Confederate Citizens Collection Station

Solicitation No. 2016-764

City of El Paso
Purchasing and Strategic Sourcing Department
300 N. Campbell, 1st Floor
El Paso, Texas

VOLUME 1 OF 2

All bids must be submitted

in a sealed envelope

BEFORE 2:00 P.M.

on the Bid Opening date to

CITY HALL

300 N. Campbell, El Paso, TX 79901

1st FLOOR

PURCHASING & STRAGETIC SOURCING DIVISION

CITY OF EL PASO
NOTICE

Confederate Citizens Collection Station
Solicitation No. 2016-764

A NON-MANDATORY PRE-BID CONFERENCE WILL BE HELD

On April 7, 2016 at 10:00 p.m.

Location: **3510 Confederate, El Paso TX, 79936**

EVENTS	DATE AND/OR TIME
Release Bids	3/29/2016
Last Day for Offerors to Submit Written Questions	4/13/2016
Bid Due Date	4/20/2016

Answers furnished during the conference will not be official until verified in writing by the issuing office.
You may address procurement questions to the *Analyst*, *Claudia Garcia*, in writing at *garciaca2@elpasotexas.gov*.
Any other communications, oral or in writing, with any person are strictly prohibited.

Attendance at the project pre-bid conference is optional for all bidders intending to submit a bid for the units and services.

Instructions to bidders: Free bid packets (Specifications, Plans and all required forms) are available online. Bidders must register in order to download bid packets from the Purchasing & Strategic Sourcing Department Website:

http://www.elpasotexas.gov/purchasing/ep-invitations.asp

Bidders must acknowledge the receipt of any and all amendments on the solicitation response. It is the bidder's responsibility to ensure that they have all pertinent information regarding solicitations, including all amendments prior to submitting their offer. Failure to acknowledge may be cause for your bid to be considered non-responsive.

TABLE OF CONTENTS

Confederate Citizens Collection Station
SOLICITATION No. 2016-764

VOLUME 1	SECTION	NO. PAGES
INVITATION TO BID	I-A	2
SCOPE OF WORK	I-A-a	1
INFORMATION FOR BIDDERS	I-B	32
BID	I-C	4
CERTIFICATION OF NONCOLLUSION	I-C-a	1
BID BOND	I-D	3
SUPPLEMENTAL BIDDER INFORMATION	I-E	21
VOLUME 2		
APPLICABLE WAGE RATES	I-G	9
QUALIFICATION AND FINANCIAL DISCLOSURE STATEMENT	I-H	5
CONTRACT	II-A	2
PERFORMANCE BOND	II-B	2
PAYMENT BOND	II-C	2
AGENT RESIDENT DESIGNATION	II-D	1
INSURANCE REQUIREMENTS (Certificate to be inserted by contractor)	II-E	3
GENERAL CONDITIONS OF CONTRACT	III-A	56
SAFETY STANDARD AND ACCIDENT PREVENTION	III-B	1
TRENCH SAFETY SYSTEM REQUIREMENTS	III-C	4
TECHNICAL SPECIFICATIONS	V	314

CITY OF EL PASO
INVITATION FOR BID

Confederate Citizens Collection Station

Solicitation No. 2016-764

Sealed bids will be received by the Purchasing & Strategic Sourcing Department, City of El Paso, 300 N. Campbell, El Paso, Texas 79901 or HAND DELIVERED to the Purchasing & Strategic Sourcing Department at City Hall, 300 N. Campbell, 1st Floor, El Paso, Texas, before 2:00 p.m., Wednesday, April 20, 2016, publicly opened and read in City Hall, 300 N. Campbell, 1st Floor, Council Chambers, unless posted otherwise, for furnishing the City with the construction of Confederate Citizens Collection Station, Bid No. 2016-764.

The City reserves the right to accept or reject any or all bids and to waive formalities. In case of ambiguity in stating the price in the bid, the City reserves the right to consider the most advantageous construction thereof or to reject any bids. Also, the City reserves the right to accept the low bid based on the tabulation of any one, combination or all of the base bid(s), alternate bid(s) and/or, optional bid(s) based on the most advantageous project bid that is desired by the City Department involved and that the City Council in their sole judgment determines is the City's best interest and benefit.

"PLEASE NOTE THE REQUIREMENTS IN SECTION 5.24 AND 5.25 OF THE CONTRACT GENERAL CONDITIONS, APPRENTICES THAT MAY APPLY TO THIS PROJECT."

Cone of Silence: Please note requirements of the City's "Cone of Silence" Policy found in section I-B, Information for Bidders, item number 26. The Cone of Silence Policy prohibits any communication except as provided in the Policy. The Cone of Silence begins on the day the bid is advertised and terminates on the day that a recommendation of contract award is placed on the City Council agenda by the Purchasing & Strategic Sourcing Department

Please note the City's experience requirements, for award of this project, in Section I-B, Information for Bidders, item No. 6, Method of Award-Lowest Responsive and Responsible Bidder:

The Bidder must demonstrate successful completion of one project similar in nature and scope of this Project and one project with a value at least fifty percent (50%) of the value bid for this project, within the last five (5) years, except when other requirements are specified in section I-E.

Wage Rates: Where there are similar wage rate classifications in wage determinations, the higher wage shall be paid. The contractor shall pay not less than the wage rate as determined by the

Department of Labor, Wage and Hour Division and the City of El Paso.

The bidder awarded the contract for this project will be required to enter payrolls electronically using the *LCP Tracker* payroll software that the City uses to certify payrolls and generate payroll reports. The City will provide Contractor with the software.

All forms in VOLUME I must be printed, completed and submitted in a sealed envelope. It is the responsibility of the bidder to submit any forms that may have been issued by amendment.

IMPORTANT NOTICE

NOTE: ANY CHANGES IN DUE DATE OR MATERIAL CHANGES FOR ANY RFP'S/SOLICITATIONS WILL BE POSTED ON THE SOLICITATIONS PAGE OF THE CITY OF EL PASO PURCHASING & STRATEGIC SOURCING DEPARTMENT'S WEBSITE:

http://www.elpasotexas.gov/purchasing/eprocurement

It is the bidder's responsibility to ensure that they have all pertinent information regarding solicitations, including all amendments prior to submitting their offer. Please check the website, even after submitting a bid, to ensure that you have all amendments as they may be posted at any time, up to and including the day of bid opening.

The City of El Paso does not provide any documents (i.e. proposal, plans, specs, etc.) in paper form (hardcopy).

The estimated project budget is in the range of $451,000.00-999,999.00

Bid Security: Each bid must be accompanied by a bid bond naming the City of El Paso as obligee and duly executed by the Bidder as principal and having as surety thereon a surety company approved by the Owner, in the amount of five percent (5%) of the total bid price (including base bid(s), option(s) and alternate(s). ALL BID BOND FORMS MUST CONTAIN ORIGINAL SIGNATURES (S).

The successful bidder must furnish a performance and payment bond as required by law, and the terms of this contract.

Bruce D. Collins, CPPO
Purchasing Director
Purchasing & Strategic Sourcing Department
City of El Paso

Advertised in the EL PASO TIMES Tuesday, March 29, 2016 and Tuesday, April 5, 2016.

CONFEDERATE CITIZENS COLLECTION STATION

Solicitation No. 2016-764

SCOPE OF WORK

THIS IS A UNIT PRICE REQUIREMENTS CONTRACT WITH THE CITY OF EL PASO

The contractor shall construct a CCS per the plans specifications provided. The project includes but is not limited to of the following:

- Demolition of existing pavement, landscaping and concrete.
- Reinforced concrete retaining walls up to 6.5 feet high with steel railings.
- 7-inch thick reinforced concrete pavement with base course and subgrade compaction.
- 2 & 3.5-inch thick Type “C” HMAC with base course and subgrade compaction.
- 6 foot high Chain Link fencing with screening.
- Electrical room, bathroom and lighting will be constructed in an existing building, along with water and sewer line connections and a new manhole
- Landscaping with irrigation
- Site lighting
- Relocation of an existing guard shack and shade structure
- Electrical service and distribution system

Prior to commencement of any work, the Contractor shall submit and obtain approval from City of El Paso, Capital Improvement Program Department, for the Sequence of Construction, Schedule of Work, and Haul/Waste Route to an approved disposal site. Traffic Control Plan must be submitted and approved, if applicable. Contractor shall provide written approved documentation from the owner or operator of the waste site.

The description of this scope of work as shown above is only a general overview of this project. Contractor shall refer to the project plans and specifications for further information.

END SCOPE OF WORK

INFORMATION FOR BIDDERS

1. RECEIPT AND OPENING OF BIDS

The City of El Paso, hereinafter called the "Owner", invites bids on the attached form hereto, all blanks of which must be appropriately filled in. Bids will be received by the Owner at the office of the Purchasing & Strategic Sourcing Department, as specified in the "Invitation to Bid", page I-A-1, and then publicly opened and read aloud at City Hall, 300 N. Campbell, 1st Floor, Council Chambers, unless otherwise posted. The envelopes containing the bids must be sealed and addressed to: Purchasing & Strategic Sourcing Department, City Hall, 300 N. Campbell, 1st Floor, El Paso, Texas 79901 or delivered to the Purchasing & Strategic Sourcing Department, City Hall, 300 N. Campbell, 1st Floor, El Paso, Texas and designated as bid for:

Confederate Citizens Collection Station

Solicitation No. 2016-764

N O T I C E

The Owner reserves the right to accept or reject any or all bids and, to the extent permitted by law, to waive informalities or irregularities that are not material, such as failure to submit sufficient offer copies, literature or similar attachments or business affiliation information. All bids are to be prepared and submitted in accordance with the provisions of the Information for Bidders, and the City reserves the right to consider any bid, therefore, subject to rejection as being nonresponsive to the bid request. The Owner may, in its sole discretion, determine that any non-material defect in the bid is harmless if such defect relates to an element that is not material, mandatory or essential to the responsiveness of the bid, and the Owner may accept the bid in spite of the existence of a harmless non-material defect. Any bid received after the time and date specified shall not be considered. No Bidder may withdraw a bid within ninety (90) consecutive calendar days after the actual date of the opening thereof.

EXPIRATION NOTICE

The bidder agrees, to furnish all items [supplies or services] at the prices offered, and delivered at the designated point or points, within the time set forth in the SCHEDULE, if this bid is accepted within **NINETY [90]** consecutive days from the date set for the receipt of bids. All bids shall expire on the **90th** day after the offers are open unless the City of El Paso requests an extension of the bids in writing and the bidder agrees to extend in writing.

2. PREPARATION OF BID

EACH BID MUST BE SUBMITTED ON THE PRESCRIBED FORM AND All blank spaces for bid prices must be entered in ink or typewritten**. FAILURE TO FILL IN ALL BLANK SPACES SHALL CAUSE THE BID TO BE DEEMED NOT RESPONSIVE AND BID WILL NOT BE CONSIDERED IN DETERMINING THE LOWEST RESPONSIBLE BIDDER.** Line item entries shall prevail over sum total entries. When discrepancies exist between unit prices and corresponding extended prices, unit prices shall prevail.

The predetermined percentage allowable for mobilization shall prevail over the total amount entered for mobilization. When discrepancies exist between the predetermined percentage allowable for mobilization and the total amount entered for mobilization, the predetermined percentage allowable shall prevail.

Each bid must be submitted in a sealed envelope bearing on the outside the name of the Bidder, his/her address, and the name of the project for which the bid is submitted.
If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified in Paragraph 1.

*** N O T I C E ***

STATE SALES TAX

The successful Bidder may be required to pay state sales tax for the purchase, rental or lease of tools, machinery and equipment used in the performance of the awarded contract and for materials purchased which are not incorporated into the completed project. It is the obligation of the Bidder to ascertain the amount of state sales tax to be paid under Chapter 151 of the Texas Tax Code and to include this amount in his/her bid submitted to the Owner. For further information, the Bidder may wish to contact the office of the Texas Comptroller of Public Accounts at 1-800-252-5555.

3. SIGNATURE FORMALITIES

THE FULL COMPANY NAME OF THE BIDDER SHOULD BE NOTED ON EVERY PAGE OF THE BID AND SHALL BE SIGNED WITH THE BIDDER'S OFFICIAL SIGNATURE. The name of the signing party or parties should be typewritten or printed under all signatures on the signature page of the bid.

The Bidder should observe the following additional formalities specific to his/her form or ownership:

a. If a corporation, a Corporate Certificate must be completed by the Secretary or by another officer if the bid is signed by the Secretary. In lieu of the certificate, there may be attached to the bid, copies of as much of the records of the corporation as will show the official character and authority of the officers signing, duly certified by the Secretary or Assistant Secretary under the corporate seal to be true copies.

b. If the Bidder should be operating as a partnership, each partner should sign the bid. If the bid is not signed by each partner, there should be attached to the bid a duly authenticated power of attorney evidencing the signer's authority to sign such bid for and in behalf of the partnership.

c. If the Bidder is an individual, the trade name (if the Bidder be operating under an assumed name) should be indicated in the bid and the bid should be signed by such individual. If signed by one other than the Bidder, there should be attached to the bid a duly authenticated power of attorney evidencing the signer's authority to execute such bid for and in behalf of the Bidder.

4. SUBCONTRACTS

The Bidder is specifically advised that any person, firm, or other party to whom it is proposed to award a subcontract under this contract must meet the following requirement(s) BEFORE the contract is awarded:

a) Be acceptable to the Owner after verification of the current eligibility status.

5. USE OF PURCHASING & STRATEGIC SOURCING DEPARTMENT

Bidders are forbidden to use any telephones or equipment, i.e., desks, calculators, etc., in the Purchasing & Strategic Sourcing Department as a whole prior to bid openings.

6. METHOD OF AWARD-LOWEST RESPONSIVE AND RESPONSIBLE BIDDER

The Owner shall award this contract on the basis of the lowest responsive and responsible bid to a single bidder, provided, however, that the Owner may accept or reject all bids or in the case of ambiguity in stating the price in the bid, the Owner may consider the most advantageous construction thereof or reject any bids.

The Owner will accept the lowest responsible bid calculated on one or more base bid(s), alternate bid(s) and/or, optional bid(s) depending on the City's available project budget and project priorities, as further detailed in the project bid specifications (Section I-C of bid documents).

It is the intention of the Owner to award the contract for this work to the lowest responsible and responsive Bidder whose construction skill, experience, and financial resources demonstrate its ability to perform the work contemplated herein, in an efficient and effective manner, and successfully completing the contract within a set time limit.

Contractor or Subcontractor performing the work shall have the required specifications.

If the Contractor can meet solicitation requirements through a subcontractor, then it must include three (3) references for the subcontractor's experience.

The Bidder must demonstrate successful construction of, and successful completion of one (1) project similar in nature and scope of this Project and one (1) project with a value at least fifty percent (50%) of the value bid for this project, within the last five (5) years, except when other requirements are specified in section I-E.

In determining the lowest and best bidder, in addition to price, the City may consider factors, which may include, but are not limited to, the following:

(1) the quality, availability, and adaptability of the supplies, materials, equipment or contractual services, to the particular use required;

(2) the ability, capability, and skill of the Bidder to perform the contract or provide the service required;

(3) whether the Bidder has already proven they will and can perform the contract or provide the service promptly, or with the time required, without delay or interference;

(4) the character, responsibility, integrity, reputation, and experience of the Bidder;

(5) the quality of performance on previous Owner contracts;

(6) the previous and existing compliance by the Bidder with laws relating to the contract or service;

(7) any previous or existing noncompliance by the Bidder with specification requirements relating to time of submission of specified data such as samples, models, drawings, certificates, or other information;

(8) the sufficiency of the financial resources and ability of the Bidder to perform the contract or provide the service;

(9) the ability of the Bidder to provide future maintenance, repair parts, and service for the use of the subject of the contract.

(10) whether the Bidder maintains a permanent place of business;

(11) whether in the opinion of the City, the Bidder has adequate plant, equipment, and personnel to do the work properly and expeditiously;

(12) whether the Bidder has failed to submit bid security by one of the approved methods set forth in Paragraph 8; and

(13) overall poor performance on previous projects.

The Owner may make such investigations of such additional elements of the Bidder's capacity as it deems necessary to determine the responsibility of the Bidder to perform the work, and the Bidder shall furnish to the Owner all such information and data for this purpose, as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein.

To assist the Owner in evaluating the Bidder's responsibility, the Owner may require that the lowest responsive Bidder complete and submit either the "Qualification and Financial Disclosure Statement", on pages I-H-2 through I-H-5 or a letter of commitment as provided on page I-H-1, within five (5) consecutive calendar days of notification by the City.

When the City proposes that the contract will be awarded to a Bidder who is not the lowest Bidder, the public posting of the time on the City Council agenda or Mass Transit Board agenda, as appropriate, shall constitute notice to each Bidder. Each lower Bidder shall be provided an opportunity to appear before the City Council or Mass Transit Board, as appropriate, and present evidence as permitted by law before such proposed award is

made. The City may, in its discretion, provide written notice or notice by publication to the lower Bidder of the proposed award.

6A. DEBRIEFING REQUESTS

A written request for a debriefing should be directed to the PROCUREMENT ANALYST identified in the BID NOTICE within five (5) days after the date of award. Debriefing requests will be scheduled with the appropriate evaluation committee and Purchasing and Strategic Sourcing Department representative.

6B. MINIMUM SPECIFICATIONS: The specifications listed are to be interpreted as meaning the minimum required by the City. Offeror commits to provide goods/services that are consistent with the City's specifications in every regard unless an exception is clearly noted. The City may accept a bid subject to an exception if, in the sole judgment of the City, the bid meets or exceeds the City's specifications. If the goods/services offered do not meet or exceed the City's specifications because of the exception, the City will consider the bid non-responsive.

SAFETY AND CAPACITY INSPECTIONS: The City reserves the right to conduct safety and capacity inspections of facilities, equipment, and staff prior to the award and periodically during the contract term. If, in the sole discretion of the City, a vendor is deemed to have inadequate safety equipment and/or procedures, has a track record of safety violations, or has insufficient capacity to honor the contract requirements then the vendor may be declared non-responsible.

EQUIPMENT, PERSONNEL AND RESPONSIBILITY DETERMINATION: At the time of submission, the vendor must provide and/or identify the following as appropriate, 1) the primary equipment it intends to use in the execution of this contract to include quantity, brand, type, and model year; 2) the number of personnel it employs that can fulfill the contract requirements and; 3) responsibility determination (financial and technical - see end of Section B for specific information).

CONTRACTING OFFICER (CO) AND CONTRACTING OFFICER'S REPRESENTATIVE (COR)
Acceptance of services will be the responsibility of the Contracting Officer (CO), who also serves as City of Paso Purchasing Director, or designee. The Contracting Officer is responsible for final approval and acceptance of all services rendered. Upon contract execution, the Contracting Officer will delegate a Contracting Officer's Representative (COR) and Department Contracts Administrator(s) (DCAs) to assist with the administration of the resultant Contract.

CONTRACT PERFORMANCE
The Respondent shall be responsible for the completion of all work set out in the Contract and task orders. All work is subject to inspection, evaluation, and acceptance by City of El Paso. City of El Paso may employ all reasonable means to ensure that the work is progressing and being performed in compliance with the Contract.

MATERIALS AND FABRICATION: Details of construction and materials, where not otherwise specified, are left to the discretion of the manufacturer, provided that only materials and workmanship of the highest quality are to be used, and best commercial practice is adhered to in the fabrication of the unit(s). Except as otherwise specified herein, the manufacturer shall be solely responsible for design and construction of the product to meet the stated performance criteria.

REFERENCE TO BRAND NAMES: Any manufacturer names, trade names, brand names, or catalog numbers used in these specifications are for the purpose of describing and establishing minimum requirements or level of quality and design required, and are in no way intended to prohibit the bidding of other manufacturers' item of equal material and quality.

MATERIALS

The items furnished shall be new, unused or the latest model in production as offered to commercial trade and shall be of the highest quality as to materials and workmanship. Manufacturer furnishing these items shall be experienced in the design and construction of such items and shall furnish evidence of having supplied similar items which have been in successful operation. The bidder shall be an established supplier of the items bid.

6C. PROTEST/DISPUTE PROCEDURE

Only a bidder who has actually submitted a bid response may appeal an award decision.

Failure to follow the requirements of the Protest procedures established by the City of El Paso, Texas, shall constitute a waiver of all protest rights.

Protest must be made after the Council agenda has been posted and by 5 p.m. the day before the Council meeting in which the award will be made. The bidder must write a letter to the Purchasing Director using the phrase “Bid Protest” to the address listed above. Protest must be sent by certified or registered mail or delivered in person. Note: the recommendation for award is posted on the City’s website at least 72 hours before each Tuesdays Council meeting.

The written protest should include 1) the bid number and should clearly state, with particularity, the relevant facts believed to constitute an error in the award recommendation, or desired remedy; 2) a specific identification of the statutory or regulatory provision that the Protesting Bidder alleges has been violated and the provisions entitling the Protesting Bidder to relief; 3) a specific factual description, with particularity, of each action by the City that the Protesting Bidder alleges to be a violation of the statutory or regulatory provision that the Protesting Bidder has identified pursuant to item (2) of this paragraph (mere disagreement with the decisions of City employees does not constitute grounds for protest). If there is no disputed issue of the material fact, the Protest must indicate this as well.

Only the information provided within the protest period will be considered in making a recommendation to Council.

CONDITIONAL BIDS WILL NOT BE ACCEPTED

The submission or attachment of company “Quotation Forms” or any other documents containing alternative terms and / or conditions is not acceptable and may result in your bid being deemed non-responsive. Unauthorized additions, serious omissions, bids that do not contain a unit price where required or irregularities of any kind which make the bid incomplete, indefinite, or otherwise ambiguous are not acceptable and may result in your bid being deemed non-responsive.

7. TIME OF AWARD

Each Contract shall be deemed as having been awarded when formal written Notice of Award shall have been duly served upon the Bidder to whom the Owner has awarded the contract by some officer or agent of the Owner duly authorized to give such notice. Upon receipt of such written notice, the Contractor will proceed to verify the availability of the required materials or equipment needed to perform the project and submit his shop drawings to the Capital Improvement Department or Owner-designated representative within (21) twenty-one calendar days from issuance of Notice to Proceed with Submittal Phase. If problems are encountered in the availability of materials or equipment, the Owner will be notified in writing immediately prior to scheduling of the Preconstruction Conference.

8. BID SECURITY

Each bid must be accompanied by an original Bid Bond prepared in the form of a Bid Bond attached hereto, naming the City of El Paso Texas as obligee and duly executed by the Bidder as principal and, having as surety thereon a surety company approved by the Owner, in the amount of five percent (5%) of the TOTAL bid price, including the base bid(s), option(s) and alternate(s), (cash, personal checks, company checks, cashier's checks or any security other than a bid bond **will not be accepted**). The surety shall meet the requirements found in the General Conditions 5.13.2.2.1 and 5.13.2.4. Each Bid Bond submitted must be an original Bid Bond with original signatures of the principal and surety. The surety company providing the Bid Bond shall designate an agent resident who resides within the County of El Paso to whom any requisite notices may be delivered and with whom service of process may be rendered in matters arising out of the surety ship. Such bid bonds will be returned promptly after the Owner and the accepted Bidder have executed the Contract, or, if no award has been made, within ninety (90) consecutive calendar days after the date of the opening of bids, upon demand of the Bidder at any time thereafter, so long as he/she has not been notified of the acceptance of his/her bid.

9. LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO CONTRACT

In the event the successful Bidder fails or refuses to execute and deliver the Contract, insurance certificates, bonds and resident agent designation as required herein within fourteen (14) consecutive calendar days after successful Bidder has received notice of award, the Owner may take the necessary steps to terminate the award and seek forfeiture of successful Bidder's bid bond as liquidated damages for such failure or refusal to enter into a contract.

10. BONDING REQUIREMENTS

In accordance with Chapter 2253, Texas Government Code, the City of El Paso requires the following for all public works contracts:

a. A Performance Bond for all public works contracts in excess of $25,000. The performance bond shall be for one hundred percent (100%) of the contract price and conditioned on the faithful performance of work in accordance with the plans, specifications, and contract documents.

b. A Payment Bond for all public works contracts in excess of $25,000. The payment bond shall be for one hundred percent (100%) of the contract price for

the protection and use of the payment bond beneficiaries who have a direct contractual relationship with the prime contractor or subcontractor to supply public work labor or material.

In accordance with Section 3503.003 of the TEXAS INSURANCE CODE, the surety company providing the Payment Bond shall designate an agent who resides within the County of El Paso to whom any required notices may be delivered and on whom process may be served in matters arising out of surety ship.

In accordance with Section 3503.004 of the TEXAS INSURANCE CODE, if a Performance or Payment Bond is an amount in excess of ten percent (10%) of the surety's capital and surplus, the City of El Paso will require, as a condition to accepting the bond(s), a written certification from the surety that the surety has reinsured the portion of the risk that exceeds ten percent (10%) of the surety's capital and surplus with one or more reinsurers who are duly authorized, accredited or trusted to do business in the State of Texas. If any portion of the surety's obligation is reinsured, the amount reinsured may not exceed 10% of the reinsurer's capital and surplus.

The required bonds shall be executed only by a surety company that is authorized to write surety bonds in Texas. If the amount of the bond exceeds $100,000, the surety company must also: (a) hold a certificate of authority from the United States secretary of the treasury to qualify as a surety on obligations permitted or required under federal law; or (b) have obtained reinsurance for any liability in excess of $100,000 from a reinsurer that: (1) is an authorized reinsurer in this state; and (2) holds a certificate of authority from the United States secretary of the treasury to qualify as a surety or reinsurer on obligations permitted or required under federal law. To determine whether the surety on the bond or the reinsurer holds a certificate of authority from the United States secretary of the treasury, a party may conclusively rely on the list published in the Federal Register by the United States Department of the Treasury, covering the date on which the bond was executed, of the companies holding certificates of authority as acceptable sureties on federal bonds and as acceptable reinsuring companies.

11. TIME OF COMPLETION AND LIQUIDATED DAMAGES

Bidder agrees to commence work on a date to be specified in a written "Notice to Proceed" issued by the Owner. The Contract Time shall begin on the date to commence work specified in the Notice to Proceed and shall run for **one hundred eighty (180)** additional **CONSECUTIVE CALENDAR DAYS** thereafter. Bidder shall substantially complete the project within **one hundred fifty (150)** CONSECUTIVE CALENDAR DAYS after the date to commence work in the Notice to Proceed. Bidder agrees to pay, as liquidated damages, the sum of **one thousand two hundred dollars and zero cents ($1,200.00)** for each consecutive calendar day after the date of Substantial Completion, as hereinafter provided in the General Conditions. Bidder further agrees to pay as liquidated damages the sum of **six hundred dollars and zero cents ($600.00)** for each consecutive calendar day after the expiration of the Contract Time for Remaining Work, as provided in Paragraph 6.8.3.1 of the General Conditions. The unit price quantities of this contract are estimated.

12. CONDITIONS OF WORK

Each Bidder must inform himself/herself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful Bidder of his/her obligation to furnish all material and labor

necessary to carry out the provisions of his/her contract. Insofar as possible, the contractor, in carrying out his/her work, must employ such methods or means as will not cause any interruption of, or interference with, the work of any other contractor.

13. OBLIGATION OF BIDDER

A the time of the opening of bids, each Bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the plans and contract documents, including all addenda. The failure or omissions of any Bidder to examine any form, instrument, General Conditions, or other document shall in no way relieve any Bidder from any obligation in respect of his/her bid.

The undersigned Bidder represents to the City and to the other Bidders that his/her bid, and the estimates on which it is based, has been carefully checked and contains no errors, and nothing has been omitted or overlooked in determining the amount bid.

14. ADDENDA AND INTERPRETATIONS

No interpretation of the meaning of plans, specifications, or other pre-bid documents will be made to any Bidder orally. Every request for such interpretation should be in writing addressed to the Purchasing & Strategic Sourcing Department, City of El Paso, 300 N. Campbell, 1st Floor, El Paso, Texas 79901. To be given consideration, the request for interpretation must be received at least seven (7) consecutive calendar days prior to the date fixed for the opening of bids. Please check the website, even after submitting a bid to ensure that you have all amendments as they may be posted at any time, up to and including the day of bid opening. Failure of any Bidder to acknowledge any such addendum or interpretation shall not relieve such Bidder from any obligation under his/her bid as submitted. All addenda so issued shall become part of the contract documents and must be acknowledged on the bid form.

15. POWER OF ATTORNEY

Attorneys-in-Fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

16. NOTICE OF SPECIAL CONDITIONS

Attention is particularly called to those parts of the contract documents and specifications that deal with the following:

a. Inspection and testing of materials.
b. Insurance requirements.
c. Wage rates.

17. HISTORICALLY UNDERUTILIZED BUSINESS ENTERPRISE PARTICIPATION

It is the policy of the City of El Paso to facilitate Historically Underutilized Business Enterprise participation in the city public works contracts. Accordingly, the city of El Paso encourages any Bidder to utilize Historically Underutilized Business Enterprises in obtaining services and/or materials as are necessary to complete the contract

requirements. The Bidder will be required to complete page I-E-2 to identify the name of each subcontractor and/or supplier the Bidder will use in the performance of the contract. For further information, call the Purchasing & Strategic Sourcing Department at (915) 212-0043.

18. LAWS AND REGULATIONS APPLICABLE

The Bidder's attention is directed to the fact that all applicable federal laws, including but not limited to, the Immigration Reform and Control Act of 1986, state laws, municipal ordinances and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout and they will be deemed to be included in the contract the same as though herein written out in full.

The successful Bidder is required to provide to the Purchasing and Strategic Sourcing Department all documents necessary to fulfill local, state and federal regulations governing this project, prior to the preconstruction conference. A Notice to Proceed with the contract **will not** be issued until the appropriate City departments have received all submittals, and any such delays by the lowest responsive Bidder's failure to submit such requirements will not be counted against the time that the bid must remain valid. Appropriate forms and technical assistance will be provided to the successful Bidder by the Purchasing and Strategic Sourcing Department and Owner Designee to fulfill these requirements. For information or assistance, call Purchasing & Strategic Sourcing Department at (915) 212-0043.

19. PREVAILING WAGE RATES AND WAGE RATE PENALTY

The Contractor and any subcontractor under him shall pay not less than the general prevailing wage rates contained herein, to all laborers, workmen and mechanics employed by them in the execution of this contract. When multiple wage rates are used (e.g. Federal wage rates and City wage rates) featuring similar job classifications, the higher wage within the relevant construction type shall be paid.

The general prevailing wage rates contained herein shall be posted at the construction work site in a prominent and accessible place where it can be easily seen by all laborers, workmen and mechanics employed on the project.

Pursuant to Chapter 2258, Texas Government Codes, the Contractor shall forfeit as a penalty to the City of El Paso sixty dollars ($60.00) for each laborer, workman or mechanic employed, for each calendar day, or portion thereof such laborer, workman or mechanic is paid less than the said stipulated rates for any work done under this contract, by him, or by any subcontractor under him.

20. APPRENTICES

The successful Bidder shall be required to comply with sections 5.24 and 5.25 of the General Conditions of the Construction Contract. The bidder shall meet the requirements of registration for a bona fide apprenticeship program, the allowable ratio of apprentices on the job site and the apprentice wage rates and fringe benefits. The bidder shall participate in a DOL certified apprenticeship program when the work required under the contract includes work that must be performed by apprenticeable occupations and the work involving such apprenticeable occupation has a value of **fifty thousand dollars** or more. The apprenticeable occupations are those listed in Section 5.24 of the General Conditions of the Construction Contract. Noncompliance of the contract provisions concerning the apprenticeship participation may be a basis to

terminate the construction contract, which shall be referred to the City Council for determination.

21. INSURANCE AND WORKER'S COMPENSATION INSURANCE

The successful Bidder will be required to furnish certificates of insurance to the Owner that will comply with Paragraphs 5.11 and 5.12 of the General Conditions of this Contract. The Bidder's attention is directed to these insurance and workers' compensation requirements. It will be presumed that each Bidder has read these requirements and that any cost associated with these requirements has been incorporated into the bid submitted to the Owner and the successful Bidder will have no claim for compensation against the Owner.

22. BIDDER ACKNOWLEDGEMENT AND AGREEMENT OF CONTRACT

All Bidders, by submitting a bid hereunder acknowledge understand and agree to the following: All terms, covenants, conditions and any other provisions of the Construction Contract, shall become a part hereof for all purposes. The Bidder formally awarded this contract, shall execute the above-referenced construction contract, and shall be bound to all provisions of this contract in the performance of the project.

22A. MOBILIZATION

Costs associated with mobilization or demobilization, including but not limited to, insurance, bonds, construction permits, fees, job trailers, utilities to job trailers, site administration expenses, or site cleanup, may be included in the line item designated for mobilization. The amount entered on the line item for mobilization may be less than the predetermined maximum percentage for mobilization established by the Owner. However, the amount entered on the line item for mobilization may not exceed the predetermined maximum percentage for mobilization established by the Owner.

If there is a discrepancy between the predetermined maximum percentage allowable for mobilization and the total amount entered for mobilization, the predetermined maximum percentage allowable shall prevail.

Owner reserves the right to determine the maximum percentage allowable for mobilization on a project by project basis depending on the complexity, schedule or other special conditions of the project. The successful bidder may include a request for mobilization costs with the first pay application for each project. **Mobilization costs for this project shall not exceed 5% of each base bid.**

23. TRAFFIC CONTROL PLANS

It shall be the duty and responsibility of the contractor to submit to the Capital Improvement Department or Owner Designee for review three (3) sets of plans for traffic control for this project within twenty one (21) days of award, in accordance with paragraph 2.6, Maintenance and Protection of Traffic of the General Conditions.

The submitted plans must be sealed by a registered professional engineer who is certified to design and implement traffic control plans.

24. PROJECT PROGRESS & PAYMENT SCHEDULES

Prior to award, Contractor shall provide Owner, in an electronic format, with project progress and payment schedules created in MS Projects, to be used for optimal project coordination. Any payment schedules will be considered estimates, and will not be contractually binding insofar as all payment applications will be processed and paid for as work is completed to the Owner's satisfaction. The Contractor shall submit updated schedules monthly throughout the course of the project; however, the Owner reserves the right to request updates at any given time.

This project will be set-up for payment through electronic funds transfer. The City will process the electronic funds transfer within five (5) days of receipt of the approved pay application from the Project's Architect and Project Manager. The vendor's banking institution may assess a processing fee for ACH and wire transfer transactions. The City reserves the right to process a manual check in the event that electronic fund processing issues arise.

NOTE: All vendors **must** accept an ACH payment effective immediately. Vendors must fill-out the attached Accounts Payable Direct Deposit Sign-Up Form located in Section I-E of this document to facilitate the Automated Clearing House (ACH) payment process.

Contract Payments

All contract payments shall be made in accordance with the Contract's invoice payment terms. The City of El Paso will make no advance payments for the goods and/or services that are subject of this solicitation, unless otherwise noted in the Form of Contract. Invoices may be submitted on no more than a monthly basis. Refer to section III-A page 51.

PROMPT PAYMENT

Unless a prompt payment discount is offered and accepted by the City of El Paso, payments will be made to the Contractor within thirty (30) days following acceptance of goods or services, or receipt of a properly prepared invoice by the City Department identified in the Invoice Instructions set forth on the Purchase Order, whichever is later. Any discount for prompt payment will be calculated from the day goods or services are accepted or when a properly prepared invoice is received. Payments will be considered to have been made on the date of mailing (postmark) of the payment check or, for an electronic funds transfer, the specified payment date. Invoices are to be submitted in single copy to the appropriate Department.

PAYMENT TERMS: Please mark appropriate block.

_____% - 10 Days ☐
_____% - 20 Days ☐
_____% - 30 Days ☐
Net - 30 Days ☐

Late Payment fees will incur at the State of Texas statutory rate.

25. ORGANIZATION CERTIFICATE, ASSUMED NAME CERTIFICATE / DBA CERTIFICATE, AND BUSINESS AFFIDAVIT

Bidder must submit with his offer a copy of the company's organization certificate issued by the Secretary of State of the State in which the bidder was organized. If the bidder uses a trade name other than the name under which the company was organized, bidder must also submit a copy of the Assumed Name Certificate. Also, a DBA certificate must be provided if the bidder uses a trade name other than the name under which the company was organized. Further, bidder must complete and submit the affidavit at the end of section I-E, Supplemental Bidder Information, stating what names the company uses and has used in the past and attest that all such names describe the company currently submitting a bid.

26. CONE OF SILENCE/ANTI-LOBBYING POLICY

The City's Cone of Silence/Anti Lobbying Policy was adopted to ensure a fair and competitive bidding environment by preventing communication between City officials, employees, or representatives and parties involved in the bidding process that could create an unfair advantage to any party with respect to the award of a City contract.

During the period of in which the City has issued a solicitation, including a competitive bid, request for proposal (RFP), request for qualifications (RFQ), highest qualified bid (best value), competitive sealed proposals, design-build, public-private partnership, any other type of solicitation required by law, or the giving of a notice of a proposed project, which shall begin on the day that is advertised and end on the date that the notice of the award has been posted by the City Clerk for placement on the agenda, no person or registrant shall engage in any lobbying activities with City officials and employees.

For an unsolicited or competing proposal for a public-private partnership, the period in which no person or registrant shall engage in any lobbying activities with City officials and employees shall begin on the date that the City receives a notice of intent to submit an unsolicited proposal and end on the date the notice of award has been posted by the City clerk for placement on the agenda.

If contact is required with City employees, such contact will be done in accordance with procedures incorporated into the solicitation document and the City's contracting policies. Any person or entity that violates this provision may be disqualified in accordance with Section 2.94.130 of this chapter. Furthermore, any person who knowingly or intentionally violates the provisions of this policy, with respect to the solicitation or award of a discretionary contract may be prohibited by the City council from entering into any contract with the City for a period not to exceed three years.

The Cone of Silence/Anti Lobbying Policy prohibits any communication or lobbying activities during the Cone of Silence period, by any person, including but not limited to, bidders, lobbyists or consultants of bidders, service providers or potential vendors and any the following:

1. City Staff and City Consultants, including any employee of the City of El Paso, any person retained by the City of El Paso as a Consultant on the project, or any person having participated in the development, design, or review of documents related to the project.

2. City Officials, including the Mayor, Council Representatives and their respective staff.

3. Members of the City's Selection Committee, whether City employees or outside experts appointed or selected by the City.

The Cone of Silence/Anti Lobbying Policy does not apply to:

1. Questions of Process and Procedure, including oral communications with the Purchasing Director or Bid Administrator, provided the communications are strictly limited to matters of process or procedure already contained in the solicitation document. A minimum of ten days will be provided for questions during solicitation unless otherwise stated in the Solicitation Schedule of Events in the documents.

2. Pre-Proposal/Pre-Bid Conferences, including oral communications at pre-proposal or pre-bid conferences, oral presentations before selection committees, contract negotiations, and public presentations made to the Mayor and Council Representatives during a duly noticed public meeting.

3. Written Communications, to the Purchasing Analyst/Agent identified in the solicitation.

27. NOTICE: PUBLIC DISCLOSURE OF BID INFORMATION

Offerors are cautioned that once a bid is opened, all information contained therein will be available to the **PUBLIC** unless the information is excepted from the requirements of Government Code Section 552.021 pertaining to Open Records. The exception that allows the City to protect information that, if released, would give advantage to a competitor or bidder does not apply after the bidding is complete and the contract has been awarded. *Trade secrets, commercial or financial background data and privileged or confidential information* may be excepted from public inspection. If any information contained in your offer qualifies for an exception because it falls into one of the categories above it should be clearly marked "CONFIDENTIAL" and the basis of your claim of confidentiality should be stated. Data so identified will be maintained as a protected record. Offerors who claim that information contained in a bid should be protected from public disclosure after the award of the contract may be asked to support such claim if the City receives an Open Records request for the information and requests a determination by the Attorney General. [Rev. 04-03-98]

Recommendation(s) for formal awards shall be posted on the City's website the Thursday afternoon prior to the Tuesday City Council Meeting wherein the recommendation shall be presented. Vendors are responsible for monitoring the City's website for said postings.

28. COOPERATIVE PURCHASING

This contract may be utilized for purchases by other local government entities under an interlocal cooperation agreement, Texas Government Code Chapter 791. Any contract award by the City of El Paso on behalf of another local government entity shall be contingent upon the issuance of a purchase order or execution of a separate contract by the other local government entity. The Contractor must deal directly with the local government entity concerning the placement of orders, issuance of the purchase order, insurance certificates, contractual disputes, invoicing and payment or any other terms and conditions that the other local government entity may require. The actual utilization of this contract award by the other local government entity is at the sole discretion of that other local government entity.

The City of El Paso is acting on the behalf of other local government entities for the sole purpose of complying with Texas competitive bidding requirements and shall not be held liable for any costs, damages, etc. incurred by any bidder with regard to any purchase by another local government entity. The City of El Paso shall be legally responsible only for payment for goods and services in the quantities detailed in the City's own purchase order or contract.

NOTE 1: BIDDERS ARE REQUIRED TO SUBMIT OFFERS ON THE PRESCRIBED FORM(S) (UNALTERED). OFFERS SUBMITTED ON OTHER THAN THE PRESCRIBED FORM(S) MAY BE CONSIDERED INCOMPLETE OR NON-RESPONSIVE. FAILURE TO FURNISH REQUIRED DOCUMENTATION WITH THE BID MAY RESULT IN THE BID BEING DEEMED INCOMPLETE AND NON-RESPONSIVE, RESULTING IN REJECTION.

NOTE 2: THE CITY IS NOT RESPONSIBLE FOR LOCATING OR SECURING ANY INFORMATION THAT IS NOT IDENTIFIED IN THE OFFER AND REASONABLY AVAILABLE TO THE CITY, AND THE CITY WILL NOT BE RESPONSIBLE FOR LOCATING OR SECURING INFORMATION NOT INCLUDED WITH THE OFFER. IN CONDUCTING ITS ASSESSMENT THE CITY MAY USE DATA PROVIDED BY THE BIDDER AND DATA OBTAINED FROM OTHER SOURCES, BUT WHILE THE CITY MAY ELECT TO CONSIDER DATA OBTAINED FROM OTHER SOURCES THE BURDEN OF PROVIDING THOROUGH AND COMPLETE INFORMATION RESTS WITH THE BIDDER.

NOTE 3: THE CITY MAY ACCEPT THE LOWEST RESPONSIBLE AND RESPONSIVE BID BASED ON THE TABULATION OF ANY ONE, COMBINATION OR ALL OF THE BASE BID(S), ALTERNATE BID(S), AND/OR OPTIONAL BID(S) BASED ON THE MOST ADVANTAGEOUS PROJECT BID THAT IS DESIRED BY THE CITY DEPARTMENT INVOLVED AND THAT THE CITY COUNCIL IN THEIR SOLE JUDGMENT DETERMINES IS IN THE CITY'S BEST INTEREST AND BENEFIT.

NOTE 4: AT ANY TIME DURING THE TERM OF THE CONTRACT THE PURCHASING DIRECTOR OR DESIGNATED PERSONNEL MAY INCREASE OR DECREASE THE SCOPE OF SUPPLIES AND OR SERVICES AS HE MAY FIND NECESSARY TO ACCOMPLISH THE GENERAL PURPOSE OF THE CONTRACT.

NOTE 5: ALL GOODS AND SERVICES DELIVERED SHALL COMPLY WITH THE SPECIFICATIONS SET FORTH IN SECTION B. DESCRIPTIVE LITERATURE CONTAINING SUFFICIENT INFORMATION TO DETERMINE PRODUCT COMPLIANCE WITH SPECIFICATIONS MUST ACCOMPANY BID. THE CITY OF EL PASO RESERVES THE RIGHT TO REQUEST SAMPLES FROM BIDDER(S) PRIOR TO AWARD OF CONTRACT.

NOTE 6: IN ADDITION TO ANY OTHER DISCOUNT, THE CITY IS ENTITLED TO A DEDUCTION FOR FEDERAL EXCISE TAX IF IT IS INCLUDED ON THE MANUFACTURER'S PUBLISHED PRICE LIST FOR APPLICABLE ITEMS, AND

CONTRACTOR MUST INVOICE ACCORDINGLY. A FEDERAL TAX EXEMPTION CERTIFICATION WILL BE PROVIDED BY THE CITY, UPON REQUEST.

NOTE 7: BIDDER MUST SUBMIT WITH HIS OFFER A COPY OF THE COMPANY'S ORGANIZATION CERTIFICATE ISSUED BY THE SECRETARY OF STATE OF THE STATE IN WHICH THE BIDDER/PROPOSER WAS ORGANIZED. ALSO, A DBA CERTIFICATE MUST BE PROVIDED IF THE BIDDER/PROPOSER USED A TRADE NAME IN THE SOLICITATION DOCUMENTS OTHER THAN THE NAME UNDER WHICH THE COMPANY WAS ORGANIZED. FURTHER, THE BIDDER/PROPOSER MUST FILL OUT THE AFFIDAVIT IN SECTION D STATING WHAT NAMES THE COMPANY USES AND HAS USED IN THE PAST AND ATTEST THAT ALL SUCH NAMES DESCRIBE THE COMPANY CURRENTLY SUBMITTING A BID OR PROPOSAL.

NOTE 8: ACCURACY OF ESTIMATED QUANTITIES – THE CITY BELIEVES THAT THE NUMBERS USED AS ITEM QUANTITIES TO BE A REASONABLY ACCURATE ESTIMATE; HOWEVER, THE ACTUAL QUANTITY MAY BE MORE OR LESS THAN THE ESTIMATE, AND SHALL NOT BE THE BASIS FOR ANY CHANGE IN THE CONTRACT PER UNIT PRICE. ADDITIONALLY, ESTIMATES ARE MINIMUMS, BUT NOT GUARANTEED MINIMUMS, AND THE CONTRACT COST CAN INCREASE SO LONG AS THE UNIT COSTS REMAIN THE SAME AND INCREASED FUNDS ARE APPROPRIATED IN THE BUDGET.

NOTE 9: ANY MANUFACTURER NAMES, TRADE NAMES, BRAND NAMES, OR CATALOG NUMBERS USED IN THESE SPECIFICATIONS ARE FOR THE PURPOSE OF DESCRIBING AND ESTABLISHING MINIMUM REQUIREMENTS OR LEVEL OF QUALITY AND DESIGN REQUIRED. THEY ARE IN NO WAY INTENDED TO PROHIBIT THE BIDDING OF OTHER MANUFACTURERS' ITEMS OF EQUAL MATERIAL AND QUALITY OR MEANT TO EXCLUDE ANY OTHER MAKE AND MODEL FROM BEING CONSIDERED. VENDORS WHO WISH TO BID A FUNCTIONALLY EQUIVALENT ITEM(S) WHICH MEETS OR EXCEEDS THE SPECIFICATIONS MUST FURNISH WITH THE BID DESCRIPTIVE LITERATURE CONTAINING SUFFICIENT INFORMATION TO DETERMINE PRODUCT COMPLIANCE.

NOTE 10: ALL OFFERS ARE SUBJECT TO THE TERMS AND CONDITIONS OF THIS SOLICITATION. MATERIAL EXCEPTIONS TO THE TERMS AND CONDITIONS, OR FAILURE TO MEET THE CITY'S MINIMUM SPECIFICATIONS, SHALL RENDER THE OFFER NON-RESPONSIVE TO THE SOLICITATION.

NOTE 11: REFER TO METHOD OF AWARD SECTION I-C-A

NOTE 12: PROMPT PAYMENT DISCOUNTS WILL BE CONSIDERED WHEN DETERMINING THE APPARENT LOWEST BIDDER, PROVIDING THE CITY IS ALLOWED AT LEAST TEN (10) DAYS IN WHICH TO TAKE ADVANTAGE OF THE DISCOUNT.

NOTE 13: AS PART OF THE REQUIREMENT TO ESTABLISH THE RESPONSIBILITY OF THE OFFEROR, THE CITY OF EL PASO MAY PERFORM A PRICE ANALYSIS TO DETERMINE THE REASONABLENESS OF THE PRICE(S) AT WHICH THE SUPPLIES AND/OR SERVICES ARE OFFERED. PRICES THAT ARE SIGNIFICANTLY LOWER THAN THE MEAN OF ALL OFFERS AND THAT APPEAR TO BE UNREASONABLY LOW MAY BE DETERMINED TO BE EVIDENCE OF NON-RESPONSIBILITY, AND CAUSE THE OFFER TO BE REJECTED.

29. TITLE VI – FORM 1273

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. General
II. Nondiscrimination
III. Nonsegregated Facilities
IV. Davis-Bacon and Related Act Provisions
V. Contract Work Hours and Safety Standards Act Provisions
VI. Subletting or Assigning the Contract
VII. Safety: Accident Prevention
VIII. False Statements Concerning Highway Projects
IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
X. Compliance with Governmentwide Suspension and Debarment Requirements
XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding $10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under

this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are

applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. 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 contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor

will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 “Contract provisions and related matters” with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH–1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b.(1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or

will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b.(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term “perform work with its own organization” refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
(2) the prime contractor remains responsible for the quality of the work of the leased employees;
(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1**. Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

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

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. **Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost $25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

h. 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 clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the

department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

30. WAGE THEFT

The City of El Paso Code – Chapter 346

346.010 Definition

1. ***Wage Theft Adjudication*** occurs when:

- Employer is criminally convicted as an employer pursuant to Section 61.019 of the Texas Labor Code for failure to pay wages; or
- Injunctive relief is granted in district court under Section 61.020 of the Texas Labor Code against the employer for repeated failures to pay wages as required by Chapter 61 of the Texas Labor Code; or
- A wage payment determination order becomes final under Section 61.055 or Section 61.060 of the Texas Labor Code; or
- The Texas Workforce Commission assesses an administrative penalty under Section 61.053 of the Texas Labor Code against the employer for acting in bad faith in not paying wages as required by Chapter 61 of the Texas Labor Code; or
- Employer is convicted for Theft of Service under Section 31.04 of the Texas Penal Code; or
- Court of competent jurisdiction finds that an employer engaged in wage theft.

2. ***Employee*** and ***employer*** have the meanings by Texas Labor Code, Section 61.001.

3. ***Wages*** means compensation owed by an employer for labor or services rendered by an employee, whether computed on a time, task piece, commission or other basis.

4. ***Wage Enforcement Coordinator*** shall mean the person designated by the City Manager to receive and investigate claims of wage theft and to create, maintain a Wage Theft database.

5. ***Wage Theft Complaint*** means a written complaint filed with the Wage Theft Coordinator alleging any instance of wage theft by an employer.

Section 3.46.020 WAGE THEFT COORDINATOR

A. **Appointment.** The City Manager shall designate a Wage Theft Coordinator to perform the duties identified in this Section.

B. **Duties.** The Wage Theft Coordinator shall:

1. Wage Theft Adjudication Database- the Wage Theft Coordinator shall create and maintain a database of employers located or operating within

the City of El Paso who have a Wage Theft Adjudication record. The Wage Theft Database will be created on a "complaint basis" and populated with information provided by third parties. The Wage Theft Coordinator shall be under no obligation to investigate wage theft or to prosecute complaints.

2. Substantiate whether a proposed party to a City Contract has a Wage Theft Adjudication record or part of the Wage Theft Adjudication Database.

3. Receive, review, and process wage theft complaint according to the process established in Section 3.46.040.

4. Coordinate with the Purchasing Director to ensure that the notice of the City's Wage Theft ordinance is included in all the City's bid documents.

5. Provide and present an annual report to City Council regarding the number of employers in the Wage Theft Adjudication Database and an update on the status of the enforcement of the City's Wage Theft ordinance.

Section 3.46.030 WAGE THEFT ADJUDICATION DATABASE

A. Inclusion in Database. No employer shall be included in the database until the

Wage Theft Coordinator has:

1. Confirmed that an employer has a Wage Theft Adjudication record;

2. Provided written notice at the address provided by the complainant, or on the documents evidencing the wage theft adjudication of the inclusion of the employer in the Wage Theft Adjudication Database.

3. Allowed the employer thirty (30) days from the date of the notice to protest the employer's inclusion in such database and provide the Wage Theft Coordinator evidence that the employer should not be included in the Wage Theft Adjudication Database. In the case of a wage theft judgment, the Wage Theft Coordinator shall not include the employer in the Database upon proof of full payment of outstanding wage theft adjudication judgment.

B. Identity of Employer. An employer operating as a business entity shall be listed by its corporate name, address and type of business organization. If the employer is an individual, the person's name, business address, type of business or occupation shall be included.

C. Removal from Database. An employer shall be removed from the database if:

1. A Wage Theft Adjudication has been annulled, withdrawn, overturned, rescinded or abrogated, and such fact has been confirmed by the Wage Theft Coordinator; or

2. Employer provides proof of full payment of an outstanding wage theft adjudication judgment; or

3. Five (5) years or more has elapsed since the date of the employer's most recent Wage Theft Adjudication.

Section 3.46.040 WAGE THEFT COMPLAINTS PROCEDURE

A. Non- City Contracts. If no City contract is involved, the Wage Theft Coordinator shall assist persons with wage theft complaints by referring the complaint to the Texas Workforce Commission.

B. City Contracts.

1. **Filing a Complaint.** A person employed in connection with a city contract who has a good faith belief that he is the victim of wage theft may file a wage theft complaint with the Wage Theft Coordinator in writing. The complaint shall contain fact including but not limited to: identity of the employer, date(s) on or during which the wages were earned and were due to be paid, the amount of the wages alleged to have been withheld or unpaid.

2. **Notification and Resolution of the Complaint.** The Wage Theft Coordinator shall notify the employer of the receipt of the wage theft complaint. Employer shall attempt to resolve the alleged issue with the affected employee by written agreement within thirty (30) days from the receipt of the City notification. Employer shall notify the Wage Theft Coordinator if the issue was resolved between the Employer and the affected employee.

3. **Texas Workforce Commission.**

a) If no resolution is achieved, the complainant shall be referred to the Texas Workforce Commission ("Commission").

b) The Wage Theft Coordinator shall seek to determine status of the complaint at the commission. The Wage Theft Coordinator shall place Employer in the Wage Theft Adjudication Database if it appears that the Commission has made a finding that wage theft occurred.

Section 3.46.050 RETALIATION PROHIBITED

a. No City Contractor shall retaliate against any person who has filed a wage theft complaint pursuant to this Chapter. Retaliation means action to discharge from employment, discipline, or otherwise punish an employee for filing a wage theft complaint in good faith.

b. If the Wage Theft Coordinator determines that retaliation has occurred, the Wage Theft Coordinator shall refer the matter to the City Attorney for appropriate action.

Section 3.46.060. SANCTIONS AND PENALTIES- CITY CONTRACTS

A. **Existing City Agreement.**

1. In the event the City becomes aware of the fact an Employer acting under a contract which was awarded prior to the effective date of this Ordinance has been adjudicated for wage theft, the City may terminate the contract.

