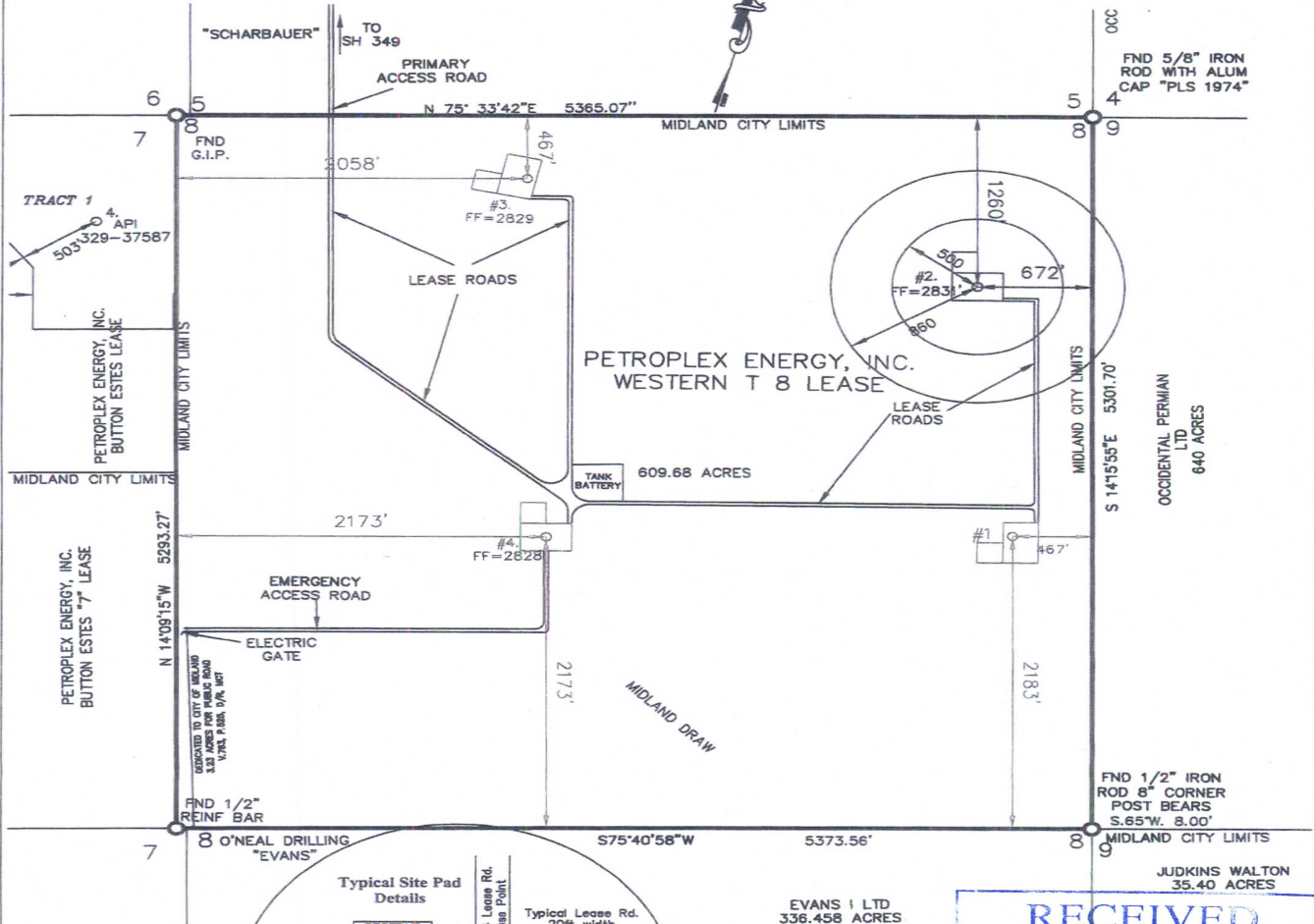


EXHIBIT "G"



NOTES:

COURSES, DISTANCES AND COORDINATES SHOWN HEREON ARE LAMBERT GRID AND CONFORM TO THE "TEXAS COORDINATE SYSTEM", TEXAS CENTRAL ZONE, NORTH AMERICAN DATUM OF 1983. ALL DISTANCES AND COORDINATES ARE SHOWN IN GRID FEET.

THE UNDERSIGNED DOES HEREBY CERTIFY THAT THIS LOCATION WAS THIS DAY MADE ON THE GROUND BY ME OR UNDER MY SUPERVISION AND THAT THIS PLAT IS A CORRECT REPRESENTATION THEREOF.

DATED THIS 9th DAY OF April, 2013

RJ DAUM
TEXAS RPLS 4826



revised lease name 10-25-2012

SCHUMANN ENGINEERING CO., INC.

REGISTERED PROFESSIONAL LAND SURVEYORS
LICENSED STATE LAND SURVEYORS

REGISTERED PROFESSIONAL CIVIL ENGINEERS
TEXAS and NEW MEXICO

Civil Engineering ~ Land Surveying

408 N. PECOS STREET - P. O. BOX 504
MIDLAND, TEXAS 79702-0504

Office (432) 684-5548
Fax (432) 684-6973

RECEIVED

MAY - 6 2013

CITY OF MIDLAND
PLANNING DIVISION OFFICE

WELLS NO. 1,2,3,&4 ARE LOCATED APPROXIMATELY 6.0 MILES IN A NW DIRECTION FROM MIDLAND, TEXAS WHICH IS THE NEAREST TOWN IN THE COUNTY

SITE PLAN

PETROPLEX ENERGY, INC.
WELL #2
WESTERN T8 LEASE

WELL NO. 2 [1260ft/NL, 672 ft/EL]

SECTION 8, ABSTRACT 719,
BLOCK 39, T-1-S, T&P RR CO SURVEY,
MIDLAND COUNTY, TEXAS

QUAD: NORTHWEST MIDLAND
SCALE: 1" = 800'

PROJECT: 73423PEI
JOB NO: 73,423



City Council Agenda

Approved for Agenda:
JNichols
City Manager's Office

MEETING DATE: May 28, 2013

TO: CITY COUNCIL/CITY MANAGER

FROM: Ken Van Dyne, Acting Planning Division Manager

SUBJECT: Consider an ordinance on a request by Mike Massey for the *vacation* of the 0.30-acre alley adjacent to Lots 1 through 5, Block 5, of the 1.45-acre alley adjacent to Lots 1 through 14, Block 6, of the 0.90-acres of the right-of-way of Mandy Lane adjacent to Lots 1 through 9, Block 6 and to Lots 1 through 9, Block 7 and the 1.78-acres of the right-of-way of Corporate Drive and Spring Park Drive adjacent to Lots 1 through 5, Block 5 and Lots 10 through 14, Block 6, all out of Corporate Plaza, Section 4, City and County of Midland, Texas. (Generally located on the east side of Edwards Street, approximately 870 feet north of E. Wadley Avenue.)

Purpose:

Consider an ordinance on a request by Mike Massey for the *vacation* of the 0.30-acre alley adjacent to Lots 1 through 5, Block 5, of the 1.45-acre alley adjacent to Lots 1 through 14, Block 6, of the 0.90-acres of the right-of-way of Mandy Lane adjacent to Lots 1 through 9, Block 6 and to Lots 1 through 9, Block 7 and the 1.78-acres of the right-of-way of Corporate Drive and Spring Park Drive adjacent to Lots 1 through 5, Block 5 and Lots 10 through 14, Block 6, all out of Corporate Plaza, Section 4, City and County of Midland, Texas. (Generally located on the east side of Edwards Street, approximately 870 feet north of E. Wadley Avenue.)

Recommended City Council Action

☒ Approve

☐ Deny

☐ Direction/Informational

Fiscal Impact:

Receipt of \$19,321.00 in exchange for right-of-way vacation.

Discussion:

The area surrounding these rights-of-way was zoned and platted in 1982, and has since remained vacant. Mike Massey wishes to consolidate these lots into a single lot for the

purpose of constructing apartments. The zone change was approved earlier this year, and a preliminary plat has been approved, conditioned upon the abandonment of the undeveloped internal rights-of-way. None of the franchised utility companies object to this request. Therefore, these rights-of-way are not needed for any public purpose, and the staff recommends that they be abandoned. MCAD has set the value of this property at \$0.10/sq. ft, or \$19,321. Staff recommends payment of this amount, unless otherwise determined by the City Council, in consideration of this requested abandonment.

Attachments:

Proposed Ordinance
Exhibits A, B, C and D

ORDINANCE NO.

AN ORDINANCE VACATING AND ABANDONING A 0.30-ACRE ALLEY ADJACENT TO LOTS 1-5, BLOCK 5, A 1.45-ACRE ALLEY ADJACENT TO LOTS 1-14, BLOCK 6, A 0.90-ACRE PORTION OF MANDY LANE RIGHT-OF-WAY ADJACENT TO LOTS 1-9, BLOCK 6, AND TO LOTS 1-9, BLOCK 7, AND A 1.78-ACRE PORTION OF CORPORATE DRIVE RIGHT-OF-WAY AND SPRING PARK DRIVE RIGHT-OF-WAY ADJACENT TO LOTS 1-5, BLOCK 5, AND TO LOTS 10-14, BLOCK 6, ALL OUT OF CORPORATE PLAZA, SECTION 4, CITY AND COUNTY OF MIDLAND, TEXAS (GENERALLY LOCATED THE EAST SIDE OF EDWARDS STREET, APPROXIMATELY 870 FEET NORTH OF EAST WADLEY AVENUE); ADOPTING THE APPRAISAL BY THE CITY MANAGER OF \$19,321.00; AND ORDERING RECORDATION BY THE CITY SECRETARY

WHEREAS, it has been determined by the Midland City Council that a 0.30-acre alley adjacent to Lots 1-5, Block 5, a 1.45-acre alley adjacent to Lots 1-14, Block 6, a 0.90-acre portion of Mandy Lane right-of-way adjacent to Lots 1-9, Block 6, and to Lots 1-9, Block 7, and a 1.78-acre portion of Corporate Drive right-of-way and Spring Park Drive right-of-way adjacent to Lots 1-5, Block 5, and to Lots 10-14, Block 6, all out of Corporate Plaza, Section 4, City and County of Midland, Texas, are no longer needed for public use; and

WHEREAS, Section 272.001 of the Texas Local Government Code provides that a political subdivision may not convey, sell, or exchange its interest in land without observing notice and bid requirements, unless the conveyance is to one or more abutting property owners; and

WHEREAS, an application for vacating the right-of-way has been received by the City from the abutting property owner; and

WHEREAS, the City Manager has appraised the value of the City's property interest in the right-of-way at \$19,321.00, as shown in Exhibit "E" attached hereto and incorporated herein by reference; and

WHEREAS, the Council finds it to be in the public interest to abandon and vacate

the right-of-way described herein;

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF MIDLAND, TEXAS:

SECTION ONE. That the 0.30-acre alley adjacent to Lots 1-5, Block 5, the 1.45-acre alley adjacent to Lots 1-14, Block 6, the 0.90-acre portion of Mandy Lane right-of-way adjacent to Lots 1-9, Block 6, and to Lots 1-9, Block 7, and the 1.78-acre portion of Corporate Drive right-of-way and Spring Park Drive right-of-way adjacent to Lots 1-5, Block 5, and to Lots 10-14, Block 6, all out of Corporate Plaza, Section 4, City and County of Midland, Texas, as described in Exhibits “A”, “B”, “C” and “D” attached hereto and made a part hereof for all legal purposes, are hereby vacated and abandoned for all public purposes. Provided, however, that the City is hereby only abandoning the public interest in said property and this ordinance in no way affects any private easement or access easement which abutting property owners may have in said right-of-way.