2. Prior to terminating the contract the City will provide Employer with thirty (30) days' notice and opportunity to provide full proof of payment of outstanding wage theft adjudication judgment.

3. The award of future City contracts after termination of an existing contract due to an Employer's wage theft adjudication shall be managed as a New City Agreement in this section.

B. **New City Agreement.**

1. In the event the City becomes aware an Employer with a wage theft adjudication record has submitted a bid or proposal for City work prior to the award of a contract, the City shall deem the Employer non-responsible and refuse to enter into a City Agreement with such Employer for a period of five (5) years after the date of final adjudication.

2. Prior to deeming the Employer as non-responsible, the City will provide the Employer with thirty (30) days' notice and opportunity to provide full proof of payment of outstanding wage theft adjudication judgment.

BID

TO THE HONORABLE MAYOR AND CITY COUNCIL
CITY OF EL PASO
EL PASO, TEXAS

The undersigned having familiarized themselves with the local conditions affecting the cost of work and with the contract documents consisting of Invitation to Bid, Instructions to Bidders, General Conditions, the contractor's Bid, special bid conditions, applicable Wage Rates, the Contract, plans, specifications, drawings and addenda on file in the Purchasing & Strategic Sourcing Department of the City of El Paso. Bidder agrees to perform everything required and to provide, furnish and install, including all the labor, materials, necessary tools, expendable equipment, all utility and transportation services and to complete in a workmanlike manner all the work necessary for

Confederate Citizens Collection Station

Solicitation No. 2016-764

within the specified limits and in accordance with the plans, including Addenda numbers

AMENDMENT	DATED	AMENDMENT	DATED	AMENDMENT	DATED	AMENDMENT	DATED
A001	_____	A002	_____	A003	_____	A004	_____
A005	_____	A006	_____	A007	_____	A008	_____

within the specified limits and in accordance with the plans, including **Addenda numbers** _____, AT THE FOLLOWING UNIT PRICES:

ONLY ONE BIDDER MAY BE AWARDED THIS CONTRACT PURSUANT TO THIS BID.

T**he lowest responsible bid will be determined based on the sum total Base Bid. If budget allows alternate will be awarded.**

NOTE: The quantities shown in the unit price schedule are ESTIMATES ONLY. They are shown here only for the purpose of comparing bids as an expected total expenditure. The City, at its sole discretion, will direct exactly how many actual units will be placed, and will pay for only those units that are ordered and accepted. No payments will be made regarding the estimated quantities, they are estimates only.

Estimates are minimums, but not guaranteed minimums, and the contract cost can increase so long as the unit costs remain the same and the increased funds are appropriated in the budget. Line item entries shall prevail over sum total entries. When discrepancies exist between unit prices and corresponding extended prices, unit prices shall prevail.

EACH BID MUST BE SUBMITTED ON THE PRESCRIBED FORM AND all blank spaces on the bid form for bid prices must be filled in, in ink or typewritten. **FAILURE TO FILL IN ALL BLANK SPACES SHALL CAUSE THE BID TO BE DEEMED NOT RESPONSIVE AND BID WILL NOT BE CONSIDERED IN DETERMINING THE LOWEST RESPONSIBLE BIDDER.**

COMPANY NAME: _____

BIDDER'S SIGNATURE: _____ PRINT NAME: _____

Base Bid:

Item	DESCRIPTION	Unit	Quantity	Unit Price	Sum Total (Unit Price X Quantity)
1	Left Blank Intentionally				
2	Traffic Control	LS	1	$_____	$_____
3	Erosion Control	LS	1	$_____	$_____
4	Demolition	LS	1	$_____	$_____
5	Relocate guard shack and shade structure	LS	1	$_____	$_____
6	Excavation	CY	2,950	$_____	$_____
7	Embankment (fill)	CY	2,400	$_____	$_____
8	Furnish and install 2-inch thick Type “C ” HMAC, 8" base course, 12" Subgrade	SY	3,585	$_____	$_____
9	Furnish and install 3.5-inch thick Type “C ” HMAC, 10" base course, 12" Subgrade	SY	265	$_____	$_____
10	Furnish and install 7-Inch thick Concrete pavement and reinforcement, 4" base course, 12" Subgrade	SY	2,530	$_____	$_____
11	Furnish and Install 6-inch Rock Rip Rap and Geotextile Fabric	LS	1	$_____	$_____
12	Furnish and Install 6-inch Standup Curb	LF	115	$_____	$_____
13	Concrete Retaining Wall and Steel Rails	LF	965	$_____	$_____
14	6' Chain Link Fence with screening	LF	290	$_____	$_____
15	6' Chain Link Fence with screening along Confederate	LF	350	$_____	$_____
16	Screening for Existing Chainlink Fence	LF	640	$_____	$_____
17	Pavement Stripping	LF	940	$_____	$_____
18	Pavement Marking Symbol	EA	2	$_____	$_____
19	Concrete Sidewalk	SY	120	$_____	$_____

COMPANY NAME: _____

BIDDER’S SIGNATURE: _____ PRINT NAME: _____

Item	DESCRIPTION	Unit	Quantity	Unit Price	Sum Total (Unit Price X Quantity)
20	1-inch Sch 80 Waterline	LF	205	$_____	$_____
21	1.5-inch Water meter	EA	1	$_____	$_____
22	Sewer Cleanout	EA	1	$_____	$_____
23	Sewer Manhole	EA	1	$_____	$_____
24	6-inch SDR 35 Sewer	LF	230	$_____	$_____
25	Small Traffic Sign Assembly	EA	10	$_____	$_____
26	Landscaping and Irrigation Work	LS	1	$_____	$_____
27	Building Improvements	LS	1	$_____	$_____
28	Electrical Site Work	LS	1	$_____	$_____
Sum Total Base Bid (items 1-28)				$_____	
Mobilization (not to exceed 5% of items 1-28)				$_____	
Sum Total Base Bid plus Mobilization				$_____	

Alternate:

If awarded, this alternate will be replacing line item No.15 within Base Bid.

Item	DESCRIPTION	Unit	Quantity	Unit Price	Sum Total (Unit Price X Quantity)
1	6' Wrought Iron Fence	LF	350	$_____	$_____
Sum Total Alternate				$_____	

COMPANY NAME: _____

BIDDER'S SIGNATURE: _____ PRINT NAME: _____

CONTRACT TIME AND LIQUIDATED DAMAGES

Bidder agrees to commence work on a date to be specified in a written "Notice to Proceed" issued by the Owner. The Contract Time shall begin on the date to commence work specified in the "Notice to Proceed" and shall run for one hundred eighty (180) additional CONSECUTIVE CALENDAR DAYS thereafter. Bidder shall Substantially Complete the project within one hundred fifty (150) CONSECUTIVE CALENDAR DAYS after the date to commence work in the "Notice to Proceed." –Bidder agrees to pay, as liquidated damages, the sum of one thousand two hundred dollars and zero cents ($1,200.00) for each consecutive calendar day after the date of Substantial Completion, as hereinafter provided in the General Conditions. Bidder further agrees to pay as liquidated damages the sum of six hundred dollars and zero cents ($600.00) for each consecutive calendar day after the expiration of the Contract Time for Remaining Work, as provided in Paragraph 6.8.3.1 of the General Conditions. The unit price quantities of this contract are estimated.

BID

Enclosed with this is a bid bond for five percent (5%) of the TOTAL bid price including base bid(s), alternate(s) and option(s) which is agreed shall be collected and retained by the owner(s) as liquidated damages in the event this bid is accepted by the Owner within ninety (90) consecutive calendar days after the date advised for the reception of bids and the undersigned fails to execute the contract and the required performance and payment bonds with the Owner within fourteen (14) consecutive calendar days after the date said bid is accepted; otherwise, the said bid security shall be returned to the undersigned upon demand.

THE UNDERSIGNED BIDDER REPRESENTS TO THE CITY AND TO THE OTHER BIDDERS THAT HIS/HER BID, AND THE ESTIMATES ON WHICH IT IS BASED, HAS BEEN CAREFULLY CHECKED AND CONTAINS NO ERRORS, AND NOTHING HAS BEEN OMITTED OR OVERLOOKED IN DETERMINING THE AMOUNTS BID.

BIDDER'S NAME: _____
(AS IT APPEARS ON ORGANIZATION CERTIFICATE ISSUED BY STATE IN WHICH COMPANY WAS ORGANIZED)

BY: _____ _____
Signature Date

_____ _____ _____
Print Signer's name & title Telephone Fax

_____ _____
Address City, State, Zip Code

_____ _____ _____
eMail address Physical Address of Business (if different from above) City, State, Zip Code

IF THE BIDDER BE A CORPORATION, THE FOLLOWING CERTIFICATE SHOULD BE EXECUTED:

I, _____, certify that I am the _____ Secretary of the corporation named as Bidder hereinabove; that _____, who signed the aforegoing contract on behalf of the Bidder, was then _____ of said corporation; that said bid was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

_____
CORPORATE SECRETARY SIGNATURE AND CORPORATE SEAL

CERTIFICATION OF NON-COLLUSION

PROJECT: Confederate Citizens Collection Station

SOLICITATION NO: 2016-764

The bidder, being sworn, deposes and says, _____, the contractor, submitting this bid, and that its agents, officers or employers have not directly or indirectly entered into any agreements, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with this proposal or with any City official.

_____
Signature

_____
Title

_____
Date

THE STATE OF TEXAS }
COUNTY OF EL PASO }

SURETY'S NO.

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that _____, (hereinafter called the Principal), as Principal, and _____ as Surety, are hereby held and firmly bound unto THE CITY OF EL PASO, as Owner/Obligee (hereafter "Owner"), in the penal sum of _____. _____for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

SIGNED, this _____ day of _____, 20_____.

The conditions of the above obligation are such that whereas the Principal has submitted to the City of El Paso a certain bid, attached hereto and hereby made a part hereof, to enter into a contract in writing for the **Confederate Citizens Collection Station, Solicitation No. 2016-764.** NOW, THEREFORE,

a) If said bid shall be rejected, or in the alternate,

b) If said bid shall be accepted and within fourteen (14) consecutive calendar days after the Principal has received notice of his acceptance, the Principal shall properly complete, execute, and deliver insurance certificates and a contract in the form approved by the Owner and shall furnish a bond for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said Bid, then this obligation shall be void; otherwise the same shall remain in force and effect, it being expressly understood and agree that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation, as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the OWNER MAY ACCEPT such bid, such extension to be upon notice to the Surety by the Principal.

IN WITNESS, WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____	_____ (Seal)
Principal • Company Name	Signed by (Principal Agent)
_____	_____
Address	Principal Agent's Name (Printed or Typed)
_____	_____ _____
City, State, Zip Code	Telephone No. Fax No.
_____	_____ (Seal)
Surety • Company Name	Signed by (Surety Agent)
_____	_____
Address	Surety Agent's Name (Printed or Typed)
_____	_____ _____
City, State, Zip Code	Telephone No. Fax No.

USE BID BOND FORM ON

PAGE I-D-1

DO NOT SUBSTITUTE BID BOND FORM

NOTE:

THE BID BOND MUST BE SIGNED & SEALED

BY BOTH THE SURETY & THE PRINCIPAL

AGENT RESIDENT DESIGNATION

Confederate Citizens Collection Station
SOLICITATION NO. 2016-764

SURETY INFORMATION

_____, as Surety on the Bid Bond for this contract, hereby appoints the following resident agent who resides within the County of El Paso and to whom any requisite notices may be delivered and on whom service of process may be had in matters arising out of suretyship, pursuant to Section 3503.003 of the Texas Insurance Code and Chapter 2253, Texas Government Code.

Assigned By:

_____(Seal)
Surety Agent

_____
Surety Agent's Signature

_____
Date

AGENT INFORMATION

Agent Resident: _____

Business Address:_____

_____

Telephone & Fax Nos. _____

Acknowledged By:

_____
Agent Resident's Name (Printed or Typed)

_____
Agent Resident's Signature

SUPPLEMENTAL BIDDER INFORMATION
Part I

Confederate Citizens Collection Station

SOLICITATION No. 2016-764

1. The legal name and the business address of the bidder are:

_____

_____

2. The bidder is doing business as a: _____ *(Sole Proprietorship, Corporation, Joint Venture, Partnership, Limited Partnership, Limited Liability Company, etc.)* organized in the County of _____, State of _____,
(Name of State)

and is ☐ publicly / ☐ privately owned.

3. Race or ethnic group designation of bidder. Enter race or ethnic group in the appropriate line:

☐ Black ☐ Hispanic ☐ Oriental ☐ American Indian
☐ Eskimo ☐ Aleut ☐ White ☐ Pacific Islander

4. The name, title and address of the owner, partner, or officers of the bidder are:

NAME TITLE ADDRESS

_____

_____

_____

5. The names and addresses of all other persons, both natural and corporate, having a substantial interest in the bidder, and the nature of the interest are:

NAME TITLE NATURE OF INTEREST

_____

_____

_____

6. The names, addresses and trade classifications of all other building construction contractors in which the bidder has a substantial interest are:

NAME TITLE TRADE CLASSIFICATION

_____

_____

_____

SUPPLEMENTAL BIDDER INFORMATION
PART II

SUBCONTRACTOR AND/OR SUPPLIER IDENTIFICATION

Confederate Citizens Collection Station

SOLICITATION No. 2016-764 **BIDDER: _____**

The Bidder shall indicate below the name of each subcontractor and/or supplier the bidder will use in the performance of the contract. The Bidder shall specify the work to be performed by the subcontractor or the materials to be provided by the supplier, the amount of the subcontract or purchase order, and the percentage of the contract the Bidder will expand throughout the life of the project. **Any changes in subcontractor and/or supplier listed below shall require additional approval prior to contract execution.**

NOTE: Subcontractors listed in Reference Section must appear on this list.

Name & Address	Service / Supplies	$ Value	% of Contract
	TOTAL:		
		(Dollars)	(% of Contract)

SUPPLEMENTAL BIDDERS INFORMATION
PART III

STATEMENT OF INCORPORATED MATERIALS

Confederate Citizens Collection Station

SOLICITATION No. 2016-764 **BIDDER**: _____

The successful Bidder shall be required to pay state sales tax on materials not incorporated into the completed project. Materials not incorporated into the completed project include, but are not limited to, the purchase, rental or lease of tools, machinery and equipment used in the performance of the awarded contract.

The Successful Bidder may be required to pay state sales tax on consumables used in construction contracts. Consumables are items used or consumed by a contractor on a project such as, but not limited to, non-reusable concrete forms, masking tape, corrugated cardboard, natural gas, and electricity.

It is the obligation of the Bidder to ascertain the amount of state sales tax to be paid and to include this amount in his/her bid submitted to the Owner.

The Successful Bidder is not required to pay state sales tax on materials incorporated into the completed project such as mortar, bricks, nails and caulk which are annexed to and become part of the completed project.

The State of Texas requires a "separated contract" for tax exemption purposes. The Bidder must separate or identify the amount of incorporated materials to be used in the completed project that are not subject to state sales tax. This form complies with the requirement.

The amounts entered for base bids, alternates and unit prices are the agreed contract prices for *incorporated materials which are not subject to state sales tax*

Base Bid $ _____

Alternate $ _____

[SEE NEXT PAGE FOR DEFINITIONS]

DEFINITIONS

SMALL BUSINESS CONCERN:
Less than $1,000,000.00 in annual receipts or fewer than one hundred [100] full time employees.

DISADVANTAGED BUSINESS ENTERPRISE:
At least fifty-one percent [51%] owned by one or more socially disadvantaged individuals, or a publicly held corporation with at least fifty-one percent [51%] of the stock owned by one or more such individuals.

WOMAN-OWNED BUSINESS:
At least fifty-one percent [51%] owned by a woman, or women, who also control and operate the business. "Control" in this context means making policy decisions. "Operate" in this context means actively carrying on day to day management

HANDICAPPED:
At least fifty-one percent [51%] owned by a person or persons with an orthopedic, otic [hearing], optic [visual], or mental impairment which substantially limits one or more of their major life activities.

LOCAL BUSINESS:
A business with a Tier 1 or Tier 2 principal place of business within the incorporated city limits of El Paso, Texas.

HUB [HISTORICALLY UNDERUTILIZED BUSINESS]
A Business Enterprise, which has been granted a Certificate by the State of Texas, as a Historically Underutilized Business. The City of El Paso utilizes information on Historically Underutilized Businesses (HUB), from the State of Texas Comptroller of Public Accounts (CPA), HUB Program, 1711 San Jacinto Ave. P.O. Box 13186, Austin, Texas 78711. The City encourages you to contact the State on the HUB program, if you feel you may qualify.

I certify that the foregoing information is a full, true and correct statement of the facts. I understand that my failure to respond to three (3) solicitations for any one class of items could cause the City of El Paso Purchasing and Strategic Sourcing Department to discontinue sending solicitations for that particular class. I also understand it is my responsibility to inform City of El Paso Purchasing and Strategic Sourcing Department in writing of any changes to this application; i.e., change of address, change of class etc. The City of El Paso does not guarantee you will receive all solicitations in your business categories. Notices of Solicitations are posted in the Purchasing and Strategic Sourcing Department, at the Chamber of Commerce, El Paso Hispanic Chamber of Commerce and at The Procurement Outreach Center, as well as being published in the official designated newspaper.

_____
Signature of Person Authorized to Sign Application

_____
Title Date

Purchasing and Strategic Sourcing Department

AFFIDAVIT

THIS IS AN OFFICIAL PURCHASING AND STRATEGIC SOURCING DEPARTMENT DOCUMENT – RETAIN WITH BID FILE

Before me, the undersigned official, on this day, personally appeared _____, a person known to me to be the person whose signature appears below, whom after being duly sworn upon his/her oath deposed and said:

1. My name is _____. I am over the age of 18, have never been convicted of a crime and am competent to make this affidavit.

2. I am an authorized representative of the following company or Firm:_____
_____

3. Listed below are all the names the company/firm uses and has used in the past and I attest that all such names describe the company currently submitting a response to Solicitation No. _____.

_____

_____

_____

_____

4. In addition to completing this Affidavit, I have included a copy of the Organization Certificate issued by the Secretary of State of the state in which the company was organized and if using a trade name in the solicitation documents other than the name under which the company was organized, a copy of the Assumed Name Certificate/DBA Certificate from the County.

5. **Note: This bidder understands that by providing false information on this Affidavit, it may be considered a non-responsible bidder on this and future solicitations and may result in discontinuation of any/all business with the City of El Paso.**

_____
Signature

SUBSCRIBED AND SWORN to before me on this _____ day of _____, _____.

_____
NOTARY PUBLIC

_____
PRINT NAME

_____
MY COMMISSION EXPIRES

City Of El Paso
Purchasing and Strategic Sourcing Department

INDEBTEDNESS AFFIDAVIT

THIS IS AN OFFICIAL PURCHASING AND STRATEGIC SOURCING DEPARTMENT DOCUMENT – RETAIN WITH PURCHASE ORDER FILE

Before me, the undersigned authority, on this day personally appeared _____ [FULL NAME] (hereafter "***Affiant***"), a person known to me to be the person whose signature appears below, whom after being duly sworn upon his/her oath deposed stated as follows:

1. Affiant is authorized and competent to give this affidavit and has personal knowledge of the facts and matters herein stated.

2. Affiant is an authorized representative of the following company or firm: _____ [*Contracting Entity's Corporate or Legal Name*] (hereafter, "***Contracting Entity***").

3. Affiant is submitting this affidavit in response to the following bid: _____ [*Solicitation No. and Solicitation Name*] which is expected to be in an amount that exceeds $25,000.

4. Contracting Entity is organized as a business entity as noted below (check box as applicable):

For Profit Entity (select below):

- ☐ Sole Proprietorship
- ☐ Corporation
- ☐ Partnership
- ☐ Limited Partnership
- ☐ Joint Venture
- ☐ Limited Liability Company
- ☐ Other (Specify type in space provided below): _____

For Non-Profit Entity (select below):

- ☐Non-Profit Corporation
- ☐Unincorporated Association

5. The information shown below is true and correct for the Contracting Entity and all owners of 5% or more of the Contracting Entity and, where the Contracting Entity is a non-profit entity, the required information has been shown for each officer. [Note: In all cases, use FULL name, business and residence addresses and telephone numbers.]

Contracting Entity:

Name	
Business Address [No./Street]	
City/State/Zip Code	
Telephone Number	

Resident Address (if applicable)	
City/State/Zip Code	
Telephone Number	
Federal Tax ID Number	
Texas Sales Tax Number	

5% Owner(s) (If none, state "None"):**

Name	
Business Address [No./Street]	
City/State/Zip Code	
Telephone Number	
Resident Address (if applicable)	
City/State/Zip Code	
Telephone Number	

**Attach additional pages if necessary to supply the required names and addresses.

6. Affiant understands that in accordance with Ordinance No. 016529 of the City of El Paso (the "***City***"), the City may refuse to award a contract to or enter into a transaction with an apparent low bidder or successful proposer that is indebted to the City.

7. Affiant understands that the term "***Debt***" shall mean any sum of money, which is owed to the City by a Contracting Entity, Owner, or Vendor, that exceeds one hundred dollars ($100.00) and that has become Delinquent, as defined hereinafter. Such Debt shall include but not be limited to: (i) property taxes; (ii) hotel/motel occupancy taxes; and (iii) license and permit fees.

8. Affiant understands that the term "***Delinquent***" shall mean any unpaid Debt that is past due for sixty (60) days or more and, which is not currently subject to challenge, protest, or appeal.

9. Affiant represents that to the best of its knowledge, the Contracting Entity is not indebted to the City in any amounts as described in Item No. 7 above, as of the date of the submittal. If the Contracting Entity is indebted to the City, the following represents the type and estimated amount of indebtedness:

   _____

   _____

10. If the Contracting Entity is indebted to the City, describe any payment arrangements that have been entered into to settle the Debt.

    _____

    _____

    _____

11. In the event that the City refuses to do business with a Contracting Entity due to any indebtedness listed above or as determined by the City Financial Services Department, the Contracting Agency may appeal this determination in accordance with the appeal regulations in Ordinance 016529.

Affiant certifies that he is duly authorized to submit the above information on behalf of the Contracting Entity, that Affiant is associated with the Contracting Entity in the capacity noted above and has personal knowledge of the accuracy of the information provided herein; and that the

information provided herein is true and correct to the best of Affiant's knowledge and belief. Affiant understands that providing false information on this form shall be grounds for debarment and discontinuation of any/all business with the City of El Paso.

_____
Signature

SUBSCRIBED AND SWORN to before me on this _____ day of _____, 20_____.

_____
Notary Public

_____
Printed Name

_____
Commission Expires

Contractor Experience References

Notice

References:

The offeror is responsible for ensuring the accuracy of the contact information for the references provided. **The City shall not contact the offeror** for replacement references and/or contact information if said e-mail addresses or telephones numbers are not valid or connected.

In addition to the above, the Offeror is encouraged to inform said references that they shall initially be contacted via e-mail at the e-mail address provided herein. If a response to the e-mail is not provided within the designated time frame, the City will attempt to contact the reference by telephone at the number provided below. If the reference does not respond after two attempts via telephone the offeror shall receive zero points for said reference.

Subcontractors:

Contractor or Subcontractor performing the work shall have the required specifications.

If the Contractor can meet solicitation requirements through a subcontractor, then it must include three (3) references for the subcontractor's experience.

Contractor Experience Reference

2016-764 Confederate Citizens Collection Station

Company Name: _____

Please provide **DETAILED** information for a project that meets the following criteria and that was completed by your organization within the **past five years**.

PROJECT INFORMATION REQUIRED – Please provide all the information requested and utilize additional sheets as necessary.

PROJECT: SIMILAR IN NATURE AND SCOPE
In order to consider this project similar in scope and nature bidder shall have successfully completed a project with at least 3,500 square yards of asphalt pavement.

Name and Location of Project:

Owner's Name	Address
Phone Number	Email
Construction Value	Completion Date
Project Description/Scope of Work	

Contractor Experience Reference

2016-764 Confederate Citizens Collection Station

Company Name: _____

Please provide **DETAILED** information for a project that meets the following criteria and that was completed by your organization within the **past five years**.

PROJECT INFORMATION REQUIRED – Please provide all the information requested and utilize additional sheets as necessary.

PROJECT: SIMILAR IN NATURE AND SCOPE
In order to consider this project similar in scope and nature bidder shall have successfully completed a project with at least 3,500 square yards of asphalt pavement.

Name and Location of Project:

Owner's Name	Address
Phone Number	Email
Construction Value	Completion Date
Project Description/Scope of Work	

Contractor Experience Reference

2016-764 Confederate Citizens Collection Station

Company Name: _____

Please provide **DETAILED** information for a project that meets the following criteria and that was completed by your organization within the **past five years**.

PROJECT INFORMATION REQUIRED – Please provide all the information requested and utilize additional sheets as necessary.

PROJECT: SIMILAR IN NATURE AND SCOPE
In order to consider this project similar in scope and nature bidder shall have successfully completed a project with at least 2,500 square yards of cast in place concrete.

Name and Location of Project:

Owner's Name	Address
Phone Number	Email
Construction Value	Completion Date
Project Description/Scope of Work	

Contractor Experience Reference

2016-764 Confederate Citizens Collection Station

Company Name: _____

Please provide **DETAILED** information for a project that meets the following criteria and that was completed by your organization within the **past five years**.

PROJECT INFORMATION REQUIRED – Please provide all the information requested and utilize additional sheets as necessary.

PROJECT: SIMILAR IN NATURE AND SCOPE
In order to consider this project similar in scope and nature bidder shall have successfully completed a project with at least 2,500 square yards of cast in place concrete.

Name and Location of Project:

Owner's Name	Address
Phone Number	Email
Construction Value	Completion Date
Project Description/Scope of Work	

Form **W-9**
(Rev. December 2014)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Give Form to the requester. Do not send to the IRS.

Print or type
See **Specific Instructions** on page 2.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification; check only **one** of the following seven boxes:
☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate
☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶ _____
Note. For a single-member LLC that is disregarded, do not check LLC; check the appropriate box in the line above for the tax classification of the single-member owner.
☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):
Exempt payee code (if any) _____
Exemption from FATCA reporting code (if any) _____
(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.)

Requester's name and address (optional)

6 City, state, and ZIP code

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the instructions for line 1 and the chart on page 4 for guidelines on whose number to enter.

Social security number
☐☐☐ – ☐☐ – ☐☐☐☐

or

Employer identification number
☐☐ – ☐☐☐☐☐☐☐

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 3.

Sign Here **Signature of U.S. person ▶** **Date ▶**

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. Information about developments affecting Form W-9 (such as legislation enacted after we release it) is at *www.irs.gov/fw9*.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following:

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See *What is backup withholding?* on page 2.

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),

2. Certify that you are not subject to backup withholding, or

3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and

4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting?* on page 2 for further information.

Note. If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien;
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States;
- An estate (other than a foreign estate); or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax under section 1446 on any foreign partners' share of effectively connected taxable income from such business. Further, in certain cases where a Form W-9 has not been received, the rules under section 1446 require a partnership to presume that a partner is a foreign person, and pay the section 1446 withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid section 1446 withholding on your share of partnership income.

In the cases below, the following person must give Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States:

- In the case of a disregarded entity with a U.S. owner, the U.S. owner of the disregarded entity and not the entity;
- In the case of a grantor trust with a U.S. grantor or other U.S. owner, generally, the U.S. grantor or other U.S. owner of the grantor trust and not the trust; and
- In the case of a U.S. trust (other than a grantor trust), the U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

Foreign person. If you are a foreign person or the U.S. branch of a foreign bank that has elected to be treated as a U.S. person, do not use Form W-9. Instead, use the appropriate Form W-8 or Form 8233 (see Publication 515, Withholding of Tax on Nonresident Aliens and Foreign Entities).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items:

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.
2. The treaty article addressing the income.
3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.
4. The type and amount of income that qualifies for the exemption from tax.
5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity, give the requester the appropriate completed Form W-8 or Form 8233.

Backup Withholding

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 28% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, payments made in settlement of payment card and third party network transactions, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester,
2. You do not certify your TIN when required (see the Part II instructions on page 3 for details),
3. The IRS tells the requester that you furnished an incorrect TIN,
4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or
5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See *Exempt payee code* on page 3 and the separate Instructions for the Requester of Form W-9 for more information.

Also see *Special rules for partnerships* above.

What is FATCA reporting?

The Foreign Account Tax Compliance Act (FATCA) requires a participating foreign financial institution to report all United States account holders that are specified United States persons. Certain payees are exempt from FATCA reporting. See *Exemption from FATCA reporting code* on page 3 and the Instructions for the Requester of Form W-9 for more information.

Updating Your Information

You must provide updated information to any person to whom you claimed to be an exempt payee if you are no longer an exempt payee and anticipate receiving reportable payments in the future from this person. For example, you may need to provide updated information if you are a C corporation that elects to be an S corporation, or if you no longer are tax exempt. In addition, you must furnish a new Form W-9 if the name or TIN changes for the account; for example, if the grantor of a grantor trust dies.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of $50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a $500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Line 1

You must enter one of the following on this line; **do not** leave this line blank. The name should match the name on your tax return.

If this Form W-9 is for a joint account, list first, and then circle, the name of the person or entity whose number you entered in Part I of Form W-9.

a. **Individual.** Generally, enter the name shown on your tax return. If you have changed your last name without informing the Social Security Administration (SSA) of the name change, enter your first name, the last name as shown on your social security card, and your new last name.

Note. ITIN applicant: Enter your individual name as it was entered on your Form W-7 application, line 1a. This should also be the same as the name you entered on the Form 1040/1040A/1040EZ you filed with your application.

b. **Sole proprietor or single-member LLC.** Enter your individual name as shown on your 1040/1040A/1040EZ on line 1. You may enter your business, trade, or "doing business as" (DBA) name on line 2.

c. **Partnership, LLC that is not a single-member LLC, C Corporation, or S Corporation.** Enter the entity's name as shown on the entity's tax return on line 1 and any business, trade, or DBA name on line 2.

d. **Other entities.** Enter your name as shown on required U.S. federal tax documents on line 1. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on line 2.

e. **Disregarded entity.** For U.S. federal tax purposes, an entity that is disregarded as an entity separate from its owner is treated as a "disregarded entity." See Regulations section 301.7701-2(c)(2)(iii). Enter the owner's name on line 1. The name of the entity entered on line 1 should never be a disregarded entity. The name on line 1 should be the name shown on the income tax return on which the income should be reported. For example, if a foreign LLC that is treated as a disregarded entity for U.S. federal tax purposes has a single owner that is a U.S. person, the U.S. owner's name is required to be provided on line 1. If the direct owner of the entity is also a disregarded entity, enter the first owner that is not disregarded for federal tax purposes. Enter the disregarded entity's name on line 2, "Business name/disregarded entity name." If the owner of the disregarded entity is a foreign person, the owner must complete an appropriate Form W-8 instead of a Form W-9. This is the case even if the foreign person has a U.S. TIN.

Line 2

If you have a business name, trade name, DBA name, or disregarded entity name, you may enter it on line 2.

Line 3

Check the appropriate box in line 3 for the U.S. federal tax classification of the person whose name is entered on line 1. Check only one box in line 3.

Limited Liability Company (LLC). If the name on line 1 is an LLC treated as a partnership for U.S. federal tax purposes, check the "Limited Liability Company" box and enter "P" in the space provided. If the LLC has filed Form 8832 or 2553 to be taxed as a corporation, check the "Limited Liability Company" box and in the space provided enter "C" for C corporation or "S" for S corporation. If it is a single-member LLC that is a disregarded entity, do not check the "Limited Liability Company" box; instead check the first box in line 3 "Individual/sole proprietor or single-member LLC."

Line 4, Exemptions

If you are exempt from backup withholding and/or FATCA reporting, enter in the appropriate space in line 4 any code(s) that may apply to you.

Exempt payee code.

- Generally, individuals (including sole proprietors) are not exempt from backup withholding.
- Except as provided below, corporations are exempt from backup withholding for certain payments, including interest and dividends.
- Corporations are not exempt from backup withholding for payments made in settlement of payment card or third party network transactions.
- Corporations are not exempt from backup withholding with respect to attorneys' fees or gross proceeds paid to attorneys, and corporations that provide medical or health care services are not exempt with respect to payments reportable on Form 1099-MISC.

The following codes identify payees that are exempt from backup withholding. Enter the appropriate code in the space in line 4.

1—An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2)

2—The United States or any of its agencies or instrumentalities

3—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

4—A foreign government or any of its political subdivisions, agencies, or instrumentalities

5—A corporation

6—A dealer in securities or commodities required to register in the United States, the District of Columbia, or a U.S. commonwealth or possession

7—A futures commission merchant registered with the Commodity Futures Trading Commission

8—A real estate investment trust

9—An entity registered at all times during the tax year under the Investment Company Act of 1940

10—A common trust fund operated by a bank under section 584(a)

11—A financial institution

12—A middleman known in the investment community as a nominee or custodian

13—A trust exempt from tax under section 664 or described in section 4947

The following chart shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 13.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt payees except for 7
Broker transactions	Exempt payees 1 through 4 and 6 through 11 and all C corporations. S corporations must not enter an exempt payee code because they are exempt only for sales of noncovered securities acquired prior to 2012.
Barter exchange transactions and patronage dividends	Exempt payees 1 through 4
Payments over $600 required to be reported and direct sales over $5,000[1]	Generally, exempt payees 1 through 5[2]
Payments made in settlement of payment card or third party network transactions	Exempt payees 1 through 4

[1] See Form 1099-MISC, Miscellaneous Income, and its instructions.

[2] However, the following payments made to a corporation and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, gross proceeds paid to an attorney reportable under section 6045(f), and payments for services paid by a federal executive agency.

Exemption from FATCA reporting code. The following codes identify payees that are exempt from reporting under FATCA. These codes apply to persons submitting this form for accounts maintained outside of the United States by certain foreign financial institutions. Therefore, if you are only submitting this form for an account you hold in the United States, you may leave this field blank. Consult with the person requesting this form if you are uncertain if the financial institution is subject to these requirements. A requester may indicate that a code is not required by providing you with a Form W-9 with "Not Applicable" (or any similar indication) written or printed on the line for a FATCA exemption code.

A—An organization exempt from tax under section 501(a) or any individual retirement plan as defined in section 7701(a)(37)

B—The United States or any of its agencies or instrumentalities

C—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

D—A corporation the stock of which is regularly traded on one or more established securities markets, as described in Regulations section 1.1472-1(c)(1)(i)

E—A corporation that is a member of the same expanded affiliated group as a corporation described in Regulations section 1.1472-1(c)(1)(i)

F—A dealer in securities, commodities, or derivative financial instruments (including notional principal contracts, futures, forwards, and options) that is registered as such under the laws of the United States or any state

G—A real estate investment trust

H—A regulated investment company as defined in section 851 or an entity registered at all times during the tax year under the Investment Company Act of 1940

I—A common trust fund as defined in section 584(a)

J—A bank as defined in section 581

K—A broker

L—A trust exempt from tax under section 664 or described in section 4947(a)(1)

M—A tax exempt trust under a section 403(b) plan or section 457(g) plan

Note. You may wish to consult with the financial institution requesting this form to determine whether the FATCA code and/or exempt payee code should be completed.

Line 5

Enter your address (number, street, and apartment or suite number). This is where the requester of this Form W-9 will mail your information returns.

Line 6

Enter your city, state, and ZIP code.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN. However, the IRS prefers that you use your SSN.

If you are a single-member LLC that is disregarded as an entity separate from its owner (see *Limited Liability Company (LLC)* on this page), enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note. See the chart on page 4 for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local SSA office or get this form online at *www.ssa.gov*. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at *www.irs.gov/businesses* and clicking on Employer Identification Number (EIN) under Starting a Business. You can get Forms W-7 and SS-4 from the IRS by visiting IRS.gov or by calling 1-800-TAX-FORM (1-800-829-3676).

If you are asked to complete Form W-9 but do not have a TIN, apply for a TIN and write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note. Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

Caution: *A disregarded U.S. entity that has a foreign owner must use the appropriate Form W-8.*

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if items 1, 4, or 5 below indicate otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). In the case of a disregarded entity, the person identified on line 1 must sign. Exempt payees, see *Exempt payee code* earlier.

Signature requirements. Complete the certification as indicated in items 1 through 5 below.

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments made in settlement of payment card and third party network transactions, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account)	The actual owner of the account or, if combined funds, the first individual on the account[1]
3. Custodian account of a minor (Uniform Gift to Minors Act)	The minor[2]
4. a. The usual revocable savings trust (grantor is also trustee)	The grantor-trustee[1]
b. So-called trust account that is not a legal or valid trust under state law	The actual owner[1]
5. Sole proprietorship or disregarded entity owned by an individual	The owner[3]
6. Grantor trust filing under Optional Form 1099 Filing Method 1 (see Regulations section 1.671-4(b)(2)(i)(A))	The grantor*
For this type of account:	**Give name and EIN of:**
7. Disregarded entity not owned by an individual	The owner
8. A valid trust, estate, or pension trust	Legal entity[4]
9. Corporation or LLC electing corporate status on Form 8832 or Form 2553	The corporation
10. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
11. Partnership or multi-member LLC	The partnership
12. A broker or registered nominee	The broker or nominee
13. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity
14. Grantor trust filing under the Form 1041 Filing Method or the Optional Form 1099 Filing Method 2 (see Regulations section 1.671-4(b)(2)(i)(B))	The trust

[1] List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

[2] Circle the minor's name and furnish the minor's SSN.

[3] You must show your individual name and you may also enter your business or DBA name on the "Business name/disregarded entity" name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

[4] List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules for partnerships* on page 2.

***Note.** Grantor also must provide a Form W-9 to trustee of trust.

Note. If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Secure Your Tax Records from Identity Theft

Identity theft occurs when someone uses your personal information such as your name, SSN, or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax preparer.

If your tax records are affected by identity theft and you receive a notice from the IRS, respond right away to the name and phone number printed on the IRS notice or letter.

If your tax records are not currently affected by identity theft but you think you are at risk due to a lost or stolen purse or wallet, questionable credit card activity or credit report, contact the IRS Identity Theft Hotline at 1-800-908-4490 or submit Form 14039.

For more information, see Publication 4535, Identity Theft Prevention and Victim Assistance.

Victims of identity theft who are experiencing economic harm or a system problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059.

Protect yourself from suspicious emails or phishing schemes. Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to *phishing@irs.gov.* You may also report misuse of the IRS name, logo, or other IRS property to the Treasury Inspector General for Tax Administration (TIGTA) at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at: *spam@uce.gov* or contact them at *www.ftc.gov/idtheft* or 1-877-IDTHEFT (1-877-438-4338).

Visit IRS.gov to learn more about identity theft and how to reduce your risk.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons (including federal agencies) who are required to file information returns with the IRS to report interest, dividends, or certain other income paid to you; mortgage interest you paid; the acquisition or abandonment of secured property; the cancellation of debt; or contributions you made to an IRA, Archer MSA, or HSA. The person collecting this form uses the information on the form to file information returns with the IRS, reporting the above information. Routine uses of this information include giving it to the Department of Justice for civil and criminal litigation and to cities, states, the District of Columbia, and U.S. commonwealths and possessions for use in administering their laws. The information also may be disclosed to other countries under a treaty, to federal and state agencies to enforce civil and criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism. You must provide your TIN whether or not you are required to file a tax return. Under section 3406, payers must generally withhold a percentage of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to the payer. Certain penalties may also apply for providing false or fraudulent information.

CITY OF EL PASO PURCHASING & STRATEGIC SOURCING DEPARTMENT
VENDOR INFORMATION FORM
This form must be accompanied by an IRS Form W-9 and Conflict of Interest Questionnaire

City Department:_____ Telephone #_____ Name:_____
Request:
___ Add ___ Update __ Inactivate
___ Vendor ___ Contractual Employee ___ City of El Paso Employee
Vendor Sales Address: If same as W-9 check box ☐
Company Name: _____

Street:_____

City:_____State_____Zip Code_____

Contact Name & Title:_____

Telephone # (**required**) (____) _____ Fax # (____) _____

E-Mail Address:_____

Web Page:_____

VENDOR STATUS:
(Yes ___) (No ___) Small business concern (Less than 100 employees or less than $1,000,000.00 Annual Receipts)
(Yes ___) (No ___) Disadvantage business concern (At least 51% owned by one or more socially disadvantaged individuals; or, a publicly-owned business at least 51% of the stock owned by one or more of such individuals.) If your company is certified please send us a photo copy. We must have an updated copy of the certificate on file. DBES include (Please mark one:)
(___) Black Americans (____) Hispanic Americans
(___) Native Americans (____) Asian-Pacific Americans
(Yes ___) (No ___) Woman-owned business (At least 51% owned by a woman or women who also control and operate it. "Control" in this context means exercising the power to make policy decisions. "Operate" in this context means being actively involved in the day-to-day management.)
(Yes ___) No ___) Handicapped (At least 51% owned by a person or persons with an orthopedic, hearing, mental or visual impairment which substantially limits one of more of his/hers/their major life activities.)
(Yes ___) No ___) Local business enterprise (At least 51% of which is owned by a resident or residents of El Paso County and the principal place of business is in El Paso County.)
(Yes ___) No ___) Hub (Historically underutilized business) If your company is certified please send us a photo copy. We need to have an updated copy of the certificate on file.

IRS-Withholding required information – Mark one of the following which applies to the type of payment that will be made to the vendor: (Incomplete forms will be returned)

___ Wages (Withholding / Default Class 7)
___ Goods (No Withholding / No Default Class)
___ Settlement / Attorney Proceeds (Withholding / Default Class 14)
___ Medical & Healthcare (Withholding / Default Class 6)
___ Garnishment Vendor (No Withholding / No Default Class)
___ Juror (No Withholding / No Default Class)
___ Services (Withholding / Default Class 7)
___ Rental Property (Withholding / Default Class 1)
___ Stipend (No Withholding / No Default Class)
___ Corporation (No Withholding/ No Default Class)

Contractual Employees or Vendors
- Based on W-9, Individual/Sole Proprietor, Partnership, Limited Liability Company (all LLCs C=Corporation, D=Disregarded Entity, S=Corporation, P=Partnership) are marked as withholding. Corporation is not marked as withholding.
- Vendors for Rent, Medical Services, Attorney Fees are **always** marked as withholding, even if they are a Corporation

City of El Paso Employees (IRS-Withholding not required for the following items)
___Pension ___Refund ___Mileage ___Reimbursement ___Settlement ___Travel Request __Tuition Reimbursement

Send Form To: M. Suky Flores Sr. Office Assistant P - 915-212-1185 F - 915-212-0044 FloresMS@elpasotexas.gov

01/12/10

CONFLICT OF INTEREST QUESTIONNAIRE

FORM CIQ

For vendor doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. *See* Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

OFFICE USE ONLY

Date Received

1 **Name of vendor who has a business relationship with local governmental entity.**

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.**

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 **Name of local government officer about whom the information in this section is being disclosed.**

_____

Name of Officer

This section (item 3 including subparts A, B, C, & D) must be completed for each officer with whom the vendor has an employment or other business relationship as defined by Section 176.001(1-a), Local Government Code. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income, other than investment income, from the vendor?

☐ Yes ☐ No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer named in this section AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more?

☐ Yes ☐ No

D. Describe each employment or business and family relationship with the local government officer named in this section.

4

_____ _____

Signature of vendor doing business with the governmental entity Date

Adopted 8/7/2015

CERTIFICATE OF INTERESTED PARTIES

FORM 1295

Complete Nos. 1 - 4 and 6 if there are interested parties.
Complete Nos. 1, 2, 3, 5, and 6 if there are no interested parties.

OFFICE USE ONLY

1 **Name of business entity filing form, and the city, state and country of the business entity's place of business.**

2 **Name of governmental entity or state agency that is a party to the contract for which the form is being filed.**

3 **Provide the identification number used by the governmental entity or state agency to track or identify the contract, and provide a description of the goods or services to be provided under the contract.**

4

Name of Interested Party	City, State, Country (place of business)	Nature of Interest (check applicable)	
		Controlling	Intermediary

5 **Check only if there is NO Interested Party.** ☐

6 **AFFIDAVIT**

I swear, or affirm, under penalty of perjury, that the above disclosure is true and correct.

_____
Signature of authorized agent of contracting business entity

AFFIX NOTARY STAMP / SEAL ABOVE

Sworn to and subscribed before me, by the said _____, this the _____ day of _____, 20 _____, to certify which, witness my hand and seal of office.

_____
Signature of officer administering oath | Printed name of officer administering oath | Title of officer administering oath

ADD ADDITIONAL PAGES AS NECESSARY

City of El Paso
ACCOUNTS PAYABLE
DIRECT DEPOSIT SIGN-UP FORM

This form is used to collect important information to enroll, update or change your Direct Deposit request. Please complete and return to the Purchasing & Strategic Sourcing Department; see contact information provided below. For assistance, please call 915-212-1185.

Part I – Vendor / Employee Information

Name of Payee (Print) _____

Federal Taxpayer ID Number or Employee KRONOS ID# _____

Address: _____

City, State, and Zip Code _____

Telephone _____

E-mail (Print) _____

Part II – Direct Deposit Information

Action Requested: ☐ Start Direct Deposit ☐ Stop Direct Deposit ☐ Change Direct Deposit

Name of Financial Institution: _____

Routing Number (must be nine digits): _____

Bank Account Number: _____

Account Type: ☐ Checking ☐ Savings

For convenience, you may attach a voided check.
Do not use a deposit slip as some banking institutions do not display the correct routing number on deposit slips.

Part III – Terms and Conditions

I hereby authorize and request the City of El Paso to initiate credit entries and if necessary, a debit entry in accordance with National Automated Clearing House Association (NACHA) rules reversing a credit entry made in error, to my account at the financial institution named. The electronic payment is to remain in effect until withdrawn by written notification to the City of El Paso. Funds that are sent to a closed bank account are returned by the banking institutions within five (5) business days. Re-issued payments will be made when funds are returned to City of El Paso.

_____ _____

Signature **Date**

Purchasing & Strategic Sourcing Department
300 N. Campbell, 1st floor – EL PASO TX 79901
Fax 915-212-0044
Email: SilvaML@elpasotexas.gov

El Paso All-America City 2010

Confederate Citizens Collection Station

Solicitation No. 2016-764

City of El Paso
Purchasing and Strategic Sourcing Department
300 N. Campbell, 1st Floor
El Paso, Texas

VOLUME 2 OF 2

NOTICE OF CLARIFICATION
PREVAILING WAGE RATES
"HEAVY," AND "HIGHWAY" CONSTRUCTION

Confederate Citizens Collection Station

SOLICITATION No. 2016-764

Effective September 24, 2013, City Council passed a resolution adopting the City of El Paso Prevailing Wage Rates for "Building," "Highway" and "Heavy" construction in accordance with Chapter 2258.022(a)(1) of the Texas Government Code.

<u>APPRENTICES MAY BE REQUIRED FOR THIS PROJECT</u>

CITY OF EL PASO, TEXAS
2012 Paving and Street Construction, Dirt Work, Heavy Construction, Pipeline Work, Highway Wage Rates

CLASSIFICATION	BASE WAGE PER HOUR	TOTAL FRINGES PER HOUR	HOURLY PREVAILING WAGE RATE	PER DIEM WAGE RATE
Asphalt Distributor Operator	12.75	-	12.75	102.00
Asphalt Paving Machine Operator	12.50	-	12.50	100.00
Asphalt Raker	10.50	-	10.50	84.00
Backhoe Operator	14.00	-	14.00	112.00
Concrete Finisher (Paving and Structures)	12.00	-	12.00	96.00
Crane Operator, Lattice Boom	17.50	-	17.50	140.00
Crane Operator, Hydraulic	17.00	-	17.00	136.00
Electrician	23.09	-	23.09	184.72
Excavator Operator	16.10	-	16.10	128.80
Form Builder/Setter	13.00	-	13.00	104.00
Form Setter (Paving and Curb)	10.75	-	10.75	86.00
Front End Loader	12.00	-	12.00	96.00
Laborer (Common)	9.00	-	9.00	72.00
Laborer (Skilled)	10.00	-	10.00	80.00
Mechanic	17.50	-	17.50	140.00
Motor Grader Operator	17.00	-	17.00	136.00
Pipe Layer	11.50	-	11.50	92.00
Reinforcing Steel Setter (Paving)	14.00	-	14.00	112.00
Rock Mason	12.00	-	12.00	96.00
Servicer	12.00	-	12.00	96.00
Traveling Mixer Operator	10.00	-	10.00	80.00

CLASSIFICATION	BASE WAGE PER HOUR	TOTAL FRINGES PER HOUR	HOURLY PREVAILING WAGE RATE	PER DIEM WAGE RATE
Truck Driver, Single Axle	10.50	-	10.50	84.00
Truck Driver, Tandem Axle	12.74	-	12.74	101.92
Tunneling Machine Operator	13.61	-	13.61	108.88
Utility Operator Grade 1	11.50	-	11.50	92.00
Utility Operator Grade 2	11.00	-	11.00	88.00
Welder, Certified/Structural Steel Welder	12.02	-	12.02	96.16
Welder	13.54	-	13.54	108.32

All persons required to be licensed or certified must meet those qualifications to be paid the associated rate.

2012 HEAVY / HIGHWAY DEFINITIONS

1	**Asphalt Distributor Operator**	Drives distributor truck, sets spray bars and operates valves and levers to control distribution of bituminous material for highway surfacing. May oil, grease or otherwise services and make adjustments to equipment as needed. Performs other related duties.
2	**Asphalt Paving Machine Operator**	Operates paving machine that spreads and levels asphaltic concrete on highway. Controls movement of machine, raises and lowers screed, regulates width of screed. May oil, grease, service and make adjustments to equipment as needed. Performs other related duties.
3	**Asphalt Raker**	Distributes asphaltic materials evenly over road surface by hand-raking and brushing material to correct thickness; may control screed to regulate width and depth of materials; directs Laborers (skilled and unskilled) when to add or take away material to fill low spots or to reduce high spots.
4	**Backhoe Operator**	Operates a rubber-tired machine mounted with a backhoe bucket on one end and a loader bucket on the other end. Used for excavating ditches and structures, laying pipe and precast concrete structures, carrying material in the loader bucket, and general excavation and backfill. May also be equipped with hydraulic attachments. May oil, grease or otherwise service and make necessary adjustments to equipment as needed. Performs other related duties.
5	**Communications Cable Installer**	Installs communication cable under direction of telecommunication technician including optical fiber and cable carrying less than 50 volts AC. Operates equipment associated with cable installation. Performs other related duties.
6	**Concrete Finisher (Paving and Structures)**	Finishes the exposed surfaces of fresh concrete paving, median barrier and every element of concrete structures. Operates bridge deck finishing machine. Forms and finishes edges and joints. Finishes all concrete flatwork, including concrete paving, curbs, driveways, sidewalks, riprap, and gutters. Finishes exposed surface of concrete after forms have been removed by patching imperfections with fresh concrete, rubbing surface with abrasive stone, and directing others in removing excess or defective concrete with power tools. Performs other related duties.
7	**Crane Operator, Lattice Boom:**	A worker who operates a lattice boom type crane to hoist and move materials, raise and lower heavy weights and perform other related operations. May be crawler type or rubber tired. May include placement of rock riprap, clamshell, dragline, pipe and pile driving operations. May oil, grease or otherwise service and make necessary adjustments to equipment as needed. Performs other related duties.

8	**Crane Operator, Hydraulic**	A worker who operates a hydraulic telescoping boom type crane to hoist and move materials, raise and lower heavy weights and perform other related operations. May be crawler type or rubber-tired. May oil, grease or otherwise service and make necessary adjustments to equipment as needed. Performs other related duties.
9	**Directional Drilling Locator**	Assist directional drilling operator in machine setup. Operates locating equipment under direction of the operator. May oil, grease or otherwise service or make necessary adjustments to equipment as needed. Performs other related duties.
10	**Electrician**	Plan and execute the layout and installation of electrical conduit, switch panels, buss bars, outlet boxes, electrical wires and cables, lighting standards, lighting fixtures, receptacles, switches, and other electrical devices and apparatus necessary for the complete installation of wiring systems, works on overhead distribution systems and underground distribution systems.. Includes installation of photovoltaic solar panels.
11	**Excavator Operator**	Operates a crawler or rubber-tired machine mounted with an excavator bucket. Used for excavating ditches and structures, laying pipe and precast concrete structures, loading trucks and placing rock riprap. May also be equipped with various hydraulic attachments. May oil, grease or otherwise service and make necessary adjustments to equipment as needed. Performs other related duties.
12	**Form Builder/Setter**	Works from plans to build, assemble, fit together, align, plumb, and set in place forms for molding concrete structures. Forms may be wood, steel, aluminum, fiberglass or any other type of material. Checks forms while concrete is being placed. Directs others in stripping forms after concrete is placed. May install miscellaneous materials integral to concrete structures. May set precast concrete elements. Prepares for slipforming traffic rail and median barrier. May install permanent metal deck forms. May work with power tools. Performs other related duties. Includes guardrail installation.
13	**Form Setter (Paving and Curb)**	Fits together, aligns and sets to grade metal and wooden forms for placement of all concrete flatwork, including concrete paving, curbs, driveways, sidewalks, and riprap. Works with survey crew to set stringline for paving, curb and gutter and curb. Performs other related duties.
14	**Front End Loader**	Operates a rubber-tired, skid steer or crawler type tractor with an attached scoop type bucket on front end. Machine is used to load materials from stockpiles, excavation, charging batch plants, loading and unloading trucks. May be used with attachments in lieu of the bucket. May oil, grease or otherwise service and make necessary adjustments to equipment as needed. Performs other related duties.
15	**Instrument Person**	Sets up, adjusts and operates surveying instruments, including GPS and total station. Works from plans to establish lines points and grades for construction purposes, keeps notes and records of data. Computes cross sections of work performed for cost or payment purposes. Directs Rod or Chain person (skilled labor) and is responsible for accuracy of this field engineering work. Performs other related duties.
16	**Insulation Workers – Mechanical**	Apply insulating materials to pipes or ductwork, or other mechanical systems in order to help control temperature on a highway project.