SECTION TWO. That this Ordinance shall not be effective until the City of Midland has received from the property owner(s) the sum of \$19,321.00.

SECTION THREE. That upon the City’s receipt of the sum set forth in Section Two hereof, the City Secretary is hereby authorized and directed to file a certified copy of this Ordinance with the County Clerk of Midland County, Texas, for purposes of recording in the Official Records of Midland County, Texas.

The above and foregoing ordinance was duly proposed, read in full and adopted on first reading, the _____ day of _____, A.D., 2013; and passed to second reading on motion of Council member _____, seconded by Council member _____, by the following vote:

Council members voting “AYE”:

Council members voting “NAY”:

The above and foregoing ordinance was read in full and finally adopted by the following vote upon motion of Council member _____, seconded by Council member _____, on the _____ day of _____, A.D., 2013, at a regular meeting of the City Council:

Council members voting "AYE":

Council members voting "NAY":

PASSED AND APPROVED THIS _____ day of _____, A.D., 2013.

W. Wesley Perry, Mayor

ATTEST:

Amy M. Turner, City Secretary

APPROVED AS TO CONTENT
AND COMPLETENESS:

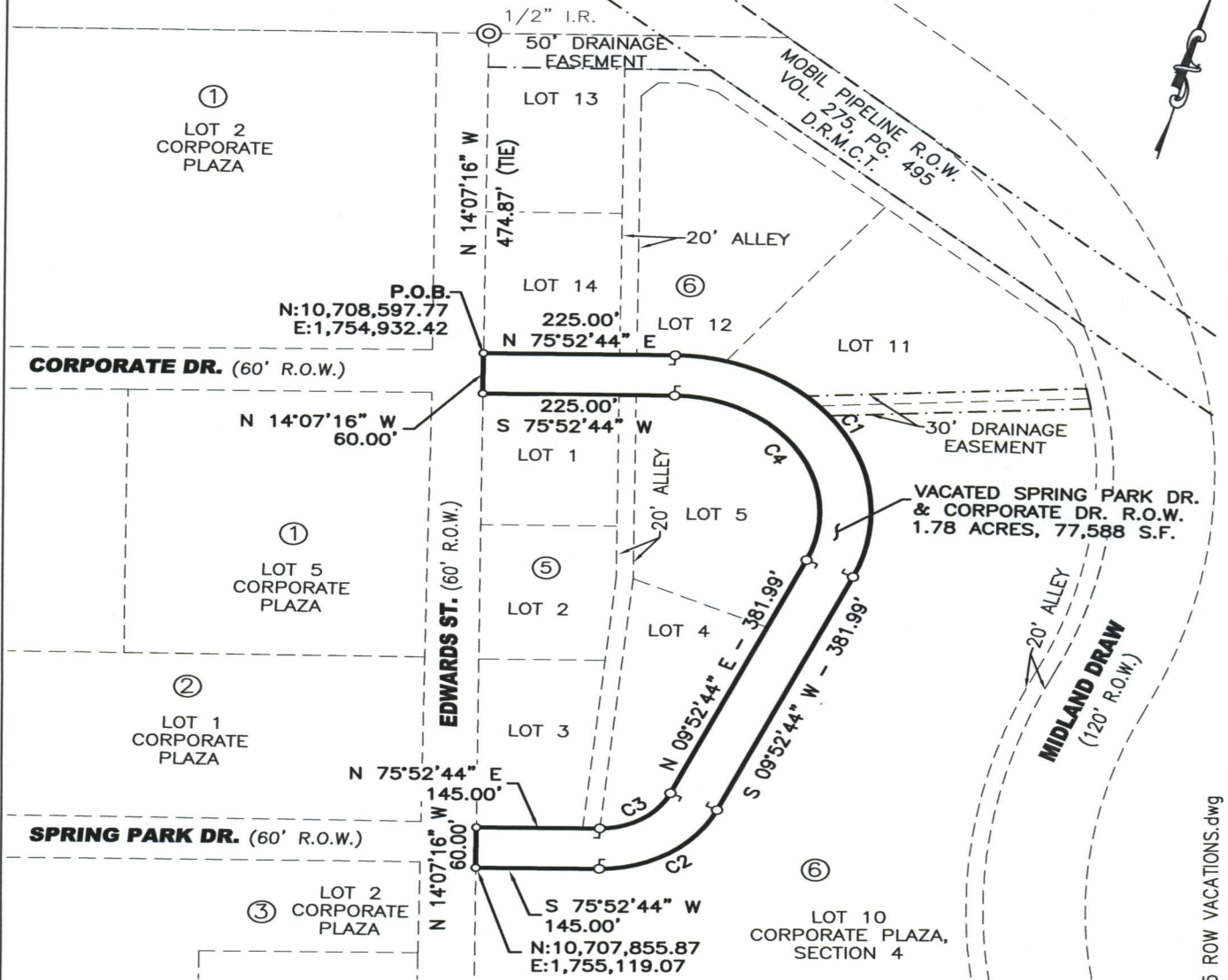
James R. Nichols, Assistant City Manager

APPROVED AS TO FORM:

Keith Stretcher, City Attorney

VACATED RIGHT OF WAY EXHIBIT SPRING PARK & CORPORATE DRIVES

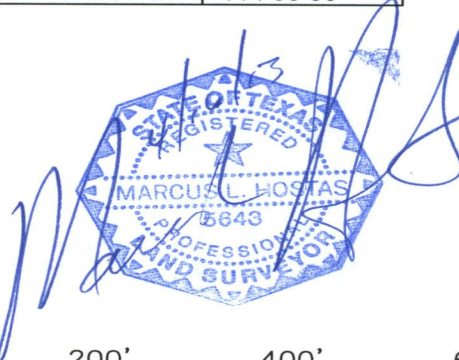
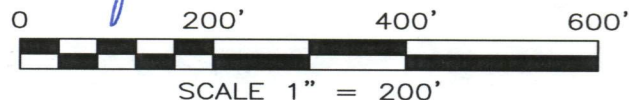
HCMC INC
VOL. 692, PG. 154, D.R.M.C.T.



CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C1	232.50'	462.60'	389.98'	S 47°07'16\" E	114°00'00\"
C2	150.00'	172.79'	163.39'	S 42°52'43\" W	66°00'00\"
C3	90.00'	103.67'	98.04'	N 42°52'43\" E	66°00'00\"
C4	172.50'	343.22'	289.34'	N 47°07'16\" W	114°00'00\"

LEGEND

- DENOTES SET 1/2-INCH IRON ROD W/RED PLASTIC CAP MARKED "WEST CO. MIDLAND"
- ⊙ DENOTES FOUND 1/2-INCH IRON ROD W/RED PLASTIC CAP MARKED "WEST CO. MIDLAND"
- DENOTES POINT OF CURVATURE
- DENOTES CALCULATED POINT
- DENOTES BOUNDARY LINE
- - - DENOTES ADJACENT TRACT
- · · DENOTES EASEMENT



T: /CIVIL DRAWINGS/2012/2012-1925/ROW VACATIONS/2012-1925 ROW VACATIONS.dwg

VACATED RIGHT OF WAY EXHIBIT SPRING PARK & CORPORATE DRIVES

LEGAL DESCRIPTION of a 1.78 acre tract out of Spring Park Drive and Corporate Drive Right-of-Way out of Corporate Plaza, Section 4, an Addition to the City of Midland Texas as recorded in Cabinet "C", Page 107 of the Plat Records of Midland County, Texas, and being located in Section 14, Block 39, T-1-S, T&P RR Co. Survey, Midland County, Texas, Subject Tract being more particularly described as follows:

BEGINNING at (N: 10,708,597.77, E: 1,754,932.42) a point at the Southwest corner of Lot 14, Block 6, said Corporate Plaza, Section 4, from which a 1/2" Iron Rod found for the Northwest corner of said Corporate Plaza, Section 4 bears N 14°07'16" W a distance of 474.87 feet, for the Northwest corner of this tract;

THENCE N 75°52'44" E with the South lines of said Lots 12 and 14, Block 6 and with the South line of a 20' Alley, a distance of 225.00 feet to a point in the South line of said Lot 12, for an Exterior corner of this tract;

THENCE Southeasterly with the South line of said Lot 12 and with the Southwest line of Lot 11, Block 6, and with the West line of Lot 10, Block 6, said Corporate Plaza, Section 4 through a curve having a Radius of 232.50 feet, an Arc Length of 462.60 feet, a Chord Length of 389.98 feet, a Chord Bearing of S 47°07'16" E, and a Delta Angle of 114°00'00", to a point in the West line of said Lot 10, for an Exterior corner of this tract;

THENCE S 09°52'44" W with the West line of said Lot 10 a distance of 381.99 feet to a point in the West line of said Lot 10, for an Exterior corner of this tract;

THENCE Southwesterly with the Northwest line of said Lot 10 through a curve having a Radius of 150.00 feet, an Arc Length of 172.79 feet, a Chord length of 163.39 feet, a Chord Bearing of S 42°52'43" W, and a Delta Angle of 66°00'00", to a point in the North line of said Lot 10, for an Exterior corner of this tract;

THENCE S 75°52'44" W with the North line of said Lot 10 a distance of 145.00 feet to (N: 10,707,855.87, E: 1,755,119.07) the most Westerly Northwest corner of said Lot 10, a point in the East Right-of-Way line of Edwards Street, a 60 foot public road, for the Southwest corner of this tract;

THENCE N 14°07'16" W with the East line of said Edwards Street, in and across said Spring Park Drive a distance of 60.00 feet to the Southwest corner of Lot 3, Block 5, said Corporate Plaza, Section 4, for an Exterior corner of this tract;

THENCE N 75°52'44" E with the South line of said Lot 3 and the South line of a 20' Alley a distance of 145.00 feet to a point at the Southwest corner of Lot 4, said Block 5, for an Interior corner of this tract;

THENCE Northeasterly with the Southeast line of said Lot 4 through a curve having a Radius of 90.00 feet, an Arc Length of 103.67 feet, a Chord length of 98.04 feet, a Chord Bearing of N 42°52'43" E, and a Delta Angle of 66°00'00", to a point in the East line of said Lot 4, for an Interior corner of this tract;

THENCE N 09°52'44" E with the East lines of said Lot 4 and Lot 5, said Block 5 a distance of 381.99 feet to a point in the East line of said Lot 5, for an Interior corner of this tract;

THENCE Northwesterly with the Northeast line of said Lot 5 through a curve having a Radius of 172.50 feet, an Arc Length of 343.22 feet, a Chord Length of 289.34 feet, a Chord Bearing of N 47°07'16" W, and a Delta Angle of 114°00'00", to a point in the North line of said Lot 5, for an Interior corner of this tract;

THENCE S 75°52'44" W with the North line of said Lot 5, the North line of a 20' Alley, and the North line of Lot 1, Block 5, said Corporate Plaza, Section 4 a distance of 225.00 feet to the Northwest corner of said Lot 1, a point in the East Right-of-Way line of said Edwards Street for an Exterior corner of this tract;

THENCE N 14°07'16" W with the East line of said Edwards Street, in and across said Corporate Drive a distance of 60.00 feet to the POINT OF BEGINNING;

Subject tract containing a total of 1.78 acres (77,588 s.f.) of land.