17	**Laborer (Common)**	A general term used on construction work covering many unskilled classifications requiring work of a physical nature. Performs a variety of work ranging from pick and shovel work to cleaning up lumber with hammer, shoveling and placing concrete, uses air tools, cleans concrete joints and fills joints with sealing compound from bucket or with hose and nozzle from a central source, applies coating of oil to inside face of forms, may help set and strip forms, unloads and transports reinforcing settle, cures newly poured concrete, helps lower pipe in ditch for pipelayers, works with dirt crew keeping construction layout stakes out of the way of dirt-moving equipment. May fine grade excavation and ditches, shovels hot asphalt material. May use power tools and other necessary equipment in demolition work. Does not ordinarily perform work permitting exercise of independent judgment or without close direction by other workers. Installs and maintains erosion control. Performs other related duties. (AGC)-A general term used on construction work covering many unskilled classifications requiring work of a physical nature. A laborer works with all crews doing everything from pick and shovel work to cleaning up lumber with hammer, shoveling and placing concrete, uses air tools, cleans concrete joints and fills joints with sealing compound from bucket or with hose and nozzle from a central source, applies coating of oil to inside face of forms, may help set and strip forms, unloads and transports reinforcing steel, cures newly poured concrete, helps lower pipe into ditch for pipelayers, builds fences, works with dirt crew keeping construction layout stakes out of the way of dirt-moving equipment. May fine grade excavation and ditches, shovels hot asphalt material. May use power tools and other necessary equipment in demolition work. Does not ordinarily perform work permitting exercise of independent judgment or without close direction by other workers. Usually an entry level position as the first step to learn a skill. Performs other related duties.
18	**Laborer (Skilled) (Utility)**	(AGC)-Performs a variety of manual duties, usually working in a utility capacity by working on multiple projects and tasks where demands require workmen with varied experience and ability to work without close direction. Unloads and transports reinforcing steel. May assist in the placement and tying of reinforcing steel. Directs common laborers in pouring concrete. Erects shoring and bracing. Assists in installation of pipe. Installs, operates, maintains dewatering systems. May assist equipment operators in positioning machines, verifying grades and signaling operators to dumping positions to maintain grades as directed. Uses power tools and air tools. May work as lead man in a labor crew. Installs and maintains erosion control. Is more or less a general utility construction worker. May be a second step in learning a skill. Includes Concrete/Gunite Pump Operator, Concrete Saw Operator, Fence Erector, Flagger, and Sign Erector. Performs other related duties.
19	**Mechanic**	(AGC-Same) Assembles, sets up, adjusts and maintains and repairs all types of construction equipment and trucks. May perform the duties of a welder in repair of equipment. Performs other related duties.

20	**Motor Grader Operator, Fine**	Operates motor grader. Performs many of the same duties of Motor Grader, Rough, but in addition performs finish grade work to blue tops or other close specification control. This work is subject to strict inspection and must conform closely to specifications. May oil, grease or otherwise service and make necessary adjustments to equipment as needed. Performs other related duties.
21	**Painter**	Paints and stains structural steel and concrete surfaces of bridges, retaining walls, or other structures. Directs cleaning and abrasive blasting of surfaces prior to painting or staining. Performs other related duties.
22	**Percussion or Rotary Drill Operator**	Operates rock drilling equipment that may be used to break rock. May oil, grease or otherwise service and make necessary adjustments to equipment as needed. Performs other related duties.
23	**Pipe Layer**	Installs concrete, clay, steel, ductile iron, plastic, corrugated pipe and any other type of pipe for storm drainage, water lines, gas lines and sanitary sewer lines. Lays underground communication and electrical ducts. May install and set electrical ground boxes, hand holes, manholes, inlets and other structures. Caulks joints, makes threaded and flanged connections. Installs valves and other accessories. Performs other related duties.
24	**Reinforcing Steel Setter (Paving)/ Reinforcing Steel Worker**	Works from plans to lay out and install reinforcing steel within forms or in mats of concrete paving. May direct unloading of material. Determines rigging required to complete work. Gives direction to reinforcing steel worker apprentice or common or utility laborers. May install miscellaneous materials integral to concrete structures or paving. May work with power tools. Performs other duties.
25	**Reinforcing Steel Setter (Structure)/ Structural Steel Worker**	Erects and places fabricated structural steel members, such as girders, plates, diaphragms, lateral bracing, and unites them permanently to form a completed structural steel unit, including reinforcing members. Fastens steel members together by welding or bolting. May include dismantling and erecting large units of equipment. Performs other related duties.
26	**Rock Mason**	Constructs partitions, fences, walks, etc., using rock. Cutting, grouting and pointing of materials listed above which is necessary shall be part of this classification. May also build or repair rock retaining walls, cutting or placing of rock in mortar or other similar material.
27	**Servicer**	Drives a truck which carries various fuels, oils, greases and filters. Must have knowledge of and is responsible for the correct oiling and greasing and changing of filters on equipment according to manufacturers' specifications. Uses compressed air grease guns, wrenches and other tools. May make adjustments to clutches, brakes and other mechanical items. Keeps record of service for preventive maintenance records. May have laborer assisting him. May require a Commercial Driver's License if driving truck on public highways. Performs other related duties.

28	**Traffic Signal/Light Pole Worker**	Sets forms, reinforcing steel, anchor bolts and pours/finishes concrete for traffic signal and light pole foundations. Assembles, erects, and plumbs traffic signal and light pole structures by bolting and other means. Installs signal spans, signal heads, signal detection, and lights on equipment. Installs cabling and wiring in signal and light poles, on signal and light spans and underground raceway systems. Properly identifies and terminates cables and wiring to appropriate equipment. Installs signal controllers and service equipment. Tests and troubleshoots system for proper operation. Performs other related duties.
29	**Telecommunication Technician**	Installs and troubleshoots communication equipment including cabling for the transmission of communication circuits. Terminates and tests communication circuits including video, voice and data. Installs communication equipment in buildings, outdoor cabinets and pole mounted installations. Installs, terminates and tests optical fiber cables as well as copper communication cable carrying less than 50 volts AC. Performs other related duties.
30	**Traveling Mixer Operator**	Operates a machine that pulverizes material of the roadbed and may mechanically mix it with asphalt, cement or other stabilizing materials. May oil, grease or otherwise service and make necessary adjustments to equipment as needed. Performs other related duties.
31	**Truck Driver, Single Axle**	Drives a light capacity truck for transporting loads of construction material. The truck is of single rear axle type, may have various kinds of beds attached such as dump, flat bed, tank, etc. May require CDL license for driving on highway. May service and make necessary adjustments for proper operation of equipment. Performs other related duties.
32	**Truck Driver, Tandem Axle**	Drives a tandem axle powered tractor. Hauls dirt, rock, aggregates or other material. May require CDL license for driving on highway. May service and make necessary adjustments for proper operation of equipment. Performs other related duties.
33	**Tunneling Machine Operator**	Operates a machine which creates a tunnel through dirt or rock for the purpose of installing subterranean facilities such as utilities, including sanitary sewer and water mains, storm sewers, pedestrian tunnels, vehicular tunnels and subways. The tunneling machine excavates tunnels greater than 2,500 feet in continuous length. Sets up machine to line and grade. Checks grade during tunneling operation. May oil, grease or otherwise service and make necessary adjustments to equipment as needed. Performs other related duties.
34	**Utility Operator Grade 1**	Clam, ditching machine, side booms (except those in Grade 2), operator on dredges, cleaning machine, coating machine, back filler, blending machine, water-kote machine, equipment welder, track tractor, derrick, dragline, shovel, motor grader rough grade, Crawler tractor, foundation drill operator (crawler and truck mounted), and pile driver.

35	**Utility Operator Grade 2**	Pipe, boom truck or winch truck with poles when used for hoisting, side boom (cradling rock drill), tow tractor, farm tractor road boring machine, fork lift (industrial type), pot fireman (power agitated), straightening machine, boring machine, bombardier (track or tow rig), mobile lubrication & service engineer, hydrostatic testing operator, rollagon or similar type equipment, scraper, stalking machine , roller operator, concrete paving curing, float, texturing machine, subgrade trimmer, slip form machine, milling machine, self propelled sweeping machine, trenching machine, directional drill, chip spreader, screening plant, joint sealer, and concrete saw, off road hauler, pavement marking machine operator, reclaimer/pulverizer operator, slurry seal or micro-surfacing machine operator, self-propelled hammer operator.
36	**Welder, Certified/ Structural Steel Welder**	Certified by the American Welding Society to perform structural steel welding. Operates welding equipment. Welds structural steel girders and diaphragms. May weld permanent metal deck forms. Performs other related duties. Includes pipe work that must be performed by a certified welder.
37	**Welder**	Operates welding equipment. Cuts, lays out, fits and welds metals or alloyed metal parts to fabricate or repair equipment. Welds the joints between lengths of pipe for oil, gas or other types of pipelines. Welds structural steel girders and diaphragms. May assist in welding of permanent metal deck forms. Performs other related duties.

LETTER OF COMMITMENT

A bidder/offeror may provide a letter of commitment or other similar document signed by a duly authorized agent of a surety that meets the requirements for sureties contained in these bid documents and the general conditions of the construction contract, wherein the surety commits to issue the performance and all other bonds required by these bid documents and the general conditions of the construction contract. Said commitment document shall specify the bidder/offeror and the project that is the subject of these bid documents by name and shall commit to issuing such bonds in the full amount of the contract amount in the event the bidder/offeror is awarded the contract under the terms of these bid documents.

The letter of commitment is not a substitute for the bid bond.

A bidder/offeror who provides the above described commitment letter shall not be required to provide the financial statements that are required on the following pages.

A letter of commitment is not required at the time the bid is submitted but is required upon request by the City. The City may request the letter of commitment anytime after opening the bids/offers and before submitting the proposed award of the construction contract to the El Paso City Council. Letter of commitment must be provided within five (5) consecutive calendar days of notification by the City. If the bidder/offeror does not provide the letter of commitment, then it must provide the financial information as specified in the pages that follow.

QUALIFICATION AND FINANCIAL DISCLOSURE STATEMENT
(To be provided by Bidder/Offeror within five days of request by City Engineer)

PROJECT: **Confederate Citizens Collection Station**

SOLICITATION No.: **2016-764**

BIDDER: _____

BUSINESS ADDRESS: _____

PHONE NUMBER: _____ FAX NUMBER: _____

1. Organization

1.1 How many years has your organization been in business as a contractor?

1.2 How many years has your organization been in business under its present business name?

1.2.1 Under what other or former names has your organization operated?

1.3 If your organization is a corporation, answer the following:

1.3.1 Date of incorporation: _____

1.3.2 State of incorporation: _____

1.3.3 President's name: _____

1.3.4 Vice-president's name(s): _____

_____

1.3.5 Secretary's name: _____

1.3.6 Treasurer's name: _____

1.4 If your organization is a partnership, answer the following:

1.4.1 Date of organization: _____

1.4.2 Type of partnership: (if applicable) _____

1.4.3 Name(s) of general partner(s): _____

_____

1.5 If your organization is individually owned, answer the following:

1.5.1 Date of organization: _____

1.5.2 Name of owner: _____

1.6 If the form of your organization is other than those listed above, describe it and name the principals:

2. Licensing

2.1 List jurisdictions and trade categories in which your organization is legally qualified to do business, and indicate registration or license numbers, if applicable.

2.2 List jurisdictions in which your organization's partnership or trade name is filed.

3. Experience

3.1 List the categories of work that your organization normally performs with its own forces.

3.2 Claims and suits. (If the answer to any of the questions below is yes, please attach details.)

3.2.1 Has your organization ever failed to complete any work awarded to it?

3.2.2 Are there any judgments, claims, arbitration, proceedings or suits pending or outstanding against its officers?

3.2.3 Has your organization filed any law suits or requested arbitration with regard to construction contracts within the last five years?

3.3 Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? (If the answer is yes, please attach details.)

3.4 On a separate sheet, list major construction projects your organization has in progress, giving the name of project, owner, phone number, architects, contract amount, percent complete, scheduled completion date, and type of work performed by your work forces. Include names and phone numbers of contact persons for each project.

3.4.1 State total worth of work in progress and under contract:

3.5 On a separate sheet, list the major projects your organization has completed in the past five years, giving the name of project, owner, architect, contract amount, date of completion, the type of work performed by your work forces,

and percentage of the cost of the work performed with your own forces. Include names and phone numbers of contact persons for each project.

3.5.1 State average annual amount of construction work performed during the past five years:

3.6 On a separate sheet, list the construction experience and present commitments of the key individuals of your organization.

4. References

4.1 Trade References:

4.2 Bank References:

4.3 Surety:

Name of Bonding Company: _____

Name of address of agent: _____

_____

_____

5. Financing

5.1 Financial Statement

5.1.1 Attach a financial statement, preferably audited, including your organization's latest balance sheet and income statement showing the following items:

a. Cash Flow Statement

b. Notes to Financial Statement

c. Auditor Statement

d. Comparison Statements, if available

e. Current Assets (e.g., cash, joint venture accounts, accounts receivable, notes receivable, accrued income, deposits, materials inventory and prepaid expenses);

f. Net Fixed Assets;

g. Other Assets;

h. Current Liabilities (e.g. accounts payable, notes payable, accrued expenses, provision for income taxes, advances, accrued salaries and accrued payroll taxes);

i. Other Liabilities (e.g., capital, capital stock, authorized and outstanding shares par values, earned surplus and retained earnings).

5.1.2 Name and address of firm preparing attached financial statement, and date thereof:

5.1.3 Is the attached financial statement for the identical organization named on page one?

5.1.4 If not, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent subsidiary).

5. Financing

5.2 Will the organization whose financial statement is attached act as guarantor of the contract for construction?

6. Signature

6.1 Dated at _____ this _____ day of _____ 20____.

Name of Organization: _____

By: _____
Signature

_____
Name printed or typed

Title: _____

6.2 _____ being duly sworn deposes and says that the information provided herein is true and sufficiently complete so as not to be misleading.

Subscribed and sworn before me this _____ day of _____, 20__.

_____
Notary Public

My Commission Expires: _____

THE STATE OF TEXAS }
COUNTY OF EL PASO }

CONTRACT

THIS AGREEMENT, made this _____ day of _____, 20_____ by and between THE CITY OF EL PASO, County of El Paso, Texas, hereinafter called "Owner", acting herein through its City Manager, Tomás González and _____ (circle one of the following: a corporation, a partnership, an individual), located in: CITY OF _____, COUNTY OF _____ and STATE OF _____, hereinafter called "Contractor".

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned, to be made and performed by the Owner, the Contractor hereby agrees with the Owner to commence and complete the construction described as follows:

Confederate Citizens Collection Station
CONTRACT NO. 2016-764

hereinafter called the "Project", for the sum of _____ Dollars and _____Cents ($_____), and all extra work in connection therewith, under the terms as stated in the contract documents; and at Contractor(s) own 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 Project, in accordance with the conditions and prices stated in the Proposal, the General Conditions, Supplemental General Conditions and Special Conditions of the Contract, the plans, which include all maps, plats, blueprints and other drawings and printed or written explanatory matter thereof, the specifications and contract documents thereof as furnished by the CITY ENGINEER or designated representative, and as enumerated in Paragraph 1.5 of the General Conditions, all of which are made a part hereof and collectively evidence and constitute the Contract.

The Contractor agrees to commence work on a date to be specified in a written "Notice to Proceed" issued by the Owner. The Contract Time shall begin on the date to commence work specified in the "Notice to Proceed" and shall run thereafter for **one hundred eighty (180) CONSECUTIVE CALENDAR DAYS**. Contractor shall Substantially Complete the project within **one hundred fifty (150) CONSECUTIVE CALENDAR DAYS** after the date to commence work in the "Notice to Proceed." Contractor agrees to pay, as liquidated damages, the sum of **one thousand two hundred dollars and zero cents ($1,200.00)** for each consecutive calendar day after the date of Substantial Completion, as hereinafter provided in the General Conditions. Contractor further agrees to pay as liquidated damages the sum of **six hundred dollars and zero cents ($600.00)** for each consecutive calendar day after the expiration of the Contract Time for Remaining Work, as provided in Paragraph 6.8.3.1 of the General Conditions. The unit price quantities of this contract are estimated.

Base Bid: $00.00 Alternate: $00.00 Total Award: $00.00

CONTRACT

IN WITNESS, WHEREOF, the parties to these presents have executed this Contract on the _____ day of _____, 20____ in two (2) counterparts, each of which shall be deemed an original, in the year and day first above mentioned.

OWNER – CITY OF EL PASO

by _____
Tomás González, City Manager

APPROVED AS TO FORM:

_____
Assistant City Attorney

APPROVED AS TO CONTENT:

_____
Department Head

Contractor:

_____

by _____

_____
Typed Name & Title

_____
Address, City, State, Zip Code

_____ _____
Telephone Number Fax Number

If the Contractor be a corporation, the following certificate should be executed:

I, _____, certify that I am the _____ Secretary of the corporation named as Bidder, hereinabove; and that _____, who signed the foregoing Contract on behalf of the Bidder was then _____ of said corporation; that said proposal was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

_____
CORPORATE SECRETARY SIGNATURE AND CORPORATE SEAL

PERFORMANCE BOND
(Value of this Bond must be 100% of Contract amount)

KNOW ALL MEN BY THESE PRESENTS:

THAT _____, hereinafter called the "Principal", as Principal and _____, a Corporation organized and existing under the laws of the State of _____ with its principal office in the City of _____, hereinafter called the "Surety", as Surety, are held and firmly bound unto THE CITY OF EL PASO, TEXAS, hereinafter called the "Obligee", in the amount of _____ Dollars and___ Cents ($_____), 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 Obligee, dated the _____day of ___**,** 20___ to construct **Confederate Citizens Collection Station.** Contract No.**2016-764**, 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 SUCH that, if the said Principal shall faithfully perform the work in accordance with the plans, specifications and contract documents, then this obligation shall be void; otherwise, to remain in full force and effect.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the provisions of Chapter 2253, Texas Government Code, as amended, and all liabilities on this Bond shall be determined in accordance with the provisions of said Chapter to the same extent as if it were copied at length herein. The Surety hereby waives notice of any change, including changes of time, to the construction contract, related subcontracts and purchase orders, which is made in accordance with Section 252.048, Texas Local Government Code.

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

WITNESS: _____

ATTEST: _____

_____	_____ (Seal)
Principal - Company Name	Signed By (*Principal Agent*)
_____	_____
Address	Principal Agent's Name (Printed or Typed)
_____	_____
City, State, Zip Code	
_____	_____
Telephone No.	Fax No.
_____	_____ (Seal)
Surety - Company Name	Signed By (*Surety Agent*)
_____	_____
Address	Surety Agent's Name (Printed or Typed)
_____	
City, State, Zip Code	
_____	_____
Telephone No.	Fax No.

INSERT

POWER OF ATTORNEY

AFTER

PERFORMANCE BOND

<u>NOTE:</u>

- **DO NOT SUBSTITUTE BOND FORM**
- **BOND MUST BEAR FOUR (4) SIGNATURES: (1) WITNESS, (2) ATTEST, (3) CONTRACTOR AND (4) ATTORNEY-IN-FACT**
- **DATE ON POWER OF ATTORNEY MUST BE SAME AS DATE ON BOND**
- **SEPARATE POWER OF ATTORNEY FORMS MUST BE PROVIDED FOR EACH BOND (PERFORMANCE & PAYMENT BOND)**
- **AGENT RESIDENT DESIGNATION MUST CONTAIN SURETY'S SEAL, ASSIGNMENT BY SURETY AGENT, AND ACKNOWLEDGMENT OF SUCH ASSIGNMENT BY AGENT RESIDENT.**

PAYMENT BOND

(Value of this Bond must be 100% of Contract amount)

KNOW ALL MEN BY THESE PRESENTS:

THAT _____, hereinafter called the "Principal", as Principal and _____, a Corporation organized and existing under the laws of the State of _____ with its principal office in the City of _____, hereinafter called the "Surety", as Surety, are held and firmly bound unto THE CITY OF EL PASO, TEXAS, hereinafter called the "Obligee", in the amount of _____ Dollars and____ Cents **($_____)**, 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 Obligee, dated the _____ day of ____**,** 20___, to construct **Confederate Citizens Collection Station,** Contract No. **2016-764,** 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 SUCH that, if the said Principal shall pay all claimants supplying labor and materials to him, or a subcontractor in the prosecution of the work provided for in said Contract, then this obligation shall be void; otherwise, to remain in full force and effect.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the provisions of Chapter 2253, Texas Government Code, as amended, and all liabilities on this Bond shall be determined in accordance with the provisions of said Chapter to the same extent as if it were copied at length herein.

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

WITNESS: _____

ATTEST: _____

_____	_____ (Seal)
Principal - Company Name	Signed By (*Principal Agent*)
_____	_____
Address	Principal Agent's Name (Printed or Typed)
_____	_____
City, State, Zip Code	
_____	_____
Telephone No.	Fax No.
_____	_____ (Seal)
Surety - Company Name	Signed By (*Surety Agent*)
_____	_____
Address	Surety Agent's Name (Printed or Typed)
_____	
City, State, Zip Code	
_____	_____
Telephone No.	Fax No.

INSERT

POWER OF ATTORNEY

AFTER

PAYMENT BOND

<u>NOTE:</u>

- **DO NOT SUBSTITUTE BOND FORM**
- **BOND MUST BEAR FOUR (4) SIGNATURES: (1) WITNESS, (2) ATTEST, (3) CONTRACTOR AND (4) ATTORNEY-IN-FACT**
- **DATE ON POWER OF ATTORNEY MUST BE SAME AS DATE ON BOND**
- **A SEPARATE POWER OF ATTORNEY FORM MUST BE PROVIDED FOR EACH BOND (PERFORMANCE & PAYMENT BOND)**
- **AGENT RESIDENT DESIGNATION MUST CONTAIN SURETY'S SEAL, ASSIGNMENT BY SURETY AGENT, AND ACKNOWLEDGMENT OF SUCH ASSIGNMENT BY AGENT RESIDENT.**

AGENT RESIDENT DESIGNATION

Confederate Citizens Collection Station
Contract No. 2016-764

SURETY INFORMATION

_____, as Surety on the Performance and Payment Bonds for this contract, hereby appoints the following resident agent who resides within the County of El Paso and to whom any requisite notices may be delivered and on whom service of process may be had in matters arising out of suretyship, pursuant to Article 7.19-1 of the Texas Insurance Code and Chapter 2253, Texas Government Code.

Assigned By:

_____(Seal)
Surety Agent

_____
Surety Agent's Signature

_____
Date

AGENT INFORMATION

Agent Resident:_____

Business Address:_____

_____

Telephone & Fax Nos. _____

Acknowledged By:

_____
Agent Resident's Name (Printed or Typed)

_____
Agent Resident's Signature

NOTIFICATION TO CONSTRUCTION CONTRACTORS

INSURANCE REQUIREMENTS

Note: Refer to the Contract General Conditions, Paragraphs 5.11 through 5.12 for complete insurance requirements for this project.

1. Commercial General Liability, Property Damage Liability, and Vehicle Liability Insurance Requirements:

Commercial General Liability Bodily Injury	$1,000,000.00 each person
Property Damage	$1,000,000.00 each occurrence
General Aggregate	$2,000,000.00
Vehicle Liability <u>(Any Auto)</u> Combined Single Limit	$1,000,000.00

2. Builder's Risk Insurance (fire and extended coverage) for certain projects is required for 100% of the completed value only when designated on p. II.E.1.A

3. The City of El Paso shall be named as an *Additional Insured* on all insurance policies except Workers' Compensation Insurance Coverage shall be provided by endorsement to the policy of insurance. The project name, type, amount, class of operations covered, effective dates and dates of expiration of policies shall be shown on certificate.

4. Statutory Texas Workers' Compensation Insurance Coverage:

   Workers' Compensation policy shall be endorsed to provide that the insurer waives any right of subrogation it may require against the Owner, the Architect/Engineer of Record and Construction Manager where applicable, see General Conditions, 5.12.

5. A 30-day notice of policy cancellation or material alteration.

6. **Important:**

   The language of the cancellation notice must substantially contain the **<u>unconditional</u>** statement: "Should any of the described policies be canceled or materially altered before the expiration date, the issuing company shall provide thirty (30) days written notice to the Owner-City of El Paso by certified mail." See General Conditions 5.11 (E); the words ***"endeavor to notify"*** and ***"failure to notify shall impose no obligation or liability upon the company ..."*** **are not acceptable**.

<u>SPECIAL NOTE:</u>

Worker's Compensation, Waiver of Subrogation, City of El Paso named as an Additional Insured and the 30-day cancellation notice must all be done through endorsement by the insurer. The document may be an endorsement, a rider or an amendment to the policy and it must include the policy number.

Builder's Risk Insurance (fire and extended coverage) **IS NOT REQUIRED** for:

Confederate Citizens Collection Station

Solicitation No. 2016-764

INSERT

INSURANCE CERTIFICATE

HERE

- BUILDER'S RISK COVERAGE REQUIRED FOR ALL BUILDING PROJECTS
- CITY OF EL PASO MUST BE SHOWN AS AN "ADDITIONAL INSURED" ON GENERAL LIABILITY AND AUTOMOBILE LIABILITY
- WORKERS' COMPENSATION CERTIFICATE MUST SHOW A WAIVER OF SUBROGATION AGAINST THE OWNER/CITY, ARCHITECT/ENGINEER AND CONSTRUCTION MANAGER, WHERE APPLICABLE
- ALL ENDORSEMENTS MUST CONTAIN THE FOLLOWING UNCONDITIONAL STATEMENT REGARDING CANCELLATION: "Should any of the described policies be canceled <u>or materially altered</u> before the expiration date, the issuing company shall provide thirty (30) days written notice to the Owner-City of El Paso by certified mail." See General Conditions 5.11 (E); the words *"endeavor to notify"* and *"failure to notify shall impose no obligation or liability upon the company..."* are not acceptable

CITY OF EL PASO, TEXAS
CONSTRUCTION CONTRACT
GENERAL CONDITIONS

Table of Contents

1.0 TERMS OF CONTRACT AND DEFINITIONS

1.1 Contract and Contract Documents
1.2 Definitions
1.3 Abbreviations
1.4 Conflicting Conditions
1.5 Enumeration of Plans, Specifications & Addenda

2.0 SCOPE OF WORK

2.1 Intent of Contract
2.2 Changes and Alterations
2.3 Differing Site/Concealed Conditions
2.4 Quantities of Estimate
2.5 Change Orders and Claims for Extra Work
2.6 Maintenance and Protection of Traffic
2.7 Additional Instructions and Detail Drawings
2.8 Shop or Setting Drawings
2.9 Conformity with Plans and Specifications
2.10 Use of Premises and Removal of Debris
2.11 Clean Up
2.12 Surveys, Permits and Regulations
2.13 Land and Right-of-Way

3.0 CONTROL OF WORK

3.1 Engineering City Engineer’s Authority/ Owner's Designated Representative
3.2 Construction Management
3.3 Reports, Records and Data
3.4 Cooperation with Utilities
3.5 Cooperation between Contractors
3.6 Inspection
3.7 Acceptance of the Work

4.0 CONTROL OF MATERIALS

4.1 Source of Supply and Quality Requirement
4.2 Contractor's Title of Materials
4.3 "Or Equal" Clause
4.4 Inspection and Testing of Materials
4.5 Rights in and Use of Materials Found on the Work Site
4.6 Handling Materials

4.7 Disposal of Materials outside the Work Site
4.8 Unacceptable Materials

5.0 CONTRACTOR'S RESPONSIBILITIES AND LEGAL OBLIGATIONS

5.1 Laws to be observed
5.2 Provisions Required by Law Deemed Inserted
5.3 Patented Devices, Materials and Processes
5.4 Public Convenience and Safety
5.5 Use of Explosives
5.6 Protection of Work and Property
5.7 Protection of Work and Property - Emergency
5.8 Protection of Work and Property - Monitor Wells
5.9 Mutual Responsibility of Contractor
5.10 Indemnification
5.11 Insurance
5.12 Texas Workers' Compensation Requirements
5.13 Contract Security
5.14 Additional or Substitute Bond
5.15 Contractor's Obligations
5.16 Correction of Work
5.17 Warranty of Construction
5.18 Use and Occupancy Prior to Acceptance by Owner
5.19 Contractor's Responsibilities for Utility Property and Services
5.20 Obligation for Temporary Electrical Power
5.21 Environmental Protection
5.22 Texas Pollutant Discharge Elimination System (TPDES) Requirements
5.23 Prevailing Wage Rates and Wage Rate Penalty
5.24 Apprentices
5.25 Apprenticeship Program

6.0 PROSECUTION AND PROGRESS

6.1 Subcontracting
6.2 Notice and Service Thereof
6.3 Progress Schedule
6.4 Limitation of Operations
6.5 Character of Workmen; Methods and Equipment
6.6 Progress Photographs
6.7 Suspension of Work
6.8 Time for Completion and Liquidated Damages
6.9 Right of Owner to Terminate Contract
6.10 Default of Contract

7.0 PAYMENTS

7.1 Construction Schedule and Periodic Estimate
7.2 Progress Payments
7.3 Assignments
7.4 Acceptance of Final Payment Constitutes Release
7.5 Payrolls and Basic Records

8.0 DISPUTES AND REMEDIES

8.1 Dispute Resolution
8.2 Governing Law
8.3 Rights and Remedies
8.4 Illegality

9.0 RECORDS/AUDIT

CONSTRUCTION CONTRACT
GENERAL CONDITIONS

1.0 TERMS OF CONTRACT AND DEFINITIONS

1.1 Contract and Contract Documents

1.1.1 The Plans, Specifications and Addenda, hereinafter enumerated in Paragraph 1.5 of the General Conditions, shall form part of this contract and the provisions thereof shall be as binding upon the parties hereto as if they were herein fully set forth. The table of contents, titles, headings, running headlines and marginal notes contained herein and in said documents are solely to facilitate reference to various provisions of the contract documents and in no way affect, limit or cast light on the interpretation of the provisions to which they refer.

1.1.2 The specifications, the accompanying plans, special provisions and supplemental agreements are essential parts of this contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to describe and provide for a complete project. In the event that there are differences between the contract documents, the following rules shall govern:

1.1.2.1 Written figured dimensions shall govern over scaled dimensions;

1.1.2.2 General Conditions shall govern over specific provisions;

1.1.2.3 Performance specifications shall govern over design specifications if they call for specific results;

1.1.2.4 Specifications shall govern over plans; and

1.1.2.5 Special provisions shall govern over both specifications and plans.

1.1.3 Where conflicts/differences exist, the Contractor has a duty to and shall consult with and obtain written clarification from the Design Engineer/Architect.

1.1.4 Any certificates required by a federal agency or other special funding source, and any conditions supplementing these general conditions shall be fully binding on the parties and shall supersede any contradicting provisions contained herein.

1.1.5 The Contractor shall take no advantage of any apparent error or omission in the plans or specifications. In the event the Contractor discovers such an error or omission, the City Engineer shall be promptly notified. The City Engineer will then make such corrections and interpretations as may be deemed necessary for fulfilling the intent of the plans and specifications.

1.2 Definitions

1.2.1 The following terms, as used in this contract, are respectively defined as follows:

1.2.1.1 "Contractor" - The person, firm, partnership or corporation who undertakes to perform the work specified in this contract. The Contractor is an independent contractor, and shall be solely responsible for its acts or omissions arising from or relating to its performance of this Agreement. The Contractor is not an employee or agent of the City of El Paso by reason of this Agreement or otherwise.

1.2.1.2 “Contract Time” means the number of consecutive calendar days specified in the contract immediately after the date to commence work issued by Owner in the Notice to Proceed and includes both the time allowed for completion of the work required to achieve Substantial Completion and the time allowed to complete the Remaining Work.

1.2.1.3 “Remaining Work” means the work required by the Contract, but not required for Substantial Completion, that the City Engineer determines has not been satisfactorily completed at the time of Substantial Completion and all maintenance and operating instructions, schedules, guarantees, warranties, bonds, certificates of inspection, marked-up record documents, prevailing wage compliance reports and other documents as required by the Contract. “Remaining Work” may also be referred to as “Punch List” work.

1.2.1.4 "Subcontractor" - A person, firm, partnership or corporation supplying labor and materials, or only labor, for work at the site of the project for and under separate contract or agreement with the Contractor.

1.2.1.5 "Work on/at the Project" - Work to be performed at the location of the project, including the transportation of materials and supplies to or from the location of the project by employees of the Contractor and any Subcontractor.

1.2.1.6 "Substantially Complete" - A project is substantially complete on the date when the construction is sufficiently complete, in accordance with the contract documents, so that the Owner may occupy or utilize the work or designated portion thereof for the use for which it is intended as expressed in the contract documents.

1.3 Abbreviations

Wherever the following abbreviations are used in the contract documents, they are to be construed the same as the respective expressions represented:

A.A.S.H.T.O.	American Association of State Highway and Transportation Officials
A.C.I.	American Concrete Institute
A.I.A.	American Institute of Architects
A.I.S.C.	American Institute of Steel Construction
A.N.S.I.	American National Standards Institute
C.B.R.	California Bearing Ratio
C.R.S.I.	Concrete Reinforcing Steel Institute
C.Y. or Cu. Yd .	Cubic Yard
Dia. or Diam.	Diameter
E.P.A.	Environmental Protection Agency
F.A.A.	Federal Aviation Administration
Ft.	Foot or Feet
In.	Inch or Inches
Lb.	Pound
L.F. or Lin. Ft.	Linear Foot (Feet)
L.S.	Lump Sum
N.E.C.	National Electrical Code
N.R.M.C.A.	National Ready Mixed Concrete Assoc.
O.S.H.A.	Occupational Safety and Health Administration
P.C.A.	Portland Cement Association
P.C.I.	Prestressed Concrete Institute
S.Y. or Sq. Yd.	Square Yard
T.D.O.T.	Texas Department of Transportation

1.4 Conflicting Conditions

Any provisions in any of the contract documents which may be in conflict or inconsistent with any of the paragraphs in these General Conditions shall be void to the extent of such conflict or inconsistency, except as stated in Paragraph 1.1.

1.5 Enumeration of Plans, Specifications, and Addenda *(Revised 12/3/04)*

The plans, specifications and addenda which form a part of this contract, as set forth in Paragraph 1.1 of the General Conditions, "Contract and Contract Documents", are attached hereto and incorporated herein by reference.

2.0 SCOPE OF WORK

2.1 Intent of Contract

It is the intent of the contract documents to describe a functionally complete project to be constructed to its completion in every detail of the work described. The Contractor shall furnish all labor, materials, equipment, transportation, and supplies required to complete the work in accordance with the plans, specifications, and terms and conditions of the contract.

2.2 Changes and Alterations

2.2.1 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 construction without affecting the validity of this contract and the accompanying bond.

2.2.2 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. If they increase the amount of work, and the increased work can fairly be classified under the specifications, such increase shall be paid according to the quantity actually done and at the unit price established for such work under this contract; otherwise, such additional work shall be paid for as provided under Paragraph 2.5, as it relates to extra work.

2.2.3.1 In case the Owner shall make such changes or alterations as shall make useless any work already done or material already furnished or used in said work, 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 expenses incurred in preparation for the work, as originally planned.

2.3 Differing Site/Concealed Conditions

Should the Contractor encounter subsurface or latent conditions at the site or concealed or unknown conditions in an existing structure materially differing from those shown on the plans or indicated in the specifications, the Contractor shall immediately give notice to the Owner's designated representative of such conditions before they are disturbed. The Owner's designated representative will thereupon promptly investigate the conditions, and if he/she finds that they materially differ from those shown on the plans or indicated in the specifications, he/she will at once make such changes in the plans or specifications as he/she may find necessary, any increase or decrease of cost resulting from such changes shall be adjusted in the manner provided in Paragraph 2.5 herein.

2.4 Quantities of Estimate

Wherever the estimated quantities of work to be done and materials to be furnished under this contract are shown in any of the documents, including the proposal, they are given for use in comparing bids and the right is expressly reserved, except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the Owner to complete the work contemplated by this contract, and such increase or diminution shall in no way violate this contract, nor shall any such increase or diminution give cause for claims of liability for damages.

2.5 Change Orders and Claims for Extra Work

2.5.1 <u>Without invalidating the contract or the accompanying Payment or Performance Bond and without obtaining the consent of the Surety or Sureties</u>, the Owner may, in accordance with applicable state law, order extra work or make changes by altering, adding to or deducting from the work, the contract sum being adjusted accordingly. Any changes in the work ordered and approved by the Owner shall become a part of the contract work and shall be covered by the accompanying Payment and

Performance Bonds. All the work of the kind bid upon shall be paid for at the price stipulated in the proposal and **no claims for any extra work or materials shall be allowed unless the work is ordered in writing by the Owner or Owner's designated representative, acting officially for the Owner, in accordance with applicable state law, and the price is stated in such order.** Additional time for change orders or utilities delays, which affect the contractor, shall be considered estimates upon their granting. The Owner reserves the right to review the actual time utilized by the contractor in the completion of the additional work of the change order at the termination of the project. Owner shall then adjust time granted per change order to reflect the actual time required by the contractor for the completion of each change order.

2.5.2 **NO CHANGES IN THE WORK COVERED BY THE APPROVED CONTRACT SHALL BE MADE WITHOUT HAVING PRIOR WRITTEN APPROVAL OF THE OWNER OR OWNER'S DESIGNATED REPRESENTATIVE AS AFORESAID.** Charges or credits for the work covered by the approved change shall be determined by one or more, or a combination of the following methods:

2.5.2.1 Unit Bid prices previously approved.

2.5.2.2 An agreed lump sum.

2.5.2.3 The actual cost of:

2.5.2.3.1 Labor, including foreman;

2.5.2.3.2 Materials and supplies, entering permanently into the work;

2.5.2.3.3 Ownership or rental cost of construction plant and equipment during the time of use on the extra work;

2.5.2.3.4 Power and consumable supplies for the operation of power equipment;

2.5.2.3.5 Public Liability and Property Damage, Worker's Compensation and all other insurances as may be required by law or ordinances, or directed by the Owner or the Owner's Representative, or by them agreed to, and;

2.5.2.3.6 Social Security, Old Age, Unemployment Contributions and Maintenance Bonds

2.5.2.4 To the cost under subparagraph 2.5.2.3 above, there shall be added a fixed fee to be agreed upon but not to exceed fifteen percent (15%) of the actual cost of the work. The fee shall be compensation to cover the cost of supervision, overhead, bond, profit and any other general expenses.

2.5.3 **No claim for extra work or cost shall be allowed unless the same was done in pursuance of a written order of the Owner's designated representative**, approved by the Owner, as aforesaid. Upon receipt of a change order cost proposal from the contractor, the owner shall have fourteen (14) calendar days in which to respond to the proposal. When work is performed under the terms of subparagraph 2.5.2.3 above, the Contractor shall furnish satisfactory bills, payrolls and vouchers covering all items of cost and, when requested by the Owner, access to accounts relating thereto.

2.6 Maintenance and Protection of Traffic

2.6.1 The Contractor shall make all necessary precautions to guard against damages to property and injury to persons. The Contractor shall prepare a traffic control plan acceptable to and approved by the Traffic Engineer or his/her representative.

2.6.2 **Guidelines for Traffic Control Plans**. A plan, drawn to scale and with the following information, is required for any activity which requires the use of the roadway or adjacent pedestrian walkway in conjunction with any street cut permit, building permit, site development permit, drainage development permit, special privilege permit, or any roadway construction.

2.6.2.1 Activity location, right-of-way, and curb lines of the street or pedestrian walkway sought to be closed or blocked.

2.6.2.2 Area of street or pedestrian walkway to be closed

2.6.2.3 Proposed detour routes.

2.6.2.4 Location and type of all barricades, signals, signs, cones, and other warning devices

2.6.2.5 The times of the day, and the total number of days, the applicant seeks to block the streets or Pedestrian walkway.

2.6.2.6 The construction zone traffic control design and plans shall conform to the specifications and principles of the "Texas Manual of Traffic Control Devices", Part VI 1980 Edition, latest revision, issued by the Texas Department of Transportation.

2.6.3 Traffic control plans will be submitted to the Engineering Department Traffic Division for approval. Any work performed on streets or pedestrian walkways, without an approved traffic control plan, will be stopped and may be subject to any penalties as per the El Paso Municipal Codes.

2.6.4 The Contractor shall put up and maintain in good condition, sufficient warning lights at night and suitable barricades and other devices necessary to protect the public. In case the Contractor fails or neglects to take such precautions, the Owner shall notify and allow the contractor four hours in which to install or restore to working order all devices necessary to protect the public. If the Contractor does not comply, the Owner shall install lights

and barricades and the cost of the work shall be charged to the Contractor. Such action by the Owner does not relieve the Contractor of any liability incurred under these specifications or the contract.

2.6.5 The Contractor will be held responsible for all damage to the work due to failure of barricades, signs and lights to protect it, and when damage is incurred, the damaged portion shall be immediately removed and replaced by Contractor at his own cost and expense. The Contractor's responsibility for maintenance of barricades, signs and lights shall not cease until the date of issuance to Contractor of City's certificate of substantial completion of the project.

2.6.6 **Description**: These specifications shall govern for the handling of traffic around and through the area during all phases of construction and the furnishing of all barricades, flags, flagmen and other essentials necessary to complete this work as required on the plans and in this specification.

2.6.7 **Barricades, Flags, Warning Signs, etc.**: Barricades, flags, warning signs, etc., shall conform to specifications given in the latest edition of the *Texas Manual on Uniform Traffic Control Devices*, Part VI, issued by the Texas State Department of Highways and Public Transportation, hereinafter called the manual, a copy of which is on file in the office of the Traffic Engineer, Engineering Department, City of El Paso.

2.6.8 **Sequence of Operations**: Sequence of operations shall be called for on the approved plans by the Traffic Engineer.

2.6.9 Before removal of barricades and other traffic control signs, the Contractor shall notify the Traffic Engineer of the Contractor's intent. Advance warning shall be given in sufficient time to permit the Director to install traffic control devices (striping, signs, etc.) before any street is reopened to traffic.

2.6.10 **Payment:** Payment for the furnishings of barricades, flags, flares, warning signs, flagmen and other incidentals and inconveniences necessary for the accomplishment of the work and objectives stated herein will not be made directly. The cost of such devices, if any, should be included in the amount bid, but not as a separate line item.

2.7 Additional Instructions and Detail Drawings

2.7.1 The Contractor will be furnished additional instructions and detail drawings as necessary to carry out the work included in the contract. The additional drawings and instructions thus supplied to the Contractor will coordinate with the contract documents and will be so prepared that they can be reasonably interpreted as part thereof. The Contractor shall carry out the work in accordance with the additional detail drawings and instructions. The Contractor and the Owner's designated representative will prepare jointly:

2.7.2 A schedule fixing the dates at which special detail drawings will be required, such drawings, if any to be furnished by the Owner's designated

representative in accordance with said schedule; and A schedule fixing the respective dates for the submission of shop drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment, and the completion of the various parts of the work; each sum schedule to be subject to change from time to time in accordance with the progress of the work.

2.8 Shop or Setting Drawings

2.8.1 The Contractor shall submit promptly to the Owner's designated representative five (5) copies of each shop or setting drawings prepared in accordance with the schedule predetermined in accordance with Paragraph 2.7 herein. After examination of such drawings by the Owner's designated representative and the return thereof, the Contractor shall make such corrections to the drawings as have been indicated and shall furnish the Owner's designated representative a minimum of four (4) sets.

2.8.2 The Contractor shall, nevertheless, be responsible for the accuracy of such drawings and for their conformity to the plans and specifications, unless he/she notifies the Owner's designated representative in writing of any deviations at the time he/she furnishes such drawings.

2.9 Conformity with Plans and Specifications

2.9.1 All work performed and all materials furnished shall conform to the lines, grades, cross sections, dimensions, and material requirements, including tolerances, shown on the plans or indicated in the specifications.

2.9.2 Plan dimensions and contract specification values are to be considered as the target values to be strived for and complied with as the design values from which any deviations are allowed. It is the intent of the specifications that the materials and workmanship shall be uniform in character and shall conform as nearly as possible to the prescribed target value or the middle portion of the tolerance range. The purpose of the tolerance range is to accommodate occasional minor variations from the median zone that are unavoidable for practical reasons. When either a maximum and minimum value or both are specified, the production and processing of the material and the performance of the work shall be so controlled that material or work will not be preponderantly of borderline quality or dimension.

2.9.3 In the event the City Engineer finds the materials furnished, work performed, or the finished product not in conformance with the plans and specifications but that acceptable work has been produced, the City Engineer shall then make a determination as to whether the work shall be accepted and remain in place. In this event, the City Engineer will document the basis of acceptance by contract modification which will provide for an appropriate adjustment in the contract price for such work or materials necessary to conform to his determination.

2.9.4 In the event the City Engineer finds the materials or the finished product in which the materials are used are not in conformance with the plans and

specifications, and have resulted in an unsatisfactory or unacceptable product, the work or materials shall be removed and replaced or otherwise corrected by and at the expense of the Contractor in a manner satisfactory to the City Engineer.

2.10 Use of Premises and Removal of Debris

2.10.1 The Contractor expressly undertakes at his/her own expense:

2.10.1.1 To take every precaution against injuries to persons or damage to property;

2.10.1.2 To store his/her apparatus, materials, supplies and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of his/her work or the work of any other contractors;

2.10.1.3 To place upon the work or any part thereof only such loads as are consistent with the safety of that portion of the work;

2.10.1.4 To clean up frequently all refuse, rubbish, scrap materials and debris caused by his/her operations, to the end that at all times the site of the work shall present a neat, orderly and workmanlike appearance;

2.10.1.5 Before final payment to remove all surplus material, false-work temporary structures, including foundations thereof, plant of any description and debris of every nature resulting from his/her operations, and to put the site in a neat, orderly condition;

2.10.1.6 To affect all cutting, fitting or patching of his/her work required to make the same to conform to the plans and specifications and except with the consent of the Owner's designated representative, not to cut or otherwise alter the work of any other contractor.

2.11 Clean Up

The Contractor shall throughout the life of the contract keep his work and storage areas free of accumulations of waste materials, rubbish, trash, and debris. Before final inspection of the work, all waste and surplus material, trash, rubbish, debris, and equipment shall be removed from the project site, material site, and other areas occupied by him in connection with the work. All areas shall be left in a neat and presentable condition.

2.12 Surveys, Permits and Regulations

2.12.1 The Owner will establish horizontal and vertical control only. The Contractor must furnish all additional stakes for the layout and construction of the project.

2.12.2 The work to be done shall be staked out by the Contractor from line and grade control stakes furnished by the Owner or Owner's designated representative. Only the minimum number of control stakes will be furnished by the Owner or Owner's designated representative to define the lines and grades to be used by the Contractor in laying out the work.

2.12.3 The Contractor shall give the Owner at least thirty six (36) hours notice in writing before requiring that control stakes be set out.

2.12.4 The Contractor must satisfy himself before commencing work as to the meaning or correctness of all control stakes or marks, and no claims will be considered by the Owner for or on account of any alleged inaccuracies, unless the Contractor notifies the Owner thereof in writing before commencing the work thereon.

2.12.5 The Contractor will be held responsible for the preservation of all such control stakes and marks in their position, and in case any of them are lost or destroyed, all expenses incurred by the Owner in replacing same shall be charged against the Contractor and paid for by him/her before the completion and final acceptance of the work.

2.12.6 The Contractor shall procure and pay for all applicable permits, licenses, and approvals necessary for the execution of the contract. Fees for permits issued by the City's Department of Building Services will be waived for work done at facilities owned or managed by the Owner. Fees, licenses, and permits pertaining to the collection, transport, and disposal of waste materials from the project shall be paid by the Contractor.

2.12.7 The Contractor shall comply with all laws, ordinances, rules, orders and regulations relating to performance of the work, the protection of adjacent property and the maintenance of passage-ways, guard fences, lateral supports or other protective facilities.

2.13 Land and Right-of-Way

2.13.1 Prior to the start of construction, the Owner shall obtain all land and right-of-way necessary for the carrying out of and completion of work to be performed under this contract.

2.13.2 The Owner's designated representative must be notified twenty-four (24) hours in advance of any work involving the placement of curbs, pavement or storm sewers on City right-of-way.

3.0 CONTROL OF WORK

3.1 City Engineer's Authority/Owner's Designated Representative

3.1.1 The City Engineer shall give all orders and directions contemplated under this contract and specifications relative to the execution of the work. The City Engineer shall determine the amount, quality, acceptability and fitness of the several kinds of work and materials which may arise in relation to

said work and the construction thereof. The City Engineer's estimates and decisions shall be final and conclusive except as herein otherwise expressly provided. In case any questions shall arise between the parties hereto relative to this contract or specifications, the determination or decision of the City Engineer shall be a condition precedent to the right of the Contractor to receive any money or payment for work under this contract affected in any manner or to any extent by such question. The City Engineer shall decide the meaning and intent of any portion of the specifications and of any plans or drawings where the same may be found obscure or be in dispute. Any differences or conflicts in regard to their work which may arise between the Contractor under this contract and other contractors performing the work for the Owner shall be adjusted and determined by the City Engineer.

3.1.2 The City Engineer may designate, in writing, an Architect/Engineer or another competent agent to act as his/her representative in the exercise of the authority of the City Engineer as set forth in this clause.

3.2 Construction Management

3.2.1 **Authority and Duties of the Construction Engineer:**

As the direct representative of the City Engineer, the Construction Engineer has immediate charge of the engineering details of each construction project and is responsible for the administration and satisfactory completion of the project.

3.2.2 **Duties of the Inspector**:

Inspectors employed by the City of El Paso Engineering Department will be authorized to inspect all work done and materials furnished. Such inspection may extend to all or any part of the work and to the preparation, fabrication, or manufacture of the materials to be used. The Inspector will not be authorized to alter or waive the provisions of the contract. The Inspector will not be authorized to issue instructions contrary to the plans and specifications, or to act as foreman for the Contractor; however, the Inspector shall have the authority to reject work or materials until any questions at issue can be referred to and decided by the City Engineer.

3.3 Reports, Records and Data

The Contractor shall submit to the Owner or Owner's designated representative such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as the Owner or Owner's designated representative may request concerning work performed or to be performed under this contract.

3.4 Cooperation with Utilities

3.4.1 It is strongly recommended that the Contractor visit and familiarize himself with the project site prior to submitting bids.

3.4.2 The Contractor shall coordinate the construction schedule with all utilities

and all other affected agencies.

3.4.3 The Contractor shall, at no additional cost to the Owner, be responsible for the replacement of any above or below ground utility lines damaged from any of the Contractor's operation during the period of the contract. The Contractor shall comply with all federal, state and local governmental rules, regulations, laws and ordinances governing any work done under this section.

3.4.4 The Contractor will notify all utility parties affected, and endeavor to have all necessary adjustments of the public or private utility fixtures, pipelines, and other appurtenances within or adjacent to the limits of construction, made as soon as practicable.

3.4.5 Water lines, gas lines, wire lines, service connections, water and gas meter boxes, water and gas valve boxes, light standards, cableways, signals, and all other utility appurtenances within the limits of the proposed construction that are to be relocated or adjusted are to be moved by the owners at their expense, unless otherwise provided in the contract.

3.4.6 It is understood and agreed that the Contractor has considered in the bid all of the permanent and temporary utility appurtenances in their present or relocated positions as shown on the plans and that no additional compensation will be allowed for any delays, inconvenience, or damage sustained due to any interference from the said utility appurtenances or the operation of moving them.

NOTE: The technical specifications will indicate various utility items, some of which are to be relocated or adjusted by the utility owner and others that are to be relocated or adjusted by the Contractor.

3.5 Cooperation between Contractors

The Contractor shall coordinate his/her operations with those of other contractors. Cooperation will be required in the arrangement for the storage of materials and in the detailed execution of the work. The Contractor, including his/her subcontractors, shall keep informed of the progress and the detail work of other contractors and shall notify the Owner's designated representative immediately of lack of progress or defective workmanship and/or materials on the part of other contractors. Failure of the Contractor to keep informed of the work progressing on the site and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by him/her of the status of the work as being satisfactory for proper coordination with his/her own work.

3.6 Inspection

3.6.1 The authorized representative and agents of the City, State or Federal agencies, if applicable, shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials and other relevant data and records.

3.6.2 Additionally, authorized representatives and agents of the City, State or Federal agencies, if applicable, shall be permitted to interview any personnel performing work on behalf of or in relation to the project, including but not limited to, workers on the job site.

3.7 Acceptance of the Work

3.7.1 **Partial Acceptance** – If at any time during the prosecution of the project, the Contractor substantially completes a unit or distinct portion of the project, such as a structure, and intersection or a section of road or pavement, the Contractor may request the City Engineer to make a final inspection of the unit or portion of the project. If the City Engineer finds upon inspection that the unit or portion of the project has been satisfactorily completed in compliance with the contract, he may accept that unit or portion of the project as being completed provided that the Contractor shall remain responsible for completion of any Remaining Work of such unit or portion of the project. Units or portions of the project eligible for the partial acceptance allowed in this paragraph shall be identified specifically in the contract documents as eligible for partial acceptance. Such partial acceptance shall in no way void or alter any of the terms of the Contract.

3.7.2 **Final Acceptance** – Upon due notice from the Contractor of completion of the entire project, the City Engineer shall make an inspection. If all construction provided for and contemplated by the contract is found to be completed to the City Engineer's satisfaction then that inspection shall constitute the final inspection and the City Engineer shall notify the contractor in writing of final acceptance effective as of the date of the final inspection.

3.7.3 **Remaining Work after Substantial Completion**. If the City Engineer determines that the work required by the Contract is Substantially Complete during an inspection conducted pursuant to Sections 3.7.1 or 3.7.2, the Contractor shall be notified of that determination and the City Engineer shall determine if there is Remaining Work. A list of Remaining Work shall be issued only by the City Engineer and only after the City Engineer has certified Substantial Completion. The City Engineer shall give the Contractor the necessary instructions for correction or completion of the Remaining Work, and the Contractor shall immediately comply with and execute such instructions within the Contract Time. Upon completion of the Remaining Work, another inspection shall be made that shall constitute the final inspection, provided the Remaining Work has been completed to the satisfaction of the City Engineer. If the remaining work has been completed to the satisfaction of the City Engineer, the City Engineer shall make the final acceptance and notify the Contractor in writing of this acceptance as of the date of final inspection.

3.7.3.1. **Default for failure to Complete Remaining Work** In the event the Contract Time expires before the Remaining Work is completed to the satisfaction of the City Engineer, the Owner may provide notice to the Contractor that the Remaining Work shall be completed by Contractor to the satisfaction of the City Engineer within ten consecutive calendar days from the date of such notice. The failure of the Contractor to satisfactorily

complete the Remaining Work within the ten days shall entitle to Owner to declare Contractor in default and thereafter terminate the Contract. The ten-day notice provided under this paragraph shall not be construed as adding any time to the Contract Time and is a time period solely for the purposes of providing notice of default.