Note: Coordinates, Bearings, Distances and Areas Shown Hereon are Lambert Grid and Conform to the "Texas Coordinate System", Texas Central Zone, North American Datum of 1983.

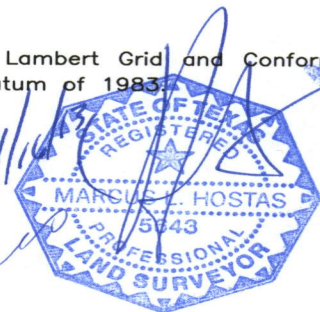
LEGEND

- | | |
|-----------|---|
| ● | DENOTES SET 1/2-INCH IRON ROD W/RED PLASTIC CAP MARKED "WEST CO. MIDLAND" |
| ◎ | DENOTES FOUND 1/2-INCH IRON ROD W/RED PLASTIC CAP MARKED "WEST CO. MIDLAND" |
| 9 | DENOTES POINT OF CURVATURE |
| o | DENOTES CALCULATED POINT |
| ————— | DENOTES BOUNDARY LINE |
| - - - - - | DENOTES ADJACENT TRACT |
| - | DENOTES EASEMENT |

0 200' 400' 600'

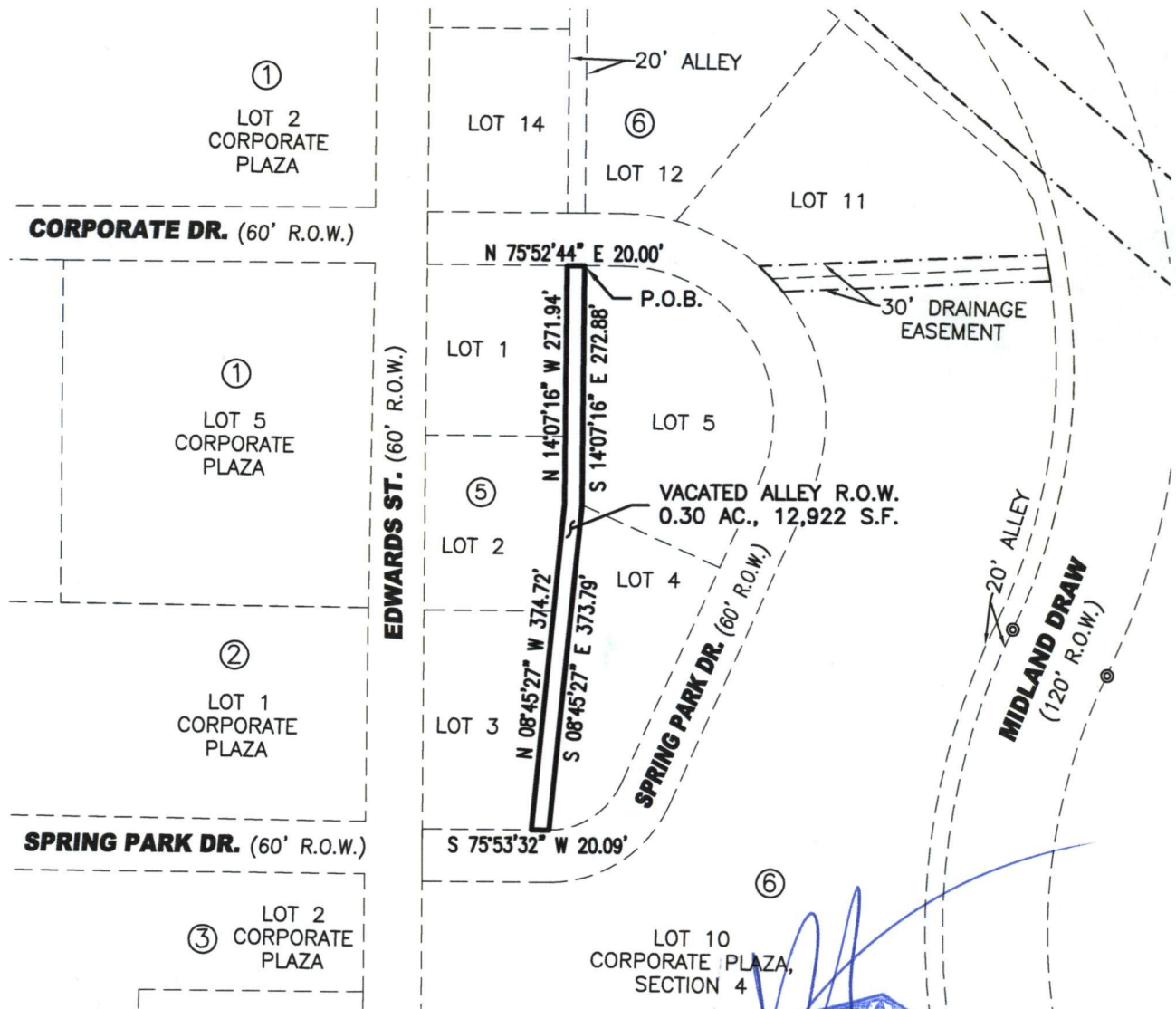


SCALE 1" = 200'



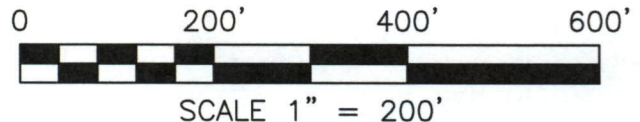
VACATED RIGHT OF WAY EXHIBIT

20' ALLEY



LEGEND

- DENOTES BOUNDARY LINE
- - - - - DENOTES ADJACENT TRACT
- · - · - DENOTES EASEMENT
- δ DENOTES POINT OF CURVATURE



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T: /CIVIL DRAWINGS/2012-1925/ROW VACATIONS/2012-1925 ROW VACATIONS.dwg

PAGE 1 OF 2

CASE NO. V-13-006

EXHIBIT B

23.8

VACATED RIGHT OF WAY EXHIBIT

20' ALLEY

LEGAL DESCRIPTION of a 0.30 acre tract of Public Alley Right-of-Way out of Corporate Plaza, Section 4, an Addition to the City of Midland Texas as recorded in Cabinet "C", Page 107 of the Plat Records of Midland County, Texas, and being located in Section 14, Block 39, T-1-S, T&P RR Co. Survey, Midland County, Texas, Subject Tract being more particularly described as follows:

BEGINNING at a point in the South line of Corporate Drive, a 60 foot public road, the Northwest corner of Lot 5, Block 5, said Corporate Plaza, Section 4, for the Northeast corner of this tract;

THENCE S 14°07'16" E with the West line of said Lot 5 a distance of 272.88 feet to the Southwest corner of said Lot 5 and the Northwest corner of Lot 4, said Block 5 for an Exterior corner of this tract;

THENCE S 08°45'27" E with the West line of said Lot 4 a distance of 373.79 feet to the Southwest corner of said Lot 4, a point in the North line of Spring Park Drive, a 60 foot public road, for the Southeast corner of this tract;

THENCE S 75°53'32" W with the North line of said Spring Park Drive a distance of 20.09 feet to the Southeast corner of Lot 3, said Block 5, for the Southwest corner of this tract;

THENCE N 08°45'27" W with the East line of said Lot 3, at 251.13 feet passing a point for the Northeast corner of said Lot 3 and the Southeast corner of Lot 2, said Block 5, and continuing on with the East line of said Lot 2 for a total distance of 374.72 feet to an angle point;

THENCE N 14°07'16" W with the East line of said Lot 2, at 76.74 feet passing a point for the Northeast corner of said Lot 2 and the Southeast corner of Lot 1, said Block 5, and continuing on with the East line of said Lot 1 for a total distance of 271.94 feet to a point in the South line of said Corporate Drive, the Northeast corner of said Lot 1, for the Northwest corner of this tract;

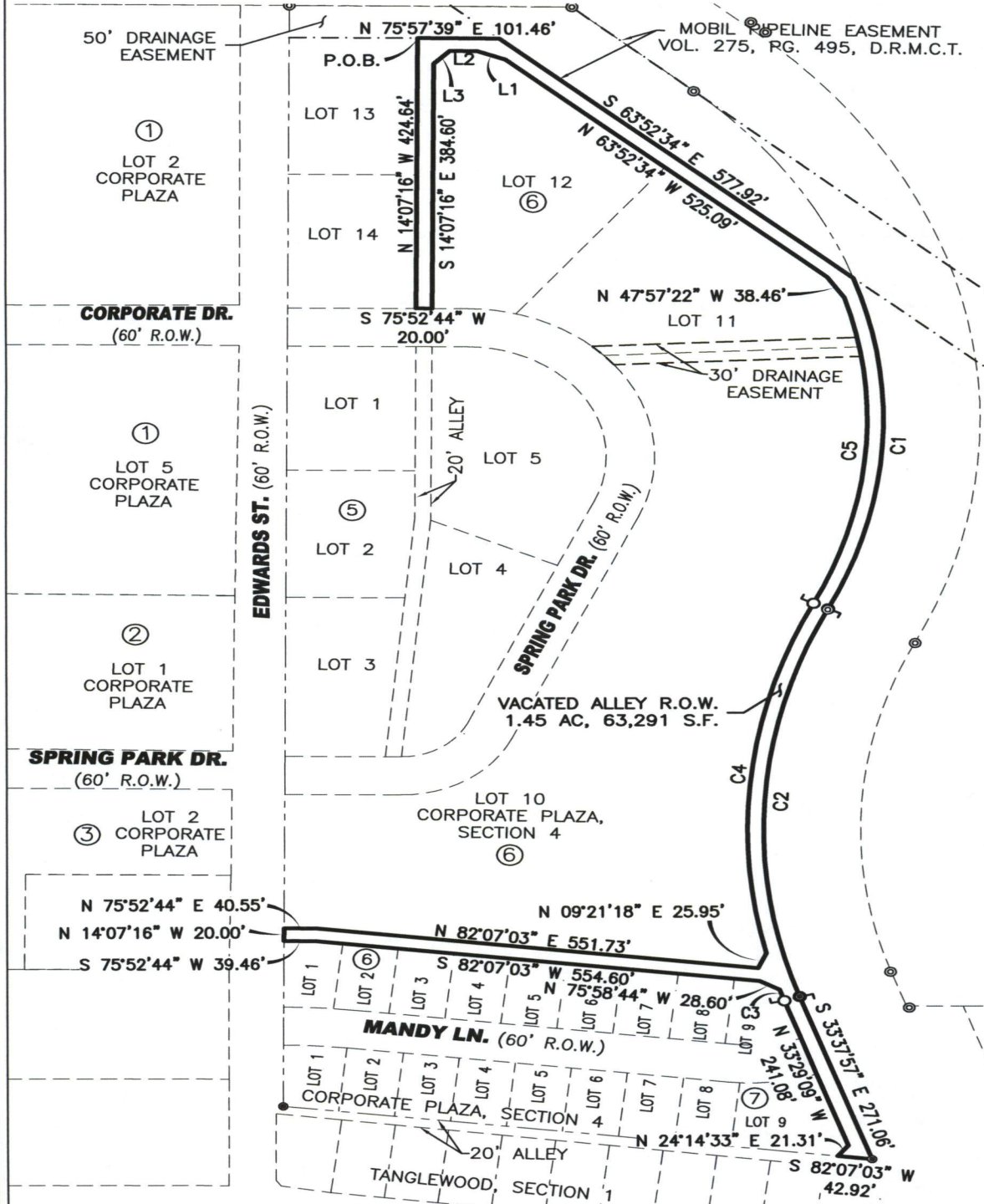
THENCE N 75°52'44" E with the South line of said Corporate Drive a distance of 20.00 feet to the POINT OF BEGINNING;

Subject tract containing a total of 0.30 acres (12,922 S.F.) of land.