3.7.4 **Application for Final Payment**. After the Contractor has completed all Remaining Work to the satisfaction of the City Engineer and delivered all maintenance and operating instructions, schedules, guarantees, warranties, bonds, certificates of inspection, marked-up record documents and other documents as required by the Contract, and after the City Engineer has indicated that the work is acceptable, as provided in Section 3.7, Contractor may make application for final payment following the procedure for progress payments. The final application for payment shall be accompanied by all documentation called for in the Contract, together with complete and legally effective releases or waivers (satisfactory to the Owner) of all liens arising out of or filed in connection with the work on the project. In lieu thereof, as approved by Owner, Contractor may furnish receipts or leases in full from suppliers, subcontractors and laborers along with an affidavit of contractor that the releases and receipts include all labor, services, material and equipment for which a lien could be filed and that all payrolls material and equipment bills and other indebtedness connected with the work for which Owner or owner's property might in any be responsible, have been paid otherwise satisfied; and consent of the surety, if any to final payment.

3.7.5 **Final Payment and Acceptance**. If the City Engineer determines that the work has been completed and the Contractor's other obligations under the Contract have been fulfilled, the City Engineer shall, within ten days after receipt of the final application for payment, indicate in writing the City Engineer's recommendation of payment and present the application to Owner for payment. Thereupon the City Engineer shall prepare a Certificate of Final Completion. Otherwise, City Engineer shall return the application to Contractor indicating in writing the reasons for refusing to recommend final payment. Contractor shall make the corrections identified in the City Engineer's refusal to recommend final payment. Thirty days after presentation to Owner of the application and accompanying documentation, with the City Engineer's recommendation and notice of acceptability of the work, the amount recommended by Engineer shall become due and payable by Owner to Contractor.

4.0 CONTROL OF MATERIALS

4.1 Source of Supply and Quality Requirement

4.1.1 The materials used on the work shall meet all quality requirements of the contract. In order to expedite the inspection and testing of material, the Contractor shall notify the Owner's designated representative of his proposed sources of materials prior to delivery.

4.1.2 At the option of the Owner's designated representative, materials may be approved at the source of supply before delivery is started. If it is found

after trial that sources of supply for previously approved materials do not produce specified products, the Contractor shall furnish materials from other sources.

4.2 Contractor's Title of Materials

No materials or supplies for the work shall be purchased by the Contractor or by any subcontractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. The Contractor warrants that he/she has good title to all materials and supplies used by him/her in the work, free from all liens, claims or encumbrances. **PROVIDED, HOWEVER, NOTHING IN THIS PARAGRAPH SHALL PREVENT THE CITY FROM EXERCISING ALL LIEN RIGHTS THE CITY MAY HAVE IN GOODS PURCHASED BY THE CONTRACTOR WHICH ARE IDENTIFIED TO THE CONTRACT.**

4.3 "Or Equal" Clause

Whenever a material, article or piece of equipment is identified on the plans or in the specification by reference to manufacturer's or vendor's name, trade names, catalog numbers, etc., it is intended merely to establish a standard; and any material, article or equipment of other manufacturers and vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article or equipment so proposed is, in the opinion of the Owner or Owner's designated representative, of equal substance and function. It shall not be purchased or installed by the Contractor without the Owner or Owner's designated representative's written approval.

4.4 Inspection and Testing of Materials

4.4.1 All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards as designated by the Owner or Owner's designated representative. The Owner or Owner's designated representative shall have the right at all reasonable times to observe and test the work.

4.4.2 Contractor shall make necessary arrangement and provide proper facilities and access for such observation and testing at any location wherever work is in preparation or progress, including but not limited to, access to the project site, shops or yards where materials may be prepared or stored, and the Contractor shall provide space at the project site for safe storage and proper curing of test specimens.

4.4.3 Contractor shall ascertain the scope of any observation which may be contemplated by Owner or Owner's designated representative and shall give at least twenty-four (24) hours advance notice to the project inspector of any required laboratory work, and as to the time each part of the work will be ready for such observation.

4.4.4 Owner or Owner's designated representative may reject any work found to be defective or not in accordance with the contract documents, regardless of the stage of its completion or the time or place of discovery of such

errors, and regardless of whether Owner's designated representative has previously accepted the work through oversight or otherwise. If any work should be covered without approval or consent of the Owner, it must, if requested by Owner or Owner's designated representative, be uncovered for examination at Contractor's expense.

4.4.5 In the event that any part of the work is being fabricated or manufactured at a location where it is not convenient for Owner or Owner's designated representative to make observations of such work or require testing of said work, then in such event, owner or owner's designated representative may require Contractor to furnish Owner or Owner's designated representative with certificates of inspection, testing or approval made by persons competent to perform such tasks at the location where that part of the work is being manufactured or fabricated. All such tests will be in accordance with the methods prescribed by the American Society for Testing and Materials or such other applicable organization as may be required by law or the contract documents.

4.4.6 All geotechnical and materials testing will be paid for by the Owner. The Contractor will be assessed (billed) for any item(s) tested that did not meet the requirements set forth by the Owner or the Owner's designated representative. Payment for the tests will be made by the Owner and billed directly to the Owner by the laboratory. **The Contractor shall be responsible for payment of overtime charges of any testing laboratory personnel or City Inspectors and any standby time of any testing laboratory personnel. Overtime charges of any testing laboratory personnel or City Inspectors and any standby time of any testing laboratory personnel shall be charged to the Contractor on an as accrued basis, and shall be deducted from the next application for payment made by the Contractor.**

4.4.7 If any work which is required to be inspected, tested or approved, is covered up without written approval or consent of the Owner or Owner's designated representative, it must, if requested by the Owner or Owner's designated representative, be uncovered for observation and testing at the Contractor's expense.

4.4.8 The cost of all such inspections, tests and approvals shall be borne by the Contractor unless otherwise provided herein. Any work which fails to meet the requirements of any such tests, inspections or approval, and any work which does not meet the requirements of the contract documents, shall be considered defective. Such defective work shall be corrected at the Contractor's expense.

4.4.9 Neither observations by the Owner or Owner's designated representative, nor inspections, tests or approval made by Owner, Owner's designated representative or other persons authorized under this agreement to make such inspections, tests or approvals shall relieve the Contractor from his obligation to perform the work in accordance with the requirements of the contract documents.

4.5 Rights In and Use of Materials Found on the Work Site

4.5.1 The Contractor with the approval of the City Engineer may use on the project such stone, gravel, sand, or other material determined suitable by the City Engineer, as may be found in the excavation. The Contractor shall replace at his own expense with other acceptable material all of that portion of the excavation material so removed and used which was needed for use in the embankments, backfills, approaches, or otherwise. The Contractor shall not excavate or remove any material from within the project location which is not within the grading limits without written authorization from the City Engineer.

4.5.2 The term "select material", specified on the drawings and/or technical specifications, generally indicates that original material has to undergo some processing in order to satisfy the requirements. Processing may involve screening or blending with other material, in order to meet gradation requirements.

4.6 Handling Materials

All materials shall be handled in such manner as to preserve their quality and fitness for the work and all precautions and requirements shall be exercised, throughout transportation, loading, storage, process, application and installation.

4.7 Disposal of Materials Outside the Work Site

Unless otherwise specified, the Contractor shall make his own arrangements for disposing of waste and excess materials outside the work site and shall pay all costs incurred thereto. The Contractor shall comply with all federal, state and local governmental rules, regulations, laws and ordinances concerning such disposal of waste and excess materials. The Contractor shall dispose of waste materials on designated routes to/and sites approved by the City Engineer, or his designated representative.

4.8 Unacceptable Materials

All materials not conforming to the requirements of the specifications shall be considered as unacceptable and will be rejected and shall be removed by the Contractor immediately from the site of the work. Rejected material shall not be used until the defects have been corrected and approved by the City Engineer.

5.0 CONTRACTOR'S RESPONSIBILITIES AND LEGAL OBLIGATIONS

5.1 Laws to be observed

5.1.1 The Contractor shall keep fully informed of all federal, state, and local laws, ordinances, and regulations and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any manner affect those engaged or employed on the work, or which any way affect the conduct of the work.

5.1.2 HE SHALL AT ALL TIMES OBSERVE AND COMPLY WITH ALL SUCH

LAWS, ORDINANCES, REGULATIONS, ORDERS AND DECREES; AND SHALL PROTECT, DEFEND AND INDEMNIFY THE CITY OF EL PASO AND ITS REPRESENTATIVES AGAINST ANY CLAIM OR LIABILITY ARISING FROM OR BASED ON THE VIOLATION OF ANY SUCH LAW, ORDINANCE, REGULATION, ORDER, OR DECREE, WHETHER BY THE CONTRACTOR OR THE CONTRACTOR'S EMPLOYEES.

5.2 **Provisions Required by Law Deemed Inserted**

Each and every provision of law and clause required by law to be inserted in this contract shall be deemed to be inserted herein and the contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party the contract shall forthwith be physically amended to make such insertion or correction.

5.3 **Patented Devices, Materials and Processes**

5.3.1 **The Contractor shall defend all suits or claims, hold and save the Owner and its officers, agents, servants and employees harmless from liability of any nature or kind, including cost and expenses for, or on account of, any patented or unpatented invention, process, article or appliance manufactured or used in the performance of the contract, including its use by Owner, unless otherwise specifically stipulated in the contract documents.**

5.3.2 License or Royalty Fees - License or royalty fees for the use of a process which is authorized by the Owner for the Project must be reasonable and must be paid to the holder of the patent, or to his/her authorized licensee by the Contractor.

5.3.3. If the Contractor uses any design, device or materials covered by letter, patent or copyright, he/she shall provide for such use by suitable agreement with the holder or owner of such patented or copyrighted design, device or materials. It is mutually agreed and understood that without exception, the contract prices shall include all royalties or costs arising from the use of such design, device or materials in any way involved in the work.

5.3.4 **THE CONTRACTOR AND/OR HIS/HER SURETY SHALL DEFEND ALL SUITS OR CLAIMS AND SHALL INDEMNIFY AND HOLD AND SAVE HARMLESS THE OWNER OF THE PROJECT FROM ANY AND ALL CLAIMS FOR INFRINGEMENT UPON OR VIOLATION OF ANY PATENT, COPYRIGHT, TRADE SECRET OR OTHER PROPRIETARY RIGHT AT ANY TIME DURING THE PROSECUTION OF THE WORK OR AFTER COMPLETION OF THE WORK, AND SHALL PAY ANY JUDGMENT (INCLUDING ALL COURT COSTS, EXPERT FEES, AND ATTORNEYS FEES) RENDERED AGAINST THE OWNER AS A RESULT OF SUCH CLAIMS.**

5.4 Public Convenience and Safety

The Contractor shall at all times so conduct work as to assure the least possible disruption of traffic. The safety and convenience of the general public and the residents along the project and the protection of persons and property shall be provided for by the Contractor as specified under Paragraph 2.6 herein.

5.5 Use of Explosives

5.5.1 When the use of explosives is necessary for the prosecution of the work, the Contractor shall observe all local, state and federal laws in purchasing and handling explosives, including but not limited to the acquiring of all required permits. The Contractor shall take all necessary precaution to protect completed work, neighboring property, water lines or other underground structures. Where there is danger to structures or property from blasting, the charges shall be reduced and the materials shall be covered with suitable timber, steel or rope mats.

5.5.2 The Contractor shall notify all owners of public utility property of his/her intention to use explosives at least eight (8) hours before blasting is done close to such property. Any supervision or direction of use of explosives by the Owner or Owner's designated representative does not in any way reduce the responsibility of the Contractor and/or his/her surety for damages that may be caused by such use.

5.6 Protection of Work and Property

5.6.1 In the event of temporary suspension of work, or during inclement weather, or whenever the Owner or Owner's designated representative shall direct, the Contractor will, and will cause his/her subcontractors, to protect carefully his/her and their work and materials against damage or injury from the weather.

5.6.2 If, in the opinion of the Owner or Owner's designated representative, any work or materials shall have been damaged or injured by reason of failure on the part of the Contractor or any of his/her subcontractors to so protect his work or materials, all such work or materials shall be removed or replaced at the expense of the Contractor.

5.7 Protection of Work and Property - Emergency

5.7.1 The Contractor shall at all times safely guard the Owner's property from injury or loss in connection with this contract. The Contractor shall at all times safely guard and protect his/her own work and that of adjacent property from damage.

5.7.2 In case of an emergency which threatens loss or injury of property and/or safety of life, the Contractor will be allowed to act, without previous instructions from the Owner or Owner's designated representative, in a diligent manner. However, the Contractor shall notify the Owner or Owner's designated representative immediately thereafter. Any claim for

compensation by the Contractor due to such extra work shall be promptly submitted to the Owner or Owner's designated representative for approval.

5.7.3 The safety precautions taken shall be the sole responsibility of the Contractor in his sole discretion as an Independent Contractor.

5.7.4 Inclusion of this paragraph in the Agreement, as well as any notice which may be given by the Owner or the Owner's designated representative concerning omissions under this paragraph as the work progresses, are intended as reminders to the Contractor of his duty and shall not be construed as any assumption of duty to supervise safety precautions by the Contractor or any of his subcontractors.

5.7.5 The amount of reimbursement claimed by the Contractor on account of any emergency action shall be determined in the manner provided in Paragraph 2.5 herein.

5.8 Protection of Work and Property - Monitor Wells

5.8.1. The Contractor shall be vigilant at all times for ground water monitor wells within public rights-of-way or on adjacent property which may belong to the Owner or to other agencies which have installed wells with the Owner's permission. Such wells may or may not be shown on the plans for the project.

5.8.2 The Contractor shall inspect all rights-of-way and property within the limits of the project and shall promptly report to the Owner's representative any monitor wells or devices, caps or other objects that might be monitor wells.

5.8.3 The Contractor may not disturb any monitor well in any way but shall protect them from disturbance or damage and shall schedule and carry out operations to prevent any disturbance of or damage to monitor wells.

5.8.4 Should the Contractor discover a monitor well during construction, it shall immediately be reported to the Owner's representative and shall be protected from any disturbance or from further disturbance.

5.8.5 Should it be necessary to change the elevation of a monitor well head, the Contractor shall so notify the Owner's representative who will make appropriate arrangements with a licensed well driller to adjust the well head. The Contractor shall work closely with the well driller and shall carry out the driller's instructions on behalf of the Owner.

5.9 Mutual Responsibility of Contractor

If, through acts of neglect on the part of the Contractor, any other contractor or any subcontractor shall suffer loss or damage on the work, the Contractor agrees to settle with such other contractor or subcontractor by agreement or arbitration if such other contractor or subcontractor will so settle. If such other contractor or subcontractor shall assert any claim against the Owner on account of any damage alleged to have been sustained, the Owner shall notify the Contractor, who shall indemnify and save

harmless the Owner against any such claim.

5.10 **INDEMNIFICATION**

Contractor or its insurer will INDEMNIFY, DEFEND AND HOLD the City, its officers, agents and employees, HARMLESS FOR AND AGAINST ANY AND ALL CLAIMS, CAUSES OF ACTION, LIABILITY, DAMAGES OR EXPENSE, (INCLUDING BUT NOT LIMITED TO ATTORNEY FEES AND COSTS) FOR ANY DAMAGE TO OR LOSS OF ANY PROPERTY, OR ANY ILLNESS, INJURY, PHYSICAL OR MENTAL IMPAIRMENT, LOSS OF SERVICES, OR DEATH TO ANY PERSON ARISING OUT OF OR RELATED TO THIS AGREEMENT, <u>even where such damage, injury, loss, illness, physical or mental impairment, loss of services, or death results from or involves NEGLIGENCE or allegations of negligence on the part OF THE CITY, its officers, agents, or employees</u>. Without modifying the conditions of preserving, asserting or enforcing any legal liability against the City as required by the City Charter or any law, the City will promptly forward to Contractor every demand, notice, summons or other process received by the City in any claim or legal proceeding contemplated herein. Contractor will 1) investigate or cause the investigation of accidents or occurrences involving such injuries or damages; 2) negotiate or cause to be negotiated the claim as the Contractor may deem expedient; and 3) defend or cause to be defended on behalf of the City all suits for damages even if groundless, false or fraudulent, brought because of such injuries or damages. Contractor will pay all judgments finally establishing liability of the City in actions defended by Contractor pursuant to this section along with all attorneys' fees and costs incurred by the City including interest accruing to the date of payment by Contractor, and premiums on any appeal bonds. The City, at its election will have the right to participate in any such negotiations or legal proceedings to the extent of its interest. The City will not be responsible for any loss of or damage to the Contractor's property from any cause. [Revised 04-15-99].

5.11 **Insurance**

5.11.1 The Contractor shall not commence work under this contract until he/she has obtained all the insurance required under this paragraph and such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence work on his/her subcontract until the insurance required of the subcontractor has been so obtained and approved.

5.11.2 **General Insurance Requirements**.

The following requirements apply to all insurance required in this section 5.11 unless specifically stated otherwise.

5.11.2.1 **Texas Insurance Requirement:** The insurance required in this section 5.11 shall be written by an accredited insurance company under the supervision of the Board of Insurance Commissioners of the State of Texas.

5.11.2.2 **Evidence of Compliance:** Evidence of compliance with these insurance requirements shall be considered as having been met when copy of the insurance policy or a certificate of insurance has been filed with and approved by the Owner which shall be prior to the execution of the construction contract. The Contractor shall furnish Owner with documentation from the insurer showing the type, amount, class of operations covered, effective dates and date of expiration of policies.

5.11.2.3 **Additional Insured and Notice Endorsements Required:** The insurance policies shall include an endorsement that the Owner is named as an additional insured [except for worker's compensation insurance] to the full amount of the policy limits and that the Owner shall be notified at least thirty days in advance in the event the policy or policies are canceled and ten days in advance for non-payment of policy premiums. The endorsement shall contain substantially the following statement: "The insurance included within this policy shall not be cancelled or materially altered except after thirty (30) consecutive calendar days [ten (10) consecutive calendar days for non-payment of policy premiums written notice by certified mail or intent to cancel or materially alter said insurance has been provided to owner [additional insured]." Endorsements stating that the insurer will "endeavor to notify" and/or "failure to notify shall impose no obligation or liability upon the (insurance) company" are not acceptable. Failure by Contractor to provide proof of insurance coverage for itself or its subcontractors shall delay release of pending payments. The required endorsement shall be provided to the Owner in addition to the certificates of insurance prior to the execution of the construction contract.

5.11.2.4 **Maintaining Insurance:** The contractor shall maintain said insurance with a solvent insurance company authorized to do business in Texas. The policy shall provide that the insurer will defend against all claims and lawsuits which arise and will pay any final judgment of a court of competent jurisdiction against the City, its officers, agents, servants or employees and Contractor to keep the policies of insurance in full force and effect throughout the term of the permit shall be grounds for termination of the construction contract.

5.11.2.5 **Time Insurance Policies Shall Remain in Effect:** All insurance policies required herein shall remain in effect until final payment and at all times thereafter when Contractor is correcting, removing or replacing defective work in accordance with paragraph 5.16 of these General Conditions.

5.11.3 Commercial General Liability, Property Damage Liability and Vehicle Liability Insurance.

The Contractor shall procure and shall maintain during the life of this contract such

Commercial General Liability, Property Damage Liability and Vehicle Liability Insurance as shall protect him and any subcontractor performing work covered by the Contractor from claims for damages for personal injury, including accidental death, as well as from claims for property damages, which may arise from operations under this contract, whether such operations be by himself or by any subcontractor or by anyone directly or indirectly employed by either of them, and the minimum limits of liability and coverages shall be as follows:

5.11.3.1 Commercial General

Liability Bodily Injury	$1,000,000.00 each person
Property Damage	$1,000,000.00 each occurrence
General Aggregate	$2,000,000.00

5.11.3.2 Vehicle Liability

Combined Single Limit	$1,000,000.00

5.11.4 **Subcontractor's Commercial General Liability and Property Damage Insurance and Vehicle Liability Insurance**.

The Contractor shall either,

5.11.4.1 Require each of his/her subcontractors to procure and to maintain during the life of his/her subcontract, Subcontractor's Commercial General Liability and Property Damage Insurance and Vehicle Liability Insurance in the amounts specified above; or

5.11.4.2 Insure the activities on his/her policy, specified in subparagraph 5.11.2 hereof.

5.11.5 **Scope of Insurance and Special Hazards**.

The insurance required under Subparagraphs 5.11.2 and 5.11.4 hereof shall provide adequate protection for the Contractor and his/her subcontractors, respectively, against damage claims which may arise from operations under this contract whether such operations are by the insured or by anyone directly or indirectly employed by him/her, and also against any of the special hazards which may be encountered herein;

HAZARD: N / A AMOUNT: N / A

5.11.6 **Builder's Risk Insurance (Fire and Extended Coverage)**.

5.11.6.1 This insurance shall be required only for building projects, as opposed to street, bridge and drainage projects.

5.11.6.2 Until the project is completed and accepted by the Owner, the Contractor is required to maintain Builder's Risk Insurance (fire and extended coverage) on a one hundred percent (100%) completed value basis on the insurable portion of the project for the benefit of the Owner, the Contractor and subcontractor, as their interests may appear. The Contractor shall not

include any costs for Builder's Risk Insurance (fire and extended coverage) premiums during construction unless the Contractor is required to provide such insurance; however, this provision shall not release the Contractor from his/her obligation to complete, according to plans and specifications, the project covered by the contract, and the Contractor and his/her Surety shall be obligated to full performance of the Contractor's undertaking.

5.12 Texas Workers' Compensation Requirements

5.12.1 Definitions:

5.12.1.1 Certificate of coverage ("certificate") -- A copy of a certificate of insurance, a certificate of authority to self-insure issued by the Commission, or a coverage agreement (TWCC-81, TWCC-82, TWCC-83, or TWCC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees providing services on a project, for the duration of the project.

5.12.1.2 Duration of the project -- includes the time from the beginning of the work on the project until the contractor's/person's work on the project has been completed and accepted by the governmental entity.

5.12.1.3 Persons providing services on the project ("subcontractor") -- includes all persons or entities performing all or part of the services the contractor has undertaken to perform on the project, regardless of whether that person contracted directly with the contractor and regardless of whether that person has employees. This includes, without limitation, independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity or employees of any entity which furnishes persons to provide services on the project. "Services" include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other service related to a project. "Services" does not include activities unrelated to the project such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

5.12.2 The Contractor shall provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all employees of the contractor providing services on the project, for the duration of the project.

5.12.2.1 Special Endorsement: The workers compensation policy provided by the contractor shall be endorsed to provide that the insurer waives any right of subrogation it may acquire against the owner, the Architect/Engineer of record, the Construction Manager, where applicable, by reason of any payment made in

account of injury, including death resulting there from, sustained by any employee of the insured. The contractor must provide the endorsement prior to execution of the contract.

5.12.3 The Contractor must provide a certificate of coverage to the governmental entity prior to being awarded the contract.

5.12.4 If the coverage period shown on the contractor's current certificate of coverage ends during the duration of the project, the contractor must, prior to the end of the coverage period, file a new certificate of coverage with the governmental entity showing that coverage has been extended.

5.12.5 The Contractor shall obtain from each person providing services on a project, and provide to the governmental entity:

5.12.5.1 A Certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage showing coverage for all persons providing services on the project; and

5.12.5.2 No later than seven days after receipt by the contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.

5.12.6 The Contractor shall retain all required certificates of coverage for the duration of the project and for one year thereafter.

5.12.7 The Contractor shall notify the governmental entity in writing by certified mail or personal delivery, within 30 days after the contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project.

5.12.8 The Contractor shall post on each project site a notice, informing all persons providing services on the project that they are required to be covered, and stating how a person may verify coverage and report failure of coverage.

5.12.9 This notice does not satisfy other posting requirements imposed by the Act or other Commission rules. This notice must be printed with a title in at least 30 point bold type and text in at least 19 point normal type, and shall be in both English and Spanish and any other language common to the worker population. The text for the notices shall be the following text provided by the Commission on the sample notice, without any additional words or changes:

REQUIRED WORKERS' COMPENSATION COVERAGE

"The law requires that each person working on this site or providing services related to this construction project must be covered by workers' compensation insurance. This includes persons providing, hauling, or

delivering equipment or materials, or providing labor or transportation or other service related to the project, regardless of the identity of their employer or status as an employee."
"Call the Texas Workers' Compensation Commission at (800) 372-7713 or (512) 804-4000 to receive information on the legal requirement for coverage, to verify whether your employer has provided the required coverage, or to report an employer's failure to provide coverage."; and

5.12.10 The Contractor shall contractually require each person with whom it contracts to provide services on a project, to:

5.12.10.1 Provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011 (44) for all of its employees providing services on the project, for the duration of the project;

5.12.10.2 Provide to the contractor, prior to that person beginning work on the project, a certificate of coverage showing that coverage is being provided for all employees of the person providing services on the project, for the duration of the project;

5.12.10.3 Include in all contracts to provide services on the project the language in Subsection 5.12.13.3 herein;

5.12.10.4 Provide the contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project:

5.12.10.5 Obtain from each other person with whom it contracts, and provide to the contractor:

5.12.10.5.1 A certificate of coverage, prior to the other person beginning work on the project; and

5.12.10.5.2 A new certificate of coverage showing extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

5.12.10.6 Retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

5.12.10.7 Notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and

5.12.10.8 Contractually require each person with whom it contracts, to perform as required by Paragraphs 5.12.10.1 through 5.12.10.8,

with the certificates of coverage to be provided to the person for whom they are providing services.

5.12.11 By signing this contract or providing or causing to be provided a certificate of coverage, the contractor is representing to the governmental entity that all employees of the contractor who will provide services on the project will be covered by workers' compensation coverage for the duration of the project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the Commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions.

5.12.12 The contractor's failure to comply with any of these provisions is a breach of contract by the contractor which entitles the governmental entity to declare the contract void if the contractor does not remedy the breach within ten days after receipt of notice of breach from the governmental entity.

5.12.13 A person providing services on a project, other than a contractor, shall:

5.12.13.1 Provide coverage for its employees providing services on a project, for the duration of the project based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements;

5.12.13.2 Provide a certificate of coverage as required by its contract to provide services on the project, prior to beginning work on the project;

5.12.13.3 Have the following language in its contract to provide services on the project:

"By signing this contract or providing or causing to be provided a certificate of coverage, the person signing this contract is representing to the governmental entity that all employees of the person signing this contract who will provide services on the project will be covered by workers' compensation coverage for the duration of the project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or in the case of a self-insured, with the Commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions."

5.12.14 Provide the person for whom it is providing services on the project, prior to the end of the coverage period shown on its current certificate of coverage, a new certificate showing extension of coverage, if the coverage period shown on the certificate of

coverage ends during the duration of the project;

5.12.15 Obtain from each person providing services on a project under contract to it, and provide as required by its contract:

5.12.15.1 A certificate of coverage, prior to the other person beginning work on the project; and

5.12.15.2 Prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

5.12.16 Retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

5.12.17 Notify the governmental entity in writing by certified mail or personal delivery, of any change that materially affects the provision of coverage of any person providing services on the project and send the notice within 30 days after the person knew or should have known of the change; and

5.12.18 Contractually require each other person with whom it contracts to:

5.12.18.1 Provide coverage based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements for all of its employees providing services on the project, for the duration of the project;

5.12.18.2 Provide a certificate of coverage to it prior to that other person beginning work on the project;

5.12.18.3 Include in all contracts to provide services on the project the language in Subsection 5.12.13.3 herein.

5.12.18.4 Provide, prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

5.12.18.5 Obtain from each other person under contract to it to provide services on the project, and provide as required by its contract:

5.12.18.5.1 A certificate of coverage, prior to the other person beginning work on the project; and

5.12.18.5.2 Prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the contract;

5.12.18.6 Retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

5.12.18.7 Notify the governmental entity in writing by certified mail or personal delivery, within 30 days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and

5.12.18.8 Contractually require each person with whom it contracts, to perform as required by Paragraphs 5.12.1 through 5.12.9, with the certificate of coverage to be provided to the person for whom they are providing services.

5.13 **Contract Security.** In accordance with Chapter 2253, Texas Government Code, the City of El Paso requires the following for all public works contracts:

5.13.1 The Contractor shall furnish a **performance bond** in an amount at least equal to one hundred percent (100%) of the contract price as security for the faithful performance of this contract and such performance bonds shall be issued for a duration sufficient to cover all warranty periods required by the construction contract.

5.13.2 A **payment bond** in an amount not less than one hundred percent (100%) of the contract price, or in a penal sum not less than that prescribed by the state, territorial or local law, as security for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract.

5.13.2.1 In accordance with Section 3503.004 of the TEXAS INSURANCE CODE, if a Performance or Payment bond is in an amount of excess of ten percent (10%) of the surety's capital and surplus, the City of El Paso will require, as a condition to accepting the bond(s), a written certification from the surety that the surety has reinsured the portion of the risk that exceeds ten percent (10%) of the surety's capital and surplus with one or more reinsurers who are duly authorized, accredited or trusteed to do business in the State of Texas. If any portion of the surety's obligation is reinsured, the amount reinsured may not exceed 10% of the reinsurer's capital and surplus.

5.13.2.2 The performance bond and the payment bond shall be in a form approved by the Owner. A copy of the payment bond provided for the construction project shall clearly and prominently display on the bond or on an attachment to the bond:

(a) The name, mailing address, physical address and telephone number, including the area code, of the surety company to which any notice of claim should be sent: or

(b) The toll-free telephone number maintained by the Texas Department of Insurance under Subchapter B, Chapter 521.051 Insurance Code, and a statement that the address of the surety company to which any notice of claim should be sent may be obtained from the Texas Department of Insurance by calling the

toll-free telephone number.

5.13.2.2.1 The surety company providing the payment bond shall designate an agent resident who resides within the County of El Paso and to whom any requisite notices may be delivered and with whom service of process may be rendered in matters arising out of suretyship.

5.13.2.3 Should the surety exercise its right to take over and perform the contract in accordance with Section 6.9 of the Construction Contract General Conditions, the surety shall submit or require the contractor to submit, a payment bond and performance bond that satisfies the requirements set forth in paragraph 5.13.1 and 5.13.2 above.

5.13.2.4 A bond provided pursuant to these General Conditions may be executed only by a surety company that is authorized to write surety bonds in Texas. If the amount of the bond exceeds $100,000, the surety company must also:

(a) hold a certificate of authority from the United States secretary of the treasury to qualify as a surety on obligations permitted or required under federal law; or

(b) have obtained reinsurance for any liability in excess of $100,000 from a reinsurer that:

(1) is an authorized reinsurer in this state; and

(2) holds a certificate of authority from the United States secretary of the treasury to qualify as a surety or reinsurer on obligations permitted or required under federal law.

To determine whether the surety on the bond or the reinsurer holds a certificate of authority from the United States secretary of the treasury, a party may conclusively rely on the list published in the Federal Register by the United States Department of Treasury, covering the date on which the bond was executed, of the companies holding certificates of authority as acceptable sureties on federal bonds and as acceptable reinsuring companies.

5.14 Additional or Substitute Bond

5.14.1 If at any time the Owner, for justifiable cause, shall be or become dissatisfied with any Surety or Sureties upon the Performance or Payment Bonds, the Contractor shall within five (5) consecutive work days after notice from the Owner to do so, substitute an acceptable bond (or bonds) in such form and sum and signed by such other Surety or Sureties as may be satisfactory to the Owner. The premiums on such bond (or bonds) shall be paid by the Contractor at no additional costs to the Owner.

5.14.2 No further payments to the contractor shall be deemed due nor shall be made until the new Surety or Sureties shall have furnished such an acceptable bond to the Owner.

5.15 Contractor's Obligations

5.15.1 The Contractor shall, and will in a good workmanlike manner, do and perform all work, and provide and pay for all materials, labor, tools, equipment, machinery, water, electricity, transportation, superintendence, temporary construction and all services and facilities necessary to complete and deliver the work within the specified time, in accordance with the provisions of the contract documents, plans and drawings, and directions of the Owner's designated representative.

5.15.2 If required, the Contractor shall furnish, erect, maintain and remove temporary works or construction plant. The Contractor shall observe, comply with and be subject to all terms, conditions, requirements and limitations of the contract and specifications, and shall do, carry on and complete the entire work to the satisfaction of the Owner's designated representative and the Owner. It is expressly required that all work performed by the Contractor shall comply with any and all applicable City Building Codes.

5.15.3 The Contractor upon completion of the project shall provide to the Owner one complete set of original drawings ("As Built Plans") reflecting all changes incorporated into the project.

5.16 Correction of Work

5.16.1 All work, all materials, whether incorporated in the work or not, all processes of manufacture and all methods of construction shall be at all times and places subject to the inspection of the Owner or Owner's designated representative, who shall be the final judge of the quality and suitability of the work, materials, processes of manufacture and methods of construction for the purpose for which they are used. Should they fail to meet the Owner or Owner's designated representative's approval, they shall be forthwith reconstructed, made good, replaced and/or corrected, as the case may be, by the Contractor at his/her own expense.

5.16.2 Rejected material shall immediately be removed from the site. If in the opinion of the Owner or Owner's designated representative, it is undesirable to replace any defective or damaged materials or to construct, reconstruct, or correct any portion of the work injured or not performed in accordance with the contract documents, the compensation to be paid to the Contractor hereunder shall be reduced by such amount as in the judgment of the Owner or Owner's designated representative shall be equitable.

5.17 Warranty of Construction

5.17.1 The Contractor warrants to the Owner that materials and equipment furnished under the contract will be of good quality and new unless

otherwise required or permitted by the contract documents, that the work will be free from defects not inherent in the quality required or permitted, and that the work will conform to the requirements of the contract documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective.

5.17.2 Neither the final certificate of payment nor any provisions in the contract documents, nor partial or entire occupancy of the premises by the Owner shall constitute an acceptance of work not done in accordance with the contract documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy any defects in the work and pay for any damage to other work resulting there from which shall appear within a period of one (1) year from the date of final acceptance of the work unless a longer period is specified, The Owner will give notice of observed defects with reasonable promptness.

5.18 Use and Occupancy Prior to Acceptance by Owner

The Contractor agrees to the use and occupancy of a portion or units of the project by the Owner prior to completion and final acceptance. In doing so, the Owner will endeavor not to interfere with any work being done by the Contractor or any subcontractors employed by him. Such use and occupancy by the Owner shall not relieve the Contractor of any requirements under this Contract, including but not limited to the final cleanup of punch list items.

5.19 Contractor's Responsibilities for Utility Property and Services

5.19.1 **It is the responsibility of the contractor disturbing the earth's surface to notify the operators of the underground facilities that there is planned work in the area near those lines. Before digging, blasting, drilling, grading, pipe positioning and moving earth, it is imperative that the Contractor call the Texas Excavation Safety System (TESS) at 1-800-344-8377. However, the Contractor's responsibilities are not fulfilled solely by placement of a phone call to the notification center about intended excavation; this is merely the first step in the location process. The directions and procedures outlined in the following paragraphs must also be adhered to.**

5.19.2 **Prior to commencing work, the Contractor shall make arrangements to protect the properties of water, sewer, gas, cable, telephone, and power companies, or other property from damage that could result in considerable expense, loss, or inconvenience.**

5.19.3 **After the markings have been made, excavators are expected to maintain a minimum clearance of two feet (24 inches) plus the width of the line between marked and unexposed facilities and the cutting edge or point of any power-operated excavating or earth-moving equipment. IF EXCAVATION IS REQUIRED WITHIN THIS DISTANCE HORIZONTALLY OF ANY MARKED UTILITY, THE EXCAVATION**

SHOULD BE PERFORMED VERY CAREFULLY WITH HAND TOOLS AND WITHOUT DAMAGE.

5.19.4 **The depth of underground facilities varies due to changing soil conditions and other variables. It is the responsibility of the excavator to determine the facility's exact depth and location by safe and acceptable means within the marked facility area.**

5.19.5 **When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.**

5.19.6 **While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.**

5.19.7 **The Contractor shall cooperate with the utility owners in the removal and rearrangement of any underground or overhead utility lines or facilities to minimize interruption to service and duplication of work by the utility owners.**

5.19.8 **In the event utility services are interrupted as a result of accidental breakage, the Contractor shall promptly notify the proper authorities and cooperate with them until service has been restored. Work undertaken around fire hydrants shall not commence until provisions for continued service have been made and approved by the local fire authority.**

5.20 Obligation for Temporary Electrical Power

The Contractor shall be responsible for obtaining temporary electrical power to the Project site and providing the temporary distribution system necessary to accomplish the construction of the Project. The Contractor shall be responsible for all coordination necessary with the El Paso Electric Company to secure and maintain temporary electrical power to the Project site and to ensure that any power necessary for construction is available at the time needed by the Contractor. This responsibility includes but is not limited to, the locating of and accessing to the nearest existing power source, or in the alternate, the providing of generators as required for construction. All charges for temporary electrical power shall be borne by the Contractor, including but not limited to meter deposits for temporary power, connect/disconnect charges, permit charges, service terminal, (meter loops, meter sockets, service entrance switch) and all costs of electrical energy and meter charges.

5.21 Environmental Protection

5.21.1 The Contractor shall comply with all federal, state, and local laws and regulations controlling pollution of the environment. Necessary precautions shall be taken to prevent pollution of land, soils, streams, lakes, ponds, and reservoirs with fuels, oils, bitumens, chemicals, or other harmful and hazardous materials and to prevent pollution of the atmosphere from particulate and gaseous matter.

5.21.2 Fording of live streams shall not be permitted unless the Contractor's plan for such operation meets the approval of the City Engineer and results in minimum siltation to the stream. Unless approved by the City Engineer, mechanized equipment shall not be operated in live streams except as required to construct channel changes and temporary or permanent structures that are part of the contract.

5.21.3 When work areas or pits are located in or adjacent to live streams, such areas shall be separated from the main stream by a dike or barrier to keep sediment from entering a flowing stream. Care shall be taken during the construction and removal of such barriers to minimize siltation of the stream.

5.21.4 Water from aggregate washing or other operations containing sediment shall be treated by filtration, settling basins, or other means sufficient to reduce the sediment content to not more than that of the stream or lake into which it is discharged.

5.22 Texas Pollutant Discharge Elimination System (TPDES) Requirements

5.22.1 TPDES Construction General Permit, Permit No. TXR150000 was approved, signed and became effective on **March 5, 2013**.

5.22.2 The Texas Pollutant Discharge Elimination System (TPDES) program implements the federal National Pollutant Discharge Elimination System (NPDES) program in the state of Texas. The EPA Region 6 (located in Dallas) has administered the Phase I storm water general permit for construction activities disturbing 5 or more acres within the state of Texas until the TPDES permit has been issued. On **March 5, 2013** the TCEQ became the permitting authority for these discharges. This general permit also covers storm water discharges from Phase II construction activities that disturb at least 1 acre and less than 5 acres. Further information may be obtained from the Executive Director's Response to Comments and the TXR 150000 Fact Sheet.

5.22.3 Large Construction Activity –Construction activities including clearing, grading and excavation that result in land disturbance of equal to or greater than five (5) acres of land. Large construction activity also includes the disturbance of less than five (5) acres of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than five (5) acres of land. Large construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, and original purpose of a ditch, channel, or other similar storm water conveyance. Large construction activity does not include the routine grading of existing dirt roads, asphalt overlays of existing roads, the routine clearing of existing right of ways, and similar maintenance activities. Construction projects that started after the issuance of the TPDES general permit and that will disturb 5 or more acres must be authorized under TPDES General Permit issued on **March 5, 2013** prior to commencement or construction activities.

5.22.3.1 Obtain a copy of the TCEQ CGP (TPDES Permit No. TXR150000).

5.22.3.2 Develop and implement a storm water pollution prevention plan (SWP3) and submit a copy of SWP3 as per **15.20.110 Storm Water Discharge from Construction Activities** to the City of El Paso Development Services Department for review and approval.

5.22.3.3 Complete and submit the (NOI) Notice of Intent form to the TCEQ State agency prior to the commencement of construction. Submit a copy of (NOI) form and the City of El Paso Storm Water Pollution Prevention Plan (SWP3) and application form to the City of El Paso Development Services Department along with the fee.

5.22.3.4 Submit a Notice of Termination (NOT) once the site has reached final stabilization. NOTE: This is a condition precedent to obtaining Final Payment under these contract documents. Submit a copy of the State NOT (Notice of Termination) form to the Development Services Department.

5.22.4 Small Construction activity –Construction activities including clearing, grading, and excavating that result in land disturbance of equal to or greater than one (1) acre to less than five (5) acres of land. Small construction activity also includes the disturbance of less than one (1) acre of total land area that is part of a larger common plan of development of sale if the larger common plan will ultimately disturb equal to or greater than (1) and less than (5) acres of land. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, and original purpose of a ditch, channel, or other similar storm water conveyance. Small construction activity does not include the routine grading of existing dirt roads, asphalt overlays of existing roads, the routine clearing of existing right- of- ways, and similar maintenance activities.

5.22.4.1 Obtain a copy of TECQ CGP (TPDES Permit No. TXR 150000).

5.22.4.2 If construction site does not qualify for the time frame required for Attachment 1 of the General Permit for small construction sites, then, the operator needs to develop and implement a storm water pollution prevention plan (SWP3) and submit the SWP3 to Development Services for review and approval.

5.22.4.3 Complete and post the Construction Site Notice Attachment I or Attachment II of the General Permit. Submit a copy to the City of El Paso Development Services Department.

5.22.4.4 Before construction begins:

5.22.4.4.1 If the site qualifies, complete and submit a Low

Rainfall Erosivity Waiver Form to TCEQ. Submit a copy to City of El Paso Development Services Department.

5.22.4.4.2 Complete and post the Construction Site Notice Attachment I or Attachment II of the General Permit. Submit a copy to the City of El Paso Development Services Department for review.

5.22.5 Small sites. For construction projects that will disturb less than one (1) acre and overall common plan is less than one (1) acre, no permit is required. TCEQ or the City of El Paso can also designate construction activities disturbing less than one acre for inclusion in the construction General Permit based on the potential for contributing to a violation of a water quality standard or for significant contribution of pollutants to waters of the United States.

5.22.5.1 NOTE: If the construction activity develops into a larger project, then permit coverage may be required at that time based on the total number of acres that will be disturbed: 5 or More Acres or 1 to Less Than 5 Acres.

5.23 Prevailing Wage Rates and Wage Rate Penalty

5.23.1 The Contractor and any subcontractor under him shall not pay less than the general prevailing wage rates contained herein, to all laborers, workmen and mechanics employed by them in the execution of this contract. When multiple wage rates are used (e.g. Federal wage rates and City wage rates) featuring similar job classifications, the higher wage within the relevant construction type shall be paid.

5.23.2 Pursuant to Chapter 2258, Texas Government Code, the Contractor shall forfeit as a penalty to the City of El Paso Sixty Dollars ($60.00) for each laborer, workman or mechanic employed, for each calendar day, or portion thereof such laborer, workman or mechanic is paid less than the said stipulated rates for any work done under said contract, by him, or by any subcontractor under him.

5.23.3 No worker shall be discharged by the Contractor or Subcontractor or in any other manner discriminated against because such worker has filed an inquiry or complaint, has instituted or caused to be instituted any legal or equitable proceeding or has testified or is about to testify in any such proceeding under or relating to the prevailing wage rates for this project.

5.23.4 **Withholding**

5.23.4.1 **The El Paso City Government, shall upon its own action withhold or cause to be withheld from the contractor under this contract or any other contract which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and**

helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract.

5.23.4.2 **In the event of failure to pay any laborer or mechanic including any apprentice, trainee, or helper, employed or working on the site of the work all or part of the wages required by the contract, the El Paso City Government, may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.**

5.24 **Apprentices**

5.24.1 Information relating to the apprenticeship program, use of apprentices and trades shall be submitted prior to the start of the work of the applicable occupations listed below. City construction contracts require that the construction contractors performing work for the City for such contract shall participate in a United States Department of Labor ("DOL") certified apprenticeship program when the work required under the contract includes work that must be performed by any of the apprenticeable occupations listed in the City's apprenticeship program adopted September 24, 2013, as amended, and the work involving such apprenticeable occupation has a value of **fifty thousand dollars** or more. Prior to the start of the work of the applicable apprenticeable occupations listed below the contractor or the applicable subcontractor through the prime contractor shall provide written certification to the city that it is a sponsor or participant in a DOL approved apprenticeship program.

Apprenticeable Occupations:

Bricklayer
Carpenter
Cement mason
Drywall applicator
Electrician
Glazier
Operating engineer
Painter
Pipefitter
Plasterer
Plumber
Roofer
Sheet metal worker
Structural worker/ironworker
Taper
Carpenter – Acoustical Ceilings
Cabinet Maker
HVAC
Insulation Worker
Electronic Technician
Elevator Installer & Repairer
Foor Layer
Locksmith

5.24.2 Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship & Training or a State Apprenticeship Agency (where appropriate) to be eligible for probation employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor/subcontractor as to the entire work force under the registered program.

5.24.3 The Contractor shall furnish the City's Engineering Department with sufficient information, which demonstrates that apprentices are employed pursuant to and individually registered in a bona fide apprenticeship program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the City wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the City wage determination for the work actually performed. Every apprentice must be paid at not less than the rates specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman's hourly rate specified in the City wage determination.

5.24.4 Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Bureau of Apprenticeship Training determines that a different practice prevails for the applicable apprentice classification, fringe benefits shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship & Training, or a state apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

5.25 Addendum to the Contract – Apprenticeship Program

5.25.1 The employment and use of apprentices to prosecute the completion of the work shall be governed by the provisions of paragraph 6.5.4 hereof and the Addendum of the Contract “Apprenticeship Program”, both of which are contained herein and incorporated herein.

5.25.2 In accordance with Resolution of the City Council of the City of El Paso, Texas regarding Apprenticeship Programs in City Projects adopted on June 1, 2010, the Contractor and each subcontractor must comply with the following:

5.25.2.1 Shall participate in a United States Department of Labor (DOL) certified apprenticeship program when the work required under the contract includes work that must be performed by apprenticeable occupations and the work involving such apprenticeable occupation has a value of *fifty thousand dollars* or more. The apprenticeable occupations are those listed in 5.24.1.

5.25.2.2 Shall hire registered apprentices enrolled in a DOL certified apprenticeship program;

5.25.2.3 Shall not substitute helpers, unregistered apprentices or other substitutes to perform apprentice level work in place of registered apprentices.

5.25.2.4 Shall pay wage rates and benefit package for apprentices as determined by the apprenticeship program/DOL;

5.25.2.5 Shall comply with DOL requirements for the ratio of apprentices to journeymen; and

5.25.2.6 Shall hire apprentices in all job classifications utilized on the project that are “apprenticeable occupations” listed in paragraph 5.24.1.

5.25.2.7 Noncompliance of the contract provisions concerning the apprenticeship participation may be a basis to terminate the construction contract, which shall be referred to the City Council for determination.

5.25.3 The Contractor shall post the prevailing wage rate schedules made part of this contract at each work site in a prominent location readily accessible to the workers through the duration of the project. In addition, the Contractor shall post a notice to be provided by the City Engineer regarding prevailing wage rates and the City of El Paso Apprenticeship Program, in English and Spanish, which shall be posted nearby the prevailing wage rates schedules.

5.25.4 The Contractor shall, in addition to all other information items to be provided to City, certify to City the names of all apprentices on the project; verification of their status as registered apprentices; and documentation as to their proper wage rates; and documentation as the journeyman-to-apprentice ratios for each trade as determined by the apprenticeship program.

5.25.5 No worker shall be discharged by the Contractor or Subcontractor or in any other manner discriminated against because such worker has filed an

inquiry or complaint, has instituted or caused to be instituted any legal or equitable proceeding or has testified or is about to testify in any such proceeding under or relating to the apprenticeship program.

5.25.6 The Contractor and every subcontractor shall allow immediate entry, into all areas of the job site, by the City Engineer and his/her agents and representatives displaying and presenting proper identification credentials to the job site superintendent or his/her representative. While on the job site the City Engineer and his/her agents and representatives may inspect for all job site and regulations, including but not limited to those concerning safety, security and fire prevention. The Contractor and each subcontractor shall allow any employee to be interviewed at random, at any time and for any reasonable duration by the City Engineer and his/her agents and representatives to determine compliance with the provisions of this contract regarding the apprenticeship program. *The Contractor and each subcontractor shall allow access to its personnel and apprenticeship books and records, at any time and for any reasonable duration by the City Engineer and his/her agents and representatives to determine compliance with the provisions of this contract regarding the apprenticeship program.*

5.25.7 The City reserves the right to terminate this Contract for cause in the Contractor and/or any subcontractor shall breach any of these provisions regarding the apprenticeship program.

5.25.8 The Contractor shall cause these and any other appropriate provisions regarding the apprenticeship program to be inserted in all subcontractor relative to the work to bind the subcontractor to the same apprenticeship program requirements as are applicable to the Contractor.

6.0 PROSECUTION AND PROGRESS

6.1 Subcontracting

6.1.1 The Contractor may utilize the services of specialty subcontractors on those parts of the work which, under normal contracting practices, are performed by specialty subcontractors.

6.1.2 The Contractor shall not award any work to any subcontractor without prior written approval of the Owner, which approval will not be given until the Contractor submits to the Owner a written statement concerning the proposed award to the subcontractor, which statement shall contain such information as the Owner may require.

6.1.3 The Contractor shall be as fully responsible to the Owner for the acts and omissions of his/her subcontractors, and of persons either directly or indirectly employed by them, as the Contractor is for the acts and omissions of persons directly employed by him/her.

6.1.4 The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the General Conditions and other contract documents insofar

as applicable to the work of subcontractors and to give the Contractor the same power as regards to the termination of any subcontract that the Owner may exercise over the Contractor under any provisions of the contract documents.

6.1.5 Nothing contained in this contract shall create any contractual relation between any subcontractor and the Owner.

6.1.6 The Owner shall have no responsibility to any subcontractor employed by the contractor for performance of work on the Project contemplated by these contract documents, but said subcontractors will look exclusively to the Contractor for any payments due subcontractors.

6.2 Notice and Service Thereof

Any notice to any Contractor from the Owner or Owner's designated representative relative to any part of this contract shall be in writing and considered delivered and the service thereof completed when said notice is posted, by certified or registered mail, to the said Contractor at his/her last given address, or delivered in person to said Contractor or his/her authorized representative on the work site.

6.3 Progress Schedule

6.3.1 The Contractor, when required, shall furnish the City Engineer with a "Progress Schedule" for approval. The progress schedule may be used to establish major construction operations and to check on the progress of the work. The Contractor shall provide sufficient materials, equipment, and labor to guarantee the completion of the project in accordance with the plans and specifications within the time set forth in the schedule.

6.3.2 If the Contractor falls significantly behind the submitted schedule, the Contractor shall submit a revised schedule for completion of the work within the contract time and modify the operations to provide such additional materials, equipment, and labor necessary to meet the revised schedule. Should the prosecution of the work be discontinued for any reason, the Contractor shall notify the City Engineer at least 24 hours in advance of resuming operations.

6.4 Limitation of Operations

6.4.1 Working Day - A working day shall be any day other than a Saturday, Sunday or legal holiday of the City of El Paso on which the working forces of the Contractor may proceed with regular work for at least six (6) hours toward completion of the contract. Unless work is suspended for causes beyond the Contractor's control, Saturdays, Sundays and holidays on which the Contractor's forces engage in regular work requiring the presence of a City Inspector will be considered as work days.

6.4.2 Contractor's Work Hours - Unless other days and hours of work are specifically prescribed in the technical specifications for this project, the

days and hours during which the Contractor may perform work under this contract are specifically limited, as follows:

6.4.2.1 The Contractor may not perform any work on the project, including grading, excavation, installation of materials or fabrication of subassemblies other than between the hours of 8 a.m. and 4:30 p.m. of each working day.

6.4.2.2 The Contractor may not start, warm up, or operate equipment, deliver, or handle materials or perform any other activity which might disturb adjacent residents or business prior to 7:30 a.m. of each working day.

6.4.2.3 The Contractor shall have completed all operation at the work site, stored all equipment and materials, and completed all clean up at the work site prior to 6 p.m. of each working day.

6.4.2.4 The legal holidays of the City of El Paso are:

6.4.2.4.1 New Year's Day
6.4.2.4.2 Labor Day
6.4.2.4.3 Martin Luther King's Birthday
6.4.2.4.4 Thanksgiving Day & the Friday following Thanksgiving Day (2 days)
6.4.2.4.5 Memorial Day
6.4.2.4.6 Christmas Day
6.4.2.4.7 Fourth of July

6.4.2.5 Permission to work outside the hours and days specified above may be granted by the City Engineer but will be granted only under exceptional circumstances involving the safety or convenience of the public. Such permission will not be granted to allow the Contractor to advance or recover his/her contract schedule unless the safety and convenience of the public are involved. Permission to work outside of normal hours as specified above must be requested in writing by 4:30 p.m. of a working day, no less than seven (7) work days prior to the date on which the Contractor wishes to commence overtime operations. The hours of work specified in this subparagraph are only for the purpose of ensuring that work can be inspected when performed and for minimizing disturbance to the public. They do not prescribe "normal working hours" for the purpose of compliance with legislation involving wages. In any event, if a condition should occur or arise at the site of this project, or from the work being done under this contract which is hazardous or dangerous to property or life, the Contractor shall immediately commence work, regardless of the day of the week or the time of day, to correct or alleviate such condition so that it is no longer dangerous to property or life.

6.4.2.6 <u>When requesting to work other than normal work hours as</u>

specified herein, the Contractor will be charged for the overtime payment to the City Inspector and any testing personnel required.

6.5 Character of Workmen; Methods and Equipment

6.5.1 At the site of the work, the Contractor shall employ a qualified full-time construction superintendent or foreman who shall have full authority to act for the Contractor. It is understood that such representative shall be acceptable to the Owner or Owner's designated representative and shall be one who can continue in that capacity for the particular job involved unless he/she ceases to be on the Contractor's payroll. The use of a subcontractor's foreman as project superintendent will not be allowed.

6.5.2 The Contractor shall at all times employ sufficient labor and equipment for prosecuting the several classes of work to full completion in a manner and time required by the contract.

6.5.2.1 All workmen shall have sufficient skill and experience to perform properly the work assigned to them. Workmen engaged in special work or skilled work shall have sufficient experience in such work and in the operation of the equipment required to perform the work satisfactorily.

6.5.2.2 Any person employed by the Contractor or by any subcontractor who, in the opinion of the City Engineer, does not perform his work in a proper and skillful manner or is intemperate or disorderly shall, at the written request of the City Engineer, be removed forthwith by the Contractor or subcontractor employing such person, **and shall not be reemployed in any portion of the Project or work without the approval of the City Engineer**.

6.5.2.3 Should the Contractor fail to remove such person or persons as required above, or fail to furnish suitable and sufficient personnel for the proper prosecution of the work, the City Engineer may, by written notice, suspend the work until the Contractor complies with the provisions of this paragraph.

6.5.3 All equipment, which is proposed to be used on the work, shall be of sufficient size and in such mechanical condition as to meet requirements of the work and to produce a satisfactory quality of work. Equipment used on any portion of the project shall be such that no injury to the street, adjacent property, or other structures will result from its use.