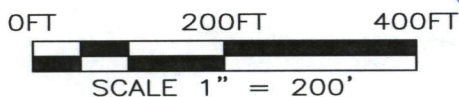
T: /CIVIL DRAWINGS/2012-1925/ROW VACATIONS/2012-1925 ROW VACATIONS.dwg

VACATED RIGHT OF WAY EXHIBIT 20' ALLEY



CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C1	683.36'	535.41'	521.82'	S 10°55'15" E	44°53'28"
C2	794.97'	626.56'	610.47'	S 11°03'12" E	45°09'29"
C3	814.97'	18.36'	18.36'	N 32°59'38" W	1°17'27"
C4	814.97'	564.00'	552.81'	N 08°18'00" W	39°39'04"
C5	663.36'	494.33'	482.97'	N 09°49'24" W	42°41'46"

LINE	BEARING	DISTANCE
L1	N 83°57'27" W	37.57'
L2	S 75°57'39" W	34.14'
L3	S 30°55'11" W	28.26'



LEGEND

- DENOTES BOUNDARY LINE
- - - DENOTES ADJACENT TRACT
- - - DENOTES EASEMENT
- o DENOTES POINT OF CURVATURE

VACATED RIGHT OF WAY EXHIBIT

20' ALLEY

THENCE Northerly with the East line of said Lot 10 through a curve to the Left having a Radius of 663.36 feet, passing the Northeast corner of said Lot 10 and the Southeast corner of Lot 11, said Block 6 an Arc Length of 414.46 feet, and continuing on through a total Arc Length of 494.33 feet, a Chord Length of 482.97 feet, a Chord Bearing of N 09°49'24" W and a Delta Angle of 42°41'46" to an Exterior corner of said Lot 11, for an Interior corner of this tract;

THENCE N 47°57'22" W with the Northeast line of said Lot 11 a distance of 38.46 feet to an Exterior corner of said Lot 11, for an Interior corner of this tract;

THENCE N 63°52'34" W with the Northeast line of said Lots 11 and 12, said Block 6, a distance of 525.09 feet to an Exterior corner of said Lot 12, for an Interior corner of this tract;

THENCE N 83°57'27" W with the Northeast line of said Lot 12 a distance of 37.57 feet to an Exterior corner of said Lot 12, for an Interior corner of this tract;

THENCE S 75°57'39" W with the North line of said Lot 12 a distance of 34.14 feet to the most Northerly northwest corner of said Lot 12, for an Interior corner of this tract;

THENCE S 30°55'11" W with the West line of said Lot 12 a distance of 28.26 feet to the most Westerly Northwest corner of said Lot 12, for an Interior corner of this tract;

THENCE S 14°07'16" E with the West line of said Lot 12 a distance of 384.60 feet to the Southwest corner of said Lot 12, a point in the North line of Corporate Drive, a 60 foot public road, for an Exterior corner of this tract;

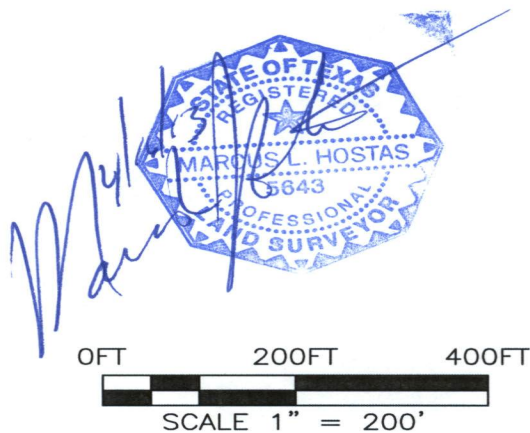
THENCE S 75°52'44" W with the North line of said Corporate Drive a distance of 20.00 feet to a point for the Southeast corner of Lot 14, said Block 6, for an Exterior corner of this tract;

THENCE N 14°07'16" W with the East line of said Lot 14, at 210.00 feet passing the Northeast corner of said Lot 14 and the Southeast corner of said Lot 13, and continuing on for a total distance of 424.64 feet to the POINT OF BEGINNING;

Subject tract containing a total of 1.45 acres (63,291 S.F.) of land.

LEGEND

- DENOTES BOUNDARY LINE
- - - - - DENOTES ADJACENT TRACT
- . - . - DENOTES EASEMENT
- ⊙ DENOTES POINT OF CURVATURE



VACATED RIGHT OF WAY EXHIBIT

20' ALLEY

LEGAL DESCRIPTION of a 1.45 acre tract of Public Alley Right-of-Way out of Corporate Plaza, Section 4, an Addition to the City of Midland Texas as recorded in Cabinet "C", Page 107 of the Plat Records of Midland County, Texas, and being located in Section 14, Block 39, T-1-S, T&P RR Co. Survey, Midland County, Texas, Subject Tract being more particularly described as follows:

BEGINNING at the Northeast corner of Lot 13, Block 6, said Corporate Plaza, Section 4, a point in the South line of a 50 foot TxDOT Drainage Easement as recorded in Cabinet "C", Page 107 of the Plat Records of Midland County, Texas, for the Northwest corner of this tract;

THENCE N 75°57'39" E with the South line of said TxDOT Drainage Easement a distance of 101.46 feet to a point in the South line of the Mobil Pipeline Easement as recorded in Volume 275, Page 495, of the Deed Records of Midland County, Texas, for an Exterior corner of this tract;

THENCE S 63°52'34" E with the South line of said Mobil Pipeline Easement a distance of 577.92 feet to a point in the West line of Midland Draw, a 120 foot public drainage right of way, for an Exterior corner of this tract;

THENCE Southerly with the West line of said Midland Draw through a curve to the Right having a Radius of 683.36 feet, an Arc Length of 535.41 feet, a Chord Length of 521.82 feet, a Chord Bearing of S 10°55'15" E, and a Delta Angle of 44°53'28" to the Point of Reverse Curvature, for an Exterior corner of this tract;

THENCE Southerly with the West line of said Midland Draw through a curve to the Left having a Radius of 794.97 feet, an Arc Length of 626.56 feet, a Chord Length of 610.47 feet, a Chord Bearing of S 11°03'12" E, and a Delta Angle of 45°09'29" to a point for an Interior corner of this tract;

THENCE S 33°37'57" E with the West line of said Midland Draw a distance of 271.06 feet to the Southeast corner of said Corporate Plaza, Section 4 plat, a point in the North line of a 20 foot public alley as recorded in Tanglewood, Section 1, an Addition to the City of Midland, Texas as recorded in Cabinet "B", Page "148" of the Plat Records of Midland County, Texas, for the Southeast corner of this tract;

THENCE S 82°07'03" W with the North line of said 20 foot alley a distance of 42.92 feet to the Southernmost Southeast corner of Lot 9, Block 7, said Corporate Plaza, Section 4, for an Exterior corner of this tract;

THENCE N 24°14'33" E with the Southeast line of said Lot 9, Block 7 a distance of 21.31 feet to the Easternmost Southeast corner of said Lot 9, Block 7, for an Interior corner of this tract;

THENCE N 33°29'09" W with the East line of said Lot 9, Block 7, at 118.45 feet passing a point in the South line of Mandy Lane, a 60 foot public road, for the Northeast corner of said Lot 9, Block 7, and continuing in and across said Mandy Lane, after an additional 60.00 feet passing a point in the North line of said Mandy Lane, for the Southeast corner of Lot 9, Block 6, said Corporate Plaza, Section 4, and continuing on with the East line of said Lot 9, Block 6 for a total of 241.08 feet to a Point of Curvature;

THENCE Northerly with the East line of said Lot 9, Block 6 through a curve having a Radius of 814.97 feet, an Arc Length of 18.36 feet, a Chord Length of 18.36 feet, a Chord Bearing of N 32°59'38" W, and a Delta Angle of 01°17'27" to the Easternmost Northeast corner of said Lot 9, Block 6, for an Interior corner of this tract;

THENCE N 75°58'44" W with the North line of said Lot 9, Block 6 a distance of 28.60 feet to the most Northerly Northeast corner of said Lot 9, Block 6 for an Interior corner of this tract;

THENCE S 82°07'03" W with the North lines of Lots 9 through 1, said Block 6 a distance of 554.60 feet to a point in the North line of said Lot 1 for an Interior corner of this tract;

THENCE S 75°52'44" W with the North line of said Lot 1 a distance of 39.46 feet to the Northwest corner of said Lot 1, a point in the East line of Edwards Street, a 60 foot public road, for the Southwest corner of this tract;

THENCE N 14°07'16" W with the East line of said Edwards Street a distance of 20.00 feet to the Southwest corner of Lot 10, said Block 6, for an Exterior corner of this tract;

THENCE N 75°52'44" E with the South line of said Lot 10 a distance of 40.55 feet to an Angle Point;

THENCE N 82°07'03" E with the South line of said Lot 10 a distance of 551.73 feet to the most Southerly Southeast corner of said Lot 10, for an Interior corner of this tract;

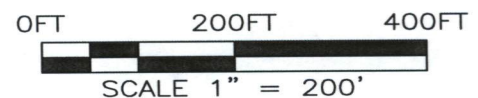
THENCE N 09°21'18" E with the Southeast line of said Lot 10 a distance of 25.95 feet to the most Easterly Southeast corner of said Lot 10, for an Interior corner of this tract;

THENCE Northerly with the East line of said Lot 10 through a curve to the Right having a Radius of 814.97 feet, an Arc Length of 564.00 feet, a Chord Length of 552.81 feet, a Chord Bearing of N 08°18'00" W and a Delta Angle of 39°39'04" to the Point of Reverse Curvature, for a corner this tract;

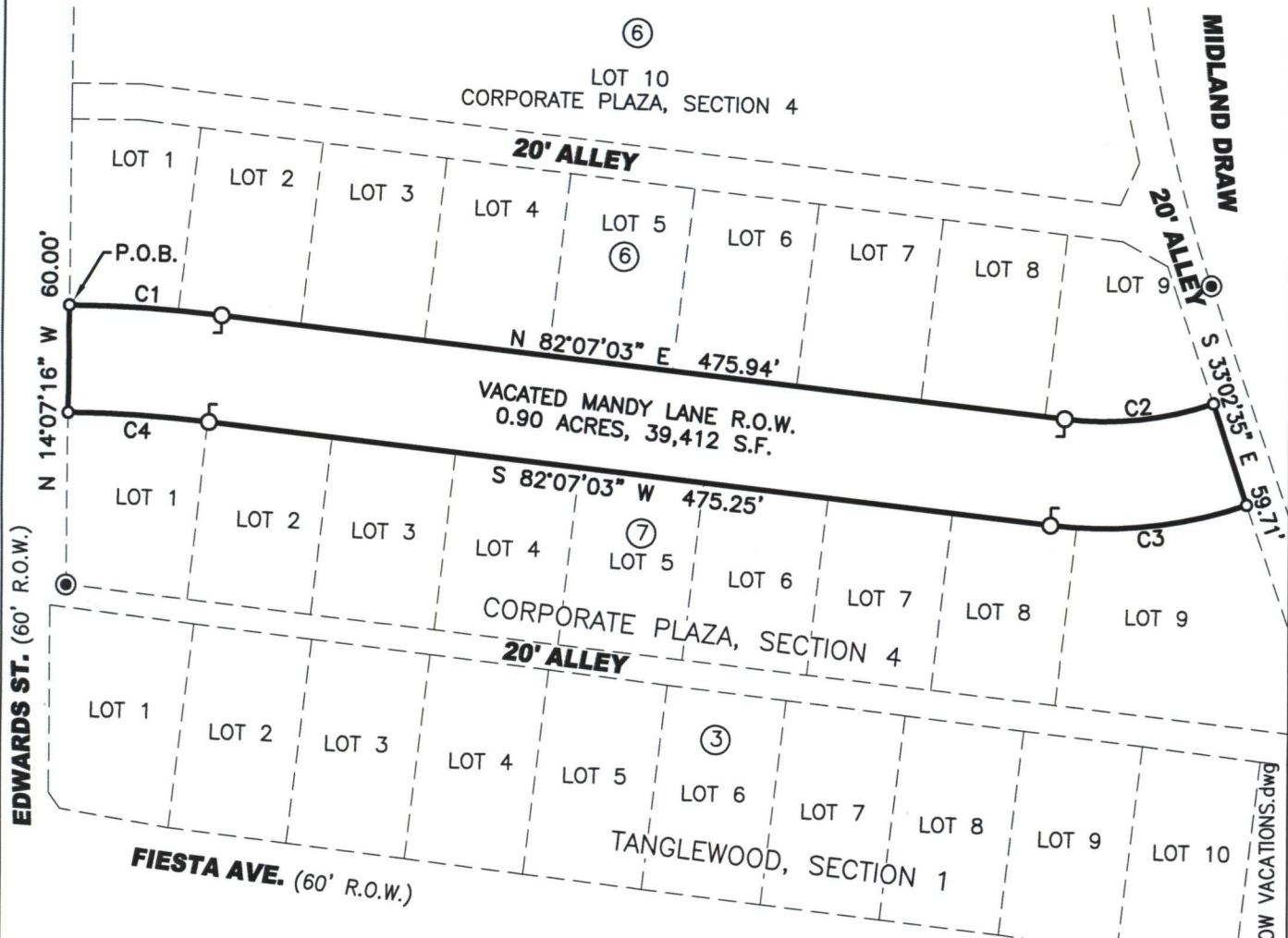
CONTINUED ON PAGE 3 OF 3

LEGEND

	DENOTES BOUNDARY LINE
	DENOTES ADJACENT TRACT
	DENOTES EASEMENT
	DENOTES POINT OF CURVATURE



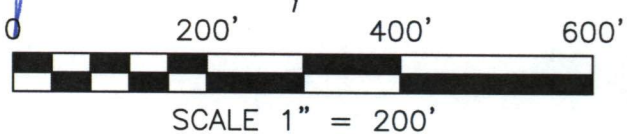
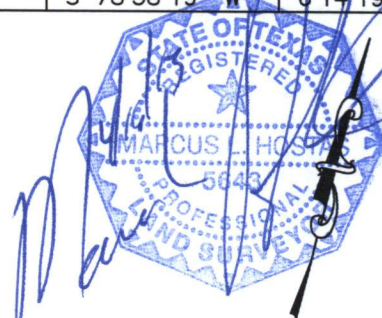
VACATED RIGHT OF WAY EXHIBIT MANDY LANE



CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C1	793.99'	86.45'	86.41'	N 78°58'19" E	6°14'18"
C2	188.75'	84.82'	84.11'	N 69°14'39" E	25°44'50"
C3	248.75'	111.79'	110.85'	S 69°14'35" W	25°44'57"
C4	733.99'	79.92'	79.88'	S 78°58'19" W	6°14'19"

LEGEND

- DENOTES SET 1/2-INCH IRON ROD W/RED PLASTIC CAP MARKED "WEST CO. MIDLAND"
- ⊙ DENOTES FOUND 1/2-INCH IRON ROD W/RED PLASTIC CAP MARKED "WEST CO. MIDLAND"
- 9 DENOTES POINT OF CURVATURE
- DENOTES CALCULATED POINT
- DENOTES BOUNDARY LINE
- - - DENOTES ADJACENT TRACT



VACATED RIGHT OF WAY EXHIBIT

MANDY LANE

LEGAL DESCRIPTION of a 0.90 acre tract of Mandy Lane Right-of-Way out of Corporate Plaza, Section 4, an Addition to the City of Midland Texas as recorded in Cabinet "C", Page 107 of the Plat Records of Midland County, Texas, and being located in Section 14, Block 39, T-1-S, T&P RR Co. Survey, Midland County, Texas, Subject Tract being more particularly described as follows:

BEGINNING at the Southwest corner of Lot 1, Block 6, said Corporate Plaza, Section 4 in the East right of way line of Edwards Street, a 60 foot public road, for the Northwest corner of this tract;

THENCE Easterly with the South lines of said Lots 1 and 2, Block 6 through a curve having a Radius of 793.99 feet, a Delta Angle of $06^{\circ}14'18''$, an Arc Length of 86.45 feet, and a Chord length of 86.41 feet, a Chord Bearing of $S 78^{\circ}58'19'' E$ to a point in the South line of said Lot 2, for an Exterior corner of this tract;

THENCE $N 82^{\circ}07'03'' E$ with the South line of Lots 2, 3, 4 5, 6, 7, 8, and 9, said Block 6, a distance of 475.94 feet to a point in the South line of said Lot 9 for an Interior corner of this tract;

THENCE Easterly with the South line of said Lot 9, Block 6 through a curve having a Radius of 188.75 feet, a Delta Angle of $25^{\circ}44'50''$, an Arc Length of 84.82 feet, and a Chord length of 84.11 feet, a Chord Bearing of $N 69^{\circ}14'39'' E$ to the Southeast corner of said Lot 9, a point in the West line of a 20' Alley for the Northeast corner of this tract;

THENCE $S 33^{\circ}02'35'' E$ with the West line of said Alley a distance of 59.71 feet to the Northeast corner of Lot 9, Block 7, said Corporate Plaza, Section 4 for the Southeast corner of this tract;

Thence Westerly with the North line of said Lot 9 and Lot 8, Block 7 through a curve having a Radius of 248.75 feet, a Delta Angle of $25^{\circ}44'57''$, an Arc Length of 111.79 feet, and a Chord length of 110.85 feet, a Chord Bearing of $S 69^{\circ}14'35'' W$ to a point in the North line of said Lot 8, Block 7 for an Exterior corner of this tract;

THENCE $S 82^{\circ}07'03'' W$ with the North line of Lots 8, 7, 6, 5, 4, 3, and 2, Block 7 a distance of 475.25 feet to the Northwest corner of said Lot 2 for an Interior corner of this tract;

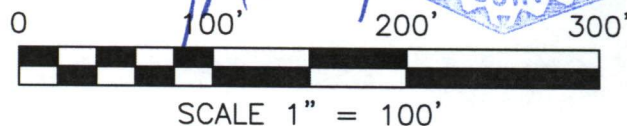
THENCE Westerly with the North line of Lot 1, Block 7 through a curve having a Radius of 733.99 feet, a Delta Angle of $6^{\circ}14'19''$, an Arc Length of 79.92 feet, and a Chord length of 79.88 feet, a Chord Bearing of $S 78^{\circ}58'19'' W$ to the Northwest corner of said Lot 1, a point in the East line of said Edwards Street for the Southwest corner of this tract;

THENCE $N 14^{\circ}07'16'' W$ with the East line of said Edwards Street, in and across said Mandy Lane a distance of 60.00 feet to the POINT OF BEGINNING;

Subject tract containing a total of 0.90 acres (34,412 s.f.) of land.

LEGEND

- DENOTES BOUNDARY LINE
- DENOTES ADJACENT TRACT
- DENOTES EASEMENT
- δ DENOTES POINT OF CURVATURE





May 20, 2013

Midland City Council
City of Midland, Texas

RE: Request for vacation of a 0.30-acre alley adjacent to Lots 1-5, Block 5, a 1.45-acre alley adjacent to Lots 1-14, Block 6, a 0.90-acre portion of Mandy Lane right-of-way adjacent to Lots 1-9, Block 6, and to Lots 1-9, Block 7, and a 1.78-acre portion of Corporate Drive right-of-way and Spring Park Drive right-of-way adjacent to Lots 1-5, Block 5, and to Lots 10-14, Block 6, all out of Corporate Plaza, Section 4, City and County of Midland, Texas

Dear Members of the City Council:

The above-referenced property has been appraised in accordance with Chapter 272 of the Texas Local Government Code. The fair market value of the property is \$19,321.00. The property can be vacated and recorded in the Midland County Clerk's office when the City of Midland has received this amount from the adjoining property owner(s).

Very truly yours,

A handwritten signature in blue ink that reads "Courtney SP".

Courtney Sharp
City Manager

Exhibit "E"

L:\Ordinances\Planning\Vacate & Abandon\2013\Corporate Plaza Addition Appraisal Letter.wpd

Case Number: V-13-006

CITY OF MIDLAND
Planning Division

APPLICATION TO VACATE RIGHT-OF-WAY

- I.** Application is hereby made to the City Council to vacate the following public right-of-way or easement:
Public Right of Ways in Corporate Plaza, Section 4, Including: All of Mandy Lane, Spring Park Drive, and
Corporate Drive, East of Edwards Street, and All of the Public Alleys North of Mandy Lane, South of the TxDOT
Drainage Channel, East of Edwards Street, and West of Midland Draw.
- II.** Reason for Request: The owner of the adjacent lots is planning to re-plat into one single lot.

- III.** Reasons, in applicant's opinion, why the requested vacation will not adversely affect the public welfare or will contribute to it in a positive way:
The streets are not currently improved. After the property is re-platted, the roads will not be needed to access any lots.

IV. REQUIRED ITEMS:

1. Applicant(s) Information: (Attach extra sheets as necessary.)

Name: Mike L. Massey

Address: 303 Corporate Drive

Phone: _____

Street

Midland

Tex.

79705

City

State

Zip Code

2. Metes and bounds description of property to be vacated including total square feet of vacation.
3. Map showing:
Property to be vacated and its relationship to the applicant's property
Lot and block numbers of all adjacent tracts
Current zoning of all adjacent tracts
4. Letter(s) of Concurrence signed by adjacent property owner(s). (See attached)
5. Application Fee: **\$300.00**

Required items attached? Date Received: 1. _____ 2. _____ 3. _____ 4. _____ 5. _____

The City of Midland will take no action on this request, until items 1-5 are received.

- V.** Clearance is needed from the following utility companies: City of Midland / Atmos Energy
Caprock Energy / Oncor Electric / AT&T / Suddenlink Cable TV Co. / Grande Communications

The City will route the request to these companies, but it is the applicant's responsibility to ensure clearance has been obtained and to work out any issues that may arise.