6.5.3.1 When the methods and equipment to be used by the Contractor in accomplishing the construction are not prescribed in the contract, the Contractor is free to use any methods or equipment that will accomplish the contract work in conformity with the requirements of the contract, provided that no other provisions of the contract are violated.

6.5.4 The employment of apprentices by the Contractor may be **mandatory.**

When required the Contractor shall at all times employ apprentices in U.S. Department of Labor certified apprenticeship programs, in such amounts and trades, as are set forth in the Schedule of Categories of Apprentices, which Schedule is maintained by the Office of the City Engineer. See 5.24 & 5.25 for more details.

6.6 Progress Photographs

The Contractor will furnish photographs in the number, type and state as enumerated below:

N/A

6.7 Suspension of Work

The Contractor shall have no claim for compensation or damages for compensation or damages for delay, including but not limited to lost profits or home office expenses/overhead, should the Contractor be prevented from proceeding with the work required by this contract either before or after the start of construction by any act or omission of the Owner or any reason beyond the control of the Owner. The Contractor further agrees that the Contractor shall be granted an extension of time to perform the work required by the contract but shall not be otherwise compensated for nor entitled to recover any additional costs or expenses arising from such delays.

6.8 Time for Completion and Liquidated Damages

6.8.1 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".

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

6.8.3 **Liquidated Damages-Substantial Completion.** 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 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 each such breach of contract set forth herein, for each and every consecutive calendar day that the Contractor shall be in default after the time stipulated in the contract for substantially completing the work.

6.8.3.1 **Liquidated Damages-The Remaining Work** The Remaining Work, as such work is determined by the City Engineer pursuant to section 3.7, shall be completed within the Contract Time or any proper extension thereof granted by Owner. If the Contractor shall neglect, fail or refuse to complete the Remaining Work within the Contract Time or any proper extension thereof granted by the Owner, then the Contractor does hereby agree, as 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 the Remaining Work for each such breach of contract set forth herein for each and every consecutive calendar day that the Contractor shall be in default after expiration of the Contract Time.

6.8.4 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.

6.8.5 It is further agreed that time is of 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 or any excess cost when the delay in completion of the work is due:

6.8.5.1 To any preference, priority, or allocation duly issued by the Government;

6.8.5.2 To unforeseeable causes 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;

6.8.5.3 To any delays of subcontractors or suppliers occasioned by any of the causes specified in subparagraphs 6.8.5.1 and 6.8.5.2 of this paragraph; provided, further, that the Contractor shall, within ten (10) work days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of the final settlement of the contract, notify the Owner, in writing, of the causes of the delay; the Owner shall ascertain the facts and extent of the delay and notify the Contractor within a reasonable time of its decision in the matter.

6.9 Right of Owner to Terminate Contract

6.9.1 In the event that any of the provisions of this contract are violated by the Contractor, or by any of his/her subcontractors, the Owner may serve written notice to contain the reasons for such intention to terminate the contract, and unless within ten (10) work days after the serving of such notice upon the Contractor, such violation or delay shall cease and satisfactory arrangement of correction be made, the contract shall, upon the expiration of said ten (10) work days, cease and terminate. The City shall have the right to immediately terminate the Contract for default if the Contractor violates any local, state, or federal laws, rules or regulations that relate to the performance of this Agreement.

6.9.1.1 In the event of such termination, the Owner shall immediately serve notice thereof upon the Surety and the Contractor, and the Surety shall have the right to take over and perform the contract, and shall execute a Take over Agreement with the Owner evidencing such intention to take over and perform the contract. Provided, however, that if the surety does not commence performance thereof within ten (10) work days from the date of the mailing of such notice to surety of termination, the Owner may take over the work and prosecute the same to completion by contract or by force, and utilize in completing the work, such materials, appliances and plant as may be on the site of the work and necessary therefore.

6.9.1.2 All costs and charges incurred by the Owner, including the costs of securing the construction site until resumption of work under the contract, together with the cost of completing the work under the contract, will be deducted from any monies due the Contractor or remaining on the contract. If such expenses exceed the sum which would have been payable under the contract, the Contractor and Surety shall be liable to the Owner for said amount.

6.9.2 The Owner may, at any time, at will and without cause, terminate any part of the work to be performed or all remaining work for any reason whatsoever by giving seven (7) days prior written notice to the Contractor. The owner shall incur no liability to the Contractor by reason of such termination, except that the Contractor shall be entitled to payment for work properly completed in accordance with this contract prior to the effective date of the termination. In the event that only part of the work is terminated, the Contractor shall continue in full force and effect as to all remaining work to be completed. <u>The owner shall not be responsible for compensation or damages for delay, damages for loss of anticipated profits on work not performed, demobilization or cancellation costs or charges on account of any termination.</u>

6.9.3 Upon a determination by a court of competent jurisdiction that a termination of the Contractor by the Owner pursuant to subparagraph (A) herein was wrongful, such termination will be deemed converted to a termination for

convenience pursuant to subparagraph (B) herein and the Contractor's remedy for wrongful termination shall be limited to the recovery permitted for termination for convenience as set forth in subparagraph (B) herein.

6.10 Default of Contract

6.10.1 The following reasons shall consist default of this contract:

6.10.1.1 If the Contractor fails to begin the work under the contract within the time specified in the Notice to Proceed, or

6.10.1.2 If the Contractor fails to perform the work with sufficient workmen and equipment or with sufficient materials to assure the prompt completion of said work, or

6.10.1.3 If the Contractor fails to perform the work in accordance with the contract requirements and/or refuses to remove and replace rejected materials or unacceptable work, or

6.10.1.4 If the Contractor discontinues the prosecution of the work, or

6.10.1.5 If the Contractor fails to resume work that has been discontinued within a reasonable time after notice to do so, or

6.10.1.6 If Contractor fails to complete any remaining punch list items for the project after notice to do so,

6.10.1.7 If the Contractor becomes insolvent or is declared bankrupt, or commits any act of bankruptcy or insolvency, or

6.10.1.8 If the Contractor allows any final judgment to remain unsatisfied for a period of 10 days, or

6.10.1.9 If the Contractor makes an assignment for the benefit of creditors, without obtaining the written consent of the Owner and the Surety or Sureties, or

6.10.1.10 If the Contractor fails to comply with contract requirements regarding minimum wage payments or EEO requirements, or

6.10.1.11 If the Contractor, for any other cause whatsoever, fails to carry on the work in an acceptable manner.

6.10.1.12 If the Contractor violates any local, state, or federal laws, rules or regulations that relate to the performance of this Agreement.

6.10.2 The City Engineer will give notice in writing to the Contractor and the Surety of such delay, neglect, or default.

6.10.3 If the Contractor or Surety, within a period of 10 days after such notice, does not proceed in accordance therewith, then the Owner will have full

power and authority without violating the contract, to take the prosecution of the work out of the hands of the Contractor. The Owner may enter into an agreement for the completion of said contract according to the terms and provisions thereof, or use such other methods as in the opinion of the Owner will be required for the completion of said contract in an acceptable manner.

6.10.4 All costs and charges incurred by the Owner, including the costs of securing the construction site until resumption of work under the contract, together with the cost of completing the work under the contract, will be deducted from any monies due or remaining on the contract. If such expense exceeds the sum which would have been payable under the contract, then the Contractor and the Surety shall be liable to the Owner for said amount.

7.0 PAYMENTS

7.1 Construction Schedule and Periodic Estimates

7.1.1 Immediately after execution and delivery of the contract, and before the first partial payment is made, the Contractor shall deliver to the Owner an estimated construction progress schedule in a form satisfactory to the Owner, showing the proposed dates of commencement and completion of each of the documents and the anticipated amount of each monthly payment that will become due the Contractor in accordance with the progress schedule. The Contractor shall also furnish, on forms to be supplied by the Owner or Owner's designated representative:

7.1.1.1 A detailed estimate giving a complete breakdown of the contract price, and

7.1.1.2 Periodic itemized estimates of work, done for the purpose of making partial payments thereon. The costs employed in making up any of these schedules will be used only for determining the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the contract price.

7.2 Progress Payments

7.2.1 The Contractor shall request a meeting, at the construction site with the appointed City Inspector and the Owner's designated representative on or about the twenty-fifth (25) of each month, to discuss progress and payment. Upon approval of the completion estimate, the Contractor shall submit an Application of Certificate for Payment, using the AIA documents G702 and G702A, accompanied by a current progress schedule. The Contractor shall submit his/her estimate not later than the first day of the month. The estimate shall indicate the amount of the work completed in percentages which was performed by subcontractors employed by the Contractor. The Owner shall have the right to review the estimate, dispute and revise the estimate based upon the Owner’s review of the progress of the work and pay the Contractor in accordance with the Owner’s findings. If the Owner disputes the estimates, the dispute shall constitute a bona fide dispute and

payment to the Contractor shall be excepted from the requirements of Chapter 2251 ("Chapter 2251") of the Texas Government Code pursuant to Section 2251.002 thereof. Upon approval of the pay request by the City Engineering Department, the following will apply:

7.2.1.1 The Owner shall make a progress payment to the Contractor in accordance with Chapter 2251, subject to applicable exceptions. Payment by the Owner will be based on the duly certified and Owner-approved estimate of the work performed during the preceding calendar month under this contract.

7.2.1.2 To ensure the proper performance of this contract, the Owner shall retain ten percent (10%) of the amount of each estimated payment for contracts in an amount of less than four hundred thousand and no/100 dollars ($400,000.00) and five percent (5%) of the amount of each estimated payment for contracts in the amount of four hundred thousand and no/100 dollars ($400,000.00) or more. The Owner may release up to fifty percent (50%) of the amount retained at the time the Owner certifies to Contractor that substantial completion has been achieved within the contract time. The remaining retainage shall not be released to Contractor until such time as the final completion and acceptance of all work covered by this contract has been achieved.

Payment of retainage for unit price contracts shall be based on the current value of the contract at the time of substantial completion.

Retainage may be reduced by Owner for deductions from the contract price, including but not limited to liquidated damages. Release of any retainage is subject to approval by the Surety providing the bonds required of the Contractor.

7.2.1.3 In preparing estimates, the material delivered on the site and preparatory work done may be taken into consideration.

7.2.1.4 All material and work covered by partial payments made shall thereupon become the sole property of the Owner, but this provision shall not be construed as relieving the Contractor from the sole responsibility for the care and protection of materials and work upon which payments have been made or the restoration of any damaged work, or stored materials stolen, nor be construed as a waiver of the right of the Owner to require the fulfillment of all of the terms of the contract.

7.2.1.5 The Owner shall, for all public works contracts in excess of $400,000, invest all retainage over five percent (5%) of payments, if any, under this contract, in interest bearing accounts and pay such interest to the Contractor upon completion of the contract. All other applicable terms and definitions in Section

2252.032, Texas Government Code, are hereby incorporated by reference in this paragraph.

7.2.1.6 The contractor agrees that he/she will indemnify and save the owner harmless from all claims growing out of the lawful 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. in accordance with tex. prop. code ann. 53.231 et. seq., when the amount of this contract does not exceed $25,000 and when the owner has received a notice of an unpaid claim(s) from a person who has furnished materials or labor in connection with the performance of a public works contract, the owner may, after having served written notice on said contractor, either pay unpaid claims of which the owner has written notice thereof, or direct or withhold from the contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged, whereupon payment to the contractor shall be resumed, in paying any unpaid claims in accordance with Texas property code ann. 53.231 et seq., the owner shall be deemed the agent of the contractor, and any payment so made by the owner shall be considered as a payment made under the contract by the owner to the contractor.

7.3 Assignments

The Contractor shall not assign the whole or any part of the contract, or any monies due or to become due hereunder without written consent of the Owner and Surety. In case the Contractor assigns all or any part of any monies due or to become due under this contract, the instrument of assignments shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any monies due or to become due to the Contractor shall be subject to prior claims of all persons, firms and corporations of services rendered or materials supplied for the performance of the work called for in this contract.

7.4 Acceptance of Final Payment Constitutes Release

The acceptance by the Contractor of final payment shall be, and shall operate as a release to the Owner of all claims and all liability to the Contractor for all things done or furnished in connection with this work and for every act and neglect of the Owner and others relating to or arising out of this work. No payment, however, final or otherwise, shall operate to release the Contractor or his/her sureties from any obligations under this contract or from the Performance and Payment Bonds.

7.5 Payrolls and Basic Records

7.5.1 Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three (3) years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security

number of each such worker, the workers correct classification, hourly rates of wages paid, including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof, daily and weekly number of hours worked, deductions made and actual wages paid.

7.5.2 Whenever the City of El Paso has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits.

7.5.3 Contractors employing apprentices and trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

7.5.4 The Contractor shall submit weekly for each week in which any contract work is performed the original copy of all payrolls submitted shall set out accurately and completely all of the information required to be maintained. This information may be submitted in any form desired. Optional form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal Stock Number 029-005-00014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime Contractor is responsible for the submission of copies of payrolls by all subcontractors.

7.5.4.1 Each payroll submitted shall be accompanied by a “Statement of Compliance”, signed by the Contractor or Subcontractor or the agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

7.5.4.1.1 That the payroll for the payroll period contains the information required, and that such information is correct and complete.

7.5.4.1.2 That each laborer or mechanic (including each helper, apprentice, and trainee), employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned other than permissible deductions.

7.5.4.1.3 That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

7.5.4.2 The falsification of any of the above certifications may subject the Contractor or the Subcontractor to debarment.

7.5.4.3 The Contractor or Subcontractor shall make the records required under this section available for inspection, copying or transcription by authorized representatives of the El Paso City Government and/or appropriate State or Federal agency, and shall permit such representatives to interview employees during working hours on the job. If the Contractor or Subcontractor fails to submit the required records or to make them available, the City of El Paso may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment.

8.0 DISPUTES AND REMEDIES

8.1 Dispute Resolution

In the event of any controversy or claim arising out of or in any way related to this contract, the parties agree to submit the controversy or claim to a mutually agreed upon non-binding alternative dispute resolution procedure prior to the filing of a lawsuit with respect to the controversy or claim. The cost of the alternative dispute resolution procedure shall be divided and borne equally by the parties.

8.2 Governing Law

This contract shall be governed by the law of the place where the project is located.

8.3 Rights and Remedies

The duties and obligations imposed by the contract documents and the rights and remedies available there under shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

8.4 Illegality

If any provision of this contract or the application thereof to any person or circumstance is rendered or declared illegal for any reason or shall be invalid or unenforceable, the remainder of this contract and the application of such provision to other persons or circumstance shall not be affected thereby but shall be enforced to the extent permitted by law. The parties agree to negotiate in good faith for a proper amendment to this contract in the event any provision is declared illegal, invalid or unenforceable to reflect the original intent of the parties.

9.0 RECORDS/AUDIT

9.1 The City of El Paso, its authorized representative, and/or the appropriate State or Federal agency reserve the right to audit the Contractor's records pertaining to this project to verify the accuracy and appropriateness of all pricing data, including data

used to negotiate any Change Orders. The City of El Paso reserves the right to decrease the contract amount and/or payments made on this contract, if upon audit of the project's records, the audit discloses that false, misleading or inaccurate cost and/or pricing data has been provided.

9.2 Additionally, authorized representatives and agents of the City, State or Federal agencies, if applicable, shall be permitted to interview any personnel performing work on behalf of or in relation to the project, including but not limited to, field and office personnel.

SAFETY STANDARD AND ACCIDENT PREVENTION

With respect to all work performed under this contract, the Contractor shall:

a. Comply with the safety standards provisions of applicable laws, building and construction codes, and the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America, the requirements of the Occupational Safety and Health Act (OSHA) of 1970 (Public Law 91-596), including but not limited to OSHA Standards.

b. Maintain at his office or other well-known place at the job site, all articles necessary for giving first aid to the injured, and shall make standing arrangements for the immediate removal to a hospital or a doctor's care of person (including employees), who may be injured on the job site. In no case shall employees be permitted to work at a job site before the employer has made a standing arrangement for removal of injured persons to a hospital or a doctor's care.

c. Shall exercise proper precaution at all times for the protection of persons and property and shall be responsible for all damages to persons or property, either on or off the site, which occurs as a result of his prosecution of the works. The City of El Paso may require additional safety and health measures as it may determine to be reasonably necessary. Accident prevention measures such as safety training and education, proper illumination, fire prevention, and provisions of personal protective equipment shall comply with OSHA Standards.

An OSHA package will be furnished to the Contractor at the required preconstruction meeting before a Notice to Proceed is issued on this project.

TRENCH SAFETY SYSTEM
(FOR PROJECTS WHERE TRENCHING IS INVOLVED)

A. GENERAL DUTIES AND RESPONSIBILITIES

a) The Contractor shall be required to install a Trench Safety System to provide for the safe excavation of all trenches exceeding a depth of five feet (5'), as per Occupational Safety and Health Act (OSHA) standards.

b) It shall be the duty and responsibility of the Contractor and all its subcontractors to be familiar and comply with all requirements of Public Law 91-596, 29 U.S.C. Secs. 651 et seq., the Occupational Safety and Health Act (OSHA) of 1970, and all amendments thereto, and to enforce and comply with all the provisions of this Act. In addition, on projects in which trench excavation will exceed a depth of five feet (5'), the Contractor and all subcontractors shall comply with all requirements of 29 C.F.R. Secs. 1926.651 and 1926.652, OSHA Safety and Health Standards, which are more fully described herein, and shall require a pay item classification, a described below.

1) The Contractor will be required to submit three (3) sets of a Trench Safety System to the Deputy Director for Engineering for review within twenty-one (21) consecutive calendar days after notification that he has been awarded the contract. Submitted plans and specifications will be considered part of the bid documents and will become part of the contract documents.

2) Submitted plans must be signed and sealed by a professional registered in the State of Texas, with professional experience in Geotechnical Engineering. The Contractor is responsible for obtaining borings and soil analysis, as required for the design and preparation of the Trench Safety System. The Trench Safety System shall be designed in conformance with OSHA standards and regulations.

3) No trenching in excess of five feet (5') below existing grade will be allowed until the Trench Safety System is reviewed. Changes in the Trench Safety System after initiation of construction will not be considered as a basis for an **extension of time** or change order. Each change will require the same review process, as per the original Trench Safety System.

4) The Contractor accepts sole responsibility for compliance with all applicable safety requirements. The review is only for general conformance with OSHA safety standards; and review of the Trench Safety System does not relieve the Contractor of responsibility for any or all construction means, methods, techniques and procedures.

5) Any property damage or bodily injury, including death, that arises from use of the trench or from the Owner's failure to note exceptions to the Trench Safety System shall remain the sole responsibility and liability of the Contractor.

6) Contractors have three (3) generally accepted methods or combination thereof to meet OSHA standards for Trench Safety System:

   a) Minimum angle of repose for sloping of the sides of excavations.

   b) Utilization of trench box.

   c) Shoring, sheeting, and bracing methods.

7) Contractors electing to utilize the minimum angle of repose must submit:

   a) Soil classification according to the Unified Soil Classification System, including water content and plasticity index, a minimum angle of the slope of excavation for the trench.

   b) A detailed plan of the excavation area and the impact on existing right-of-way and infrastructure.

8) Contractors electing to utilize a trench box must submit physical dimensions, materials, position in the trench, expected loads and the strength of the box.

9) Contractors electing to utilize shoring, sheeting, and bracing must submit dimensions and materials of all uprights, stringers, cross-bracing and spacing required to meet OSHA requirements. No claims for delay will be permitted.

10) The Deputy Director for Engineering has the authority to request for review all design data, calculations and information pertinent to the Trench Safety Systems.

B. INDEMNIFICATION

THE CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS THE OWNER, ITS EMPLOYEES AND AGENTS FROM ANY AND ALL DAMAGES, COSTS (INCLUDING, AND WITHOUT LIMITATION, LEGAL FEES, COURT COSTS AND THE COST OF INVESTIGATION), JUDGEMENTS OR CLAIMS BY ANYONE, FOR INJURY OR DEATH OF PERSONS RESULTING FROM THE COLLAPSE OR FAILURE OF TRENCHES CONSTRUCTED UNDER THE CONTRACT.

THE CONTRACTOR ACKNOWLEDGES AND AGREES THAT THIS INDEMNITY PROVISION PROVIDES INDEMNITY FOR THE OWNER IN THE EVENT THAT A CLAIM IS MADE THAT THE OWNER IS NEGLIGENT EITHER BY ACT OR OMISSION IN PROVIDING FOR TRENCH SAFETY, INCLUDING, BUT NOT LIMITED TO, INSPECTIONS, FAILURE TO ISSUE STOP WORK ORDERS, AND THE HIRING OF THE CONTRACTOR.

C. DESCRIPTION

This item shall govern the Trench Safety Systems required for the construction of all trench excavation to be utilized in the project, including all additional excavation and backfill necessitated by the safety system. The Trench Safety System shall be suitable for construction of pipelines, utilities, etc., that are installed below grade and shall be sufficient to fully protect public or private property, including other existing utilities and structures below, or above grade. Trench Safety Systems include, but are not limited to, sloping of sides of excavation, sheeting, trench boxes or trench shields, sheet piling, cribbing, bracing, shoring, dewatering or diversion of water to provide adequate drainage.

The Contractor shall be responsible for the design of Trench Safety Systems and procedures such as the use of sheet piling, shoring or other means of temporary support to protect existing buildings, streets, highways, water conveying structures or any other structures. In the case of existing utilities, the Contractor may elect to remove the utilities under the stipulated condition that the removal and subsequent replacement of these utilities shall meet with the approval of the Engineer, the Owner, the Utility Owner, and all agencies having jurisdiction of the structure or property. In all cases, the Contractor shall be fully responsible for the protection of public, or private property, and for the protection of any person or persons who, as a result of the Contractor's work, may be injured.

D. CONSTRUCTION METHODS

Trench Safety Systems shall be accomplished in accordance with the detailed specifications set out in the provisions for Excavations, Trenching, and Shoring, Federal Occupational Safety and Health Administration (OSHA) Standards, 29 CFR, Part 1926, Subpart P, as amended, including proposed Rules published in the Federal Register (Volume 52, No. 72) on Wednesday, April 15, 1987. The sections that are incorporated into these specifications by reference include Sections 1926-650 through 1926-653.

Legislation that has been enacted by the Texas Legislature (H. B. No. 662 and H. B. No. 665) with regard to Trench Safety Systems, hereby incorporated by reference, into these specifications.

E. SAFETY PROGRAM

The Contractor shall submit a safety program specifically for the construction of trench excavations together with the trench excavation plans for Trench Safety Systems. The trench safety program shall be in accordance with OSHA standards governing the presence and activities of individuals working in and around trench excavations.

F. PAY ITEM

Measurement: Trench Safety Systems shall be measured by the linear foot along the centerline of trench including manholes and other line structures.

Payment: Payment for Trench Safety Systems, measured as prescribed above, shall be made at the unit price bid per linear foot of Trench Safety Systems. Payment of all work prescribed under this item shall be full compensation for the Trench Safety Systems including all design, testing, inspection, excavation, and backfill required to furnish, install, maintain and remove all shoring, sheeting, or bracing; for dewatering or diversion of water; for all jacking and jack removal; for required compaction; and for all other labor, material, tools, equipment, and incidentals necessary to complete the Trench Safety Systems work.

G. INSPECTION

The Contractor shall provide a qualified person to make daily inspections of the Trench Safety Systems to ensure that the systems meet OSHA requirements. The Contractor shall maintain a permanent record of daily inspections, and submit a weekly report to the Deputy Director for Engineering.

If evidence of possible cave-ins or slides is apparent, all work in the trench shall cease until the necessary precautions have been taken by the Contractor to safeguard personnel entering the trench. It is the sole duty, responsibility, and prerogative of the Contractor, not the Owner or the Owner's designated representative, to determine the specific applicability of the designed Trench Safety Systems to each field condition encountered on the project.

H. EMERGENCIES

In any emergency situation which may threaten or affect the safety or welfare of persons or property, the Contractor shall act at his discretion to prevent possible damage, injury, or loss. Any additional compensation or extension of time claimed for such action shall be considered in view of the cause of the emergency and in accordance with Paragraph 5.7 of the General Conditions of the Contract, Protection of Work and Property Emergency.

TECHNICAL SPECIFICATIONS

For

Confederate Citizens Collection Station

SOLICITATION No.2016-764

Specifications

City of El Paso, Texas

Confederate Citizens Collection Station

February 2016

PSC Project # 01512415

PARKHILLSMITH&COOPER

Specifications

City of El Paso, Texas

Confederate Citizens Collection Station

PARKHILL SMITH & COOPER, INC. F-560
STATE OF TEXAS
NICHOLAS N. YBARRA
111156
LICENSED
PROFESSIONAL ENGINEER

02/02/16

February 2016

PSC Project # 01512415

PARKHILLSMITH&COOPER

TABLE OF CONTENTS

DIVISION 00 – BIDDING REQUIREMENTS AND CONTRACT INFORMATION

Not Used

DIVISION 01 - GENERAL REQUIREMENTS

01010 General
01019 Contract Considerations
01025 Measurement and Payment
01039 Coordination and Meetings
01090 Reference Standards
01230 Alternates
01300 Submittal Procedures
01356 Storm Water Pollution Prevention Measures
01400 Quality Control
01420 References
01500 Construction Facilities and Temporary Controls
01550 Material and Equipment
01560 Environmental Protection
01600 Progress Schedules
01700 Contract Closeout

DIVISION 02 - SITE WORK

02201 Excavation, Grading, and Subgrade Preparation
02230 Base Course
02510 Asphalt Pavement
02513 Pavement Markings
02600 Schedule of Pipe
02610 Pipe, Valves, and Fitting Materials
02810 Irrigation Systems
02820 Chain Link Fencing
02826 Steel Ornamental Fence System
02930 Exterior Plants

DIVISION 03 – CONCRETE

03300 Cast-In-Place Concrete

DIVISION 04 - MASONRY

Not Used

DIVISION 05 – METALS

05400 Cold-Formed Metal Framing
05500 Metal Fabrications

DIVISION 06 – WOODS AND PLASTICS

06114 Wood Blocking and Curbing

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

07210 Building Insulation
07900 Joint Sealers

DIVISION 08 – DOORS AND WINDOWS

08110 Hollow Metal Doors and Frames
08211 Flush Wood Doors
08305 Access Doors and Frames
08700 Hardware

DIVISION 09 – FINISHES

09250 Gypsum Board Systems
09650 Resilient Flooring and Base
09912 Interior Painting

DIVISION 10 – SPECIALTIES

10522 Fire Extinguishers and Accessories
10800 Toilet Accessories

DIVISIONS 11 - 14

Not Used

DIVISION 15 – MECHANICAL

15000 General Mechanical Requirements
15050 Basic Mechanical Materials and Methods
15060 Hangers and Supports
15075 Mechanical Identification
15080 Mechanical Insulation
15140 Domestic Water Piping

15150 Sanitary Waste and Vent Piping
15410 Plumbing Fixtures
15480 Domestic Water Heaters
15731 Mini-Split System Air Conditioners
15762 Electric Resistance Heaters
15810 Ducts
15830 Fans

DIVISION 16 – ELECTRICAL

16000 Electrical General Provisions
16111 Conduit
16123 Wire and Cable
16130 Boxes
16140 Wiring Devices
16170 Grounding and Bonding
16190 Supporting Devices
16195 Electrical Identification
16441 Enclosed Switches
16461 Dry Type Transformers
16470 Panelboards
16670 Surge Protective Device
16990 Electrical System Testing and Start-up

DESIGN PROFESSIONAL RESPONSIBLITY

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

DIVISION 02 - SITE WORK

02810 Irrigation Systems
02930 Exterior Plants

01/28/16

DESIGN PROFESSIONAL RESPONSIBILITY

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

DIVISION 03 – CONCRETE

03300 Cast-In-Place Concrete

PARKHILL SMITH & COOPER, INC. F-560
STATE OF TEXAS
JOHN DAVID PASS
58070
LICENSED PROFESSIONAL ENGINEER

01/28/16

DESIGN PROFESSIONAL RESPONSIBLITY

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

DIVISION 15 – MECHANICAL

15000	General Mechanical Requirements
15050	Basic Mechanical Materials and Methods
15060	Hangers and Supports
15075	Mechanical Identification
15080	Mechanical Insulation
15140	Domestic Water Piping
15150	Sanitary Waste and Vent Piping
15410	Plumbing Fixtures
15480	Domestic Water Heaters
15731	Mini-Split System Air Conditioners
15762	Electric Resistance Heaters
15810	Ducts
15830	Fans

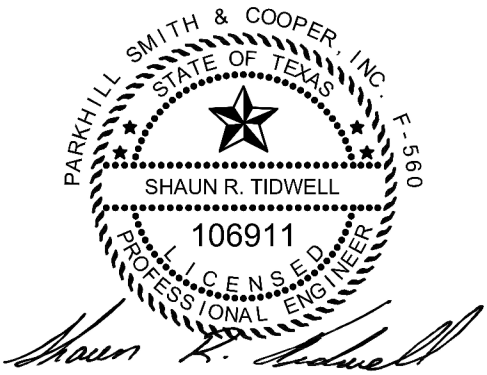
PARKHILL SMITH & COOPER, INC. F-560
STATE OF TEXAS
BRADLEY BLOUNT
115111
LICENSED
PROFESSIONAL ENGINEER
01/28/16

DESIGN PROFESSIONAL RESPONSIBLITY

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

DIVISION 16 - ELECTRICAL

16000	Electrical General Provisions
16111	Conduit
16123	Wire and Cable
16130	Boxes
16140	Wiring Devices
16170	Grounding and Bonding
16190	Supporting Devices
16195	Electrical Identification
16441	Enclosed Switches
16461	Dry Type Transformers
16470	Panelboards
16670	Surge Protective Device
16990	Electrical System Testing and Start-up



01/28/16

SECTION 01010

GENERAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Work covered by Contract Documents
   2. Contractor use of site.
   3. Owner occupancy.
B. Related Sections:
   1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Identification: City of El Paso Confederate CCS.
B. Location: 3510 Confederate Road, El Paso, Texas.
C. Verbal Summary: Without force or effect on requirements of the Contract Documents a brief description of the Project is as follows:
   1. A Citizen's Collection Station will be constructed with which includes HMAC and concrete roadways, cast-in place-retaining walls, HMAC paved parking lot, electrical services, and light poles. Construction will include two (2) new access driveways off of Confederate Road.
   2. A bathroom, electrical room, and lighting will be added inside the existing building on site. New water and sewer services will run to the building.
   3. New trees will be installed with a dedicated irrigations system connected to it.

1.3 CONTRACTOR USE OF SITE

A. Limit use of site to allow Owner occupancy.
B. Construction Operations will be limited to areas adjacent to construction site as designated by the Owner.

1.4 PROTECTION OF EXISTING UTLITIES AND STRUCTURES

A. The Contractor shall exercise care to prevent damage to, and shall be liable for any damage to, and for maintenance and protection of such lines and structures as are shown on the drawings or otherwise brought to the attention of the Contractor. The Contractor shall not cut, remove, change or disturb any existing lines, except as provided by the plans and these specifications, without the express permission of the Owner of any such line. Utility adjustments or relocations will be accomplished by the Owner of each utility, except for water and sewer or as otherwise shown on the drawings.
B. The Contractor shall coordinate with El Paso Electric prior to any excavations adjacent to El Paso Electric Facilities. The overhead electric is owned by El Paso Electric.

1.5 OWNER OCCUPANCY

A. The Owner will occupy the site during construction for the conduct of normal operations.
B. Cooperate with Owner to minimize conflict, and to facilitate Owner's operations.
C. Schedule the Work to accommodate this requirement.

1.6 TRAFFIC CONTROL

A. It will be the Contractor’s responsibility to implement project traffic control and temporary bypass roads as required so that the owner and all solid waste customers have access through Confederate Road. The project has been designed so the majority of work occurs on site.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01019

CONTRACT CONSIDERATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
   1. Application for Payment.
   2. Change procedures.
B. Related Sections:
   1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 PROJECT DURATION

A. Definitions
   1. Substantial Completion – The point at which the new Citizen's Collection Station has been satisfactorily constructed and all related work complete.
   2. Final Completion – The point at which remaining punchlist items are completed.
B. Substantial Completion – Work associated with the project shall be substantially complete within 150 calendar days of Notice-to-Proceed.
C. Final Completion – Within 30 days of Substantial Completion.

1.3 APPLICATIONS FOR PAYMENT

A. Submit payment application to the Engineer through the Engineer's Info-Exchange website.
B. Payment Period: As defined in Owner-Contractor agreement.
C. Waiver of liens from subcontractor.
D. Stored materials invoices.
E. Receipted invoices for previously-stored materials.

1.4 CHANGE PROCEDURES

A. The Engineer will advise of minor changes in the Work not involving an adjustment to Contract Sum/Price or Contract Time.
B. Execution of Change Orders: Engineer will issue Change Orders for signatures of parties as provided in the General Conditions of the Contract.
C. All Change Orders must be approved and signed by Owner. Do not commence with work included in a Change Order until it has been approved and signed by the Owner.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 REQUIREMENTS

A. The unit price or lump sum price bid on each item, as stated in the proposal, shall include furnishing all labor, superintendence, machinery, equipment, and materials necessary or incidental to complete the various items of work in accordance with the plans and specifications.

B. All estimated quantities for unit price bid items stipulated in the bid proposal are approximate and are to be used only (a) as a basis for estimating the cost of the work and (b) for the purpose of comparing the bids submitted for the work. The actual amount of work done and materials furnished under unit price items may differ from the estimated quantities. The basis of payment for unit price work and materials will be the actual amount of work done and material furnished as measured by the Engineer.

C. All measurements and payments will be based on completed and accepted work performed in strict accordance with the Drawings and Specifications and in accordance with contract bid prices. All incidental work and subsidiary items whether shown or not or listed for measurement or payment will not be paid for separately, but will be included in the payment for the bid items stated in the contract and shall be full compensation for all labor, equipment, materials, testing and incidentals necessary to perform the work in accordance with the Contract Documents.

D. Cost of work or materials shown on the Drawings, called for in the Specifications and on which no separate payment is made, shall be included in the bid price for the various items for which they are associated. A claim by the Contractor for extra compensation for an item required but not shown on the Drawings or described in the Specifications will not be considered.

E. Interconnections between the various items of equipment and the control system will require coordination and in some cases interface devices such as, but not limited to, couplings, flanges, reducers, converters, conduit, relays, contacts, wiring, etc., will be required whether or not these items are shown on the Drawings. It is the General Contractor's responsibility to provide the necessary coordination and interface devices at no additional cost to the Owner.

1.2 MOBILIZATION/DEMOBILIZATION (BID ITEM 1)

A. Payment will be made for mobilizing and demobilizing all equipment, tools, insurance, bonds and all other job-related items to and from the job site. Price will be on a lump sum basis and shall include all equipment, labor, materials, superintendence and all incidentals necessary to become fully mobilized at the start of the project and demobilized when work is complete. Mobilization related expenses include Contractor's cost for the following: obtaining a construction staging area; obtaining storage areas for equipment and construction office facilities; obtaining and setting up construction office facilities; obtaining and paying for electric power required for construction; providing sanitary facilities for construction personnel; obtaining and paying for water needed for construction; providing and maintaining dust control over the project working area; temporary fencing; and all other incidentals required for Contractor to complete mobilization. This bid item shall not exceed 5% of the contract price.

1.3 TRAFFIC CONTROL (BID ITEM 2)

A. Payment will be made for providing traffic control on a lump sum basis. Payment shall include all costs associated with providing all labor, equipment, materials and supervision necessary to implement an approved traffic control plan. Payment shall also include all costs associated with grading and constructing any necessary temporary bypass roads needed to keep the flow of traffic moving during construction operations.

1.4 EROSION CONTROL (BID ITEM 3)

A. Payment will be made for providing, installing and maintaining erosion control measures as shown on the plans on a lump sum basis and shall include the following: preparation of a formal Storm Water Pollution Prevention Plan (SW3P) by a Texas licensed professional engineer; submitting and obtaining approval of the formal SW3P from the required governing agencies; furnishing, installing, and maintaining the approved SW3P complete for the duration of the project; implementing and maintaining best management practices and good-housekeeping for control of drainage run-off over the project area; silt-fences; soil stabilization; hay-bales; and all other incidentals required for Contractor to complete and implement the SW3P requirements.

1.5 DEMOLITION (BID ITEM 4)

A. Payment for demolition of the site shall be paid for on a lump sum basis. This price shall be full compensation for removing and disposing all items at the Confederate CCS site prior to construction. Payment shall include all costs associated with providing all labor, permits and fees, equipment, hauling of materials, and supervision necessary to demolish and dispose of existing pavement, fencing, trees, structures, concrete foundations, and additional items as shown in plans in accordance to the specifications.

1.6 GUARD SHACK AND SHADE STRUCTURE (BID ITEM 5)

A. Payment shall include all costs associated with providing all labor, equipment, materials and supervision necessary to anchor a guard shack and shade structure on site on a lump sum basis. Payment shall include all costs associated with providing all labor, equipment, and supervision necessary.

1.7 EXCAVATION (BID ITEM 6)

A. Payment will be made for providing all labor, equipment, materials, supplies, etc., necessary to excavate the road and drainage ponds to the elevations and grades shown on the plans. Payment will be made for the total excavation on a per-cubic yard of excavation. Subgrade preparation to receive concrete structures is incidental to this bid item.

1.8 EMBANKMENT FILL (BID ITEM 7)

A. Payment will be made for providing all labor, equipment, materials, supplies, etc., necessary to fill the areas shown to construct the access road and drainage channels as shown. Payment will be made for the actual measured cubic yardage of embankment fill. Subgrade preparation to receive concrete structures is incidental to this bid item.

1.9 2-INCH HMAC PAVEMENT, 8-INCH BASE COURSE, 12-INCH SUBGRADE PREP (BID ITEM 8)

A. Payment will be made for providing and installing 2-inch HMAC pavement, 8-inch base course and preparation of 12 inches of subgrade on a per square yard basis. Pavement shall include all costs associated with providing all labor, equipment, materials and supervision necessary to install the pavement sections to the grades shown on the plans in accordance with the specifications.

1.10 3.5-INCH HMAC PAVEMENT, 10-INCH BASE COURSE, 12-INCH SUBGRADE PREP (BID ITEM 9)

A. Payment will be made for providing and installing 3.5-inch HMAC pavement, 10-inch base course and preparation of 12-inch of subgrade on a per square yard basis. Pavement shall include all costs associated with providing all labor, equipment, materials and supervision necessary to install the pavement sections to the grades shown on the plans in accordance with the specifications.

1.11 7-INCH CONCRETE PAVEMENT, 4-INCH BASE COURSE, 12-INCH SUBGRADE PREP (BID ITEM 10)

A. Payment will be made for providing and installing 4-inch concrete pavement and reinforcement, 4-inch base course and preparation of 12-inch of subgrade on a per square yard basis. Pavement shall include all costs associated with providing all labor, equipment, materials and supervision necessary to install the pavement sections to the grades shown on the plans in accordance with the specifications. 6-inch ramps, transformer pad, condensing unit pad, bollards, and wheel stops are incidental to this bid item.

1.12 6-INCH ROCK RIP RAP AND FABRIC (BID ITEM 11)

A. Payment will be made for the installation of a 6-inch rock rip rap layer overlaying a geotextile fabric on a lump sum basis. Payment shall include all costs associated with providing all labor, equipment, materials and supervision necessary to install the 6-inch rock rip rap layer overlaying the geotextile. Such payment shall be complete compensation for the complete performance of the work in accordance with the drawings and the provisions of these specifications.

1.13 6-INCH CURB (BID ITEM 12)

A. Payment will be made for the installation of a 6-inch curb on a per linear foot basis. Payment shall include all costs associated with providing all labor, equipment, materials and supervision necessary to install the 6-inch curb. Such payment shall be complete compensation for the complete performance of the work in accordance with the drawings and the provisions of these specifications.

1.14 CONCRETE RETAINING WALL (BID ITEM 13)

A. Payment will be made for providing and installing the concrete retaining wall on a linear foot basis. Payment shall include all costs associated with providing all labor, equipment, materials, supervision, excavation, fine grading, curing, welding, painted steel posts and rails, steel embed

plates, steel C-channels, control joints, backfill, and all other appurtenances necessary to install the retaining wall as shown on the plans and in accordance with the specifications.

1.15 CHAIN LINK FENCE WITH 3-STRAND BARB WIRE AND SCREENING (BID ITEM 14)

A. Payment will be made for providing and installing the chain link fence with 3-strand barb wire and screening along the northern property boundary on a linear foot basis. Payment shall include all costs associated with providing all labor, equipment, materials, and supervision necessary to install the shown on the drawings and in accordance with the specifications.

1.16 CHAIN LINK FENCE WITH 3-STRAND BARB WIRE AND SCREENING ALONG CONFEDERATE ROAD (BID ITEM 15)

A. Payment will be made for providing and installing the chain link fence with 3-strand barb wire and screening along confederate road on a linear foot basis. Payment shall include all costs associated with providing all labor, equipment, materials, and supervision necessary to install the shown on the drawings and in accordance with the specifications. Sliding gates are incidental to this bid item.

1.17 FENCE SCREENING (BID ITEM 16)

A. Payment will be made for providing and installing fence screening to the existing chain link fence along the east and south property boundary on a linear foot basis. Payment shall include all costs associated with providing all labor, equipment, materials, and supervision necessary to install the shown on the drawings and in accordance with the specifications.

1.18 PAVEMENT STRIPING (BID ITEM 17)

A. Payment will be made for providing and installing pavement striping on a linear foot basis. Payment shall include all costs associated with providing all labor, equipment, materials and supervision necessary to install the pavement striping as shown on the plans and in accordance with the specifications.

1.19 PAVEMENT MARKING SYMBOLS (BID ITEM 18)

A. Payment will be made for providing and installing pavement marking symbols on a per each basis. Payment shall include all costs associated with providing all labor, equipment, materials and supervision necessary to install the pavement markings as shown on the plans and in accordance with the specifications.

1.20 CONCRETE SIDEWALK (BID ITEM 19)

A. Payment will be made for providing and installing the concrete sidewalk and ADA accessible ramps on a square yard basis. Payment shall include all costs associated with providing all labor, equipment, materials, and supervision necessary to install what is shown on drawings and in accordance with the specifications.

1.21 1-INCH SCHEDULE 80 WATER LINE (BID ITEM 20)

A. Payment will be made for providing and installing the 1-inch schedule 80 water line on a linear foot basis. Payment shall include all costs associated with providing all labor, equipment,

materials, and supervision necessary to install what is shown on drawings and in accordance with the specifications.

1.22 1.5-INCH WATER METER (BID ITEM 21)

A. Payment will be made for providing and installing the 1.5-inch water meter on a unit basis. Payment shall include all costs associated with providing all labor, equipment, materials, and supervision necessary to install what is shown on drawings and in accordance with the specifications.

1.23 SEWER CLEANOUT (BID ITEM 22)

A. Payment will be made for providing sewer cleanout on a unit basis. Payment shall include all costs associated with providing all labor, equipment, materials, and supervision necessary to install what is shown on drawings and in accordance with the specifications.

1.24 SEWER MANHOLE (BID ITEM 23)

A. Payment will be made for providing and installing the sewer manhole on a unit basis. Payment shall include all costs associated with providing all labor, equipment, materials, and supervision necessary to install what is shown on drawings and in accordance with the specifications.

1.25 6-INCH SEWER LINE (BID ITEM 24)

A. Payment providing and installing the 6-inch SDR 35 gravity sewer line on a linear foot basis. Payment shall include all costs associated with providing labor, equipment, materials, and supervision necessary to install what is shown on the drawings and in accordance with specifications.

1.26 SITE SIGNAGE (BID ITEM 25)

A. Payment will be made for the installation of site signage on per each basis. Payment shall include all costs associated with providing all labor, equipment, materials, and supervision necessary to install site signage. Such payment shall be complete compensation for the complete performance of the work in accordance with the drawings and provisions of these specifications.

1.27 LANDSCAPE AND IRRIGATION WORK (BID ITEM 26)

A. Payment will be made for providing and installing landscape and irrigation on a lump sum basis. Payment shall include all costs associated with providing all labor, equipment, materials, and supervision necessary to install what is shown on drawings and in accordance with the specifications.

1.28 BUILDING IMPROVEMENTS (BID ITEM 27)

A. Payment will be made for building improvements on a lump sum basis. Payment for furnishing and installing a toilet room, electrical room, and exterior door on the north side of the building. Payment shall include metal stud with gypsum board walls, doors, frames, door hardware, toilet room accessories, floor and wall finishes, acoustical and gypsum board ceilings, signage, wall access panel, painting, sealing, and fire extinguishers. Minor demolition to include the saw cutting of the existing slab for installation of plumbing lines. New concrete to patch

plumbing trenches, flush concrete with existing slab finish floor. Saw cut an opening for a new exterior door. Trim and seal around new door installation. Mechanical work includes plumbing piping, plumbing fixtures, heater, and condenser unit. Electrical work includes grounding system, service pole, weatherhead, riser, meter can, main disconnect, fusible/non-fusible disconnects, electrical racks, distribution panels, dry-type transformers, in-ground pullboxes, conduits and necessary accessories, wire/cables, interior and exterior light fixtures with accessories, receptacles, light switches, data connection points, preparation for camera locations, installation of any other electrical items indicated on Contractor drawings and all associated terminations. Payment shall include all costs associated with providing all labor, equipment, materials, and supervision necessary to install what is shown on drawings and in accordance with the specifications.

1.29 ELECTRICAL WORK (BID ITEM 28)

A. Payment will be made for the electrical site improvements on a lump sum basis. Electrical work includes grounding system, service pole, weatherhead, riser, meter can, main disconnect, fusible/non-fusible disconnects, electrical racks, distribution panels, dry-type transformers, in-ground pullboxes, conduits, trenching and backfill, wires/cables, area light fixtures with poles and foundations, interior and exterior light fixtures, receptacles, light switches, data connection points, preparation for camera locations, installation of Owner-provided compactor and guard shack, installation of any other electrical items indicated on Contract drawings, and all associated terminations. Payment includes full compensation for complete performance of the work in accordance with the drawings and provisions of these specifications.

PART 2 - ALTERNATES

A. Alternates quoted on Proposal forms will be reviewed and accepted or rejected at the Owner's option. Accepted alternates will be identified in the Owner-Contractor agreement.
B. Coordinate related work and modify surrounding work as required.
C. Schedule of Alternates:
   1. Alternate No. 1: Remove existing chain link fence and replace with wrought iron fence and gates along Confederate Drive.

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01039

COORDINATION AND MEETINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Coordination.
   2. Field engineering.
   3. Site mobilization conference.
   4. Preinstallation meetings.

B. Related Sections:
   1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 COORDINATION

A. Coordinate scheduling, submittals, and Work of the various Sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

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 Section in preparation for Substantial Completion and for portions of work designated for Owner's occupancy.

1.3 FIELD ENGINEERING

A. Control datum for survey is shown on Drawings.
B. Provide field engineering services. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.

1.4 SITE MOBILIZATION CONFERENCE

A. Engineer will schedule a conference at the Project site prior to Contractor occupancy.
B. Attendance Required: Engineer and Contractor's Project Manager, Jobsite Superintendent, and major subcontractors.
C. Agenda:
    1. Submission of 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 Engineer.
    5. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders and Contract closeout procedures.
    6. Scheduling.
    7. Use of premises by Owner and Contractor.
    8. Owner's requirements and partial occupancy.
    9. Construction facilities and controls provided by Owner, if any.
    10. Temporary utilities provided by Owner, if any.
    11. Survey layout and building layout.
    12. Security and housekeeping procedures.
    13. Schedules and Coordination.
    14. Procedures for testing.
    15. Procedures for maintaining record documents.
    16. Requirements for start-up of equipment.
    17. Inspection and acceptance of equipment put into service during construction period.
D. Engineer or his representative will record meeting minutes and distribute copies within three (3) days after meeting to participants and those affected by decisions made.

1.5 BI-WEEKLY MEETINGS

A. Biweekly meetings will be held at the work area on a day agreeable to all parties. At minimum, the meeting will be attended by the Contractor, major subcontractors and the Engineer. The purpose of the meeting is to:
    1. Review the work activity and location for the week.
    2. Discuss the Contractor's personnel assignment for the week.
    3. Review the previous week's activity.
    4. Review the work schedule.
    5. Discuss the possible problem areas and situations.
    6. Review of submittals schedule and status of submittals.
    7. Review of off-site fabrication and delivery schedules.
    8. Maintenance of progress schedule.
    9. Corrective measures to regain projected schedules.
    10. Planned progress during succeeding work period.
    11. Coordination of projected progress.

12. Maintenance of quality and work standards.
13. Effect of proposed changes on progress schedule and coordination.
14. Review status of "as-built" drawings prepared by Contractor to ascertain that Contractor is keeping "as-built" drawings CURRENT.
15. Other business relating to Work.

B. Engineer or his representative will record meeting minutes and distribute copies within three (3) days to Contractor, Owner, participants, and those affected by decisions made.

1.6 PREINSTALLATION MEETING

A. When required in individual specification Section, 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 Engineer 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. Engineer or representative will record minutes, and distribute copies within three (3) days after meeting to participants, with three copies to Engineer.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01090

REFERENCE STANDARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Quality assurance.
   2. Schedule of references.
B. Related Sections:
   1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 QUALITY ASSURANCE

A. For products or workmanship specified by association, trade, or Federal 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 for receiving bids.
C. Obtain copies of standards when required by Contract Documents.
D. Should specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.
E. 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.

1.3 SCHEDULE OF REFERENCES

AA	Aluminum Association 818 Connecticut Avenue, N.W. Washington, DC 20006
AABC	Associated Air Balance Council 1000 Vermont Avenue, N.W. Washington, DC 20005
AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol Street, N.W. Washington, DC 20001
ACI	American Concrete Institute Box 19150 Reford Station Detroit, MI 48219
ADC	Air Diffusion Council 230 North Michigan Avenue Chicago, IL 60601

AGA	American Gas Association 1515 Wilson Blvd. Arlington, VA 22209
AGC	Associated General Contractors of America 1957 E Street, N.W. Washington, DC 20006
AI	Asphalt Institute Asphalt Institute Building College Park, MD 20740
AIA	American Institute of Architects 1735 New York Avenue, N.W. Washington, DC 20006
AISC	American Institute of Steel Construction 400 North Michigan Avenue Eighth Floor Chicago, IL 60611
AISI	American Iron and Steel Institute 1000 16th Street, N.W. Washington, DC 20036
AMCA	Air Movement and Control Association 30 West University Drive Arlington Heights, IL 60004
ANSI	American National Standards Institute 1430 Broadway New York, NY 10018
APA	American Plywood Association Box 11700 Tacoma, WA 98411
ARI	Air-Conditioning and Refrigeration Institute 1501 Wilson Boulevard Arlington, VA 22209
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 1791 Tullie Circle, N.E. Atlanta, GA 30329
ASME	American Society of Mechanical Engineers 345 East 47th Street New York, NY 10017

ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103
AWI	Architectural Woodwork Institute 2310 South Walter Reed Drive Arlington, VA 22206
AWPA	American Wood-Preservers' Association 7735 Old Georgetown Road Bethesda, MD 20014
AWS	American Welding Society 550 LeJeune Road, N.W. Miami, FL 33135
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235
BHMA	Builders' Hardware Manufacturer Association 60 East 42nd Street, Room 511 New York, NY 10165
BIA	Brick Institute of America 11490 Commerce Park Drive Reston, VA 22091
CDA	Copper Development Association 57th Floor, Chrysler Building 405 Lexington Avenue New York, NY 10174
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

EJMA	Expansion Joint Manufacturers Association 25 North Broadway Tarrytown, NY 10591
FGMA	Flat Glass Marketing Association 3310 Harrison White Lakes Professional Building Topeka, KS 66611
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 1603 Orrington Avenue Evanston, IL 60201
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
MBMA	Metal Building Manufacturer's Association 1230 Keith Building Cleveland, OH 44115

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
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
NFPA	National Forest Products Association 1619 Massachusetts Avenue, N.W. Washington, DC 20036
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
NWMA	National Woodwork 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
PS	Product Standard U. S. Department of Commerce Washington, DC 20203
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 111 East Wacker Drive Chicago, IL 60601

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
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 01230

ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Administrative and procedural requirements for alternates.
B. Related Sections:
   1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
   1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
   2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
   1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
C. Execute accepted alternates under the same conditions as other work of the Contract.
D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Additive Alternate No. 1 – Steel Ornamental Fence System
   1. Base Bid: Provide and install 350 linear feet of 6-foot tall chain link fence, with 3-strand barbed wire, screening and gates along the west property line.
   2. Alternate: Provide and install 350 linear feet of 6-foot tall steel ornamental fence with gates along the west property line.

END OF SECTION

SECTION 01300

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Submittal procedures.
   2. Construction progress schedules.
   3. Proposed products list.
   4. Shop drawings.
   5. Product data.
   6. Samples.
   7. Design data.
   8. Test reports.
   9. Certificates.
   10. Manufacturers' instructions.
   11. Manufacturers' field reports.

B. Related Sections:
   1. Other Division 01 Specification Sections apply to Work of this Section.
   2. Section 01010 – General.
   3. Section 01700 - Contract Closeout: Contract warranty, manufacturer's certificates and closeout submittals.

1.2 SUBMITTAL PROCEDURES

A. Submit to Engineer 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.

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.

H. For each submittal for review, allow 14 calendar days for Engineer Review.

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 Engineer 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 Engineers 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 to be submitted, not digital files), Design Data, Test Reports, Certificates, Manufacturer's Instructions and Field Reports, Erection Drawings and any other type of submittal submitted to Engineer.

1.3 MASTER SUBMITTAL REGISTRY

A. Submit Master Submittal Registry for review within 15 calendar days of Notice to Proceed.

B. Submittal Registry shall include an itemized listing of all submittals proposed for the Project, date of when Contractor will submit each, and notification of any critical lead time submittals requiring an expedited review to maintain Project schedule.

1.4 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.

D. Engineer shall review each submittal and one (1) respective resubmittal at no cost to Contractor. Costs associated with resubmittal reviews beyond one (1) resubmittal is the Contractor's responsibility.

1.5 CONSTRUCTION PROGRESS SCHEDULES

A. Submit initial progress schedule for Engineer'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. 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.

F. Indicate estimated percentage of completion for each item of Work at each submission.

G. Submit separate schedule of submittal dates for shop drawings, product data, and samples, and dates reviewed submittals will be required from Engineer.

H. 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 including effect of changes on schedules of separate contractors.

1.6 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 24 x 36 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 Engineer 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 Engineer per other Division 01 sections 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 Engineer upon request. Cost of the files is $100.00 plus applicable taxes per drawing sheet. 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 Engineer. File will be provided through Engineer’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.