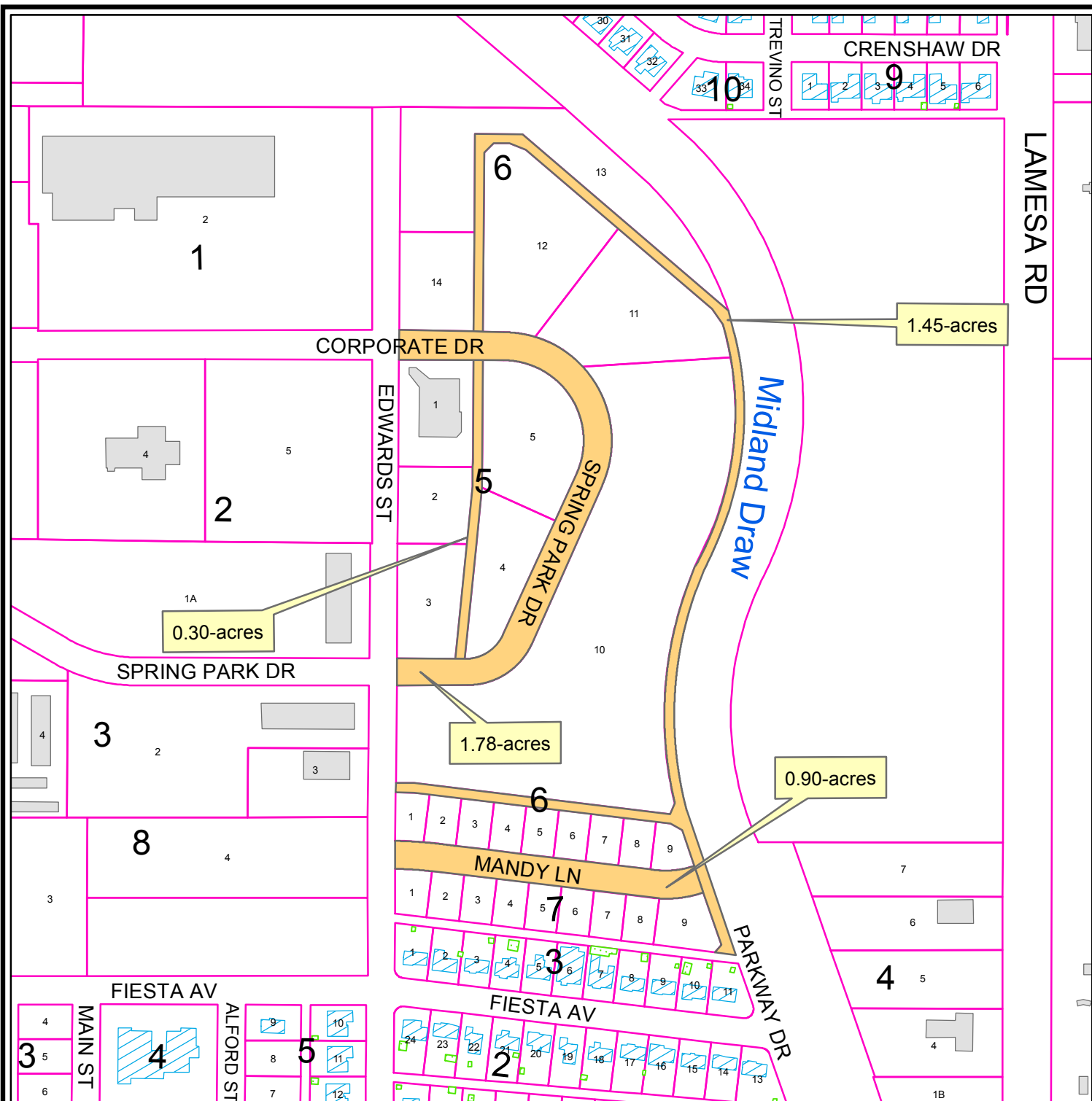
VI. Policies:

1. If the vacation request involves only a portion of a section right-of-way, such that approval would not affect the public's ability to travel along said right-of-way, then the request will be scheduled for consideration by the City Council. No public hearing will be needed.
2. If the vacation request involves an entire section of right-of-way, such that approval would cause the public to lose all rights to use it, then the following procedures apply:
 - a. Nearby land owners who have a reasonable expectation to use said right-of-way, as determined by the Transportation Division, must first agree to the proposed vacation. It is the applicant's responsibility to obtain a letter of concurrence signed by the affected landowners.
 - b. If all letters are received indicating that the affected landowners agree to the request, then a public hearing before the City Council will be scheduled. The Transportation Division will mail public notice of the hearing to landowners within 400 feet of the affected right-of-way.
 - c. If a request is approved, the right-of-way shall be divided into two equal parts, with each half becoming the property of the respective abutting owner. If the applicant desires to own the entire width, he or she must negotiate with the opposite landowner.

Signature of applicant: Mike Massey Date: 2-14-13

****Application will not be considered for scheduling until all required items are reviewed by City Staff.****

FOR OFFICE USE ONLY	
Rec'd. By: <u>RS</u>	Date: <u>2/19</u>
Assigned: <u>JC</u>	
For: <u>CC</u>	On: <u>5/28/13</u>



LOCATION MAP

V - 13 - 006

Scale: 1" = 300'

Consider a request for the vacation of the 0.30-acre alley adjacent to Lots 1 - 5, Block 5, of the 1.45-acre alley adjacent to Lots 1 - 14, Block 6, of the 0.90-acres of the right-of-way of Mandy Lane adjacent to Lots 1 - 9, Block 6 and to Lots 1 - 9, Block 7, and of the 1.78-acres of the right-of-way of Corporate Drive and Spring Park Drive adjacent to Lots 1 - 5, Block 5 and Lots 10 - 14, Block 6, all out of Corporate Plaza, Section 4, City and County of Midland, Texas.

LEGEND

- CITY LIMITS
- PARCEL
- PUBLIC BLDGS
- PRIVATE BLDGS
- ACCESSORY BLDGS



©THE CITY OF MIDLAND - 2013
THE CITY OF MIDLAND SHALL NOT BE RESPONSIBLE FOR ANY DECISIONS BASED UPON THE USE OF THIS DATA WHILE THIS DATA IS MADE AVAILABLE TO THE PUBLIC. IT WAS CREATED FOR INTERNAL USE BY THE CITY OF MIDLAND WHICH MAKES NO CLAIM AS TO ITS ACCURACY OR COMPLETENESS. THIS DATA IS NOT DESIGNED TO BE USED AS A PRIMARY TOOL IN PERMITTING, SITING, OR OTHER DECISIONS BASED SOLELY ON THE INFORMATION CONTAINED HEREIN.



City Council Agenda

Approved for Agenda:
thudson
City Manager's Office

MEETING DATE: 5/28/2013

TO: City Council / City Manager

FROM: Regina Stephenson, Purchasing Manager

SUBJECT: Consider a resolution awarding a contract for Lamesa Road Pedestrian Access Improvements and appropriating funds for the Engineering Services Department.

Purpose:

Approval of a resolution authorizing a contract for Lamesa Road Pedestrian Access Improvements.

Recommended City Council Action

☒ Approve ☐ Deny ☐ Directional / Informational

Fiscal Impact:

To be determined after bid opening on Wednesday, May 22, 2013 at 11:00 AM

Discussion:

Bids will be opened for the Lamesa Road Pedestrian Access Improvements project on Wednesday, May 22, 2013 at 11:00 AM in the City Secretary's office. Due to the need of a timely construction award, General Services is requesting City Council authorize City Management to award the contract instead of taking the contract directly to Council.

RESOLUTION NO.

**RESOLUTION AUTHORIZING THE CITY MANAGER
TO SELECT THE MOST ADVANTAGEOUS BIDDER,
AND TO NEGOTIATE AND EXECUTE A CONTRACT
WITH THE CHOSEN BIDDER FOR THE
CONSTRUCTION OF THE LAMESA ROAD
PEDESTRIAN ACCESS PROJECT**

WHEREAS, the City Manager advertised the construction of the Lamesa Road Pedestrian Access Project for competitive bids; and

WHEREAS, bids received for said Project were opened on May 22, 2013; and

WHEREAS, the City Council finds it to be in the public interest to authorize the City Manager to select the most advantageous bidder and to negotiate and execute a contract with the chosen bidder for said project;

**NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE
CITY OF MIDLAND, TEXAS:**

SECTION ONE. That the City Manager is hereby authorized and directed to select the most advantageous bidder for the construction of the Lamesa Road Pedestrian Access Project.

SECTION TWO. That the City Manager is hereby authorized and directed to negotiate and execute, on behalf of the City of Midland, a contract with the chosen bidder for the construction of the Lamesa Road Pedestrian Access Project.

SECTION THREE. That the City Treasurer is hereby authorized and directed to pay for said Lamesa Road Pedestrian Access Project in an amount not to exceed \$1,665,474.00 from funds available in the Street Paving and Ancillary Uses Project (8912) budget account upon proper receipt of invoices or statements approved by the City Manager.

On motion of Council member _____, seconded by Council member _____, the above and foregoing resolution was adopted by the City Council of the City of Midland at a regular meeting on the _____ day of _____, A.D., 2013, by the following vote:

Council members voting "AYE":

Council members voting "NAY":

W. Wesley Perry, Mayor

ATTEST:

Amy M. Turner, City Secretary

RECOMMENDED AND APPROVED:

Courtney Sharp, City Manager

APPROVED AS TO CONTENT
AND COMPLETENESS:

Robert Patrick, General Services Director

APPROVED AS TO FORM:

Keith Stretcher, City Attorney

Project # P13-416-8946 LAMESA ROAD PEDESTRIAN ACCESS SIDEWALK IMPROVEMENTS

Project # P13-416-8946 (Lamesa Road Pedestrian Access Sidewalk Improvements)				Onyx		Ti-Zack	
		Quantity	Unit	Unit Price	Total	Unit Price	Total
Base Bid							
Item	Description						
1	Roadway Excavation	8266	SY	\$3.00	\$24,798.00	\$4.50	\$37,197.00
2	4" thick sidewalks	4432	SY	\$45.00	\$199,440.00	\$60.00	\$265,920.00
3	Removal of existing concrete sidewalk	468	SY	\$15.00	\$7,020.00	\$16.00	\$7,488.00
4	6" type A curb and 24" gutter	2596	LF	\$21.00	\$54,516.00	\$30.00	\$77,880.00
5	8" reinforced C-R laydown curb for driveway entrance	444	LF	\$25.25	\$11,211.00	\$25.00	\$11,100.00
6	Removal of existing curb and gutter	5564	LF	\$5.00	\$27,820.00	\$5.00	\$27,820.00
7	Concrete Handicap Access Ramps	6324	SF	\$26.00	\$164,424.00	\$12.00	\$75,888.00
8	6" thick concrete residential driveways	836	SY	\$75.00	\$62,700.00	\$65.00	\$54,340.00
9	8" thick concrete commercial driveways	726	SY	\$88.00	\$63,888.00	\$85.00	\$61,710.00
10	Removal of existing concrete driveways	577	SY	\$42.00	\$24,234.00	\$18.00	\$10,386.00
11	Construct 8" concrete alley approach	1215	SY	\$88.00	\$106,920.00	\$95.00	\$115,425.00
12	Concrete valley gutter and fillets 6" thick	1621	SY	\$98.00	\$158,858.00	\$70.00	\$113,470.00
13	Concrete steps	2	EA	\$3,500.00	\$7,000.00	\$1,250.00	\$2,500.00
14	Concrete block retaining	1780	SF	\$25.00	\$44,500.00	\$30.00	\$53,400.00
15	Parking lot pavement repair	461	SY	\$21.60	\$9,957.60	\$65.00	\$29,965.00
16	Adjust grade to water valve boxes	23	EA	\$200.00	\$4,600.00	\$300.00	\$6,900.00
17	Adjust to grade of water meter boxes	2	EA	\$300.00	\$600.00	\$300.00	\$600.00
18	Removal and replacement of mail box	9	EA	\$300.00	\$2,700.00	\$250.00	\$2,250.00
19	Remove and replace street sign post	32	EA	\$300.00	\$9,600.00	\$300.00	\$9,600.00
20	Implement Jobe Safety and Traffic Control	1	LS	\$50,000.00	\$50,000.00	\$10,000.00	\$10,000.00
21	Implement Erosion Control Plan	1	LS	\$3,000.00	\$3,000.00	\$25,000.00	\$25,000.00
		TOTAL BASE BID		\$1,037,786.60		\$998,839.00	

City of Midland
City Secretary's Office
Interoffice Memorandum

Date: May 28, 2013
To: The Honorable Mayor Perry and Council
From: Amy M. Turner, City Secretary
Subject: Membership - Boards and Commissions

Attached is an updated membership listing for the City's Boards and Commissions effective May 28, 2013. Remaining expirations and vacancies are listed below:

AIRPORT PLANNING AND DEVELOPMENT BOARD – Two terms expired on September 30, 2012.

CITY DEVELOPMENT ADVISORY COMMITTEE – One terms expired on September 30, 2012.

CONSTRUCTION BOARD OF ADJUSTMENTS AND APPEALS – Two vacancies for Alternate terms expired on September 30, 2007.

HOUSING AUTHORITY COMMISSION – One vacancy as Alternate term expiring in October 2015

MIDLAND FOOTBALL-SOCCER AND BASEBALL COMPLEX DEVELOPMENT CORPORATION – Two terms expired in November 2011.

MIDLAND HIGHER EDUCATION FACILITIES CORPORATION – Three vacancies expired on January 1, 2007, one term expired on January 1, 2009, and two terms expired on January 1, 2010.

MIDLAND HOUSING FINANCE CORPORATION – One vacancy expired on September 30, 2010, two terms expired on September 30, 2011 and one term expired on September 30, 2012.

MIDLAND MUNICIPAL MANAGEMENT DISTRICT BOARD – One vacancy.

MIDLAND-ODESSA URBAN TRANSIT DISTRICT BOARD – Two terms expired on September 30, 2012.

PERMIAN BASIN AIRPORT BOARD – Two terms expired on September 30, 2010 (Carlsbad and Hobbs New Mexico), one term expired on September 30, 2011 and two terms expired on September 30, 2012.

TAX INCREMENT REINVESTMENT ZONE BOARD – Four terms expired on March 20, 2010,

one term expired March 20, 2011, one terms expired on March 20, 2012 and two terms expired on March 20, 2013. (Four City representatives, two Hospital representatives and two County representatives.)

ZONING BOARD OF ADJUSTMENT AND AIRPORT ZONING BOARD OF ADJUSTMENT-

One term expired on September 30, 2011, one term expired on September 30, 2012 and one vacancy for Alternate term expired on September 30, 2006 and one vacancy for Alternate term expired September 30, 2009.

BOARDS AND COMMISSIONS OF THE CITY OF MIDLAND

May 28, 2013

AIRPORT PLANNING AND DEVELOPMENT BOARD

(Advisory)

(Membership-10; Terms - 3 Years expiring 3-3-4.)

	<u>Appt Date</u>	<u>Term Expires</u>	<u>Eligibility Expires</u>
Ronald Schwisow	09/06	Sept 30 2012	Sept 30 2012
Herbert Blankinship	09/06	Sept 30 2012	Sept 30 2012
Jerry Walton	11/09	Sept 30 2015	Sept 30 2015
Mike Owen	10/07	Sept 30 2013	Sept 30 2013
Gregory F. Baiano	09/10	Sept 30 2013	Sept 30 2016
John T. Echols	09/10	Sept 30 2013	Sept 30 2016
Dallas L. Smith	09/10	Sept 30 2013	Sept 30 2016
Earl Erdmann, Chairman	09/08	Sept 30 2014	Sept 30 2014
J. Ross Lacy	09/12*	Sept 30 2014	Sept 30 2020
Don "Woody" Woodward	11/11	Sept 30 2014	Sept 30 2017

Ex-Officio members are Harry Spannaus, the City Manager and the City Attorney. The Secretary is the Director of Aviation.

ANIMAL SERVICES ADVISORY COMMISSION

(Advisory)

(Membership - 6; Terms - 4 Years)

	<u>Appt Date</u>	<u>Term Expires</u>	<u>Eligibility Expires</u>
Dr. Tom Green (Veterinarian)	10/07*	Sept 30 2013	Sept 30 2017
Kelly Spencer	09/09	Sept 30 2013	Sept 30 2017
Laura Hollifield	09/08*	Sept 30 2013	Sept 30 2017
Justin Petty	04/07*	Sept 30 2013	Sept 30 2017
Tony Carrillo	09/09	Sept 30 2013	Sept 30 2017
Paul O'Neill	09/09	Sept 30 2013	Sept 30 2017

BUILDING CODES REVIEW COMMITTEE

(Membership – 9; Terms – 2 Years)

	<u>Appt Date</u>	<u>Term Expires</u>	<u>Eligibility Expires</u>
James Rigger	12/09	Dec 31 2013	Dec 31 2013
Chris Repman	12/09	Dec 31 2013	Dec 31 2013
John Cooper	12/09	Dec 31 2013	Dec 31 2013
Bill Routh	12/09	Dec 31 2013	Dec 31 2013
Tom Woodruff	12/09	Dec 31 2013	Dec 31 2013
Ron Ainsworth	12/09	Dec 31 2013	Dec 31 2013
Walter Pate	12/09	Dec 31 2013	Dec 31 2013
Robert Harrington	12/09	Dec 31 2013	Dec 31 2013
Jerry Morales	12/09	Dec 31 2013	Dec 31 2013

CITY DEVELOPMENT ADVISORY COMMITTEE

(Advisory)

(Membership - 5; Terms - 2 Years expiring 2 even & 3 odd)

	<u>Appt Date</u>	<u>Term Expires</u>	<u>Eligibility Expires</u>
Reggie Lawrence	09/10	Sept 30 2012	Sept 30 2014
Alonda Massey	11/11	Sept 30 2013	Sept 30 2015
Tim Bryson	11/11	Sept 30 2013	Sept 30 2015
W. Roger Beebe	02/13	Sept 30 2014	Sept 30 2016
Avery I. Pullins	02/13*	Sept 30 2013	Sept 30 2017

CONSTRUCTION BOARD OF ADJUSTMENTS AND APPEALS

(Decision Making)

(Membership - 7; Terms - 4 Years expiring 2-2-2-1)

Position to include: 1. Registered Architectural or Builder Superintendent, 2. Registered Structural Engineer, 3. Registered Mechanical and Plumbing, 4. Registered Electrical Engineer, 5. Registered Fire Protection Engineer

	<u>Appt Date</u>	<u>Term Expires</u>	<u>Eligibility Expires</u>	<u>Position</u>
Don Woodward (At Large)	11/11*	Sept 30 2016	Sept 30 2020	5
Richard D. Dunham	10/05	Sept 30 2013	Sept 30 2013	1
Greg Turner	03/11*	Sept 30 2013	Sept 30 2021	4
Chris Repman	10/07*	Sept 30 2014	Sept 30 2018	3
Jay K. Bradford	09/10	Sept 30 2014	Sept 30 2018	2

ALTERNATES:

Vacancy	Sept 30 2007	Any
Vacancy	Sept 30 2007	Any

HOTEL/MOTEL TAX ADVISORY BOARD

(Advisory)

(Membership - 7; Terms - 2 Years Staggered)

	<u>Appt Date</u>	<u>Term Expires</u>	<u>Eligibility Expires</u>
Karmen Hendrix Bryant	02/12*	Sept 30 2013	Sept 30 2017
David Baur	09/10	Sept 30 2013	Sept 30 2014
Lisa Grissom	09/09	Sept 30 2013	Sept 30 2013
Steve Jones	02/09*	Sept 30 2013	Sept 30 2013
Annabell Ramirez	09/12	Sept 30 2014	Sept 30 2016
Brian Smith	09/12	Sept 30 2014	Sept 30 2016
Alex Singh-Hotel/Motel Assn. Rep.	09/09	Dec 31 2013	Assn. Appt.
Vicky Hailey (Liaison Officer)			

* Indicates appointment to an unexpired term.

HOUSING AUTHORITY COMMISSION

(Membership - 5; Terms - 2 Years expiring 2 even & 3 odd.)

	<u>Appt Date</u>	<u>Term Expires</u>	<u>Eligibility Expires</u>
Gregory Maes	11/11	Oct 2013	Oct 2015
Carla Repman, Vice Chairman	09/09	Oct 2013	Oct 2013
James A. Blischke	01/10	Oct 2013	Oct 2015
Dennis Bade	09/12	Oct 2014	Oct 2016
Norma Duran	11/08*	Oct 2014	Oct 2014

ALTERNATES:

Vacancy	Oct 2013	Oct 2015
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JOINT ECONOMIC DEVELOPMENT TASK FORCE

(Ad Hoc)

	<u>Appt. Date</u>
(Midland)	
Wes Perry	01/08
LuAnn Morgan	12/00
Keith Stretcher	12/00
Tommy Hudson	08/07
John Breier	01/04
(Odessa)	
Larry Melton	08/01
Jim Morris	11/00
Richard Morton	11/02
Joel Roberts	11/00
Neil McDonald	11/00

MANAGED COMPETITION COMMITTEE

(Ad Hoc)

	<u>Appt. Date</u>
Jon Morgan	01/02
Wes Perry	01/02
Roy Nelson	01/02
Hugh "Andy" Shaffer	12/03
Scott Dufford	01/02
Ted Tipton	04/04
Kevin Sparks	11/07
Scott Lovett	04/10
P. Lourcey Sams	04/10

Ex-Officio members are the Mayor and the City Manager.

MIDLAND CENTER ADVISORY BOARD

(Advisory & Decision Making)

(Membership - 9; Terms - 3 Years expiring 3-2-2.)

		<u>Appt Date</u>	<u>Term Expires</u>	<u>Eligibility Expires</u>
Brent Blackburn	(City)	09/09*	Sept 30 2013	Sept 30 2016
Charles Spence	(CC)	11/07	Sept 30 2013	N/A
Lorri Lyon West	(City)	09/10	Sept 30 2013	Sept 30 2016
Patricia S. Blackwell	(City)	10/07*	Sept 30 2014	Sept 30 2014
Paula Mitchell	(City)	09/08	Sept 30 2014	Sept 30 2014
Vicky Hailey	(CC)	01/13*	Sept 30 2014	N/A
Tracy Bacon	(CC)	12/11	Sept 30 2014	N/A
Jerry Morales (Liaison Officer)				

Ex-Officio members are the City Manager and Executive Director of the Chamber of Commerce.

MIDLAND CENTRAL APPRAISAL DISTRICT BOARD OF DIRECTORS

Five Directors, Elected by Local Taxing Entities.