1.7 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.

1.8 DESIGN DATA

A. Submit for Engineer'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.

1.9 TEST REPORTS

A. Submit for Engineer'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.

1.10 CERTIFICATES

A. When specified in individual specification sections, submit certification by manufacturer, installation/application subcontractor, or Contractor to Engineer.
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 Engineer.

1.11 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.

1.12 MANUFACTURER'S FIELD REPORTS

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

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01356

STORM WATER POLLUTION PREVENTION MEASURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Where required, the Contractor shall develop a Storm Water Pollution Prevention Plan (SWPPP), file a Notice of Intent (NOI), and implement storm water pollution prevention measures shown on the drawings. The Contractor shall be responsible for any fines or penalties assessed by the appropriate regulatory agency for failure to make required inspections, failure to properly document those inspections, and/or failure to adequately implement and adjust the storm water pollution prevention measures where a SWPPP is implemented.

B. Related Sections:
1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 SUBMITTALS

A. Inspection Reports.

1.3 EROSION AND SEDIMENT CONTROLS

A. General
1. Structural measures shall be implemented to divert flows from exposed soils, temporarily store flows, or otherwise limit run-off and the discharge of pollutants from exposed areas of the site. Structural practices shall be implemented in a timely manner during the construction process to minimize erosion and sediment run-off.

B. Stabilized Ingress/Egress
1. Stabilized access to and from the construction site shall be installed as soon as practical where a SWPPP is required.
2. In all cases, Contractor shall ensure that any soil tracked off-site is cleaned from existing roads, alleys, and any adjacent properties as soon as possible. The Contractor or other responsible party shall check for any pollutants (mud, silt, sand, cement, construction materials, etc.) tracked or washed off-site and perform necessary clean-up measures at the end of each work day.

C. Silt Fences/Diversion Berms
1. Where necessary, the Contractor shall provide silt fences and/or diversion berms as a temporary structural practice to minimize erosion and sediment runoff. Silt fences and/or diversion berms shall be properly installed to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g. clearing and grubbing, excavation, embankment, and grading).

D. Sand/Gravel Bags
1. The Contractor may provide sand/gravel bags as a temporary structural practice to minimize erosion and sediment runoff. Bags shall be properly placed to effectively retain sediment immediately after completing each phase of work (e.g., clearing and grubbing, excavation, embankment, and grading) in each independent runoff area (e.g., after clearing and grubbing in an area between a ridge and drain, bags shall be placed as work

progresses, bags shall be removed/replaced/relocated as needed for work to progress in the drainage area). Sand/gravel bags must remain in good condition, or they shall be replaced.

E. Site Stabilization
   1. Contractor shall disturb the least amount of site area as possible.
   2. Stabilization measures may include any of the following measures:
      a. Temporary or permanent seeding or sodding.
      b. Mulching.
      c. Geotextiles.
      d. Vegetative buffer stips.
      e. Paving.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 STORM WATER POLLUTION PREVENTION PLAN

A. A SWPPP is only required if the limits of disturbance exceed 1.0 AC.
   1. NOTE: The limits of disturbance for this project <u>will</u> exceed 1.0 AC in size. Contractor must prepare and submit bid accordingly.

B. If limits of disturbance exceed 1 AC, the Contractor is responsible for meeting requirements of TPDES. (Contractor shall develop SWPPP, file a NOI and implement SWPPP measures).

C. A completed Construction Site Notice form in accordance with the requirements of the State's general permit for storm water discharges from construction sites will be prepared by the Contractor (where a SWPPP is required).

D. The SWPPP (where required) shall be continually updated as necessary to reflect current and changing conditions on site. Additional measures not specifically shown in the SWPPP may be used to control erosion from leaving the site.

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Quality assurance and control of installation.
   2. Tolerances.
   3. References.
   4. Move-up requirements.
   5. Inspection and testing laboratory services.
   6. Manufacturer's Field Services.
   7. Examination.
   8. Preparation.

B. Related Sections:
   1. Other Division 01 Specification Sections apply to Work of this Section.
   2. Section 01090 - Reference Standards.
   3. Section 01300 – Submittal Procedures: Submission of Manufacturers' Instructions and Certificates.
   4. Section 01550 - Material and Equipment: Requirements for material and product quality.

1.2 QUALITY ASSURANCE/CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
B. Comply fully with manufacturers' instructions, including each step in sequence.
C. If manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
D. Perform work by persons qualified to produce workmanship of specified quality.
E. Verify field measurements are as indicated on Shop drawing or as instructed by Manufacturer.

1.3 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. If manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.
C. Adjust products to appropriate dimensions; position before securing in place.

1.4 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 Engineer shall be altered from Contract Documents by mention or inference otherwise in any reference document.

1.5 INSPECTION AND TESTING LABORATORY SERVICES

A. Contractor will perform all quality control testing to assure construction meets the project specifications. Once the Contractor is satisfied he meets the specification requirements, he shall coordinate with Owner's representative for quality assurance (QA) testing.
B. Owner will appoint, employ, and pay for services of an independent firm to perform quality assurance testing.
C. The Contractor or the independent firm will perform inspections, tests, and other services specified in individual specification Sections and as required by the Engineer.
D. Reports will be submitted by the Contractor or the independent firm to the Engineer, in triplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
E. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Engineer. **Payment for retesting will be charged to the Contractor.**

1.6 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, start-up of equipment, test, adjust, and balance of equipment as applicable, and to initiate instructions when necessary.
B. Submit qualifications of observer to Engineer 30 days in advance of required observations. Observer subject to approval of Engineer.
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 01300 - Submittal Procedures, Manufacturers' Field Reports article.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
B. Verify existing 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.

END OF SECTION

SECTION 01420

REFERENCES

PART 1 - GENERAL

1.1 SUMMARY

A. Related Requirements:
   1. Other Divisions 01 Specification Sections apply to Work of this Section.

1.2 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.
B. "Approved": When used to convey Engineer's action on Contractor's submittals, applications, and requests, "approved" is limited to Engineer's duties and responsibilities as stated in the Conditions of the Contract.
C. "Directed": A command or instruction by Engineer. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
   1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."

B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. AABC - Associated Air Balance Council; www.aabc.com.
2. AAMA - American Architectural Manufacturers Association; www.aamanet.org.
3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
7. ABMA - American Boiler Manufacturers Association; www.abma.com.
8. ACI - American Concrete Institute; (Formerly: ACI International); www.abma.com.
9. ACPA - American Concrete Pipe Association; www.concrete-pipe.org.
10. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
11. AF&PA - American Forest & Paper Association; www.afandpa.org.
12. AGA - American Gas Association; www.aga.org.
13. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
14. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
15. AI - Asphalt Institute; www.asphaltinstitute.org.
16. AIA - American Institute of Architects (The); www.aia.org.
17. AISC - American Institute of Steel Construction; www.aisc.org.
18. AISI - American Iron and Steel Institute; www.steel.org.
19. AITC - American Institute of Timber Construction; www.aitc-glulam.org.
20. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
21. ANSI - American National Standards Institute; www.ansi.org.
22. AOSA - Association of Official Seed Analysts, Inc.; www.aosaseed.com.
23. APA - APA - The Engineered Wood Association; www.apawood.org.
24. APA - Architectural Precast Association; www.archprecast.org.
25. API - American Petroleum Institute; www.api.org.
26. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
27. ARI - American Refrigeration Institute; (See AHRI).
28. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
29. ASCE - American Society of Civil Engineers; www.asce.org.
30. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
31. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
32. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
33. ASSE - American Society of Safety Engineers (The); www.asse.org.
34. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.
35. ASTM - ASTM International; www.astm.org.
36. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
37. AWEA - American Wind Energy Association; www.awea.org.
38. AWI - Architectural Woodwork Institute; www.awinet.org.
39. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.

40. AWPA - American Wood Protection Association; www.awpa.com.
41. AWS - American Welding Society; www.aws.org.
42. AWWA - American Water Works Association; www.awwa.org.
43. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
44. BIA - Brick Industry Association (The); www.gobrick.com.
45. BICSI - BICSI, Inc.; www.bicsi.org.
46. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.org.
47. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
48. BWF - Badminton World Federation; (Formerly: International Badminton Federation); www.bissc.org.
49. CDA - Copper Development Association; www.copper.org.
50. CEA - Canadian Electricity Association; www.electricity.ca.
51. CEA - Consumer Electronics Association; www.ce.org.
52. CFFA - Chemical Fabrics and Film Association, Inc.; www.chemicalfabricsandfilm.com.
53. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
54. CGA - Compressed Gas Association; www.cganet.com.
55. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
56. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
57. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
58. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
59. CPA - Composite Panel Association; www.pbmdf.com.
60. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
61. CRRC - Cool Roof Rating Council; www.coolroofs.org.
62. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
63. CSA - Canadian Standards Association; www.csa.ca.
64. CSA - CSA International; (Formerly: IAS - International Approval Services); www.csa-international.org.
65. CSI - Construction Specifications Institute (The); www.csinet.org.
66. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
67. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.cti.org.
68. CWC - Composite Wood Council; (See CPA).
69. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
70. DHI - Door and Hardware Institute; www.dhi.org.
71. ECA - Electronic Components Association; (See ECIA).
72. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
73. ECIA - Electronic Components Industry Association; www.eciaonline.org.
74. EIA - Electronic Industries Alliance; (See TIA).
75. EIMA - EIFS Industry Members Association; www.eima.com.
76. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
77. ESD - ESD Association; (Electrostatic Discharge Association); www.esda.org.
78. ESTA - Entertainment Services and Technology Association; (See PLASA).
79. EVO - Efficiency Valuation Organization; www.evo-world.org.
80. FCI - Fluid Controls Institute; www.fluidcontrolsinstitute.org.
81. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.

82. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
83. FM Approvals - FM Approvals LLC; www.fmglobal.com.
84. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
85. FRSA - Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; www.floridaroof.com.
86. FSA - Fluid Sealing Association; www.fluidsealing.com.
87. FSC - Forest Stewardship Council U.S.; www.fscus.org.
88. GA - Gypsum Association; www.gypsum.org.
89. GANA - Glass Association of North America; www.glasswebsite.com.
90. GS - Green Seal; www.greenseal.org.
91. HI - Hydraulic Institute; www.pumps.org.
92. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
93. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
94. HPVA - Hardwood Plywood & Veneer Association; www.hpva.org.
95. HPW - H. P. White Laboratory, Inc.; www.hpwhite.com.
96. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
97. IAS - International Accreditation Service; www.iasonline.org.
98. IAS - International Approval Services; (See CSA).
99. ICBO - International Conference of Building Officials; (See ICC).
100. ICC - International Code Council; www.iccsafe.org.
101. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
102. ICPA - International Cast Polymer Alliance; www.icpa-hq.org.
103. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
104. IEC - International Electrotechnical Commission; www.iec.ch.
105. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
106. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
107. IESNA - Illuminating Engineering Society of North America; (See IES).
108. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
109. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
110. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
111. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
112. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
113. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
114. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
115. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
116. ISO - International Organization for Standardization; www.iso.org.
117. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
118. ITU - International Telecommunication Union; www.itu.int/home.
119. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
120. LMA - Laminating Materials Association; (See CPA).
121. LPI - Lightning Protection Institute; www.lightning.org.
122. MBMA - Metal Building Manufacturers Association; www.mbma.com.
123. MCA - Metal Construction Association; www.metalconstruction.org.

124. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
125. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
126. MHIA - Material Handling Industry of America; www.mhia.org.
127. MIA - Marble Institute of America; www.marble-institute.com.
128. MMPA - Moulding & Millwork Producers Association; www.wmmpa.com.
129. MPI - Master Painters Institute; www.paintinfo.com.
130. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
131. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
132. NACE - NACE International; (National Association of Corrosion Engineers International); www.nace.org.
133. NADCA - National Air Duct Cleaners Association; www.nadca.com.
134. NAIMA - North American Insulation Manufacturers Association; www.naima.orgwww.naima.org.
135. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
136. NBI - New Buildings Institute; www.newbuildings.org.
137. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
138. NCMA - National Concrete Masonry Association; www.ncma.org.
139. NEBB - National Environmental Balancing Bureau; www.nebb.org.
140. NECA - National Electrical Contractors Association; www.necanet.org.
141. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
142. NEMA - National Electrical Manufacturers Association; www.nema.org.
143. NETA - InterNational Electrical Testing Association; www.netaworld.org.
144. NFHS - National Federation of State High School Associations; www.nfhs.org.
145. NFPA - National Fire Protection Association; www.nfpa.org.
146. NFPA - NFPA International; (See NFPA).
147. NFRC - National Fenestration Rating Council; www.nfrc.org.
148. NHLA - National Hardwood Lumber Association; www.nhla.com.
149. NLGA - National Lumber Grades Authority; www.nlga.org.
150. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
151. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
152. NRCA - National Roofing Contractors Association; www.nrca.net.
153. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
154. NSF - NSF International; www.nsf.org.
155. NSPE - National Society of Professional Engineers; www.nspe.org.
156. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
157. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
158. NWFA - National Wood Flooring Association; www.nwfa.org.
159. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
160. PDI - Plumbing & Drainage Institute; www.pdionline.org.
161. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); www.plasa.org.
162. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
163. RFCI - Resilient Floor Covering Institute; www.rfci.com.
164. RIS - Redwood Inspection Service; www.redwoodinspection.com.
165. SAE - SAE International; www.sae.org.
166. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
167. SDI - Steel Deck Institute; www.sdi.org.

168. SDI - Steel Door Institute; www.steeldoor.org.
169. SEFA - Scientific Equipment and Furniture Association (The); www.sefalabs.com.
170. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
171. SIA - Security Industry Association; www.siaonline.org.
172. SJI - Steel Joist Institute; www.steeljoist.org.
173. SMA - Screen Manufacturers Association; www.smainfo.org.
174. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
175. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
176. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
177. SPIB - Southern Pine Inspection Bureau; www.spib.org.
178. SPRI - Single Ply Roofing Industry; www.spri.org.
179. SRCC - Solar Rating & Certification Corporation; www.solar-rating.org.
180. SSINA - Specialty Steel Industry of North America; www.ssina.com.
181. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
182. STI - Steel Tank Institute; www.steeltank.com.
183. SWI - Steel Window Institute; www.steelwindows.com.
184. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
185. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
186. TCNA - Tile Council of North America, Inc.; www.tileusa.com.
187. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
188. TIA - Telecommunications Industry Association (The); (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
189. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
190. TMS - The Masonry Society; www.masonrysociety.org.
191. TPI - Truss Plate Institute; www.tpinst.org.
192. TPI - Turfgrass Producers International; www.turfgrasssod.org.
193. TRI - Tile Roofing Institute; www.tileroofing.org.
194. UL - Underwriters Laboratories Inc.; www.ul.com.
195. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
196. USAV - USA Volleyball; www.usavolleyball.org.
197. USGBC - U.S. Green Building Council; www.usgbc.org.
198. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
199. WASTEC - Waste Equipment Technology Association; www.wastec.org.
200. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
201. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
202. WDMA - Window & Door Manufacturers Association; www.wdma.com.
203. WI - Woodwork Institute; www.wicnet.org.
204. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.
205. WWPA - Western Wood Products Association; www.wwpa.org.

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.
1. DIN - Deutsches Institut fur Normung e.V.; www.din.de.
2. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
3. ICC - International Code Council; www.iccsafe.org.
4. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.

1. COE - Army Corps of Engineers; www.usace.army.mil.
2. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
4. DOD - Department of Defense; www.quicksearch.dla.mil.
5. DOE - Department of Energy; www.energy.gov.
6. EPA - Environmental Protection Agency; www.epa.gov.
7. FAA - Federal Aviation Administration; www.faa.gov.
8. FG - Federal Government Publications; www.gpo.gov.
9. GSA - General Services Administration; www.gsa.gov.
10. HUD - Department of Housing and Urban Development; www.hud.gov.
11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; www.eetd.lbl.gov.
12. OSHA - Occupational Safety & Health Administration; www.osha.gov.
13. SD - Department of State; www.state.gov.
14. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; www.trb.org.
15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
16. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
17. USDJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
18. USP - U.S. Pharmacopeial Convention; www.usp.org.
19. USPS - United States Postal Service; www.usps.com.

E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
2. DOD - Department of Defense; Military Specifications and Standards; Available from DLA Document Services; www.quicksearch.dla.mil.
3. DSCC - Defense Supply Center Columbus; (See FS).
4. FED-STD - Federal Standard; (See FS).
5. FS - Federal Specification; Available from DLA Document Services; www.quicksearch.dla.mil.
   a. Available from Defense Standardization Program; www.dsp.dla.mil.
   b. Available from General Services Administration; www.gsa.gov.
   c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org/ccb.
6. MILSPEC - Military Specification and Standards; (See DOD).
7. USAB - United States Access Board; www.access-board.gov.
8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).

F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CBHF; State of California; Department of Consumer Affairs; Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation; www.bearhfti.ca.gov.
2. CCR; California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; www.calregs.com.
3. CDHS; California Department of Health Services; (See CDPH).
4. CDPH; California Department of Public Health; Indoor Air Quality Program; www.cal-iaq.org.
5. CPUC; California Public Utilities Commission; www.cpuc.ca.gov.
6. SCAQMD; South Coast Air Quality Management District; www.aqmd.gov.
7. TAS; Architectural Barriers Texas Accessibility Standards; www.tdlr.texas.gov/ab/abtas.htm.
8. TFS; Texas A&M Forest Service; Sustainable Forestry and Economic Development; www.txforestservice.tamu.edu.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Temporary Utilities: Electricity, water, and sanitary facilities.
   2. Temporary Controls: Barriers, water control, protection of the Work, and security.
   3. Construction Facilities: Progress cleaning and removal of utilities.

B. Related Sections:
   1. Other Division 01 Specification Sections apply to Work of this Section.
   2. Section 01700 - Contract Closeout: Final cleaning.

1.2 CONSTRUCTION ENTRANCE

A. Contractor shall coordinate with Owner and use operations entrance for site ingress/egress.

1.3 TEMPORARY ELECTRICITY

A. Contractor shall contact electric company to provide service for temporary power.

B. Owner will not pay cost of energy used. Exercise measures to conserve energy.

C. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required by Contractor's operations. Provide flexible power cords as required.

D. Provide main service disconnect and overcurrent protection at convenient location in conformance with National Electrical Code (NEC).

1.4 TEMPORARY WATER SERVICE

A. Contractor shall provide temporary water service for all purposes (potable and non-potable).

B. Owner will not pay cost of water used. Exercise measures to conserve water.

C. Contractor must provide a means at Contractor’s expense to pump the water from the source and load water transport vehicles.

1.5 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures.

B. Permanent building facilities shall not be used during construction operations. Maintain daily in clean and sanitary condition.

1.6 BARRIERS/TRAFFIC CONTROL

A. Provide barriers to prevent unauthorized entry to construction areas to allow for Owner's use of site, and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Furnish all necessary traffic control signs and flag personnel. The Contractor shall establish a parking area in a location approved by the engineer and Owner.

1.7 STORM WATER CONTROL

A. Grade site to drain. Maintain excavations free of water.
B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

1.8 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.

1.9 SECURITY/WORKING HOURS

A. Provide security and facilities to protect Work from unauthorized entry, vandalism, or theft. Cost for security shall be included in bid price.

1.10 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
B. Remove waste materials, debris, and rubbish from site and dispose on existing working face at intervals as required to maintain clean site.

1.11 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary above grade or buried utilities, equipment, facilities and materials as soon as permanent facilities can be utilized.
B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.
C. Clean and repair damage caused by installation or use of temporary work.
D. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01550

MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Products.
2. Product delivery, storage, and handling.
3. Product options.
4. Equipment list.
5. Substitutions.

B. Related Sections:
1. Other Division 01 Specification Sections apply to Work of this Section.
2. Section 01400 - Quality Control: Product quality monitoring.

1.2 PRODUCTS

A. Products mean new material, components, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work.

B. Provide interchangeable components of the same manufacturer, for similar components.

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery
1. Deliver materials, products and equipment to the project site in undamaged condition 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. Store sensitive products in weather-tight, climate controlled enclosures.
2. For exterior storage of fabricated products, place on sloped supports, above ground.
3. Provide off-site storage and protection when site does not permit on-site storage or protection.
4. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
5. Store loose granular materials on solid flat surfaces in a well-drained area. Provide cover to stockpile to prevent windblown contaminants from mixing with the stockpile. Granular materials shall not be stored on bare ground or asphalt surfaces.

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 Engineer 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 request with written approval of the Engineer.

C. Handling
1. Handle materials, products and equipment in a manner prescribed by manufacturer or specified to protect from damage during storage and installation.

1.4 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.

1.5 EQUIPMENT LIST

A. Submit in accordance with Section 01300 - Submittal Procedures.

1.6 SUBSTITUTIONS

A. Engineer will consider requests for substitutions only within 30 days after date established in Notice to Proceed.
B. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.
C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.
D. A request 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.
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 Engineer for review or redesign services associated with re-approval by authorities.
E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
F. Substitution Submittal Procedure:
1. Submit four (4) copies of request for Substitution for consideration. Limit each request to one proposed Substitution.

2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
3. The Engineer will notify Contractor, in writing, of decision to accept or reject request.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01560

ENVIRONMENTAL PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Related Sections:
   1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 REFERENCES

A. The listed publications form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.
   1. Code of Federal Regulations (CFR)
      a. 29 CFR 1910-Subpart G - Occupational Health and Environmental Control.
   2. Corps of Engineers (COE)
      a. COE EP-1165-2-304 - 1976 Flood Plain Regulations for Flood Plain Management.

1.3 DEFINITIONS

A. Sediment: Soil and other debris that have eroded and have been transported by runoff water or wind.
B. Solid Waste: Rubbish, debris, garbage, and other discarded solid materials resulting from industrial, commercial, and agricultural operations and from community activities.
C. Rubbish: Combustible and noncombustible wastes such as paper, boxes, glass, crockery, metal, lumber, cans, and bones.
D. Debris: Combustible and noncombustible wastes such as ashes and waste materials resulting from construction or maintenance and repair work, leaves, and tree trimmings.
E. Chemical Wastes: This includes salts, acids, alkalies, herbicides, pesticides, organic chemicals, and spent products which serve no purpose.
F. Sanitary Wastes: Sewage.
G. Wastes characterized as domestic sanitary sewage: Garbage.
   1. Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.
H. Oily Waste: Petroleum products and bituminous materials.

1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS

A. Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during normal construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Comply with Federal, state, and local regulations pertaining to the environment, including but not limited to water, air, and noise pollution.

B. Best Management Practices (BMPs)

1. Waste Materials

   a. All waste materials, including construction debris, shall be collected and stored in a securely lidded metal dumpster. No construction material shall be buried on site. The transit dumpster shall comply with ordinance 18.52.010 (enclosure and removal of waste materials during construction.) The dumpster shall be emptied as necessary or as required by ordinance 9.04 (solid waste management) and the trash shall be hauled to a licensed landfill.

2. Hazardous Waste

   a. At a minimum, any products in the following categories shall be considered hazardous: Paint, acids for cleaning masonry surfaces, cleaning solvents, asphalt products, chemical additives for spill stabilization, curing compounds and additives. In the event of a spill which may be hazardous, the Contractor shall take immediate action and contact the fire dept. and TCEQ.

3. Sanitary Waste

   a. All sanitary waste shall be collected from the construction portable units as necessary or as required, chapter 18.08 (building code), by a licensed sanitary waste management contractor. All waste material shall be the responsibility of the Contractor.

4. Spill Prevention - Practices to use for reducing the risk of spills or other accidental exposures of materials to storm water runoff.

   a. Good Housekeeping

      1) Store only enough products required to do the job.
      2) Neatly store materials on-site in an orderly manner.
      3) Keep products in their original container.
      4) Do not mix substances with one another, unless otherwise recommended by the manufacturer.
      5) Use entire contents of a product before disposing the container.
      6) Follow manufacturer's recommendations for proper use and disposal.

   b. Hazardous Products - <u>Practices used to reduce risks:</u>

      1) Keep products in their original container if at all possible.
      2) Retain original labels, product information and material safety data sheets (MSDS).
      3) Dispose surplus product in accordance with manufacturer's or local and state recommended methods.

   c. Petroleum Products:

      1) All on-site vehicles shall be monitored for leaks and receive regular preventive maintenance to reduce the chance of spills. Petroleum shall be stored in tightly sealed containers which are clearly labeled. Any asphalt substances used on-site shall be applied according to the manufacturer's recommendation.

5. Spill Control Practices:

   a. Manufacturer-recommended methods for spill cleanup shall be clearly posted and site personnel shall be made aware of the procedures.
   b. Materials and equipment necessary for spill cleanup shall be kept in the material storage area on-site.
   c. All spills shall be cleaned up immediately after discovery.
   d. Spill area shall be well ventilated and appropriate clothing will be worn.
   e. Any spill shall be reported to the appropriate governmental agency.
   f. Measures shall be taken to prevent a spill from reoccurring.

6. Maintenance and Inspection Procedures
   a. All pollution prevention measures shall be inspected at least once a month and following a storm event of 0.5 inches or more, best management practices and pollution control procedures shall be inspected for adequacy. A record of the result of the inspections of the site shall be kept on site.
7. Remarks
   a. Disposal areas, stockpiles, and haul roads shall be constructed in a manner that will minimize and control the amount of sediment that may enter receiving waters or streambeds. Construction staging areas and vehicle maintenance areas shall be constructed by the contractor in a manner to minimize the runoff of pollutants.

C. Storm Water Pollution Prevention Plan (SWPPP)
   1. The Contractor shall understand and sign the certification statement relating to the National Pollutant Discharge Elimination System (NPDES)
   2. The Contractor shall install erosion control measures as follows:
      a. Silt fencing or temporary berms shall be installed prior to start of construction.
      b. Temporary swales and desilting basins will be placed where necessary in order to convey stormwater run-off.
      c. A stabilized construction entrance will be provided to help reduce vehicle tracking of sediments. The paved street adjacent to the site entrance will be swept daily to remove any excess mud. Dirt or rock tracked from the site.
      d. The owner shall be responsible for insuring that all erosion control methods are inspected on a monthly basis or after every erodible rainfall (0.5 inches or more). Any necessary repairs or cleanup to maintain the effectiveness of the erosion control shall be made at that time.
      e. A temporary berm shall be provided at the toe of slope and lot line at time of grading.
      f. The measures listed are recommendations only. The Contractor shall make sure that the requirements of the NPDES are met.

D. Perform a preconstruction survey of the project site with the Engineer assess existing environmental conditions in and adjacent to the site.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES

A. Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work. Confine construction activities to within the limits of the work indicated or specified.

B. Land Resources

Except in areas to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without the Engineer's permission. Do not fasten or attach ropes, cables, or guys to existing nearby trees for anchorages unless authorized by the Engineer. Where such use of attach ropes, cables, or guys is authorized, the Contractor shall be responsible for any resultant damage.

1. Protection
   a. Protect existing trees which are to remain and which may be injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. By approved excavation, remove trees with 30% or more of their root systems destroyed.
2. Replacement
   a. Remove trees and other landscape features scarred or damaged by equipment operations, and replace with equivalent, undamaged trees and landscape features. Obtain Engineer's approval before replacement.
3. Temporary Construction
   a. Remove traces of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other signs of construction. Grade temporary roads, parking areas, and similar temporarily used areas to conform to surrounding contours.

C. Water Resources

1. Oily Wastes
   a. Prevent oily or other hazardous substances from entering the ground, drainage areas, or local bodies of water. Surround all temporary fuel oil or petroleum storage tanks with a temporary earth berm of sufficient size and strength to contain the contents of the tanks in the event of leakage or spillage.

D. Fish and Wildlife Resources

1. Do not disturb fish and wildlife. Do not alter water flows or otherwise significantly disturb the native habitat adjacent to the project and critical to the survival of fish and wildlife, except as indicated or specified.

3.2 HISTORICAL AND ARCHAEOLOGICAL RESOURCES

A. Carefully protect in-place and report immediately to the Engineer historical and archaeological items or human skeletal remains discovered in the course of work. Stop work in the immediate area of the discovery until directed by the Engineer to resume work. If historical and archaeological resources such as artifacts (stone tools), features (stone walls), deposits (sea shells and charcoal stained soil), human bones and other cultural remains are encountered, stop that portion of work and notify the Engineer immediately. Within 36 hours, the Owner will determine if a change pursuant to the Contract should be issued or to direct the Contractor to proceed without change. No adjustment in contract price or completion time will be allowed for delays that do not exceed 36 hours from the time the Contractor is notified to stop work. The Owner retains ownership and control over historical and archaeological resources.

3.3 EROSION AND SEDIMENT CONTROL MEASURES

A. Burnoff

1. Burnoff of the ground cover is not permitted.

B. Borrow Areas

1. Manage and control borrow areas to prevent sediment from entering nearby streams or lakes. Restore areas, including those outside the borrow areas, disturbed by borrow and

haul operations. Restoration includes grading, replacement of topsoil, and establishment of a permanent vegetative cover.

C. Protection of Erodible Soils

1. Immediately finish the earthwork brought to a final grade, as indicated or specified. Immediately protect the side slopes and back slopes upon completion of rough grading. Plan and conduct earthwork to minimize the duration of exposure of unprotected soils.

D. Temporary Protection of Erodible Soils

1. Mechanically retard and control the rate of runoff from the construction site. This includes construction of diversion ditches, benches, and berms to retard and divert runoff to protected drainage courses.

3.4 CONTROL AND DISPOSAL OF SOLID AND SANITARY WASTES

A. Pick up solid wastes, and place in containers which are regularly emptied. Do not prepare, cook, or dispose of food on the project site. Prevent contamination of the site of other areas when handling and disposing of wastes. On completion, leave the areas clean. Control and dispose of waste.

B. Disposal of Rubbish and Debris

1. Dispose of rubbish and debris in accordance with the requirements specified in area as directed by Owner. Rubbish may be disposed of in current landfill provided all rules for disposal are followed.

C. Garbage Disposal

1. Place garbage in approved containers, and move to a pickup point or disposal area, where directed.

3.5 DUST CONTROL

A. Contractor will be fully responsible for dust control along all haul roads and in the project area. Keep dust down at all times, including during nonworking periods. Sprinkle or treat, with dust suppressants, the soil at the site, haul roads, and other areas disturbed by operations.

END OF SECTION

SECTION 01600

PROGRESS SCHEDULES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. The work shall be executed with such progress as required to prevent any delay to other contractors, the contract milestones, or the general completion of the project.
   2. The Contractor shall provide a statement to the Engineer describing his computerized scheduling capability for review and approval. This statement shall include the following as a minimum:
      a. Identification, qualifications, and experience of the member(s) of the Contractor's scheduling staff or any other Consultant's staff.
      b. References of not less than two previous projects on which the Contractor or Consultant has utilized computerized CPM scheduling, which were of not less than one-quarter of the value of the present contract.
      c. The name and description of the project management software and computer hardware to be utilized on this Contract.

B. Related Sections:
   1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 CONSTRUCTION SCHEDULE

A. The Contractor shall show the sequence and interdependence of activities required for complete performance of all the work. The Contractor's Construction Schedule shall begin with the date of the Notice to Proceed and conclude with the date of Final Completion of the Contract. Float or slack time accrues to the benefit of the Owner but is a resource available to both parties as needed to meet contract milestones and the contract completion date. Accordingly, no time extensions will be granted nor delay damages paid until a delay occurs which extends the work beyond the Contract completion date.

B. Pursuant to the Float Sharing requirements of the Contract Documents, (1) use of float suppression techniques such as preferential sequencing, use of lead/lag logic restraints, extended Activity times, or imposed dates and (2) use of Float Time disclosed or implied by the use of alternate float suppression techniques shall be shared to the proportionate benefit of the Owner, Contractor, and Contractor's Subcontractors.

C. Comments made by the Engineer on the Contractor's Construction Schedule during review will not relieve the Contractor from compliance with requirements of the Contract Documents. This review is only for general conformance with the schedule concept of the project and general compliance with the information given in the Contract Documents."

1.3 SUBMITTALS

A. The Contractor shall submit the following items as specified in this section:
   1. Overall schedule
   2. Scheduled reports
   3. Progress Reports

1.4 PROGRESS OF THE WORK

A. General: The Contractor shall execute work at such times and on such parts of the project, and with such forces, materials, and equipment, to assure completion in the time established by the Contract.

B. Activity Coordination: To ensure consistency with General Contractor's breakdown of work and nomenclature, each Subcontractor shall work in concert with the General Contractor throughout all aspects of schedule development.

C. Activities

1. The work activities comprising the Contractor's Construction Schedule shall be of sufficient detail to assure adequate planning and execution of the work, such that the schedules provide an appropriate basis for monitoring and evaluating the progress of the work. A work activity is defined as an activity which requires time and resources (manpower, equipment, and/or material) to complete.
2. Show information in such detail that duration times of activities will range normally from one to fifteen calendar days. However, no activity shall have more than 30 calendar days' duration for any onsite operation. Selected exceptions may be approved by the Engineer where sub-networks will be used. The selection and number of the Contractor's construction activities shall be subject to review of the Engineer.
3. If requested by the Engineer, the Contractor, at the Contractor's sole expense, shall provide highly detailed short-term schedules for specific crucial items (work-arounds, start-up, etc.)

1.5 SCHEDULE

A. Preliminary Network Analysis: Within 15 calendar days after the date of Award of the Contract the Contractor shall submit a preliminary network analysis indicating the Contractor's planned operations for the first 60 days after the notice to proceed. This should also indicate the Contractor's general approach to the remainder of the work and the cost of activities expected to be completed or partially completed before submittal and review of the completed network analysis.

B. Completed Network Analysis: Within 45 calendar days after the date of Award of the Contract or ten (10) days after the Notice to Proceed, whichever date is earlier, the Contractor shall submit a completed CPM network analysis including diagrams, mathematical analysis, and computer printouts, as determined in consultation with the Engineer. This analysis is for review and acceptance as a condition precedent to approval of first pay application.

C. Detailed Network Diagram: The Contractor's Construction Schedule shall include time-scaled network diagrams based on calendar days. The network diagrams shall be Critical Path Method (CPM) precedence format and shall show the sequence and interdependence of activities required for complete performance of the work. A calendar shall be shown on all sheets.

D. Each activity shall be plotted so that the beginning and completion dates of said activity can be accurately determined by graphical comparison with the calendar scale.

1.6 SCHEDULED REPORTS

A. The Contractor shall prepare schedule listings of the information in the network diagram in tabular format, sorted according to early start, within responsibility, or as directed by Engineer.

B. The schedule listings shall show activity numbers, description, responsibility, total duration in work days, percent complete, early-start date, late-start date, early-finish date, and total float for each activity in the network diagram.

C. The Overall Schedule and subsequent revisions shall reflect actual progress of the project. The Contractor shall sign and submit one reproducible and three copies of the initial Overall Schedule and each revision.

D. If the initial submittal or a subsequent revision does not meet the requirements specified, the Contractor shall revise the Overall Schedule and resubmit until it is acceptable to the Engineer. Failure to submit and adequately update the Overall Schedule, and schedule reports, will be considered cause for withholding partial payments otherwise due under the Contract.

1.7 PROGRESS REPORTS

A. Once biweekly on a date mutually agreed upon by the Contractor, Owner's Representative, and Engineer, a meeting will be held at which time the schedule will be reviewed. Immediately prior to the meeting the Contractor shall obtain the necessary information to update the Overall Schedule to reflect progress to date and furnish sufficient copies of the updated schedule at the meeting for review.

B. The schedule provided by the Contractor at the biweekly meetings with the Engineer and Owner shall be a detailed 2-week look ahead schedule for the work to be performed during the current week and subsequent week period. This schedule shall be updated biweekly by the Contractor with copies available for the biweekly meetings. The Contractor shall invite his subcontractors to participate in the biweekly meetings, or if requested by the Engineer.

C. In updating the schedule, progress will be reviewed for the following items:
   1. To identify those activities started and completed during the previous period.
   2. For remaining duration, from the date of update, required to complete each activity started but not completed.
   3. For review of durations for activities not yet started.
   4. For addition of Change Orders and proposed sequencing changes to the network diagram and schedule listings.

D. At least once a month, and utilizing data accumulated during the previous joint Owner-Engineer-Contractor reviews, Contractor shall revise the network diagram and generate updated schedule reports.

E. Whenever revised scheduling documents are submitted, they shall be accompanied by a written narrative report. The narrative report shall:
   1. Describe amount of progress since the last revision in terms of activities started, continuing, and completed.
   2. Describe problem areas, current and anticipated delay factors, and the estimated impact on performance of other activities and completion dates.
   3. Explain corrective action taken or proposed.

1.8 MAINTAINING SCHEDULE

A. If at any time during the project the Contractor fails to complete an activity by its latest scheduled completion date, which late completion will impact the end date of the work past the Contract substantial completion due date, the Contractor shall submit within seven (7) calendar days plans to reorganize the work force to return to the original schedule for review and approval of owner.
B. The Contractor will add equipment, or construction forces, as well as increase working hours, if operations fall behind schedule at any time.
C. Addition of equipment or construction forces, increasing working hours, or other method, manner, or procedure to return to the contractually required completion date will not be justification for an increase in Contract Price or treated as an acceleration.
D. Contractor shall plan, schedule, and coordinate construction operations and activities in a manner that will facilitate progress of work.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Closeout procedures.
   2. Final cleaning.
   3. Adjusting.
   4. Hazardous materials affidavit.
   5. Project record documents.
   6. Operations and maintenance data.
   7. Warranties.
   8. Spare parts and maintenance materials.

B. Related Sections:
   1. Other Division 01 Specification Sections apply to Work of this Section.

1.2 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 Engineer's inspection.

B. Provide submittals to Engineer that are required by governing or other authorities.

C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.3 FINAL CLEANING

A. Execute final cleaning prior to final inspection.

B. Clean equipment and fixtures to a sanitary condition.

C. Replace filters of operating equipment.

D. Clean debris from roofs, gutters, downspouts, and drainage systems.

E. Clean site; sweep pave areas, rake clean landscaped surfaces.

F. Remove waste and surplus materials, rubbish, and construction facilities from the site.

G. Repair, patch and touch-up marred surfaces to match adjacent finishes.

H. Clean ducts, blowers and coils if air conditioning units were operated during construction.

I. Remove waste and surplus materials, rubbish, and construction facilities as directed by Engineer.

1.4 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

1.5 HAZARDOUS MATERIALS AFFIDAVITS

A. Contractor, each subcontractor, and each material/product supplier to provide a notarized affidavit declaring that hazardous materials were not incorporated into construction of nor 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 Names, Address and Phone and date of Construction Completion.
E. Provide two (2) complete, identical binders of aforementioned information in prescribed format.
F. Submit prior to final Application for Payment.

1.6 PROJECT RECORD DOCUMENTS

A. Maintain on site, two (2) sets of these record documents; record actual revisions to Work:
   1. Contract Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other Modifications to the Contract.
   5. Reviewed shop drawings, product data, and samples.
B. Store Record Documents separate from documents used for construction.
C. Record information concurrent with construction progress.
D. 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.
   3. Changes made by Addenda and Modifications.
E. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish first 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 and modification.
F. Submit documents to Engineer with claim for final Application for Payment.

1.7 OPERATION AND MAINTENANCE DATA

A. Submit one (1) copy 15 days prior to final inspection, 8 ½ x 11 inch text pages, bound in three (3) D-ring binders with durable plastic covers.
B. This copy will be returned after final inspection, with Engineer comments. Revise content of documents as required prior to final submittal.

C. Submit two (2) final volumes revised within ten days after final inspection.
D. Prepare binder covers with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS," title of project, and subject matter of binder when multiple binders are required.
E. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
F. Contents: Prepare a Table of Contents for each volume, with each Product or system description identified type on 24-pound white paper.
G. Part 1: Directory, listing names, addresses, and telephone numbers of Engineer, Contractor, Subcontractors, and major equipment suppliers.
H. 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:
    1. Significant design criteria.
    2. List of equipment.
    3. Parts list for each component.
    4. Operating instructions necessary for Owner to make full and efficient use of equipment including recommended maintenance and seasonal change-over procedures for HVAC systems.
    5. Maintenance instructions for equipment and systems.
    6. Maintenance instructions for finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.
I. Part 3: Project documents and certificates, including the following:
    1. Shop drawings and product data.
    2. Air and water balance reports.
    3. Certificates.
    4. Photocopies of warranties and bonds.

1.8 WARRANTIES

A. Provide duplicate notarized copies.
B. Execute and assemble documents from Subcontractors, suppliers, and manufacturers.
C. Provide Table of Contents and assemble with metal prong binder in durable plastic presentation cover.
D. Submit prior to final Application for Payment.
E. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

1.9 SPARE PARTS AND MAINTENANCE MATERIALS

A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification Sections.
B. Deliver to project site and place in location as directed; obtain receipt prior to final payment.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 02201

EXCAVATION, GRADING, AND SUBGRADE PREPARATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. All excavation, filling and grading in connection with the new roads and Citizen's Collection Station (CCS). Refer to the structural sections for structure foundation. Excavation, filling and grading shall conform to the lines and grades as shown on the plans. The Contractor shall furnish all materials, equipment, tools, labor, superintendence and incidentals necessary to complete the work in accordance with the drawings and as specified herein.

B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.

PART 2 - PRODUCTS

2.1 EMBANKMENT

A. Embankment shall be constructed to the lines and grades as shown on the plans or as directed by the Engineer, in approximately horizontal layers. Only suitable material, approved by the Engineer, shall be placed as embankment. The Contractor shall obtain borrow source if necessary to complete embankment areas. Material shall meet ASTM D2487 soil classification groups SP and SM, free of rock or gravel larger than 1 inch in any dimension, debris, waste or vegetation. The material shall have a PI less than 12. The existing surface on which fill is to be placed shall be scarified to a depth of approximately 12 inches prior to the placement of any fill material, in order to bond the fill to the existing surface. Any unsuitable subgrade materials below the finished subgrade excavation, shall be removed and replaced with suitable materials. No separate payment for removing and replacing such materials will be made and shall be incidental to subgrade preparation.

B. Placing and Compacting: After the existing surface has been prepared, acceptable fill material shall be deposited in loose layers and then wetted and thoroughly mixed to uniform optimum moisture content. The material shall then be spread in a uniform layer and compacted to the required density by any method, type and size of equipment which will give the required compaction. The depth of the layers shall depend upon the type of sprinkling and compacting equipment used. Additional water shall be added to maintain optimum conditions during the compaction, if required. If the material contains excess moisture, from rain or other sources, rolling shall be deferred until optimum conditions are reached. Succeeding layers shall be placed in a like manner. If a "crust" has formed on any layer before the succeeding layer is placed, this surface shall be scarified before additional fill material is placed on it. Material in soft places which develop under compaction shall be removed and replaced with other, acceptable, material so that uniform density is obtained throughout the fill. Areas not accessible to rolling equipment shall be compacted by hand tamping or other approved methods to a density equal to that of the remainder of the work. Under paved or concrete areas the material shall be compacted to 95% of maximum density or as shown on the plan, within ± 2% optimum moisture, as determined by ASTM D1557.

PART 3 - EXECUTION

3.1 EXCAVATION

A. General
   1. Excavation will consist of removing all material from areas where subgrade or finished grade is below existing ground. Excess excavated material not required, or otherwise unsuitable, for making necessary fills for items in this project shall be disposed of by the Contractor, as directed by the Engineer, in approved waste areas. No additional compensation will be made for hauling or disposing of waste material or excess excavation.

B. Existing Pavement, Curbs, Gutters, Sidewalks, Etc.
   1. All existing pavement, concrete curbs, trees, grass or other organic materials which are removed as excavation shall be classified as waste material and shall not be incorporated in fills unless specific direction to do so is given by the Engineer. Where sidewalks are removed, care shall be taken to avoid damage to that portion of the walk not requiring removal. Waste material shall be disposed of as provided herein.

C. Finishing
   1. All excavation shall be to the lines and grades as shown on the plans. Any excavation below such grade, and the consequential filling to the established grade, shall be done at the expense of the Contractor. Excavation beyond the ends of intersection stubs, between the curb and property line, or other transition areas, shall be finished neatly to the lines and grades shown on the plans or established by the Engineer.

D. Damage to Existing Pavement, Curbs, Utilities, Etc.
   1. Care shall be taken in all excavation work to avoid damage to existing pavement, curbs, utilities and other such installations. Should the installations mentioned above be damaged by the Contractor's forces or equipment, they shall be replaced or repaired, as directed, at the expense of the Contractor.

E. Unclassified Excavation
   1. All material excavated as part of this project shall be classified as Unclassified Excavation. Excavation shall be made to subgrade elevations indicated, regardless of character of materials and obstructions encountered.

3.2 EXCAVATION FOR STRUCTURES

A. Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 foot, and extend a sufficient distance from footings and foundations to permit placing and removal of concrete form work, installation of services, other construction, and inspection.
   1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade, trim bottoms to require lines and prior to placement of reinforcement and concrete, the base shall be compacted as herein specified.

3.3 DEWATERING

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

B. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to the 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 excavation.

C. 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.

3.4 COLD WEATHER PROTECTION

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

3.5 SUBGRADE FINISHING

A. The subgrade shall be finished accurately to the lines, grades and cross sections as shown on the plans or as established in the field. Subgrade in cut areas shall be brought to grade by blading or hand grading. The surface shall be compacted with an approved pneumatic roller followed by an approved three wheel roller until it presents a uniform compacted appearance. Subgrade in fill areas shall be compacted with an approved pneumatic roller. The final rolling of the last layer deposited shall be followed by blading and rolling with the 3-wheel roller as described.

B. The entire subgrade area shall be compacted to 95% of maximum density and within ±2% optimum moisture, as determined by ASTM D1557. Areas inaccessible to rolling shall be compacted by other approved methods to produce the same compaction. Moisture shall be maintained in the material, by sprinkling as required, during this operation.

C. Warped sections, valley gutters and other irregularities in section as shown on the plans or established in the field, shall be accurately formed in the subgrade during the finishing operation. Subgrade shall be checked by "teeing" from gutter to gutter on cross section and valley gutters and by means of a straightedge, longitudinally. A satisfactory straightedge shall be furnished by the Contractor if required. Variations of more than 0.05 inch from true grade or from true cross sections shall be corrected by loosening, adding or removing material, reshaping and re-compacting the area affected. "Blue tops" set to finished subgrade elevations shall be set in areas where the elevations cannot be checked as stated above.

3.6 ROLLING EQUIPMENT

A. Pneumatic rollers shall consist of not less than nine (9) pneumatic-tired wheels, running on two (2) axles in such a manner that the rear group of tires will not follow in the tracks of the forward group and shall be mounted in a rigid frame and provided with a loading platform or body suitable for ballast loading. The front axle shall rotate around a king pin so located that the roller may be turned within a minimum circle. The roller, under working conditions, shall have an effective rolling width of approximately 60 inches and shall give a minimum compression of 325 pounds/inch of width of tire tread. The roller shall be drawn by either a suitable pneumatic-tired tractor, or shall be of the self-propelled type.

B. Three Wheel Roller shall be a self-propelled type, weighing not less than ten (10) tons and shall provide a compression on the rear wheels of not less than 325 pounds/linear inch of width. The rear wheels shall be flat, shall have a diameter of not less than 48 inches and shall have a width of not less than 20 inches.

3.7 QUALITY CONTROL

A. One (1) field density test for each lift shall be required for each 500 square yards of prepared subgrade surface.

B. One (1) field density for every 50 linear feet along wall foundations.

END OF SECTION

SECTION 02230

BASE COURSE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Constructing the flexible base course at cut and removed portions of existing roadways. The Contractor shall furnish all materials, equipment, tools, labor, superintendence and incidentals for the complete construction of the base course in accordance with the drawings and these specifications.

B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 02201 - Excavation, Grading, and Subgrade Preparation.

PART 2 - PRODUCTS

2.1 FLEXIBLE BASE COURSE

A. The flexible base courses shall be constructed upon compacted subgrades specified in Section 02201 - Excavating, Grading, And Subgrade Preparation. The base courses shall provide foundation courses for Asphaltic Concrete Surface Courses and shall be constructed in one or more courses in conformity with the typical sections shown on the drawings and to the lines and grades established, compacted to not less than 98% per ASTM D1557.

B. The base courses shall be constructed in the locations indicated on the drawings or as necessary to reconstruct or repair pavement damaged or removed during construction of the pipeline and its accessories.

2.2 MATERIAL

A. The material shall be crushed and shall consist of durable particles of stone mixed with approved binding material. The base material shall be screened or partially screened or otherwise manipulated, prior to crushing, in order that all soil, clay and other objectionable material will be removed. Samples for testing the material shall be taken prior to the compaction operations.

2.3 GRADING

A. When properly slaked and tested by standard AASHTO Methods, the flexible base course material shall meet the requirements 1993 TxDOT-Standard Specification, Item 247, Flexible Base, Type A, Grade 2.

2.4 MATERIAL SOURCE

A. Material sources shall be in accordance with TxDOT-Standard Specification, Item 247.

2.5 CONSTRUCTION METHODS

A. Construction methods shall be in accordance with TxDOT-Standard Specification Construction Methods, Item 247.

PART 3 - EXECUTION

3.1 PAYMENT

A. Payment will be made for all work covered in this section at the contract unit price for base course as shown on the proposal. Such payment shall be complete compensation for the complete performance of the work in accordance with the drawings and the provisions of these specifications. No separate payment will be made for compliance with this section.

END OF SECTION

SECTION 02510

ASPHALT PAVEMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Surface course composed of mineral aggregate and bituminous material mixed in a central mixing plant and placed on a prepared course in accordance with these specifications and shall conform to the lines, grades, thicknesses, and typical cross sections shown on the plans.
   2. Each course shall be constructed to the depth, typical section, or elevation required by the plans and shall be rolled, finished and approved before the placement of the next course.

B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.

1.2 JOB EXPERIENCE

A. Asphalt pavement business firm shall have continuously been in business for a minimum of five (5) years in the commercial asphalt pavement business. Additionally, supervisor and/or project superintendent shall have a minimum of five (5) years' experience as an asphalt paver.

PART 2 - PRODUCTS

2.1 AGGREGATE

A. Aggregates shall consist of crushed stone or crushed gravel with or without sand or other inert finely divided mineral aggregate. The portion of materials retained on the No.8 sieve shall be known as coarse aggregate, the portion passing the No. 8 sieve and retained on the No. 200 sieve as fine aggregate, and the portion passing the No. 200 sieve a mineral filler.

B. Coarse Aggregate:
   1. Coarse aggregate shall consist of sound, tough, durable particles, free from adherent films of matter that would prevent thorough coating with the bituminous material. The percentage of wear shall not be greater than 40% when tested in accordance with ASTM C131. The sodium sulfate soundness loss shall not exceed 9%, after five (5) cycles, when tested in accordance with ASTM C88.
   2. Aggregate shall contain at least 60% by weight of crushed pieces having two (2) or more fractured faces and 75% having at least one (1) fractured face. The area of each face shall be equal to at least 75% of the smallest mid-sectional area of the piece. When two (2) fractured faces are contiguous, the angle between the planes of fractures shall be at least 30 degrees to count as two (2) fractured faces. Fractured faces shall be obtained by artificial crushing.
   3. The aggregate shall not contain more than 8%, by weight, of flat or elongated pieces. A flat particle is one having a ratio of width to thickness greater than five (5); an elongated particle is one having a ratio of length to width greater than five (5).

C. Fine Aggregate:

1. Fine aggregate shall consist of clean, sound, durable, angular particles produced by crushing stone or gravel that meets the requirements for wear and soundness specified for coarse aggregate. The aggregate particles shall be free from coatings of clay, silt, or other objectionable matter and shall contain no clay balls. The fine aggregate, including any blended filler, shall have a plasticity index of not more than six (6) when tested in accordance with ASTM D424 and a liquid limit of not more than 25 when tested in accordance with ASTM D423 or shall have a sand equivalent value not less than 45 in accordance with ASTM D2419.
2. Natural sand may be used to obtain the gradation of the aggregate blend or to improve the workability of the mix. The amount of sand to be added will be adjusted to produce mixtures conforming to requirements of this specification.

2.2 SAMPLING AND TESTING

A. ASTM D75 shall be used in sampling coarse and fine aggregate, and ASTM C183 shall be used in sampling mineral filler. The Contractor shall furnish documentation to the Engineer or his designated representative confirming that the aggregates meet specification requirements.

2.3 SOURCES OF AGGREGATES

A. Sources of aggregates shall be selected well in advance of the time the materials are required in the work. When the aggregates are obtained from a previously approved source or an existing source producing aggregates that has a satisfactory service record in bituminous pavement construction for at least five (5) years, samples shall be submitted 14 days prior to start of production. An inspection of the producer's operation will be made by the Engineer or his designated representative. When new sources are to be developed, the Contractor shall indicate the sources and shall submit a plan for operation 30 days in advance of starting production. Samples from test pits, borings, and other excavations shall be submitted at the same time. Approval of the source of aggregate does not relieve the Contractor in any way of the responsibility for delivery at the job site of aggregates that meet the requirements specified herein.

2.4 SAMPLES OF AGGREGATES

A. Samples of aggregates shall be furnished by the Contractor at the start of production or at every 500 tons with a minimum of two (2) per project. The sampling points will be designated by the Engineer or his designated representative. The samples will be the basis of approval of specific lots of aggregates from the standpoint of the quality requirements of this section.

2.5 FILLER

A. If filler, in addition to that naturally present in the aggregate, is necessary, it shall meet the requirements of ASTM D242.

2.6 BITUMINOUS MATERIAL

A. Bituminous material shall conform to AC-20 In accordance with ASTM D3381.
B. The Contractor shall furnish vendor's certified test reports for each tank load of bitumen shipped to the project. The report shall be delivered to the City Engineer or his designated

representative before permission is granted for use of the material. The furnishing of the vendor's certified test report for the bituminous material shall be the basis for final acceptance.

2.7 JOB MIX FORMULA

A. No bituminous mixture for pavement shall be produced until a job mix formula has been approved by the Engineer or his designated representative. The formula shall be submitted in writing by the Contractor to the Engineer or his designated representative at least ten (10) days prior to the start of paving operations and shall indicate the definite percentage of each sieve fraction of aggregate, the percentage of bitumen, and the temperature of the completed mixture when discharged from the mixer. All test data used to develop the job mix formula shall also be submitted. The job mix formula for each mixture shall be in effect until modified in writing by the Engineer or his designated representative. Should a change in sources of materials be made; a new job mix formula must be established before the new material is used.

2.8 BITUMINOUS MIXTURE.

A. The bituminous mixture shall be designed using procedures contained in Chapter III, Marshall Method Of Mix Design, of the Asphalt Institute's Manual Series No. 2 (MS-2), current edition, and shall meet the requirements of Tables 1 and 2. The temperature of the mix immediately prior to compaction shall be 250° ± 5°F.

TABLE 1 - MARSHALL DESIGN CRITERIA

Test Property	
Number of Blows	75
Stability, minimum pounds	1500
Flow, 0.01 in. (0.25mm)	8-16
Percent air voids	3-5
Percent voids in mineral aggregate	See Table 2

TABLE 2 - MINIMUM PERCENT VOIDS IN MINERAL AGGREGATE

Maximum Particle Size		Minimum Voids in Mineral Aggregate
In	mm	Percent
3/4	19.0	15
1	25.0	14
1-1/4	31.25	13

B. The mineral aggregate shall be of such size that the percentage composition by weight, as determined by laboratory screens, will conform to the gradation or gradations specified in Table 3 when tested in accordance with ASTM Standard C136 d (dry sieve). The percentage by weight for the bituminous material shall be within the limits specified.

C. The gradations in Table 3 represent the limits which shall determine the suitability of aggregate for use from the sources of supply. The aggregate, as finally selected, shall have a gradation within the limits designated in Table 3 and shall not vary from the low limit on one (1) sieve to the high limit on the adjacent sieve, or vice versa, but shall be uniformly graded from coarse to fine.

TABLE 3 - AGGREGATE BITUMINOUS PAVEMENT SPECIFICATION GRADATION BAND

Sieve	Percentage by Weight Passing Sieves	
	TYPE C	TYPE D
Size:	3 / 4" max	
1¼ in	---	---
1 in	---	---
3/4 in	100	---
5/8 in	95 -100	---
1/2 in	-----	100
3/8 in	70-85	85-100
No.4	43-63	50-70
No.10	30-40	32-42
No.40	10-25	11-26
No.80	3-13	4-14
No.200	1-6	1-6
Bitumen Percent		
Stone	4.5 - 7.0	4.8-5.5
Gravel	5.0 - 9.0	

D. The job mix tolerances shown in Table 4 shall be applied to the job mix formula to establish a job control grading band. The full tolerances still will apply if application of the job mix tolerances results in a job control grading band outside the master grading band.

TABLE 4 - JOB MIX FORMULA TOLERANCES
(Based on a Single Test)

Material	Tolerance Plus or Minus
Aggregate Passing No.4 Sieve or Larger	7 %
Aggregate Passing Nos. 8 and 16 sieves	6 %
Aggregate Passing Nos. 30 and 50 sieves	5 %
Aggregate Passing Nos. 100 and 200 sieves	3 %
Bitumen	0.45 %
Temperature of Mix	20°F

E. Materials complying with TxDOT Specifications will be accepted for consideration in lieu of materials mentioned above. Written approval from the Engineer or his designed representative is required before use of proposed (TxDOT) specifications.

F. Deviation from the final approved design for bitumen content and gradation of aggregates shall not be greater than the tolerances permitted and shall be based on daily plant extraction. Extraction tests for bitumen content and aggregate gradation will be made at least twice daily. The mixture will be tested for bitumen content in accordance with AASHTO T30.

G. The completed mixture shall be sampled at the plant to retain job control. One (1) sample shall be taken from each sublot on a random basis, in accordance with procedures contained in ASTM D3665. The lot size shall be consistent with that specified in paragraph 4.12 (a). Testing shall be in accordance with the Marshall Method procedures contained in Chapter III of the Asphalt Institute Manual Series No.2 (MS-2), current edition, except the temperature of the mix prior to compaction shall be 250°F ± 5°F. If any two (2) consecutive Marshall Test results of any property do not conform to the requirements

shown in Tables 1 and 2, the Contractor shall take immediate corrective action. In no instance shall the percent air voids exceed ± 1% of the job mix formula value.

H. The Engineer or his designated representative may halt production if the Marshall Test criteria are not met and not allow it to resume until the problem is corrected.

I. If the index of retained strength of the specimens of composite mixture, as determined by ASTM D1075, is less than 75, the aggregates shall be rejected or the asphalt shall be treated with an anti-stripping agent. The amount of anti-stripping agent added to the asphalt shall be sufficient to produce an index of retained strength of not less than 75.

2.9 TEST SECTION

A. Prior to full production, the Contractor shall prepare a quantity of bituminous mixture according to the job mix formula. The amount of mixture should be sufficient to construct a test section 50 feet long and 12 feet wide placed in two (2) sections and shall be of the same depth specified for the construction of the course which it represents. The underlying grade or pavement structure upon which the test section is to be constructed shall be the same as the remainder of the course represented by the test section. The equipment used in construction of the test section shall be the same type and weight to be used on the remainder of the course represented by the test section.

B. If the test section should prove to be unsatisfactory, the necessary adjustments to the mix design, plant operation, and/or rolling procedures shall be made. Additional test sections, as required, shall be constructed and evaluated for conformance to the specifications. When test sections do not conform to specification requirements, the pavement shall be removed and replaced at the Contractor's expense. A marginal quality test section that has been placed in an area of little or no traffic may be left in place. If a second test section also does not meet specification requirements both sections shall be removed at Contractor expense. Full production shall not begin without the Engineer or his designated representative's approval.

2.10 TESTING LABORATORY

A. The testing laboratory used to develop the job mix formula and to perform the tests required by this specification shall meet the requirements of ASTM D3666. A certification that the laboratory meets these requirements shall be submitted to the Engineer or his designated representative.

PART 3 - EXECUTION

3.1 WEATHER LIMITATIONS

A. The bituminous mixture shall not be placed upon a wet surface or when the surface temperature of the underlying course is less than specified in Table

TABLE 5 - BASE TEMPERATURE LIMITATIONS

Mat Thickness (Minimum)	Base Temperature
3 in or Greater	40°F
Greater than 1 in but Less than 3 in	45°F
1 in or Less	50°F

3.2 BITUMINOUS MIXING PLANT

A. Plants used for the preparation of bituminous mixtures shall conform to the requirements of ASTM D995 with the following changes:

3.3 REQUIREMENTS FOR ALL PLANTS

A. Truck scales: The bituminous mixture shall be weighed on approved scales furnished by the producer, or on public scales at the producer's expense. Such scales shall be inspected and sealed as often as the Engineer or his designated representative deems necessary to assure their accuracy.

B. Testing laboratory: The Contractor or producer shall provide laboratory facilities for control and acceptance testing functions during periods of mix production, sampling, and testing and whenever materials subject to the provisions of these specifications are being supplied or tested. The laboratory shall provide adequate equipment, space, and utilities as required for the performance of the specified tests.

C. Inspection of plant: The Engineer or his designated representative shall have access, at all times, to all parts of the plant for checking adequacy of equipment; inspecting operation of the plant - verifying weights, proportions, and character of materials, and checking the temperatures maintained in the preparation of the mixtures.

D. Storage bins and surge bins: Paragraph 3.9 of ASTM D995 is deleted. Instead, the following applies. Use of surge bins or storage bins for temporary storage of hot bituminous mixtures will be permitted as follows:

1. The bituminous mixture may be stored in surge bins for period of time not to exceed three (3) hours, provided all specifications, temperature and segregation, requirements are fully met.
2. The bituminous mixture may be stored in insulated storage bins provided an inert gas atmosphere or oxygen proof hot oil seal is maintained in the bin during the storage period.
3. The bins shall be such that mix drawn from them meets the same requirements as mix loaded directly into trucks.
4. If the Engineer or his designated representative determines that there is an excessive amount of heat loss, segregation or oxidation of the mixture due to temporary storage, no storage will be allowed.

3.4 HAULING EQUIPMENT

A. Trucks used for hauling bituminous mixtures shall have tight, clean, and smooth metal beds. To prevent the mixture from adhering to them, the truck beds shall be lightly coated with a minimum amount of paraffin oil, lime solution, or other approved material. Each truck shall have a suitable cover to protect the mixture from adverse weather. When necessary, to ensure that the mixture will be delivered to the site at the specified temperature. Truck beds shall be insulated and covers shall be securely fastened.

B. All equipment used to haul material to the job site shall dump material directly unto the paver hopper, unless a low lift loader is used to transfer asphalt mix from windrow to paver hopper.

3.5 BITUMINOUS PAVERS

A. Bituminous pavers shall be self contained, power propelled units with an activated vibrating screed or strike off assembly, heated if necessary, and shall be capable of spreading and finishing courses of bituminous plant mix material which will meet the

specified thickness, smoothness, and grade. Pavers used for shoulders and similar construction shall be capable of spreading and finishing courses of bituminous plant mix material in widths shown on the plans.

B. The paver shall have a receiving hopper of sufficient capacity to permit a uniform spreading operation. The hopper shall be equipped with a distribution system to place the mixture uniformly in front of the screed. The screed or strike off assembly shall effectively produce a finished surface of the required evenness and texture without rearing, shoving, or gouging the mixture.

C. The paver shall be capable of operating at forward speeds consistent with satisfactory laying of the mixture.

D. If an automatic grade control device is used the paver shall be equipped with a control system capable of automatically maintaining the specified screed elevation. The control system shall be automatically actuated from either a reference line or surface through a system of mechanical sensors or sensor directed mechanisms or devices which will maintain the paver screed at a predetermined transverse slope and at the proper elevation to obtain the required surface. The transverse slope controller shall be capable of maintaining the screed at the desired slope within plus or minus 0.1%.

E. The controls shall be capable of working in conjunction with any of the following attachments:
   1. Ski type device of not less than 30 feet in length or as directed by the Engineer or his designated representative.
   2. Taut stringline (wire) set to grade.
   3. Short ski or shoe.

3.6 ROLLERS

A. Rollers of the steel wheel (minimum 15 tons), or pneumatic tired type (minimum 20 tons) may be used. Vibratory rollers may be used subject to approval, in writing, of the Engineer or his designated representative. The number, type, and weight of rollers shall be sufficient to compact the mixture to the required density while it is still in a workable condition. The use of equipment which causes excessive crushing of the aggregate will not be permitted.

3.7 PREPARATION OF BITUMINOUS MATERIAL.

A. The bituminous material shall be heated in a manner that will avoid local overheating and provide a continuous supply of the bituminous material to the mixer at a uniform temperature. The temperature of the bituminous material delivered to the mixer shall be sufficient to provide a suitable viscosity for adequate coating of the aggregate particles but shall not exceed 325°F.

3.8 PREPARATION OF MINERAL AGGREGATE

A. The aggregate for the mixture shall be dried and heated to the temperature designated by the job formula within the job tolerance specified. The maximum temperature and rate of heating shall be such that no permanent damage occurs to the aggregates. Particular care shall be taken that aggregates high in calcium or magnesium content are not damaged by overheating. The temperature shall not be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability.

3.9 PREPARATION OF BITUMINOUS MIXTURE

A. The aggregates and the bituminous material shall be weighed or metered and introduced into the mixer in the amount specified by the job mix formula.

B. The combined materials shall be mixed until the aggregate obtains a uniform coating of bitumen and is thoroughly distributed throughout the mixture. Wet mixing time shall be the shortest time that will produce a satisfactory mixture. It shall be established by the Contractor, based on the procedure for determining the percentage of coated particles described in ASTM D2489, and approved by the Engineer or his designated representative for each individual plant and for each type of aggregate used. The minimum mixing time shall be 25 seconds. The mixing time will be set to achieve 95% of coated particles. For continuous mix plants, the minimum mixing time shall be determined by dividing the weight of its contents at operating level by the weight of the mixture delivered per second by the mixer. The moisture content of the mix shall not exceed 1.0%.

3.10 TRANSPORTING, SPREADING, AND FINISHING

A. The mixture shall be transported from the mixing plant to the point of use in vehicles conforming to the requirements of Paragraph 3.4. Deliveries shall be scheduled so that spreading and rolling of all mixture prepared for one day's run can be completed during daylight, unless adequate artificial lighting is provided. Hauling over freshly placed material shall not be permitted until the material has been compacted, as specified, and allowed to cool to atmospheric temperature.

B. Immediately before placing the bituminous mixture, the underlying course shall be cleared of all debris with power blowers, power brooms, or hand brooms as directed.

C. The mix shall be placed at a temperature of not less than 250°F when asphalt cement is used and not less than 150°F when tar is used.

D. Upon arrival, the mixture shall be spread to the full width by an approved bituminous paver. It shall be struck off in a uniform layer of such depth that, when the work is completed, it shall have the required thickness and conform to the grade and contour indicated. The speed of the paver shall be regulated to eliminate pulling and tearing of the bituminous mat. Unless otherwise directed, placement of the mixture shall begin along the centerline of a crowned section or on the high side of areas with a 1-way slope. On streets with inverted crown, no joint will be placed at invert of street. The mixture shall be placed in consecutive adjacent strips having a minimum width of 12 feet except where edge lanes require less width to complete the area.

E. In a 2-layer operation the longitudinal joint in one layer shall offset that in the layer immediately below by at least 1 foot; however, the joint in the top layer shall be at the centerline of the pavement. Except on streets with inverted crowns, where the invert is at the center line of the street.

F. Transverse joints in one layer shall be offset by at least 2 feet from transverse joints in the previous layer. Transverse joints in adjacent lanes shall be offset a minimum of 10 feet.

G. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the mixture may be spread, raked, and luted by hand tools.

3.11 COMPACTION OF MIXTURE

A. After spreading, the mixture shall be thoroughly and uniformly compacted by rolling. The surface shall be rolled when the mixture has attained sufficient stability so that the rolling does not cause undue displacement, cracking or shoving. **No vibratory roller or any**

other type of vibratory machine shall be permitted without the written authorization from the Engineer or his designated representative. The sequence of rolling operations and the type of rollers used shall be at the discretion of the Contractor with approval from Engineer or his designated representative.

B. The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot mixture. Any displacement occurring as a result of reversing the direction of the roller, or from any other cause, shall be corrected at once.

C. Sufficient rollers shall be furnished to handle the output of the plant. Rolling shall continue until all roller marks are eliminated, the surface is of smooth uniform texture, free of segregation and voids and true to grade and cross section, and the required field density is obtained. No exposed aggregate will be accepted, failure to comply with this requirement, will result in complete removal and replacement of pavement.

D. To prevent adhesion of the mixture to the roller, the wheels shall be kept properly moistened, but excessive water will not be permitted.

E. In areas not accessible to the roller, the mixture shall be thoroughly compacted with hot hand tampers.

F. Any mixture that becomes loose and broken, mixed with dirt, or in any way defective shall be removed and replaced with fresh hot mixture and immediately compacted to conform to the surrounding area. This work shall be done at the Contractor's expense. Skin patching shall not be allowed.

G. A minimum prime coat coverage (CSSIH) of 0.25 gallons per square yard shall be placed on all new asphaltic pavement surfaces.

3.12 JOINTS

A. The formation of all joints shall be made in such a manner as to ensure a continuous bond between old and new sections of the course. All joints shall have the same texture, density, and smoothness as other sections of the course.

B. The roller shall not pass over the end of the freshly laid mixture except when necessary to form a transverse joint. When necessary to form a transverse joint, it shall be made by means of placing a bulkhead or by tapering the course, in which case the edge shall be cut back to its full depth and width on a straight line to expose a vertical face. In both methods all contact surfaces shall be given a tack coat of bituminous material before placing any fresh mixture against the joint.

C. Longitudinal joints which are irregular, damaged, or otherwise defective shall be cut back to expose a clean, sound surface for the full depth of the course. All contact surfaces shall be given a tack coat of bituminous material prior to placing any fresh mixture against the joint.

3.13 ACCEPTANCE SAMPLING AND TESTING OF BITUMINOUS MIXTURE (DENSITY)

A. Pavement density will be determined by comparing the density of cores or nuclear density machine taken from the compacted pavement to the density of laboratory compacted specimens.

1. Lot sizes.
   a. The pavement will be accepted for density on a lot basis. A lot will consist of one (1) day’s production.
2. Laboratory Density.
   a. The specimens shall be compacted in accordance with ASTM D6927. The temperature immediately prior to compaction shall be 250°F ± 5°. The sample of bituminous mixture can be placed in an oven for not more than 30 minutes

to maintain the heat, but it shall not be reheated if it cools below 250°F before use. The density of each specimen shall be determined in accordance with ASTM D2726 or D1188, whichever is applicable.

3. Core Density or Nuclear Density Machine.
   a. Cores or nuclear density machine for determining the density of the compacted pavement shall be taken as indicated in Paragraph 3.14. The density of each core shall be determined in accordance with ASTM D2726 or D1188, whichever is applicable. The density from nuclear density machine shall be determined in accordance with ASTM D2950.
4. Pavement Density.
   a. The target density (percent compaction) of each lot of in-place pavement shall be 98% of the average density of the laboratory prepared specimens. The pavement density shall be determined by dividing the core density of one (1) day's production by the average density of the laboratory prepared specimens.

3.14 ACCEPTANCE CRITERIA.

A. Surface / Smoothness Tests
   1. Tests for conformity with the specified crown and grade shall be made by the Contractor immediately after initial compaction. Any variation shall be corrected by the removal or addition of materials and by continuous rolling.
   2. The finished surface shall not vary more than 1/4 inches for the surface course when tested with a 16 foot straightedge applied parallel with, or at right angles to, the centerline.
   3. After the completion of final rolling, the smoothness of the course shall be tested by the Engineer or his designated representative; humps or depressions exceeding the specified tolerances shall be immediately corrected by removing the defective work and replacing with new material, as directed by the City Engineer or his designated representative. This shall be done at the Contractor's expense.
   4. The finished surfaces of bituminous courses shall not vary from the grade line, elevations, and cross sections shown on the contract drawings by more than 1/2 inch. The Contractor shall correct pavement areas varying in excess of this amount by removing and replacing the defective work. **Skin patching will not be permitted**.
   5. Segregation and/or exposed aggregate will not be accepted, failure to comply with this requirement, will result in complete removal and replacement of pavement at the contractor’s expense. Patching will not be accepted.
B. Sampling Pavement
   1. Core samples or Nuclear Density Machine for determination of the density of completed pavements shall be obtained by the Owner. The size, number, and locations of the samples will be as directed by the Engineer or his designated representative. Samples shall be neatly cut with a saw, core drill, or other approved equipment. The Contractor shall patch core locations in accordance with this specification, at no additional cost to the Owner. Density tests will be taken at every 500 square yards or at every 200 linear feet of street with a minimum of two (2) densities taken for each street.
C. Thickness
   1. Thickness shall be evaluated for compliance to the requirements shown on the plans. At the discretion of the Engineer or his designated representative, the thickness of the pavement course shall be determined by cores taken at locations indicated by the Engineer or his designated representative. Contractor shall patch, core locations in accordance with this specification, at no additional cost to the Owner.

D. Mat Density
   1. Shall comply with Paragraph 3.13.
   2. All tests necessary to determine conformance with requirements specified in this item will be performed by the Engineer or his designated representative without cost to the Contractor. All failures shall be paid by the Contractor.

3.15 TESTING REQUIREMENTS

A. ASTM C29 - Unit Weight of Aggregate.
B. ASTM C88 - Soundness of Aggregates by Use of Magnesium Sulfate.
C. ASTM C131 - Resistance to Abrasion of Small Size Coarse Aggregate by Use of the Los Angles Machine.
D. ASTM C136 - Sieve or Screen Analysis of Fine and Coarse Aggregate Aggregates.
E. ASTM C183 - Sampling Hydraulic Cement.
F. ASTM D75 - Sampling Aggregates.
G. ASTM D423 - Liquid Limit of Soils.
H. ASTM D424 - Plastic Limit and Plasticity Index of Soils.
I. ASTM D995 - Requirements for Mixing Plants for Hot Mixed, Hot Laid Bituminous Paving Mixtures.
J. ASTM D1075 - Effect of Water on Cohesion of Compacted Bituminous Mixtures.
K. ASTM D1188 - Bulk Specific Gravity of Compacted Bituminous Mixtures Using Paraffin Coated Specimens.
L. ASTM D1461 - Moisture of Volatile Distillates in Bituminous Paving Mixtures.
M. ASTM D1557 - Tests for Moisture Density Relations of Soils and Soil Aggregate Mixtures, Using 10 pound (4.5 kg) Rammer and 18 inch (457mm) Drop.
N. ASTM D2172 - Quantitative Extraction of Bitumen from Bituminous Paving Mixtures.
O. ASTM D2419 - Sand Equivalent Value of Soil and Fine Aggregate.
P. ASTM D2489 - Degree of Particle Coating of Bituminous Aggregate Mixtures.
Q. ASTM D2726 - Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface Dry Specimens.
R. ASTM D3665 - Random Sampling of Paving Materials.
S. ASTM D3666 - Inspection and Testing Agencies for Bituminous Paving Materials.
T. ASTM D6927 - Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.
U. AASHTO T30 - Mechanical Analysis of Extracted Aggregate.
V. The Asphalt Model Construction Specifications for Institute's Asphalt Concrete and Other Plant Type Series (SS-1) Mixes.
W. The Asphalt Mix Design Methods for Asphalt Concrete Institute's Manual No.2 (MS-2)

3.16 MATERIAL REQUIREMENTS

A. ASTM D242 - Mineral Filler for Bituminous Paving Mixtures.
B. ASTM D490 - Tar.
C. ASTM D946 - Asphalt Cement for Use in Pavement Construction.
D. ASTM D3381 - Viscosity Graded Asphalt Cement for Use in Pavement Construction.
E. AASHTO M226 - Viscosity Graded Asphalt Cement.

3.17 PAYMENT

A. Payment will be made for all work covered in this section at the contract unit price per square yard as shown on the proposal. Either such payment shall be complete

compensation for the complete performance of the work in accordance with the drawings and the provisions of these specifications.

END OF SECTION

SECTION 02513

PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. 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 Engineer.

B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.

PART 2 - PRODUCTS

2.1 PARKING LOT PAVEMENT MARKING

A. Furnish in accordance with TxDOT DMS-8200, “Traffic Paint.”
B. Glass Traffic Beads. Furnish drop on glass beads
C. Labeling - use clearly marked containers that indicate color, mass, material type, manufacturer.

2.2 ROADWAY PAVEMENT MARKINGS

A. Materials: Use materials that produce an adherent, retroreflective pavement marking system that meets all of the performance requirements of this Specification. Use materials that do not result in the generation of any hazardous materials/wastes. If requested, provide a laboratory report from a commercial laboratory indicating material used does not result in the generation of any hazardous materials/wastes during application or removal.

B. Use a multipolymer resin material, as follows:
   1. 2-component (a predominantly multipolymer pigmented resin component with a curing agent component).
   2. 100% solids, producing no toxic fumes when heated to application temperature.
   3. Track-free in less than 40 min. with appropriate ambient temperature as recommended by the manufacturer.
   4. Formulated and tested to perform as a pavement marking material with glass spheres applied to the surface.
   5. On the TxDOT Material Producer List for Pavement Markings (Multipolymer).

C. Before work begins, provide a laboratory report from an independent testing laboratory showing that the initial color of each material selected for use conforms to the color limits set forth in Table 1, measured by 45°/0° geometry CIE, D65 Illuminant, 2° standard observation angle in accordance with ASTM E1347, E1348, or E1349.

PART 3 - EXECUTION

3.1 CONSTRUCTION METHODS

A. Weather Limitations
   1. Apply markings on surfaces with a minimum surface temperature of 50ºF, when measured in accordance with TxDOT test method Tex-829-B.
   2. Apply markings during good weather unless otherwise directed. If markings are placed at Contractor option when inclement weather is impending and the markings are damaged by subsequent precipitation, the Contractor is responsible for all costs associated with replacing the markings if required.

B. Equipment
   1. Parking Lot Pavement Markings. Use pavement marking application equipment when:
      a. It is maintained in satisfactory condition.
      b. Meets or exceeds the requirements of the National Board of Fire Underwriters and Texas Railroad Commission for this application.
      c. Uses an automatic bead dispenser attached to the pavement marking equipment.
      d. Can provide continuous mixing and agitation of the pavement marking material.
      e. Lines with clean edges, uniform cross-section and thickness, and reasonably square ends.
      f. Beads uniformly and almost instantly upon the marking as the marking is being applied.
      g. Beads uniformly during the application of two adjacent lines. Each line must have an equivalent bead yield rate and embedment.
      h. Type II and Type III beads from separate bead applicators, when applying a combination of Type II and Type III beads.
   2. Roadway Pavement Markings. Use pavement marking application equipment as follows:
      a. A minimum of 40,000 feet of 4 inch solid or broken markings per day at the specified thickness over five consecutive days.
      b. Linear markings up to 8 inch wide in a single pass.
      c. Markings other than solid or broken lines at an approved rate.
      d. A center-line and no-passing barrier-line configuration consisting of one (1) broken line with two (2) solid lines at the same time to the alignment, spacing, and thickness shown on the plans.
      e. White lines from both sides.
      f. Lines with clean edges, uniform cross-section and thickness, and reasonably square ends.
      g. Skip lines between 10 and 10-1/2 feet, an approximate stripe-to-gap ratio of one-to-three, and a stripe-gap cycle between 39-1/2 feet and 40-1/2 feet.
      h. Beads uniformly and almost instantly upon the marking as the marking is being applied.
      i. Beads uniformly during the application of two (2) adjacent lines. Each line must have an equivalent bead yield rate and embedment.
   3. Additional Roadway Pavement Markings Equipment.
      a. Provide a colorimeter using 45°/0° geometry CIE, D65 Illuminant, 2° standard observation angle meeting the requirements of ASTM 1347, E1348, or E1349.
      b. Provide a portable retro-reflectometer meeting the requirements of ASTM E1710.

3.2 CONSTRUCTION

A. Place markings before opening to traffic unless short-term or work zone markings are allowed.
B. Obtain approval for the sequence of work and estimated daily production.
C. Apply markings on pavement that is completely dry and passes the following tests:
D. Place a 1 square foot, clear piece of plastic on the pavement and weigh down the edges. The pavement is dry if, after observation for 15 minutes, no condensation occurs on the underside of the plastic.

3.3 PARKING LOT PAVEMENT MARKINGS

A. Apply markings:
   1. Using dimensions, colors and at locations shown in the plans.
   2. In proper alignment with the guides without deviating from the alignment more than 2 inch maximum.
   3. Free of blisters and with no more than 5%, by area, holes or voids.
   4. With uniform cross section and thickness.
   5. With clean and reasonably square ends.
   6. Using personnel skilled and experienced with installation of pavement markings.
   7. Remove all applied markings that are not in alignment or sequence as stated in the plans or as stated in the specifications at the Contractor's expense.
   8. Apply glass beads immediately following markings to ensure adequate embedment before marking dries.
B. Surface Preparation. Unless otherwise shown on the plans, prepare surfaces in accordance with this section.
C. Cleaning and Retracing for Asphalt Surfaces. Air-blast or broom the pavement surface to remove loose material, unless otherwise shown on the plans.
D. Application
   1. Apply markings at an application rate of 100 – 110 square feet per gallon for a solid 4 inch line and same rate adjusted proportionally for other widths. The addition of thinner will not be permitted.

3.4 ROADWAY PAVEMENT MARKINGS

A. Apply Markings:
   1. According to the multipolymer manufacturer's recommendations using widths, colors, and shapes, and at locations as shown on the plans.
   2. Establish guides to mark lateral location of pavement and have guide locations verified using materials that will not leave a permanent mark on roadway.
   3. In proper alignment with the guides without deviating from the alignment more than 1 inch per 200 feet of roadway or mare than 2 inch maximum.
   4. With uniform cross section and thickness.
   5. Using personnel skilled and experienced with installation of pavement markings.
   6. Remove all applied markings that are not in alignment or sequence as stated in the plans or as stated in the specifications at the Contractor's expense.
B. Surface Preparation. Prepare the pavement surface using controlled techniques that minimize pavement damage and hazards to the traveling public and must have prior approval by Engineer prior to commencing the operation.

3.5 INITIAL PERFORMANCE REQUIREMENTS

A. Meet the following initial performance requirements after installation. Perform an initial performance evaluation from 7 - 15 days after MPM are installed to verify that the MPM meet the performance requirements for retro-reflectivity. Conduct initial retro-reflectivity evaluations of placed pavement markings with a portable retro-reflectometer. The Contractor is responsible for traffic control when conducting performance evaluations.
   1. The Engineer will conduct a visual evaluation for color and durability and require testing only if MPM do not appear to meet the performance requirements.
   2. For MPM not meeting performance requirements, repair or replace until re-evaluation shows the MPM meet the performance requirements.

B. Color: Provide MPM consisting of pigments blended to provide color conforming to standard highway colors as shown in Table 1.

Table 1 - Color Requirements

Federal 595 Color		Chromaticity Coordinates								Brightness (Y)
		1		2		3		4		
		x	y	x	y	x	y	x	y	
White	17855	.290	.315	.310	.295	.350	.340	.330	.360	60 Min
Yellow	33538	.470	.455	.510	.489	.490	.432	.537	.462	30 Min
Black	-	-	-	-	-	-	-	-	-	5 Max

C. Retro-reflectivity. Provide MPM meeting the minimum retro-reflectivity values listed in Table 2.

Table 2 - Minimum Retro-reflectivity Requirements

Color	Retro-reflectivity, $mcd/m^2/lx$, Min
White	250
Yellow	175

D. Durability. Provide MPM that do not lose more than 5% of the striping material in a 1,000 foot section of continuous stripe or broken stripe (25 broken stripes). Pavement markings must remain in the proper alignment and location.

3.6 PERFORMANCE EVALUATIONS

A. Provide traffic control and conduct evaluations of color, retro-reflectivity, and durability as required or directed.

B. Color: Measure the color using 45°/0° geometry CIE, D65 Illuminant, 2° standard observation angle in accordance with ASTM E1347, E1348, or E1349.

C. Retro-reflectivity:
   1. Unless otherwise shown on the plans, conduct retro-reflectivity evaluations of pavement markings with a portable retro-reflectometer. Make all measurements in the direction of traffic flow, except for broken centerline on 2-way roadways, where measurements will be made in both directions.
   2. Take a minimum of one (1) measurement every half mile on each series of markings (i.e., edgeline, center skip line, each line of a double line, etc.), at approved locations. If more than one (1) measurement is taken, average the measurements. For all markings measured in both directions, take a minimum of one (1) measurement in each direction.

If the measurement taken on a specific series of markings within each mile segment falls below the minimum retro-reflectivity values, take a minimum of five (5) more measurements within that half mile segment for that series of marking. If the average of these five (5) measurements falls below the minimum retro-reflectivity requirements, that half mile segment of the applied markings does not meet the performance requirement.

D. Durability: Measure the durability in accordance with ASTM D913 for marking material loss and visual inspection for alignment and location. Conduct evaluations at approved locations.

END OF SECTION

SECTION 02600

SCHEDULE OF PIPE

PART 1 - GENERAL

1.1 SUMMARY

A. Related Sections:
1. Division 01 Specification Sections apply to Work of this Section.
2. Section 02610 – Pipe, Valves, and Fitting Materials

1.2 PIPE

A. Approved pipe shall be used in construction of all pipelines and connections. The only types of pipe which will be considered for use are those listed in this section. All pipe of like sizes shall be of the same type and class. Acceptable types and classes of pipe which may be approved for the various items of work are shown in the schedule below. See Section 02610 - Pipe, Valves, and Fitting Materials, of these specifications for other requirements.

PART 2 - PRODUCT

2.1 WATER

A. 1-inch Water Service Line - PVC, SCH 80.

2.2 SEWER

A. 6-inch Sewer Line - PVC, SDR 35, Solid Wall, Green in color.

PART 3 - EXECUTION

3.1 PAYMENT

A. Payment will be made for all work covered in this section at the contract unit price per unit or will be included in the lump sum price per job for items, as shown on the proposal. Either such payment shall be complete compensation for the complete performance of the work in accordance with the drawings and the provisions of these specifications. No separate payment will be made for compliance with this section.

END OF SECTION

SECTION 02610

PIPE, VALVES, AND FITTING MATERIALS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Materials for all relocated piping, valves, and fittings required for installation of proposed storm sewer.
   2. The Contractor shall furnish all materials, equipment, tools labor, superintendence, and incidentals required for the complete construction of the work as shown on the drawings and as specified herein. All pipe and fittings used for this project are to be new. PVC and ductile iron pipe shall be properly restrained.

B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. 02600 – Schedule of Pipe.

1.2 SUBMITTALS

A. Submit one (1) pipe supplier and provide documentation that proposed pipe meets the requirement set forth in Section 02600 – Schedule of Pipe.

1.3 CERTIFICATION

A. Certifications properly executed by the manufacturer shall be furnished to the Engineer showing compliance with the required specifications. All potable water pipe and fittings must conform to ANSI/NSF standard 61 and must be certified by an organization accredited by ANSI. Data resulting from tests performed shall be provided by the Contractor as requested by the Engineer.

1.4 INSPECTION

A. The Engineer and his representatives shall have access to all phases of the work. The manufacturer and Contractor shall provide proper facilities for access and inspection. Materials, fabricated parts, and pipe which are discovered to be defective, or which do not conform to the requirements of this Specification, will be subject to rejection at any time prior to final acceptance of the pipe.

PART 2 - PIPE MATERIALS

2.1 GENERAL

A. The Contractor shall supply all pipe required for the project. Refer to Section 02600 - Schedule of Pipe for minimum pressure class and wall thickness to be provided for the various types of pipe materials acceptable. The Contractor is responsible for verifying the availability of the acceptable pipe chosen for this project. The contract time will not be extended due to delays in pipe delivery. For design purposes all pressure pipe for this

project shall be of the sizes shown on the drawings, and shall be designed for a minimum rated working pressure of a minimum of **150 psi**, plus an additional surge pressure of **50 psi**. The pipe shall also be designed for the earth loads based upon a soil unit weight of 125-lbs/cu ft and the depths of cover as indicated on the drawings. In addition, 24,000-lb. wheel load and a 1.5 impact factor, using a Type 5 laying condition as defined by AWWA C151 shall be used. Bedding constant shall be 0.1 and the deflection lag factor shall be 1.1. The modulus of soil reaction (E') for design purposes shall be 700 psi. Design calculations shall be submitted to the Engineer for approval prior to the fabrication of any pipe.

2.2 PVC GRAVITY SEWER PIPE

A. PVC Gravity Sewer Pipe shall be unplasticized polyvinyl chloride plastic pipe conforming to ASTM F679 with an integral bell, bell-and-spigot type rubber gasketed joint, green in color.

B. Fillers shall not exceed 22 parts by weight to 100 parts by weight resin as tested per the Ash Burn Test ASTM D817. An Ash Burn Test per ASTM D817 shall be conducted on material at the job site to verify the filler content. The test will be conducted by a testing lab retained by the Engineer. If the filler exceeds the above requirement the pipe will be rejected and removed at the Contractors cost.

C. The pipe and fittings shall be made of PVC plastic having a minimum cell classification of 12454-B, 12454-C or 13364-B as defined in ASTM C1784. Rubber gaskets for joints shall conform to ASTM F477.

D. The spigot end of each length of pipe shall be tapered and shall have a painted mark indicating the proper depth of insertion into the bell. The joint shall be designed to avoid displacement of the gasket when installed in accordance with the manufacturer's recommendation.

E. The following physical and chemical tests shall be performed to demonstrate pipe quality and the manufacturer shall provide certified conformance test reports to the Engineer. Pipe shall be designed to pass all tests described herein at 73°F.

F. Determine the impact resistance of the pipe in accordance with ASTM D2444, using the 30-lb., Type B and flat plate holder B. Ten (10) specimens shall be tested. Failure in the test specimens shall be any shattering or any crack or split extending through the wall of the pipe that was created by the impact and that can be seen by the naked eye. Nine (9) out of ten (10) specimens passing constitute an acceptable product. The impact strength shall not be less than 220 ft. lbs.

G. Determine the pipe stiffness at 5% deflection datum in accordance with ASTM D2412. Test three specimens, minimum 12 inches long and determine the average pipe stiffness at 5% deflection in accordance with Method D2412. The pipe stiffness shall equal or exceed 46 psi.

H. Two (2) sections of pipe shall be assembled in accordance with the manufacturer's recommendation. Joint shall be assembled in accordance with ASTM D3212 - Joints for Drain and Sewer Plastic Pipe Using Flexible Elastomeric Seals.

I. Flatten three (3) specimens of pipe, each a minimum of 6 inches long between parallel plates in a suitable press until the distance between the plates is 40% of the outside diameter of the pipe. The rate of loading shall be uniform and such that the compression is completed within 2 to 5 minutes. The specimen shall pass if no splitting, cracking, or breaking is observed under normal light with the unaided eye.

2.3 PVC PRESSURE PIPE

A. PVC pressure pipe shall be unplasticized polyvinyl chloride plastic water pipe, green in color for wastewater and blue in color for water, with integral bell and spigot joints. Pipe 12 inches in diameter and smaller shall meet the requirements of AWWA C900, "Polyvinyl Chloride (PVC) Pressure Pipe," Pressure Class 150 (DR18). Pipe greater than 12 inches in diameter shall meet the requirements of AWWA C905, "Polyvinyl Chloride (PVC) Water Transmission Pipe," Pressure Rating 235(DR18). Provisions must be made for expansion and contraction at each joint with an elastomeric ring. The bell shall consist of an integral wall section with a locked in, solid cross section elastomeric ring, which meets the requirements of ASTM F477. The bell section shall be designed to be at least as hydrostatically strong as the pipe to meet AWWA C900/C905. The spigot end of each length of pipe shall be tapered and shall have a painted mark indicating the proper depth of insertion into the bell

B. The pipe shall withstand a minimum quick burst pressure of 755 psi when tested in accordance with ASTM C1599. The pipe shall withstand, with no visible evidence of shattering or splitting, when subjected to the drop impact test, an impact of 120 ft/lbs. in accordance with ASTM D2444.

C. The PVC pressure pipe used to replace sanitary sewer lines shall meet the requirements of ANSI/AWWA C900-89 and shall be Class 150 (DR 18), green in color, and it shall be connected to existing sewer pipe at each end with adapter couplings having stainless steel hardware. The upstream end needs to be a rigid coupling.

D. The PVC pressure pipe used to relocate and/or replace existing water lines shall be rated for minimum working pressure of 150 psi and shall meet the requirements of either ANSI/AWWA C900-89, minimum DR 18, blue in color, or ANSI/AWWA C905-88, minimum DR 18, blue in color, with cast iron pipe O.D.

E. The minimum length of restrained joints shall be as indicated. The procedure and materials used for restraining the joints shall be as recommended by the pipe manufacturer. The Contractor shall submit the recommended procedure with details to the Engineer for field inspection purposes.

2.4 DUCTILE IRON PIPE

A. Ductile iron pipe shall conform to the requirements of AWWA C151. The pipe shall be of the sizes shown on the drawings, and it shall be of the pressure class indicated in Section 02600 - Schedule of Pipe, except where thicker pipe is required by AWWA C151 for a particular design condition.

1. Joints: Push-on joints shall be used to connect the sections of pipe, except where flanged, mechanical joints, or restrained joints are indicated on the drawings or in these specifications. The push-on joints shall conform to the requirements of AWWA C111. The mechanical joints and the flanged joints shall conform to the requirements of AWWA C110, and shall be rated for a minimum of **50 psi** working pressure. Any and all 4-inch, 6-inch or 8-inch ductile iron pipe utilized for water service or water distribution as part of this project shall utilize restrained joints. The mechanical joints and the flanged joints utilized for water service or water distribution shall conform to the requirements of AWWA C110, and shall be rated for a minimum of **150 psi** working pressure.
2. Interior Coating: The interior of the ductile iron pipe shall have an epoxy lining conforming to the requirements of ANSI/AWWA C116/A21.16-98. Minimum lining thickness shall be 40 mils. Acceptable coatings are Protecto 401 and Griffin

Pipe SewperCoat or approved equal. The coating on all field cut pipe shall be completed and conform to the coating suppliers and pipe manufacture's recommendations and specifications.

3. Exterior Coating: The ductile iron pipe shall be supplied an asphaltic varnish. The ductile iron pipe shall be encased in polyethylene film (double-wrap encasement, green in color) in accordance with the requirements of AWWA C105. The nominal minimum film thickness (each wrap) for low-density polyethylene shall be 8 mils, and the nominal minimum film thickness (each wrap) for high-density polyethylene shall be 4 mils. Where ductile iron pipe crosses underneath steel gas lines, Contractor shall install double wrap of polyethylene encasement. Double wrap encasement of pipe shall extend 25 feet past centerline of gas lines, on both sides of crossing.
4. Restrained Joints: Restrained joint pipe and fittings shall conform to the requirements of AWWA C110. Push-on Joints for such fittings shall conform to the requirements of AWWA C111. Restrained push-on joint pipe and fittings shall be capable of being deflected after assembly. Restrained joint pipe and fittings shall be American Cast Iron Pipe., Flex-Ring Joint or Lok-Ring Joint; U.S. Pipe TR Flex or equal. Any joint employing field-welded retainers is unacceptable.
5. The minimum length of restrained joints shall be as indicated s.

PART 3 - PIPE FITTINGS

3.1 POLYVINYL CHLORIDE PRESSURE (PVC) FITTINGS

A. The fittings for AWWA C900 and AWWA C905 PVC pipe shall be ductile or cast iron conforming to the requirements of ANSI/AWWA C110/A21.10-87, and shall be suitable for use with the specified PVC pipe with which they are used. For other classes and schedules of PVC pipe, the fittings shall have the same, or greater, respective class/schedule as that of the pipe with which they will be used. Fittings shall have elastomeric rings for sealing. Solvent welding will not to be acceptable. Where necessary, VINYL-iron PVC pipe to A/C pipe coupling adapter will be used for connecting to exiting A/C pipe.

B. Restrained Joints for PVC Pipe: Restrained joint devices for all PVC pipe shall incorporate a series of machined serrations (not "as cast") on the inside diameter to provide positive restraint, exact fit and 360 degree contact and support of the pipe wall. The solid back-up ring shall have a beveled leading edge to assure an exact fit behind the pipe bell. Restraint devices shall be of ductile iron, ASTM A536, Grade 65-45-12. Connecting bolts shall be of high strength, low alloy material in accordance with ANSI/AWWA C111/A21.11.

C. All restraint devices for PVC pipe shall have a working pressure rating equivalent to the full rated pressure of the PVC pipe on which they are installed, with a minimum 2:1 safety factor in any nominal pipe size. In addition, they shall meet or exceed the requirements of UNI-B-13-94. Notarized certification from the manufacturer of the joint restraint device shall be submitted. Restraint devices shall be Uni-Flange Block Buster Series 1300 manufactured by Ford or an Engineer approved equal.

3.2 DUCTILE IRON FITTINGS

A. Fittings for ductile iron pipe shall be cast iron or ductile iron and shall be end grooved, mechanical joint, flanged, or a combination as shown or required and shall conform to AWWA C110. In general, flange fittings shall be used on all exposed piping and all other fittings shall be mechanical joints. End grooved fittings shall only be used where shown on the drawings. All fittings or restrained joints shall be designed for a working pressure of a minimum of **50 psi** and an additional **50 psi** surge pressure.

B. The interior of ductile iron fittings shall have an epoxy lining conforming to the requirements of ANSI/AWWA C116/A21.16-98. Minimum lining thickness shall be 40 mils. Acceptable coatings are Protecto 401 and Griffin Pipe SewperCoat or approved equal. Exterior coating shall be for DIP specified herein before.

C. All ductile iron fittings shall be cast from the same quality of metal used in casting ductile iron pipe and shall be subjected to the same test requirements. Marking and weighing shall be as required for the ductile iron pipe.

D. All flanged fittings shall be faced and drilled in accordance with the standard drilling for ANSI B16.1 Class 125 flanges.

E. Bolts shall be of the length and diameter required by the ANSI specification for Class 125 flanges. Bolts and nuts shall be of best quality mild steel and shall be provided with hexagonal heads, except where other types of bolts are specified. Ring gaskets shall be used in all flanged joints and shall be rubber composition sheet packing, Rainbow, Durable Barlock or equal.

PART 4 - WATER SYSTEM

4.1 WATER SERVICE CONNECTIONS

A. Scope: This section covers the requirements for materials and installation of water. Furnish labor, materials, equipment, and incidentals necessary to install water service connections, complete for potable water supply. New water meters, unless otherwise specified, will be furnished by the Utility. All other materials required, including meter boxes, shall be furnished and installed by the Contractor.

B. Submittals: Submittals shall include certifications from manufacturers that the products comply with appropriate ASTM, AWWA, and Utility Standards.

C. Manufactured Products: Castings and Washer Nuts: Shall be of certified cast bronze composition, 85-5-5-5% per ASTM B62, fully formed, tapped threads meeting requirements of AWWA C-800 for underground service.

1. Gaskets: Shall be self-sealing, 100% neoprene or Buna-N rubber, formulated for water service.
2. Service Saddles: Shall be two (2) or three (3) piece all-bronze, double strap with National Coarse Class 2 thread. Saddles shall be suitable for Class 200 asbestos cement pipe, cast iron pipe and ductile iron pipe with double straps. Saddles for C-900 or C-905 PVC pipe shall be single strap. Saddle body shall extend 180-degrees around pipe. Acceptable manufacturers and models are as follows:
   a. Ford Meter Box Co - Model S90.
   b. James Jones Co. - J-996.
   c. A.Y. McDonald Mfg. Co. – 3805.
   d. Mueller - H-1344X.

3. Straps: Shall be silicon bronze, approximate tensile strength of 70,000 psi chamfered for easy nut starting and flattened to provide wide bearing surface
4. Valves: Shall be in accordance with Utility acceptable standards. Valves for copper pipe shall be bronze with minimum 85% copper content casting. Valves for PVC pipe shall be cast-iron and conform to requirements for Gate Valves.
    a. Corporation stops shall conform to the requirements of AWWA C800. Acceptable manufacturers are Ford Meter Box Co., Mueller or approved equal.
    b. Angle ball valves with padlock wings shall be copper flared inlet and female iron pipe thread outlet such as James Jones Company Model J-1965W, McDonald MFG Model 4606B, or approved equal. Outlet meter coupling nut shall be used for 3/4-inch and 1-inch meters. Valves for 1-1/2-inch and 2-inch meters shall be inlet female iron pipe by outlet oval flange ends.
5. Service Pipe: Shall be copper Type "K" for sizes up to and including 2-inch, meeting ASTM B88. Pipe for 3-inch services shall be 4-inch PVC per AWWA C-900, with reducers at meters. Pipe for 4-inch services and larger shall be PVC pipe per AWWA C-900.
6. Fittings: Shall be bronze for copper pipe. Fittings for PVC pipe shall be ductile iron. Meter Boxes: Shall be manufactured and installed in accordance with Utility Standard Details.

D. Installation: Service taps for 3/4-inch to 2-inch services shall be made with service saddle to be furnished and installed by the Contractor. No direct taps, (i.e. without the saddle), shall be made. Taps for 3-inch and 4-inch services shall be made using 4-inch tapping sleeve and valve. Copper service pipe attached to metallic water mains shall be insulated at the corporation stop with a dielectric insulator. Installation shall comply with Utility Standards for Excavating, Backfilling and Compacting.
    a. Multiple tapping, two or more taps on a length of pipe, shall not be on a common line parallel to the longitudinal axis of the pipe and shall be no closer than 18 inches on the longitudinal axis of the pipe.
    b. No splices shall be allowed in any portion of the service pipe run between the main line connection and the meter assembly. No dry or direct taps are authorized.
    c. When specified, meter installations larger than 1 inch shall be made with a bypass meter connection according to the following schedule:
        1) 1-1/2-inch and 2-inch meters - 1-inch bypass.
        2) 3-inch and 4-inch meters - 2-inch bypass.
        3) 6-inch and 8-inch meters - 3-inch bypass.

E. Existing Services: Where existing water services are indicated on the Drawings to be replaced, relocated, or reconnected to new water lines, the Contractor shall make prior arrangements with each water customer as to the time and length of shutdown necessary. The customer shall be notified 24 hours before any connections are made. A maximum shut-off time of 4 hours will be allowed for making connections, after which time the Contractor shall supply the customer with potable water from an approved source.

F. Metallic Tracer Tape: For 3-inch services and larger (i.e. PVC), width shall be a minimum of 6 inches or twice the line diameter. The burial depth shall not exceed 36 inches below final grade nor be at an elevation of less than 12 inches above the utility line. Recommended burial depth shall be according to the tape manufacturer. Color of tape shall conform to American Public Works Association (APWA) color code.

Acceptable manufacturer shall be THOR Enterprises, Inc., "Magnatec" or equivalent as approved.

G. Testing and Flushing Procedures: All services shall be pressure tested for leakage by opening the corporation or service valve at the main service connection point, maintaining the meter angle valve closed, and visually observing all connections and piping for leaks. If no leaks are observed, the service line shall then be flushed as follows. The angle valve is opened to "full" and then the corporation valve is slowly opened to full capacity. Water is allowed to flow until piping has been thoroughly flushed. Then the angle valve is slowly closed to prevent water hammer or shock pressure which might rupture the main or adjacent water service connections. If no customer piping is currently connected to the meter outlet connection, a fitted plug shall be used at the end of this connection to prevent the entrance of dirt or muddy water.

4.2 WATER METERS

A. Scope: This section provides the requirements for relocation and connection of existing water meters. Generally, the EPWU shall be responsible for replacement of meter valve as directed by EPWU representative meters within the EPWU distribution system.

B. Standards: All meters shall comply with applicable AWWA Standards. Such compliance shall be verified by an affidavit from the manufacturer/vendor.

1. If a meter is replaced, the meter shall be accompanied by a factory test tag certifying compliance with applicable AWWA accuracy standards.

C. Rejection of Meters: All meters failing to satisfy the requirements of applicable AWWA Standards and these Specifications shall be rejected. Replacement or repair of all rejected meters shall be paid for by the manufacturer.

4.3 CONCRETE METER BOXES

A. Contractor shall relocate existing meter boxes. Furnish labor, materials, equipment, and incidentals to remove existing and relocate pre-cast concrete meter boxes and vaults.

4.4 TAPPING SLEEVES AND PIPE COUPLINGS

A. Scope: The Contractor shall furnish labor, materials, equipment, and incidentals necessary to install tapping sleeves and pipe couplings as specified. All tapping sleeves and pipe couplings furnished for incorporation in the work shall be suitable for operation at pressures as specified for the pipelines in which they will be installed, including test pressures and surge allowances.

B. Submittals: The Contractor shall furnish all necessary shop drawings as required.

C. Cast Tapping Sleeves: Tapping sleeves shall be of suitable construction and reinforced to provide resistance to line pressures. They shall be designed for the pipe size and material on which they will be used. Tapping sleeves shall be built in halves for assembly around the main to be tapped.

1. The branch outlet shall have a flanged face for bolting to the tapping valve. The inside diameter of outlet branch shall be sufficiently larger than the nominal size to provide clearance for the full size cutters of the tapping machine.
2. Acceptable manufacturers shall be:
   a. Mueller Company.
   b. Kennedy Valve Squareseal.
   c. M&H.

3. Type 1: Cast tapping sleeve allows water to circulate between the sleeve and the outside surface of the pipe. Gaskets of suitable material, designed for use on potable water shall form watertight joints along the entire length of the sleeve. Circumferential joints at the ends of the run of the sleeves shall be sealed by mechanical joints, conforming to AWWA C-111 as to dimensions, clearances, and materials, except that gaskets and glands form mechanical joints shall be totally confined or compressed between ridges or grooves extending continuously for the full length of both halves of the sleeve casting. Bolts shall be located close to the outside of the gaskets and spaced so as to exert sufficient pressure to form a watertight joint and withstand stresses imposed by the intended use.
4. Type 2: Water is confined to the immediate area of the tap opening. The outlet half of each sleeve shall be fitted with a continuous gasket of approximately circular cross section, permanently cemented into a groove surrounding the outlet opening. The back half of each sleeve shall be fitted with elastomeric pads, a metal shoe, or other device for developing adequate pressure on the gasket to prevent leakage at any pressure within the design capacity of the pipe.
5. Protective Coating: All surfaces exposed to flow shall be coated in accordance with AWWA C-550.

D. Fabricated Tapping Sleeves: Fabricated tapping sleeves shall be rated for a working pressure of 150 psi. All tapping sleeves shall meet the following requirements:
1. Acceptable manufactures of fabricated tapping sleeves shall be:
   a. Ford- FTSC.
   b. JCM – 412.
   c. Romac - FTS 420.
2. Markings: Each tapping sleeve shall be permanently marked to identify the outer diameter size range.
3. Test Plug: Shall be a 3/4-inch NPT with standard square head.
4. Nuts and Bolts: Shall be high strength, corrosion resistant 18-8 Type 304 Stainless Steel.
5. 4 inches – 12 inches: Tapping sleeve body and flange shall be 18-8 Type 304 Stainless Steel. The body, lug, and gasket armor plate shall be in compliance with ASTM A-240. All metal surfaces shall be passivated, in accordance with ASTM A380, after fabrication.
6. Gasket: Shall provide a watertight sealing surface around the full circumference of the pipe. Gaskets shall be formed of natural or synthetic rubber.
7. Lugs: Shall be welded to the shell and prevent alignment problems by allowing the bolts to pass through. Bolts shall not be welded to the sleeve.
8. 16-inches and Larger: Tapping sleeves shall have a heavy welded steel body in compliance with ASTM A36 or ASTM A285, Grade C.
9. Gasket: Shall be natural or synthetic rubber compounded for water use and shall provide a watertight sealing surface.
10. Flange: Shall be in constructed in accordance with AWWA C-207 Class D, and shall be properly recessed for aligning the sleeve and tapping valves.
11. Protective Coating: Steel tapping sleeves shall be coated with epoxy. Minimum thickness shall be 8 mils.

E. Flexible Couplings: Shall be furnished and installed where shown on the drawings, specified, or in locations, as approved by the Engineer. Flexible couplings installed underground shall be ductile iron and Type 316 Stainless Steel nuts and bolts shall be used. When flexible couplings are used as expansion joints, the pipe ends shall be

separated to allow for expansion. Where indicated on the drawings or required by field conditions, flexible couplings shall be suitable for connecting pipes having different outside diameters. Flanged coupling adapters shall be restrained with tie rods.

1. Protective Coating: Entire coupling assembly shall be given a 20 mil coating of T.C. Mastic as manufactured by Tape Coat Company, Bitumastic No. 50 as manufactured by Koppers Company, or approved equal.
2. Ductile Iron Pipe: Flexible Joint Couplings shall be Dresser Style 38, Rockwell Style 411, or equal. Flanged coupling adapters for ductile iron pipe shall be Dresser Type 127, Rockwell International 112, Baker Series 600, or equal.
3. Steel Pipe: Flexible couplings shall be Dresser Style 38, Rockwell International 411, or equal, except where other styles are required for special conditions.
4. Gaskets: Shall be neoprene rubber or equal.

F. Installation: Tapping sleeves shall be installed in accordance with the manufacturer's recommendations. Tapping valves shall meet the noted requirements, Gate Valves. Disc and seat ring shall be so constructed that the inside diameter of the ring is at least 3/16 inch larger than nominal size of valve. Tapping sleeve and valve assembly shall be blocked as indicated.