City Nominates/Cast Vote for one Director

(Terms - 2 Years)

	<u>Appt Date</u>	<u>Term Expires</u>
Chad Clark	3/12*	Dec 31 2013

MIDLAND DEVELOPMENT CORPORATION

(Membership - 5; Terms -3 Years - Staggered)

	<u>Appt Date</u>	<u>Term Expires</u>	<u>Eligibility Expires</u>
Laura Roman	01/08	Jan 14 2014	Jan 14 2014
Robert Rendall, Chairman	01/09*	Jan 14 2014	Jan 14 2017
Michael Trost	02/11*	Jan 14 2016	Jan 14 2019
Cary J. Love	12/09	Jan 14 2016	Jan 14 2016
Gary Douglas	11/11*	Jan 14 2016	Jan 14 2019

MIDLAND FRESH WATER SUPPLY DISTRICT #1

(Ad Hoc)

(3 Non Voting Members)

Appt Date

Wes Perry
 Gary Harris
 Wayne Merritt

05/12
 05/12
 05/12

**MIDLAND FOOTBALL-SOCCER AND BASEBALL COMPLEX
 DEVELOPMENT CORPORATION**

(Decision Making)

Membership - 7; Terms - 2 Years)

	<u>Appt Date</u>	<u>Term Expires</u>	<u>Eligibility Expires</u>
Ken Marks, Vice President	10/07	Nov 2011	Nov 2011
James G. Smith	12/07	Nov 2011	Nov 2011
Mike Thompson	11/11	Nov 2013	Nov 2015
Tim Bryson	11/11	Nov 2013	Nov 2015
Wesley D. Bownds	02/09*	Nov 2013	Nov 2013
John James	08/08*	Nov 2013	Nov 2013
Rick Davis (MISD Resp.)	10/10*	Nov 2013	Nov 2015

MIDLAND HIGHER EDUCATION FACILITIES CORPORATION

(Membership - 7; Terms - 2 Years Staggered)

	<u>Appt Date</u>	<u>Term Expires</u>	<u>Eligibility Expires</u>
Vacancy		Jan 1 2007	
Vacancy		Jan 1 2007	
Vacancy		Jan 1 2007	
Vacancy		Jan 1 2009	
Cathy Oestmann	11/05*	Jan 1 2010	Jan 1 2010
Steve Jones	09/08*	Jan 1 2010	Jan 1 2012
Curt Kamradt	11/05*	Jan 1 2014	Jan 1 2014

* Indicates appointment to an unexpired term.

MIDLAND HOUSING FINANCE CORPORATION

(Decision Making)

(Membership - 5; Terms - 2 Years - Staggered)

	<u>Appt Date</u>	<u>Term Expires</u>	<u>Eligibility Expires</u>
Vacancy - (Damon L. Blakeley)	07/07*	Sept 30 2010	
Adrienne Valencia	10/07	Sept 30 2011	Sept 30 2011
Melissa Wicker	10/07	Sept 30 2011	Sept 30 2011
Jerry Morales (Liaison Officer)	10/08	Sept 30 2012	Sept 30 2012
Nathan Miller	11/11*	Sept 30 2012	Sept 30 2016

MIDLAND MUNICIPAL MANAGEMENT DISTRICT BOARD

(Ad Hoc)

Appt. Date

Vacancy	
Richard Hatchett	11/08
W. L. "Scooter" Brown	09/04
Ken Burgess	09/04
Jim Hightower	11/08
Ted H. Jones	09/04
Mitch Malouf	11/08
Christi Newton	09/04
Dan Rush	09/04

MIDLAND-ODESSA URBAN TRANSIT DISTRICT BOARD

(Decision Making)

(Membership - 6; Terms - 2 Years Staggered)

	<u>Appt Date</u>	<u>Term Expires</u>	<u>Eligibility Expires</u>
Willie Barber	09/08	Sept 30 2012	Sept 30 2012
Michael Trost	09/08	Sept 30 2012	Sept 30 2012
John H. James	09/09	Sept 30 2013	Sept 30 2013
Karen York	06/09*	Sept 30 2013	Sept 30 2013
Guy McKenize	03/11*	Sept 30 2013	Sept 30 2015
Rebecca Bell	09/12	Sept 30 2014	Sept 30 2016

* Indicates appointment to an unexpired term.

OIL AND GAS ADVISORY COMMITTEE

(Advisory)

(Membership – 5; Terms – 3 Years expiring 2-2-1)

	<u>Appt Date</u>	<u>Term Expires</u>	<u>Eligibility Expires</u>
Russell Richards (Petroleum Eng.)	09/12	Sept 30 2015	Sept 30 2018
Perry Dan Taylor (Real Estate)	09/12	Sept 30 2015	Sept 30 2018
Lance Friday (Real Estate)	09/12*	Sept 30 2013	Sept 30 2019
Paul Brown (Petroleum Eng.)	11/11	Sept 30 2014	Sept 30 2017
David Rosen (Petroleum Eng.)	11/11	Sept 30 2014	Sept 30 2017

PARKS AND RECREATION COMMISSION

(Advisory)

(Membership - 9; Terms - 3 Years expiring 3-3-3.)

	<u>Appt Date</u>	<u>Term Expires</u>	<u>Eligibility Expires</u>
Charles A. Spence	01/10*	Sept 30 2013	Sept 30 2016
Susan Nichols	02/06*	Sept 30 2013	Sept 30 2013
Eric L. West	10/07	Sept 30 2013	Sept 30 2013
Kenny Harper	03/12*	Sept 30 2013	Sept 30 2019
P. Lourcey Sams	09/08	Sept 30 2014	Sept 30 2014
Tina Corbett	09/08	Sept 30 2014	Sept 30 2014
Katey Howard	09/12*	Sept 30 2014	Sept 30 2020
Amanda McCann	11/11*	Sept 30 2015	Sept 30 2018
Edward Mayberry	09/12	Sept 30 2015	Sept 30 2021

PERMIAN BASIN AIRPORT BOARD

(Advisory)

(Membership - 30; Terms - 1 year.)

	<u>Appt. Date</u>	<u>Term Expires</u>
10 Members of the Airport Planning and Development Board		
Bob Forrest (Carlsbad, NM)	10/04	Sept 30 2010
Larry Shed (Hobbs, NM)	10/01	Sept 30 2010
Larry Gill (Abilene)	10/10	Sept 30 2011
David Hardwick (Ft. Stockton)	10/07	Sept 30 2012
Lex Hinds (Seminole)	10/08	Sept 30 2012

PERMIAN BASIN AIRPORT BOARD CON'T

	<u>Appt. Date</u>	<u>Term Expires</u>
Elvin Brownlee III (Andrews)	12/10*	Sept 30 2013
Jim Little (Big Spring)	09/03	Sept 30 2013
Frankie Rolfe (Kermit)	09/12	Sept 30 2013
Don Bethel (Lamesa)	02/91	Sept 30 2013
Willie Taylor (Odessa)	02/00	Sept 30 2013
Gloria Pena (Odessa)	03/03*	Sept 30 2013
Barbara Graff (Odessa)	06/10*	Sept 30 2013
Henry Cutbirth (Monahans)	09/05	Sept 30 2013
Isabelle Blanchard (Pecos)	10/10	Sept 30 2013
Luis E. Elguezabal (San Angelo)	10/07	Sept 30 2013
Glenn Wortham (Sweetwater)	10/07	Sept 30 2013
John Rogotzke (Snyder)	01/12	Sept 30 2013
Lance Goodrich (Artesia, NM)	09/09	Sept 30 2013
Larry Fry (Roswell, NM)	09/00	Sept 30 2013

Ex-Officio members are the City Manager and the City Attorney. The Secretary is the Director of Aviation.

**PERMIAN BASIN COMMUNITY CENTER FOR MENTAL HEALTH
AND MENTAL RETARDATION**

(Decision Making)

(Membership - 2 (City); Terms - 2 Years)

	<u>Appt Date</u>	<u>Term Expires</u>	<u>Eligibility Expires</u>
Janet R. Pritchett (City)	05/09*	June 2014	June 2014
Larry Edgerton	07/10*	June 2013	June 2015

PERSONNEL BOARD OF APPEALS

(Decision Making)

(Membership - 3; No designated terms.)

	<u>Appt. Date</u>
John James	03/08
Hugh A. "Andy" Shaffer	09/05
Michael Trost	01/10

PLANNING AND ZONING COMMISSION

(Advisory & Decision Making)
(Membership - 9; Terms - 3 Years)

	<u>Appt Date</u>	<u>Term Expires</u>	<u>Eligibility Expires</u>
Jane Wolf	03/09*	Sept 30 2013	Sept 30 2016
Cindy Lanning	09/10	Sept 30 2013	Sept 30 2016
Jay Norris	11/11	Sept 30 2014	Sept 30 2017
Galen Gatten, Vice Chairman	09/08	Sept 30 2014	Sept 30 2014
Kevin Wilton	09/08*	Sept 30 2015	Sept 30 2017
Royce Watkins	02/08*	Sept 30 2015	Sept 30 2017
Karen York	10/10*	Sept 30 2015	Sept 30 2018
Sharla Hotchkiss	10/12	Sept 30 2015	Sept 30 2018
Warren Lvey	10/12*	Sept 30 2014	Sept 30 2020
<u>ALTERNATES:</u>			
Tony Carrillo	11/11	Sept 30 2014	Sept 30 2017

TAX INCREMENT REINVESTMENT ZONE BOARD

(Decision Making)
(Membership - 12; Terms - 2 Years, or 3 Years if appointed after 3/1/07)

	<u>Appt Date</u>	<u>Term Expires</u>	<u>Eligibility Expires</u>
Mark T. Wellen (City), Chairman	07/01	Mar 20 2010	Mar 20 2010
Randy Prude (County)	03/07	Mar 20 2010	Mar 20 2013
Ken Burgess (City)	10/12*	Mar 20 2013	Mar 20 2018
Judge Mike Bradford (County)	01/07*	Mar 20 2010	Mar 20 2014
Bob Lanier (City), Secretary	04/03	Mar 20 2011	Mar 20 2011
Pete Hulder (Hospital)	03/10	Mar 20 2016	Mar 20 2016
Michael Blonkvist (City)	09/12*	Mar 20 2014	Mar 20 2020
John L. Kennedy (City)	10/09*	Mar 20 2015	Mar 20 2018
Link Grimes (City)	12/12*	Mar 20 2015	Mar 20 2021
Charlene McBride (College)	12/12	Mar 20 2016	Mar 20 2019
Steve Castle (College)	04/13*	Mar 20 2015	Mar 20 2021
Russell Meyer (Hospital)	12/12	Mar 20 2016	Mar 20 2019

Ex-Officio member is President, Board of Trustees, Midland Independent School District

ZONING BOARD OF ADJUSTMENT
AND
AIRPORT ZONING BOARD OF ADJUSTMENT

(Decision Making)

(Membership - 5; Terms - 2 Years expiring 3 odd & 2 even.)

	<u>Appt Date</u>	<u>Term Expires</u>	<u>Eligibility Expires</u>
Manny Ribera	10/07	Sept 30 2011	Sept 30 2011
Ken Morgan	01/10*	Sept 30 2012	Sept 30 2014
Carla Repman	01/10*	Sept 30 2013	Sept 30 2015
Scott Young	09/12*	Sept 30 2013	Sept 30 2017
Todd Byars	02/08*	Sept 30 2014	Sept 30 2014

ALTERNATES: (not applicable to Airport Zoning)

Vacancy		Sept 30 2006	
Vacancy		Sept 30 2009	
Annabel Holguin	11/11	Sept 30 2013	Sept 30 2015
Greg Turner	11/11	Sept 30 2013	Sept 30 2015

* Indicates appointment to an unexpired term.