4.5 DISINFECTION AND TESTING

A. Scope: After completion of all pipe line section, the following procedure will be used to clean, sterilize and pressure test the pipeline. The pipeline shall be filled and flushed until all evidence of dirt or debris has been washed from the pipeline. The line shall then be refilled if necessary, introducing the chlorinating material. Each valved section shall then be brought up to test pressure and the leakage test performed. After all sections have been accepted, all valves shall be cleaned and the line left full of sterilizing water.

B. Quality Assurance: The Contractor shall take special care to keep the interior of the pipe clean during storing, handling, and laying operations in order to reduce the need for flushing to an absolute minimum. In addition, all open ends shall be tightly covered whenever unattended to prevent small animals and dirt from entering the pipeline after it is in place.

C. Standards: Disinfecting and Testing of Water Mains shall comply with applicable requirements of the following:

1. AWWA B-300 - Standard for Hypochlorites.
2. AWWA B-301 - Standard for Liquid Chlorine.
3. AWWA C-651 - Standard for Disinfecting Water Mains.

D. Materials: Water required for filling, flushing and testing the line will be furnished at the Contractor’s expense, at such points along the pipeline as water is available from the existing distribution or supply systems. Wasting of water will not be condoned and such actions may require the Owner to make appropriate charges for such water.

1. The Contractor shall make provisions to provide the water, by tank truck or other means, to the points necessary to produce specified test pressure.
2. Chlorinating Material: Shall be either liquid chlorine conforming to AWWA B-301 or hypochlorite conforming to AWWA B-300.

E. Sterilization: Before acceptance for operation, each unit of completed water system shall be sterilized as specified below or as prescribed by AWWA Standard C-651. As per C-651, two (2) consecutive sets of acceptable samples, taken at least 24-hours apart, shall be collected from the new main. The unit to be sterilized shall be thoroughly flushed with water until all entrained dirt and mud have been removed before introducing the chlorinating material. The Contractor shall provide all chlorination material for

sterilization at his cost. The chlorinating material shall provide a dosage of not less than 50 parts per million and shall be introduce into the water line in an approved manner. The treated water shall be retained in the pipe long enough to destroy all non-spore-forming bacteria. Except where a shorter period is approved, the retention time shall be at least 25 hours and shall produce not less than 10 ppm of chlorine at the extreme end of the line at the end of the retention period. All valves on the lines being sterilized shall be opened and closed several times during the contact period.

F. Hydrostatic Pressure and Leakage Testing: All valves and hydrants shall be checked for proper operation and pressure the pipe system shall be subjected to a hydrostatic pressure and leakage test. After completion of each valved section and following the filling and disinfection of the section, the system shall be subjected to this test. The meter, pressure gauges, pump, small piping, hose connections and all labor necessary for conducting the test, shall be furnished by the Contractor.

1. After the section of pipeline has been filled, water shall be pumped into the section and the pressure raised to 150-lbs/sq inch. This test pressure shall be maintained for a period of at least 2 hours. The water required to maintain this pressure shall be delivered into the pipe through the meter. The amount of water through the meter during the two-hour test period will be the total leakage. Should this leakage exceed the allowable amount, as specified herein, the Contractor shall make such repairs as may be required until the actual leakage, as determined by succeeding tests, is no greater than the allowable as determined by the following formula:

$$L = S \times D \times \frac{\sqrt{P}}{133{,}200}$$

a. Except that L = 0 in above ground systems and otherwise.
b. L = Allowable Leakage in gallons/hour.
c. S = Length of pipe tested in fee.t
d. D = Nominal diameter of pipe in inches.
e. P = Average test pressure during the test, in pounds per square inch, gage; determined by computing the weighted average of actual pressures on various portions of the section.

2. After all sections of the pipeline have been tested, as described above, all valves shall be closed and the line left filled with the water to be used for disinfection and testing.

PART 5 - SANITARY SEWER SYSTEM

5.1 SEWER SERVICE CONNECTIONS

A. Scope: Furnish labor, materials, equipment and incidentals to install sewer service lines as indicated on the plans, in accordance with EPWU Standard Details.

B. Materials: Fittings, service risers, and laterals shall be as specified for the material type utilized. Where additional service connections are required on an existing main line, an approved service saddle compatible to the size and type of both the collection line and service lateral shall be installed.

1. All sanitary sewer services shall be of materials conforming to the requirements of the City of El Paso's Plumbing Code and all amendments thereto.

2. Where PVC saddles with rubber seals and stainless steel bands are used, the saddles shall be encased with Class B (2500 psi) concrete in accordance with EPWU Standard Details to protect the steel bands from corrosion and to add stability.

C. Tee and Riser: Where designated on the plans or directed by the Engineer in the field, Contractor shall install tee or wye fittings for future house service connections. Fittings shall be bell-type and shall be sealed on the branch outlet with an approved plug which can be easily removed for service riser or lateral line installation.

1. Where ground water is encountered, the Contractor shall install the tee and a sufficient service line RISER, thereby raising the final bell above the ground water level. In deep trenches, the RISER shall be extended to the depth of the intersecting service line, or to within 6 feet of the surface, whichever is designated by the plans or appropriate for field conditions.
2. Contractor shall install a maximum of four (4) service connections at manholes located at the ends of street cul-de-sacs. Additional services shall connect to the main line at a minimum spacing 24 inches.

D. Service Line Laterals: Where required by the Contract drawings and specifications, the Contractor shall extend lateral service lines for future or existing customer service connections. Unless otherwise specified, the minimum diameter of the lateral service lines shall be 4 inches. Although the maintenance of service laterals is the responsibility of private property owners, including the portion within public right-of-way, as established by Public Service Board Rules and Regulations, the Contractor shall be responsible for the integrity of the installation or re-connection of all such service lines during the warranty period. All sanitary sewer services shall be of materials conforming to the requirements of the City of El Paso's Plumbing Code and all amendments thereto.

1. Unless otherwise specified or shown in the drawings, service lines shall be installed and extended 6 inches beyond existing or proposed improvements such as pavement, curb and gutter, sidewalk, etc. Service lines shall be installed at a minimum slope of 2% with a minimum cover at the terminus of 18 inches for standard subdivisions having curb and gutter for drainage. For subdivisions with flat terrain and on-site ponding (no curb and gutter), minimum cover shall be 3.5 feet, unless otherwise directed by the Engineer. Prior to installation, utility personnel will curb mark the locations of proposed service tees for the Contractor. Service lines and/or tees shall be laid such that the branch makes an angle of 45-degrees with the vertical on the side of the main facing the lot to be served.
2. Service pipe shall be uniformly supported on bedding having a density of not less than 90% of maximum density per ASTM D1557. Backfill on service lines shall be carefully placed and compacted per requirements. The terminus of the service line shall be plugged with an approved universal end cap compatible with the pipe size and material.
3. All service risers and lateral extensions shall be installed by a qualified licensed plumber who shall be bonded and approved by the City Public Inspection Department. Contractor shall provide evidence to the Engineer that the Plumber is licensed and insured in accordance with the requirements of the City of El Paso.

E. Location Marking and Recording: The Contractor shall maintain as-built records of the horizontal and vertical location of installed sewer service lines. In unpaved areas without curb, the plugged ends of risers or laterals shall be marked using a 1-inch by 2-inch by 24-inch wooden stake set vertically at the plugged terminus, and a sufficient length of plastic metallic marking tape extended vertically from the terminus to within 6 inches of

ground surface. An electronic marker disk may be used in lieu of metallic tape. Utility personnel will mark locations of the installed service line or riser ends by chipping an arrowhead mark on top of the curb directly over the service plug.

5.2 MANHOLE STRUCTURES

A. Scope: Contractor shall furnish all labor, materials, equipment and incidentals necessary to provide all manholes as required.
   1. Manholes for the various sized lines shall be Standard Type "A" (48 inches inside diameter), Type "B" (72 inches inside diameter), or Drop Manhole constructed at the locations designated, and in accordance with Utility Standard Details, and as otherwise indicated in the project drawings.
   2. Manholes shall be constructed pre-cast concrete sections, as herein specified.

B. Quality Assurance: All manholes shall be free of visible leakage. Each structure shall be tested for leaks and inspected, and all leaks shall be repaired in a manner subject to Engineer's approval.

C. Submittals: Complete manufacturer's shop drawings on the manhole section(s), to include the joints, shall be submitted for approval. If the shop drawings do not meet specifications and secure the El Paso Water Utilities Engineer's approval, the vendor shall revise their shop drawings to meet specifications and receive Engineer's approval. Manufacturer's specification data and recommendations shall be submitted on the lifters and joint material.
   1. Compliance with ASTM C478 and these Specifications shall also be submitted. Failure to provide either the detailed shop drawings, specification data and recommendation on lifters and joint material, or the letter certifying that all material provided shall meet specifications shall be grounds for rejection of the material.

D. STANDARDS: Manhole structures shall comply with applicable requirements of the following:
   1. ASTM A48 - Specification for Gray Iron Castings.
   2. ASTM A82 - Specification for Steel Wire, Plain, for Concrete Reinforcement.
   3. ASTM A185 - Specification for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement.
   4. ASTM A615 - Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
   5. ASTM C32 - Specification for Sewer and Manhole Brick (Made from Clay or Shale).
   6. ASTM C33 - Specification for Concrete Aggregates.
   7. ASTM C144 - Specification for Aggregate for Masonry Mortar.
   8. ASTM C150 - Specification for Portland Cement.
   9. ASTM C309 - Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
   10. ASTM C478 - Specification for Pre-cast Reinforced Concrete Manhole Sections.
   11. ASTM C923 - Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes.
   12. ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil Aggregate Mixtures Using 10-lb (4.54-kg) Rammer and 18-in (457-mm) Drop.

E. Materials - Frame and Cover: The manhole frame and cover shall be of cast iron of the weight, dimensions, and pattern indicated by the Utility Standard Details. The casting shall be made from superior quality, gray cast iron conforming to the requirements of ASTM A48. No holes shall be in the cover, but edge notches for embedded rings shall be

used for lifting. "SEWER" or a suitable designation is to be on the cover. Mating surfaces shall be machined to assure a snug fit of the cover and frame.

1. Manhole Rings: Manhole rings used for a maximum 2-foot final grade shall conform to the applicable requirements of ASTM C32, Grade MS.
2. Cement: Cement shall be Portland Cement conforming to ASTM C150, Type V.
3. Mortar Sand: Mortar sand shall conform to ASTM C144.
4. Concrete Aggregates: Concrete aggregates shall conform to ASTM C33 except that the requirement for gradation shall not apply to concrete manhole conical and riser sections.
5. Steel Reinforcement: Billet-steel bars shall conform to ASTM A615 and welded steel wire fabric shall conform to ASTM A82 or to ASTM A185.
6. Water: Water shall be clean, clear, free from oil, acid or organic matter and injurious amounts of alkali, salts or other chemicals or deleterious materials.
7. Mortar: Mortar shall be composed of one (1) part Portland Cement Type V and three (3) parts mortar sand mixed in an approved manner with water to form a workable mixture.

F. Pre-Cast Concrete Manholes - General: The manhole riser and conical section shall be designed for sewer and water installations in the diameters specified or shown. All manhole sections shall have a 5-inch wall thickness with tongue and groove, unless otherwise specified. Rings shall be available in various lengths from 1 foot to 4 feet. The conical sections shall be concentric and adapted to the ring at one end and to El Paso Water Utilities standard cast iron frame at the other. The base ring shall have a flat bottom joint. Steps or rungs are not required. Manufacturing of manhole section(s) shall comply with ASTM C478 and any additional specifications listed here forth:

1. Concrete: Concrete to have a minimum 28 days compressive strength of 4000 psi. Water cement ratio shall be 0.5 or less by weight or not more than 5.5 gallons per sack.
2. Aggregates: All aggregates fine and coarse other than lightweight aggregate shall conform to specifications outlined by ASTM C33. Aggregates shall be free of deleterious substances causing reactivity with oxidized hydrogen sulfide. Both types of aggregates shall be graded in order to produce a homogeneous concrete mix. All materials are to be accurately weighed at a central batching facility for mixing.
3. Cement: All cement shall be Portland cement conforming to ASTM C150, Type V (sulfate resistant) for sewer applications. Cement content shall be sufficient to produce a minimum strength of 4,000 psi, or other design strengths required.
4. Placing: All concrete shall be handled from the mixer or transport vehicle to the place of final deposit in a continuous manner, as rapidly as practicable, and without segregation or loss of ingredients, until (the approved unit operation) is completed. Concrete shall be placed in layers not over 2 feet deep. Each layer shall be compacted by mechanical internal or external vibrating equipment. Duration of the vibration cycle shall be limited to the time necessary to produce satisfactory consolidation without causing objectionable segregation.
5. Quality Assurance: The Engineer reserves the right to inspect the manufacturing process at any time to make tests on materials used, and to have cores cut out of the completed manholes for compressive strength testing and placement of reinforcement.
6. Curing: For purposes of early re-use of forms, the concrete may be heated in the mold after the initial set has taken place. The temperature shall not exceed 160° and shall be raised from normal ambient temperature at a rate not to exceed 40° per

hour. The cured unit shall not be removed from forms until sufficient strength is obtained for the unit to withstand any structural strain that may be subjected during the form stripping operation. After the stripping of forms, further curing by means of water spraying or a membrane curing compound may be used and shall be of a clear or white type, conforming to ASTM C309-58.

7. Steel Reinforcement: Reinforcing steel shall be as outlined in ASTM C478 and any additional specifications herein. The minimum steel area of 0.12 square inches shall apply to both risers and cone sections and the maximum center to center spacing of 6 inches shall apply as well. Placing of reinforcing steel for one line circumferential reinforcement shall be on the tension side of the wall (the inner half part of the wall with a minimum 1-inch cover) for two lines circular reinforcement, refer to ASTM C478. All reinforcing shall be sufficiently tied to withstand any displacement during the pouring operation.
8. Joint Reinforcement: Both tongue and groove shall contain a #4 re-bar.
9. Lifters: Lifters shall be designed to handle the imposed weights, and shall be placed per manufacturer's requirements.
10. Joint Material: All joints to be sealed using Ram-Nek joint sealer. Joint sealer to be provided in sufficient quantities by the vendor as part of the manhole section(s). Size shall be per manufacturer's recommendations.

G. Cast-In-Place Concrete Manholes: In special circumstances, cast-in-place concrete manholes shall be constructed as shown in the plans, and provided the wall thickness is not less than 6 inches, the concrete is of good quality and well vibrated, and the method of construction materials and type of forms to be used are approved by the El Paso Water Utilities.

H. Manhole Connectors: At manholes, a water-tight resilient connection shall be made between the wall and the pipe. This shall be accomplished by use of an engineering approved manhole waterstop adaptor such as Indiana Seal Manhole Adaptor, Kor-N-Seal, or approved equal, meeting the requirements of ASTM C923. The connector must be compatible to both the type of pipe wall and manhole wall, and shall be installed in strict accordance with the recommendations of the connector manufacturer.

I. Installation: The manholes shall be constructed at the location shown on the plans or as directed by the Engineer and in accordance with the details shown on the plans and as specified herein. After the excavation has been completed, the concrete base or bottom shall be poured.

1. When the concrete has sufficiently set, the riser work may proceed. After the manhole rise has been completed, the invert shall be neatly formed in the bottom of the manhole with concrete. The invert shall have a true curve of as large a radius as the size of the manhole will permit and shall be given a smooth trowel finish.
2. The subgrade under pre-cast manhole bases shall be compacted to 95% density in accordance with ASTM D1557. Compaction limits shall be 1 foot beyond the perimeter of the concrete base and shall be a minimum of 1 foot in depth.
3. Drop connections shall be constructed as shown on the drawings.
4. All manholes that are in ground water shall be externally coated with a bituminous coating such as Coal Tar Epoxy. Interior coating of manholes shall be required only when specified in the construction plans. The coating shall be an epoxy resin-type material such as Plascite 7122 or approved equal.

5.3 INSPECTION AND TESTING

A. Scope: Test all piping as specified herein unless authorized by the Engineer.

B. Standards: Inspection and testing sewer lines and manholes shall adhere to requirements of the following:

1. ASTM C-828 - Recommended Practice for Low-Pressure Air Test of Vitrified Clay Pipe Lines (4-12 In).
2. ASTM C-1103 - Standard Practice for Joint Testing of Installed Pre-Cast Concrete Pipe Sewer Lines.
3. ASTM D-3034 - Specification for Type PSM Poly(Vinyl Chloride)(PVC) Sewer Pipe and Fittings.
4. ASTM F-679 - Specification for Poly(Vinyl Chloride)(PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings.
5. UNI-BELL-6 - Standards and Practices for Low-Pressure Air Testing of Installed Sewer Pipe.
6. UNI-BELL-9 - Polyvinyl Chloride (PVC) Large Diameter Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter (Nominal Pipe Sizes 18-48 Inch).

C. Manufactured Products: Contractor shall provide all testing apparatus including pumps, compressors, hoses, gauges and fittings, mandrels, and other equipment necessary to perform the required tests.

D. Television Inspection: Prior to placing lines into operation, completed sewer lines shall be inspected by Utility personnel with a television camera as a condition of final acceptance of the installation. The Contractor shall thoroughly clean and flush all lines and notify the Utility Engineer that the line is ready for television inspection.

1. Any defects discovered in the pipe or construction methods shall be corrected by the contractor at no additional cost to the Owner. The Owner will pay for the initial TV inspection. Any additional inspection(s) required due to failure of the initial inspection shall be paid for by the Contractor.

E. Leakage Testing - General: To ensure the integrity of the pipe and joints, all sewer lines installed under these specifications shall be tested for leakage using the guidelines established by ASTM C828 and UNI-BELL B6, and the methods and procedures here forth described.

1. Contractor shall provide all testing apparatus including pumps, compressors, hoses, gauges and fittings and other equipment necessary to perform the required tests. Acceptable equipment shall be as manufactured by Cherne Industries Incorporated or approved equal.
2. Unless otherwise approved, Contractor shall conduct tests in the presence of the Engineer. The Engineer shall be notified 48 hours in advance of testing. Test results shall be recorded on standard Utility forms.
3. Low pressure air testing may be conducted by the Contractor or an independent testing firm, acceptable to the Utility Engineer.
4. Sewer lines shall be tested after the "pipe zone" backfilling is completed, and prior to construction of finished surfacing. Where house laterals are included as integral part of the project, testing shall be performed on the main and laterals after the risers or laterals have been completed and backfilled.
5. Pipe shall be thoroughly cleaned prior to conducting leakage tests. Pipelines which exceed the allowable leakage rate shall be repaired and retested at the Contractor's expense.

6. All persons conducting an Air Test shall understand fully that an Air Test may be dangerous if conducted improperly.
7. Exfiltration Air Testing: A Low Pressure Air Test shall be the standard method for testing sewer lines.
8. Pneumatic plugs shall be sealed tested above ground using a random pipe section pressurized to 5 psig. Plugs should remain intact without bracing or movement out of the section.
9. Test shall proceed as follows:
   a. Seal off each end of the section of pipe to be tested at a manhole connection. Securely brace test plugs.
   b. Introduce air slowly into the test section through the test plug until an internal pressure of 4.0 psi is reached. Allow internal air temperature to stabilize. Adjust the internal air pressure to 3.5 psi, disconnect the air supply and begin the test.
   c. The section shall maintain the test pressure without losing more than 1.0 psi for a length of time as determined by the following table. If the section being tested includes more than one size of pipe, the test time for each size shall be calculated and added to determine the total test time for the section.

Nominal Pipe Size (d), Inches	Time (t), Minutes/100 Ft.
4	0.3
6	0.7
8	1.2
10	1.5
12	1.8
15	2.1
18	2.4
21	3.0
24	3.6
30	4.8
36	6.0
42	7.3

10. Any section losing more than 1.0 psi shall be considered to have failed the test, and shall be repaired and re-tested prior to acceptance.
11. Infiltration Test: Infiltration testing of sewer lines under groundwater shall be mandatory. This test shall be performed prior to initiating any service connections and after backfilling. At testing time, the level of the groundwater shall be over the entire section of the pipe or near its maximum level.
12. The allowable infiltration for any portion of the sewer system shall be measured by a weir or current meter placed in the appropriate manhole and shall not exceed 50 gallons/inch of internal pipe diameter per mile per day, including manholes.
13. Suitable plugs or other facilities shall be provided by the Contractor in order to measure the amount of infiltration. If infiltration is excessive, the Contractor shall immediately proceed to locate the source of leakage. Once located, the source of leakage shall be sealed by grouting, cementing and rebuilding as required, or by methods approved by the Engineer.

14. Joint Testing: At the direction of the Engineer, individual joint testing of pipe larger than 24 inches in diameter shall be performed in accordance with ASTM C1103 for special conditions not covered by other test methods.
15. Inspection of Sewer Manholes: Manholes installed under groundwater shall be visually inspected for infiltration leakage through all joints and the manhole base. All leaks or cracks shall be repaired with an approved hydro-cement grout.

F. Deflection Testing - General: As a condition for acceptance of the pipeline, a mandrel test (deflection test) is performed by Contractor to verify roundness and proper installation of flexible pipeline.
1. Within 30 days (but no less than 7 days) after the installation and backfilling of the flexible sewer line and including any service connections, Contractor shall, in Engineer's presence, test deflection of the pipe with a mandrel (GO-NOGO device).
2. Mandrel Fabrication: Mandrels shall be of high quality fabrication and precision as commercially available by Cherne Industries Incorporated, or approved equal. Mandrels shall be approved by the Engineer and shall be equipped with proven rings and meet the following requirements:
   a. Mandrel outside diameter (gauge dimension) shall be fabricated to:
      1) Mandrel O.D.: Pipeline Base I.D. - (% deflection limit x Pipeline Base I.D.) in accordance with ASTM D3034, F679, or UNI-BELL-9.
   b. Mandrel Construction: The mandrel design shall be open thereby preventing debris buildup between channels of adjacent fins. The fin sets shall number at least nine (9) and removable from the mandrel core. Gauges of various diameters shall be assembled by substituting fin sets of appropriate dimension. The length of the minimum radius portion of the mandrel shall not be less than one-third of the nominal diameter of the pipe being tested.
3. Execution: Prior to testing, the pipe shall be flushed and cleaned by the Contractor. Flow shall not be permitted in the pipeline throughout the duration of the deflection test.
4. The mandrel shall be manually pulled through the pipeline with a suitable rope or cable that is connected to an eyebolt at one end of the gauge. A similar rope or cable shall be attached to the eyebolt at the opposite end of the mandrel and tension shall be applied to it. This will ensure that the mandrel maintains its correct position during testing, while providing easy removal of the mandrel should it become lodged in an excessively deflected pipeline. Winching or other methods of forcing the mandrel through the pipeline shall be unacceptable.
5. Deflection of a pipeline deflection tested within 30 days of installation shall have a deflection not exceeding 5% of the base inside pipe diameter as established by ASTM D3034 and F679 listed in the following table:

Deflection Gauge Dimensions: SDR 35 or RSC 160

Nominal Size	5% Average I.D.	Base I.D.	Deflection Gauge
6"	5.893	5.742	5.46
8"	7.891	7.665	7.28
10"	9.864	9.563	9.08
12"	11.737	11.361	10.79
15"	14.374	13.898	13.20
18"	17.564	16.976	16.13

21"	20.707	20.004	19.00
24"	23.296	22.480	21.36
27"	26.258	25.327	24.06

6. Pipeline deflection tests performed 30 days beyond the date of installation shall have a deflection not exceeding 7.5% of the nominal inside diameter or as established otherwise by the applicable governing body. Mandrel Gauge shall be adjusted for 7.5% and approved by the Engineer. The Contractor shall make every effort to test for deflection prior to the 30-day expiration.
7. A permanent record of all testing with locations where excessive pipeline deflections occur shall be kept by the Contractor and forwarded to the Engineer after completion of testing on each line.
8. The Contractor shall replace all sections of pipe which deflect more than 5% (or 7-1/2%). Pipelines with acceptable ovality shall be laid such that the larger diameter is situated in the vertical direction.
9. All expenses for re-trenching, backfill, compaction, paving, and related work necessary due to failure to satisfy deflection test requirements shall be borne by the Contractor.

5.4 CLEAN-UP

A. After completing each section of water line, the Contractor shall remove all debris, construction materials, and equipment from the site of the work; grade and smooth over the surface on both sides of the line and leave the entire right-of-way in a clean, neat and serviceable condition.

PART 6 - THRUST RESTRAINT

6.1 THRUST

A. All underground pressure piping 12 inches diameter and less shall be provided with both mechanically restrained joints and concrete thrust blocking at all changes in direction and at the locations of valves, fittings, service stub-outs, and dead-ends in accordance with the drawing details. For pressure piping 16 inches diameter and larger restrained joints (mechanically and/or welded) shall be provided at the locations shown on the plans and at all changes in direction, valves, fittings, and dead-ends. Additionally, thrust blocks shall be provided for pressure pipe 16 inches diameter and larger, where specifically called out in the drawings or where there is a dead-end. All pressure pipelines installed within casings shall have restrained joints throughout the entire length of casing plus a minimum of one (1) additional joint length on both sides of casing. Restrained lengths shall be designed to withstand 1.5 x (rated working pressure of the pipeline); and shall be designed for the configuration and earth loads indicated on the drawings. These restrained lengths shown on the plans are the minimum required to be provided and are considered to be in addition to what the pipe manufacturer recommends. The most conservative restrained lengths shall be used for this project, whether they are what are indicated in the plans or what the pipe manufacturer calculates.

PART 7 - PAYMENT

7.1 PAYMENT

A. Payment for all work covered in this section will be included per unit price per relocation of pipelines as described in Section 01025 - Measurement and Payment. Such payment shall be complete compensation for the complete performance of the work in accordance with the drawings and the provisions of these specifications.

END OF SECTION

SECTION 02810

IRRIGATION SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Piping.
   2. Manual valves.
   3. Automatic control valves.
   4. Transition fittings.
   5. Dielectric fittings.
   6. Miscellaneous piping specialties.
   7. Drip irrigation specialties.
   8. Controllers.
   9. Boxes for automatic control valves.

B. Related Section:
   1. Division 01 Specification Sections apply to Work of this Section.

1.2 DEFINITIONS

A. Lateral Piping: Downstream from control valves to sprinklers, specialties, and drain valves. Piping is under pressure during flow.

B. Drain Piping: Downstream from circuit-piping drain valves. Piping is not under pressure.

C. Main Piping: Downstream from point of connection to water distribution piping to, and including, control valves. Piping is under water-distribution-system pressure.

D. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.

1.3 PERFORMANCE REQUIREMENTS

A. Irrigation zone control shall be automatic operation with controller and automatic control valves.

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% irrigation coverage of 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 psi.
   2. Circuit Piping: 200 psi.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

B. Wiring Diagrams: For power, signal, and control wiring.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.
B. Zoning Chart: Show each irrigation zone and its control valve.
C. Controller Timing Schedule: Indicate timing settings for each automatic controller zone.
D. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For sprinklers controllers and automatic control valves to include in operation and maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers that include a Licensed Irrigator by the State of Texas.
B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.8 DELIVERY, STORAGE, AND HANDLING

A. 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.
B. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.9 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 Owner no fewer than two days in advance of proposed interruption of water service.
    2. Do not proceed with interruption of water service without Owner's written permission.

PART 2 - PRODUCTS

2.1 PIPES, TUBES, AND FITTINGS

A. Comply with requirements in the piping schedule for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.
B. Ductile-Iron Pipe with Mechanical Joints: AWWA C151, with mechanical-joint bell and spigot ends.
    1. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
        a. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts.
C. PVC Pipe: ASTM D1785, PVC 1120 compound, Schedules 40 and 80.
    1. PVC Socket Fittings: ASTM D2466, Schedules 40 and 80.

2. PVC Threaded Fittings: ASTM D2464, Schedule 80.
3. PVC Socket Unions: Construction similar to MSS SP-107, except both headpiece and tailpiece shall be PVC with socket ends.

D. PVC Pipe, Pressure Rated: ASTM D2241, PVC 1120 compound, SDR 21.
1. PVC Socket Fittings: ASTM D2467, Schedule 80.
2. PVC Socket Unions: Construction similar to MSS SP-107, except both headpiece and tailpiece shall be PVC with socket or threaded ends.

2.2 PIPING JOINING MATERIALS

A. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, 1/8 inch thick unless otherwise indicated; full-face or ring type unless otherwise indicated.
B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.
C. Solvent Cements for Joining PVC Piping: ASTM D2564. Include primer according to ASTM F656.
D. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

2.3 MANUAL VALVES

A. Plastic Ball Valves:
1. Description:
a. Standard: MSS SP-122.
b. Pressure Rating: 150 psi.
c. Body Material: PVC.
d. Type: Union.
e. End Connections: Socket or threaded.
f. Port: Full.

B. Bronze Gate Valves:
1. Description:
a. Standard: MSS SP-80, Type 2.
b. Class: 125.
c. CWP Rating: 200 psi.
d. Body Material: ASTM B62 bronze with integral seat and screw-in bonnet.
e. Ends: Threaded or solder joint.
f. Stem: Bronze, non-rising.
g. Disc: Solid wedge; bronze.
h. Packing: Asbestos free.
i. Handwheel: Malleable iron, bronze, or aluminum.

2.4 AUTOMATIC CONTROL VALVES

A. Plastic, Automatic Control Valves:
1. Rainbird PESB Valves.
2. Rainbird XCZ-075-PRF, 200 mesh stainless steel filter, drip control zone values.
3. Description: Molded-plastic body, normally closed, diaphragm type with manual-flow adjustment, and operated by 24-V ac solenoid.

2.5 TRANSITION FITTINGS

A. General Requirements: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined.
B. Plastic-to-Metal Transition Fittings:
   1. Description: PVC 1-piece fitting with manufacturer's Schedule 80 equivalent dimensions; one end with threaded brass insert, and one solvent-cement-socket or threaded end.

2.6 DIELECTRIC FITTINGS

A. General Requirements: Assembly of copper alloy and ferrous materials or ferrous material body with separating nonconductive insulating material suitable for system fluid, pressure, and temperature.

2.7 MISCELLANEOUS PIPING SPECIALTIES

A. Pressure Gages: ASME B40.1. Include 4-1/2-inch- diameter dial, dial range of two (2) times system operating pressure, and bottom outlet. Install downstream of backflow prevention.

2.8 BACKFLOW PREVENTION

A. Febco 825 YA.
B. Provide Hotbox LB.75 enclosure, install per Manufacturer specifications.

2.9 DRIP IRRIGATION SPECIALTIES

A. Rainbird XFS-09-12 (12 inches).
B. Drip Tubes with Integral Emitters:
   1. Tubing: Flexible PE.
   2. Emitters: Devices to deliver water at approximately 40 psi.
      a. Body Material: PE, with flow control and check valve.
      b. Mounting: Integral with tubing at set intervals.
   3. Capacities and Characteristics:
      a. Tubing Size: OD – 0.634”.
      b. Emitter Spacing: 12 inches.
      c. Emitter Flow: 0.9 gph.
C. Application Pressure Regulators: Plastic housing, with corrosion-resistant internal parts; capable of controlling outlet pressure to approximately 40 psi.
D. Filter Units: Plastic housing, with corrosion-resistant internal parts; of size and capacity required for devices downstream from unit.
E. Air Relief Valves: Brass or plastic housing, with corrosion-resistant internal parts.
F. Vacuum Relief Valves: Brass or plastic housing, with corrosion-resistant internal parts.
G. Steel Ground Stakes: Install as per manufacturer’s specifications.

2.10 CONTROLLERS

A. Rainbird ESP-4ME Controller.
B. Description:
   1. Controller Stations for Automatic Control Valves: Each station is variable from approximately 1 to 720 minutes. Include switch for manual or automatic operation of each station.
   2. Interior Control Enclosures: NEMA 250, Type 4, weatherproof, with locking cover and two (2) matching keys; include provision for grounding.
      a. Body Material: Enameled-steel sheet metal.
      b. Mounting: Surface type for wall.
   3. Control Transformer: 24-V secondary, with primary fuse.
   4. Timing Device: Adjustable, 24-hour, 14-day clock, with automatic operations to skip operation any day in timer period, to operate every other day, or to operate two (2) or more times daily.
      a. Manual or Semiautomatic Operation: Allows this mode without disturbing preset automatic operation.
      b. Nickel-Cadmium Battery and Trickle Charger: Automatically powers timing device during power outages.
      c. Surge Protection: Metal-oxide-varistor type on each station and primary power.
   5. Sensor: Rainbird WR2-RFC Wireless Rain and Freeze Sensor Combo.
   6. Wiring: UL 493, Type UF single conductor, with solid-copper conductors; insulated cable; suitable for direct burial.
      a. Feeder-Circuit Cables: No. 12 AWG minimum, between building and controllers.
      b. Low-Voltage, Branch-Circuit Cables: No. 14 AWG minimum, between controllers and automatic control valves; color-coded different from feeder-circuit-cable jacket color; with jackets of different colors for multiple-cable installation in same trench.
      c. Splicing Materials: 3M-DBY, or approved equal.

2.11 BOXES FOR AUTOMATIC CONTROL VALVES

A. Plastic Boxes:
   1. Description: Box and cover, with open bottom and openings for piping; designed for installing flush with grade.
      a. Size: As required for valves and service.
      b. Shape: Rectangular.
      c. Sidewall Material: PE.
      d. Cover Material: PE.
         1) Lettering: "IRRIGATION."
B. Drainage Backfill: Cleaned gravel or crushed stone, graded from 3/4 inch minimum to 3 inches maximum.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Install warning tape directly above pressure piping, 12 inches below finished grades, except 6 inches below subgrade under pavement and slabs.
B. Provide minimum cover over top of underground piping according to the following:
   1. Irrigation Main Piping: Minimum depth of 18 inches below finished grade, or not less than 18 inches below average local frost depth, whichever is deeper.
   2. Lateral Piping: 12 inches.
   3. Drain Piping: 12 inches.
   4. Sleeves: 18 inches.

3.2 PREPARATION

A. Set stakes to identify locations of proposed irrigation system. Obtain Architect approval before excavation.

3.3 PIPING INSTALLATION

A. Location and Arrangement: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are approved on Coordination Drawings.
B. Install piping free of sags and bends.
C. Install groups of pipes parallel to each other, spaced to permit valve servicing.
D. Install fittings for changes in direction and branch connections.
E. Install unions adjacent to valves and to final connections to other components with NPS 2 or smaller pipe connection.
F. Install flanges adjacent to valves and to final connections to other components with NPS 2-1/2 or larger pipe connection.
G. Lay piping on solid subbase, uniformly sloped without humps or depressions.
H. Install ductile-iron piping according to AWWA C600.
I. Install PVC piping in dry weather when temperature is above 40°F. Allow joints to cure at least 24 hours at temperatures above 40°F before testing.
J. Install piping in sleeves under parking lots, roadways, and sidewalks.
K. Install sleeves made of Schedule 40 PVC pipe and socket fittings, and solvent-cemented joints.
L. Install transition fittings for plastic-to-metal pipe connections according to the following:
   1. Underground Piping:
      a. NPS 1-1/2 and Smaller: Plastic-to-metal transition fittings.
      b. NPS 2 and Larger: AWWA transition couplings.
   2. Aboveground Piping:
      a. NPS 2 and Smaller: Plastic-to-metal transition fittings.
      b. NPS 2 and Larger: Use dielectric flange kits with one plastic flange.
M. Install dielectric fittings for dissimilar-metal pipe connections according to the following:
   1. Underground Piping:
      a. NPS 2 and Smaller: Dielectric coupling or dielectric nipple.
      b. NPS 2-1/2 and Larger: Prohibited except in control-valve box.
   2. Aboveground Piping:
      a. NPS 2 and Smaller: Dielectric union.
      b. NPS 2-1/2 to NPS 4: Dielectric flange.
      c. NPS 5 and Larger: Dielectric flange kit.

3. Piping in Control-Valve Boxes:
    a. NPS 2 and Smaller: Dielectric union.
    b. NPS 2-1/2 to NPS 4: Dielectric flange.
    c. NPS 5 and Larger: Dielectric flange kit.

3.4 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
    1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
    2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
D. Flanged Joints: Select rubber gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
E. Ductile-Iron Piping Gasketed Joints: Comply with AWWA C600 and AWWA M41.
F. Copper-Tubing Brazed Joints: Construct joints according to CDA's "Copper Tube Handbook," using copper-phosphorus brazing filler metal.
G. Copper-Tubing Soldered Joints: Apply ASTM B813 water-flushable flux to tube end unless otherwise indicated. Construct joints according to ASTM B828 or CDAs "Copper Tube Handbook," using lead-free solder alloy (0.20% maximum lead content) complying with ASTM B32.
H. PVC Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
    1. Comply with ASTM F402 for safe-handling practice of cleaners, primers, and solvent cements.
    2. PVC Pressure Piping: Join schedule number, ASTM D1785, PVC pipe and PVC socket fittings according to ASTM D2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D2855.
    3. PVC Non-pressure Piping: Join according to ASTM D2855.

3.5 VALVE INSTALLATION

A. Underground Gate Valves, Resilient Seat: Comply with AWWA C600 and AWWA M44. Install in valve casing with top flush with grade.
    1. Install valves and PVC pipe with restrained, gasketed joints.
B. Aboveground Valves: Install as components of connected piping system.

3.6 DRIP IRRIGATION SPECIALTY INSTALLATION

A. Install drip tubes with integral emitters on ground below mulch and weed barrier fabric.
B. Install application pressure regulators and filter units in control-valve boxes.
C. Install air relief valves in piping, and in control-valve boxes.

3.7 AUTOMATIC IRRIGATION-CONTROL SYSTEM INSTALLATION

A. Equipment Mounting: Install interior controllers on wall.
   1. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   2. Install anchor bolts to elevations required for proper attachment to supported equipment.
B. Install control cable in same trench as irrigation piping and at least 2 inches below piping. Provide conductors of size not smaller than recommended by controller manufacturer. Install cable in separate sleeve under paved areas.

3.8 CONNECTIONS

A. Comply with requirements for piping for water supply from exterior water service piping, water meters, protective enclosures and backflow preventers. Drawings indicate general arrangement of piping, fitting and special ties.
B. Install piping adjacent to equipment, valves, and devices to allow service and maintenance.
C. Connect wiring between controllers and automatic control valves.

3.9 IDENTIFICATION

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.
B. Warning Tapes: Arrange for installation of continuous, underground, detectable warning tapes over underground piping during backfilling of trenches.

3.10 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
B. Perform tests and inspections.
   1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
C. Tests and Inspections:
   1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
   2. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
   3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
D. Any irrigation product will be considered defective if it does not pass tests and inspections.
E. Prepare test and inspection reports.

3.11 STARTUP SERVICE

A. Perform startup service.
   1. Complete installation and startup checks according to manufacturer-written instructions.
   2. Verify controllers are installed and connected according to the Contract Documents.
   3. Verify electrical wiring installation complies with manufacturer's submittal.

3.12 ADJUSTING

A. Adjust settings of controllers.
B. Adjust automatic control valves to provide flow rate at rated operating pressure required for each sprinkler circuit.
C. Adjust sprinklers and devices, except those intended to be mounted aboveground, so they will be flush with, or not more than 1/2 inch above, finish grade.

3.13 CLEANING

A. Flush dirt and debris from piping before installing sprinklers and other devices.

3.14 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain automatic control valves and controllers.

3.15 PIPING SCHEDULE

A. Install components with pressure rating equal-to-or-greater-than system operating pressure.
B. Piping in control-valve boxes and aboveground may be joined with flanges or unions instead of joints indicated.
C. Underground irrigation main piping, NPS 4 and smaller, shall be:
   1. Schedule 40, PVC pipe and socket fittings, and solvent-cemented joints.
D. Underground irrigation main piping, NPS 5 and larger, shall be:
   1. SDR 21, PVC, pressure-rated pipe; Schedule 80, PVC socket fittings; and solvent-cemented joints.
E. Lateral piping, NPS 2 shall be:
   1. Schedule 40, PVC pipe and socket fittings; and solvent-cemented joints.
F. Lateral piping, NPS 2-1/2 to NPS 4, shall be:
   1. Schedule 40, PVC pipe and socket fittings; and solvent-cemented joints.
G. Underground Branches and Offsets at Sprinklers and Devices:
   1. Flex Nipples: Plastic assemblies, with offsets for flexible joints, manufactured for this application.

END OF SECTION

SECTION 02820

CHAIN LINK FENCING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
1. Removal and replacement of chain link fence in the way of construction during this project. As well as the installation of new chain link fencing. The Contractor shall furnish all materials, labor, superintendence, tools, equipment and incidentals necessary for the complete construction of this work in accordance with the drawings and these specifications.
2. The Contractor has the option to relocate the existing fence as shown on the drawings to the new specified location, or install a new fence in the specified location.
3. If the Contractor chooses to install a new fence the Contractor will still be required to remove the existing fence line and all of its appurtenances. The Contractor will then be allowed to salvage the fencing materials or coordinate with the Owner to landfill the material.
4. If the Contractor decides to relocate the existing fence it will be required to perform a pre-construction video survey in the presence of the Owner's representative to document the pre-existing condition of the southern fence line. The Contractor will submit the video survey in DVD format to the Engineer. The contractor will then be required to relocate and reinstall the existing fence in the new location to a condition that equals or exceeds the pre-existing condition. The Contractor will be required to install new fencing and appurtenances for any shortage in quantity as a result of the new fence alignment.

B. Related Sections:
1. Division 01 Specification Sections apply to Work of this Section.

PART 2 - PRODUCTS

2.1 GENERAL

A. Design Standard No. 4-1 and 4-2, on sheets 314 and 315 respectively, of the Subdivision Ordinance, Title 19 of the City of El Paso, Texas governs work of this section and constitutes minimum requirements. Where specific requirements in this section of the specifications are more stringent, they shall supersede the corresponding requirements of the Design Standards.

2.2 MATERIALS

A. Chain link fencing materials shall conform to the following requirements:
1. Wire Fabric: Width (or height) 8-feet; 2-inch Chain Link pattern, No. 9 gauge wire having a tensile strength of at least 70,000 pounds per square inch and heavily galvanized by Hot-Dip Process after weaving. Top and bottom selvages shall be twisted and barbed.

2. Tension Wire: Tension wire at bottom of fence shall be No. 7 coil spring wire, heavily galvanized.
3. LinePosts: Hot-Dip Galvanized 1 7/8-inch nominal outside diameter pipe weighing at least 2.8 pounds per linear foot.
4. End, Corner and Gate Posts: 3-inch O.D. pipe weighing 5.79 pounds per linear foot, hot-dip galvanized, for end and corner posts. Gate posts of 4-inch O.D. pipe weighing 9.11 pounds per linear foot, hot-dip galvanized.
5. Braces and Truss Rods: Braces at end, gate and corner posts shall be the same materials as the top rail with suitable connections. Truss-bars - 3/8-inch round rod, galvanized.
6. Fittings: All fittings shall be cast iron, wrought iron or pressed steel, hot-dip galvanized of adequate size.
7. Cantilever Gates: Gate frames shall be 2-1/2-inch O.D. hot-dip galvanized tubular steel weighing 4.80 pounds per linear foot. Fittings shall be heavy malleable castings galvanized. Fabric covering same as fence.
8. Extension Arms: Hot-dip galvanized with provisions for three (3) barbed wires.
9. Barbed Wire: 4-point pattern, two (2) strands of No. 12-1/2 gauge with large barbs, 3 inches apart.
10. Fence Height: The height of fencing shall be 8 feet – 0 inches from finished grade to the top of rail as shown on the drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. The chain link fence shall be installed to the lines and grades as shown in the plans. All materials required for the complete installation, including gates, shall be furnished and installed by the Contractor.

B. Line posts shall be spaced not over 10-feet apart. Gateposts shall be spaced to fit the gate furnished. All posts shall be set at least 3-feet deep in holes not less than 8-inches in diameter filled with concrete. Concrete around posts shall be adequate for maintaining the posts truly plumb under the strains imposed and shall contain not less than four (4) sacks of cement per cubic yard.

C. Bracing shall be placed at all gate and end posts in accordance with details approved by the Engineer.

D. Fabric shall be stretched taut and securely attached to line posts and top rails with fabric bands spaced approximately 18-inches apart. Suitable stretcher bars and bands shall be used at all end and gateposts. Fabric shall be placed so that the bottom edge is at the established grade. Tension wire shall be tightly stretched and securely attached to each post. Gates shall be provided with accessories specified.

3.2 PAYMENT

A. Payment will be made for all work covered in this section at the contract unit price per unit or will be included in the lump sum price per job for the various project items. Payment for any fencing item will be made under a single bid item. Such payment shall be complete compensation for the complete performance of the work in accordance with the drawings and the provisions of these specifications.

END OF SECTION

SECTION 02826

STEEL ORNAMENTAL FENCE SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. The Contractor shall provide all labor, materials and all necessary items for the installation of the Montage II ornamental fence system defined herein.

B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 03300 - Cast-In-Place Concrete.

1.2 SYSTEM DESCRIPTION

A. The manufacturer shall supply a total fencing system of the Ameristar Montage II or approved equal. The system shall include all components (i.e., pickets, posts, rails, gates and hardware) required.

1.3 QUALITY ASSURANCE

A. The Contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and the materials specified.

1.4 REFERENCES

A. ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus.
B. ASTM D523 - Test Method for Specular Gloss.
C. ASTM D822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.
D. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
E. ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
F. ASTM D2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
G. ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.
H. ASTM F2408 - Ornamental Fences Employing Galvanized Steel Tubular Pickets.

1.5 SUBMITTAL

A. The manufacturer's submittal package shall be submitted prior to installation to confirm compliance with all requirements for materials specified in this section.

1.6 PRODUCT HANDLING AND STORAGE

A. Upon receipt at the job site, all materials shall be checked to ensure that no damages occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage and to protect against damage, weather, vandalism and theft.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. The ornamental fence system shall conform to Ameristar's ornamental fencing, Montage II manufactured by Ameristar Fence Products, Inc., in Tulsa, Oklahoma, or approved equal.

2.2 MATERIAL

A. Steel material for fence framework (i.e., tubular pickets, rails and posts) shall conform to the requirements of ASTM A653/A653M, with a minimum yield strength of 45,000 psi and a minimum zinc coating of 0.90 oz/ft^2.

B. Pickets shall be 1-inch square x 14 gauge tubing. Horizontal rails shall be 1.75-inch x 1.75-inch x .105-inch. The number of rails shall vary with the style, height and strength as determined by manufacturer. Fence posts and gate posts shall meet the minimum size requirements of Table 1.

2.3 FABRICATION

A. Pickets, rails and posts shall be pre-cut to specified lengths. Rails shall be pre-punched to accept pickets.

B. Pickets shall be inserted into the pre-punched holes in the rails and shall be aligned to standard spacing using a specially calibrated alignment fixture. The aligned pickets and rails shall be joined at each picket-to-rail intersection by Ameristar's proprietary fusion welding process, thus completing the rigid panel assembly (Note: The process produces a virtually seamless, spatter-free good-neighbor appearance, equally attractive from either side of the panel).

C. The manufactured panels and posts shall be subjected to an inline electrodeposition coating (E-Coat) process consisting of a multi-stage pretreatment/wash (with zinc phosphate), followed by a duplex application of an epoxy primer and an acrylic topcoat. The minimum cumulative coating thickness of epoxy and acrylic shall be 2 mils. The color shall be Black. The coated panels and posts shall be capable of meeting the performance requirements for each quality characteristic shown in Table 2 (Note: The requirements in Table 2 meet or exceed the coating performance criteria of ASTM F2408).

D. The manufactured fence system shall be capable of meeting the vertical load, horizontal load, and infill performance requirements for Industrial weight fences under ASTM F2408.

E. Swing gates shall be fabricated using 1.75-inch x 14ga Forerunner double channel rail, 2-inch sq x 11 ga gate ends, and 1-inch sq x 14 ga pickets. Gates that exceed 6 feet in width will have a 1.75-inch sq x 14 ga intermediate upright. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined by welding. Gusset plates will be welded at each upright to rail intersection. Cable kits will be provided for additional trussing for all gates leaves over 6 feet.

PART 3 - EXECUTION

3.1 PREPARATION

A. All new installation shall be laid out by the Contractor in accordance with the construction plans. The Contractor shall adjust column and post spacing as required to fit premanufactured panels as recommended by manufacturer.

3.2 FENCE INSTALLATION

A. Fence post shall be spaced according to Table 3, plus or minus 1/2-inch. For installations that must be raked to follow sloping grades, the post spacing dimension must be measured along the grade. Fence panels shall be attached to posts with brackets supplied by the manufacturer. Posts shall be set in concrete footers having a minimum depth of 36 inches (Note: In some cases, local restrictions of freezing weather conditions may require a greater depth). The “Earthwork” and “Concrete” sections of this specification shall govern material requirements for the concrete footer. Posts setting by other methods such as plated posts or grouted core-drilled footers are permissible only if shown by engineering analysis to be sufficient in strength for the intended application.

3.3 FENCE INSTALLATION MAINTENANCE

A. When cutting/drilling rails or posts adhere to the following steps to seal the exposed surfaces: 1) Remove all metal shavings from cut area. 2) Apply zinc-rich primer to thoroughly cover cut edge and/or drilled hole; let dry. 3) Apply 2 coats of custom finish paint matching fence color. Failure to seal exposed surfaces per steps 1 to 3 will negate warranty. Ameristar spray cans or paint pens shall be used to finish exposed surfaces; it is recommended that paint pens be used to prevent overspray. Use of non-Ameristar parts or components will negate the manufactures’ warranty.

3.4 GATE INSTALLATION

A. Gate posts shall be spaced according to the manufacturers’ gate drawings, dependent on standard out-to-out gate leaf dimensions and gate hardware selected. Type and quantity of gate hinges shall be based on the application; weight, height, and number of gate cycles. The manufacturers’ gate drawings shall identify the necessary gate hardware required for the application. Gate hardware shall be provided by the manufacture of the gate and shall be installed per manufacturer’s recommendations.

3.5 CLEANING

A. The Contractor shall clean the jobsite of excess materials; post-hole excavations shall be scattered uniformly away from posts.

Table 1 – MINIMUM SIZES FOR MONTAGE II POSTS

Fence Posts	Panel Height		
2-1/2” x 12 Ga.	Up to and Including 6’ Height		
3” x 12 Ga.	Over 6’ Up to and Including 8’ Height		
Gate Leaf	**Gate Height**		
	Up to & Including 4’	**Over 4’ Up to & Including 5’**	**Over 5’ Up to & Including 6’**
Up to 4’	2-1/2” x 12 Ga.	3” x 12 Ga.	3” x 12 Ga.
4’1” to 6’	3” x 12 Ga.	4” x 11 Ga.	4” x 11 Ga.
6’1” to 8’	3” x 12 Ga.	4” x 11 Ga.	6” x 3/16”
8’1” to 10’	4” x 11 Ga.	6” x 3/16”	6” x 3/16”
10’1”to 12’	4” x 11 Ga.	6” x 3/16”	6” x 3/16”
12’1” to 14’	4” x 11 Ga.	6” x 3/16”	6” x 3/16”
14’1” to 16’	6” x 3/16”	6” x 3/16”	6” x 3/16”

Table 2 – COATING PERFORMANCE REQUIREMENTS

Quality Characteristics	ASTM Test Method	Performance Requirements
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117, D714 & D1654	Corrosion Resistance over 1,500 hours (Scribed per D1654; failure mode is accumulation of 1/8” coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625” ball).
Weathering Resistance	D822, D2244, D523 (60˚ Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

Table 3 – MONTAGE II – POST SPACING BY BRACKET TYPE

Span	**For INVINCIBLE® 8' Nominal (91-1/4" Rail)**		**For CLASSIC, GENESIS, & MAJESTIC 8' Nominal (92-5/8" Rail)**					
Post Size	2-1/2"	3"	2-1/2"	3"	2-1/2"	3"	2-1/2"	3"
Bracket Type	Industrial Flat Mount (BB301)		Industrial Universal (BB302)	Industrial Universal (BB303)	Industrial Flat Mount (BB301)		Industrial Swivel (BB304)*	
Post Settings ± 1/2" O.C.	94-1/2"	95"	96"	96-1/2"	96"	96-1/2"	*96"	*96-1/2"
*Note: When using BB304 swivel brackets on either or both ends of a panel installation, care must be taken to ensure the spacing between post and adjoining pickets meets applicable codes. This will require trimming one or both ends of the panel.								

END OF SECTION

SECTION 02930

EXTERIOR PLANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Plants.
   2. Tree stabilization.
   3. Tree-watering devices.

B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.

1.2 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with a ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

C. Balled and Potted Stock: 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 plant required.

D. Bare-Root Stock: Plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than the minimum root spread according to ANSI Z60.1 for type and size of plant required.

E. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a 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 type and size of plant required.

F. Fabric Bag-Grown Stock: Healthy, vigorous, well-rooted 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 plant.

G. Finish Grade: Elevation of finished surface of planting soil.

H. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.

I. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

J. Planting Area: Areas to be planted.

K. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

L. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.
M. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.
N. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.
O. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.3 COORDINATION

A. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.
1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.
1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
2. Plant Photographs: Include color photographs in digital format of each required species and size of plant material as it will be furnished to Project. Take photographs from an angle depicting true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph. For species where more than 20 plants are required, include a minimum of five (5) photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.
B. Samples for Verification: For each of the following:
1. Organic Mulch: 1-pint volume of each organic mulch required; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of color, texture, and organic makeup.
2. Mineral Mulch: 2 lb of each mineral mulch required, in sealed plastic bags labeled with source of mulch. Sample shall be typical of the lot of material to be delivered and installed on-site; provide an accurate indication of color, texture, and makeup of the material.
3. Weed Control Barrier: 12 by 12 inches.
4. Proprietary Root-Ball-Stabilization Device: One (1) unit.
5. Slow-Release, Tree-Watering Device: One (1) unit of each size required.
6. Edging Materials and Accessories: Manufacturer's standard size, to verify color selected.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.

B. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:
   1. Manufacturer's certified analysis of 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. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

D. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before expiration of required maintenance periods.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of plants.
   1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
   2. Experience: Five (5) years' experience in landscape installation in addition to requirements in Section 01400 - Quality Requirements.
   3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
   4. Personnel Certifications: Installer's field supervisor shall have certification in one of the following categories from the Professional Landcare Network:
      a. Landscape Industry Certified Technician - Exterior.
      b. Landscape Industry Certified Interior.
      c. Landscape Industry Certified Horticultural Technician.
   5. Pesticide Applicator: State licensed, commercial.

B. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.
   1. Selection of plants purchased under allowances is made by Architect, who tags plants at their place of growth before they are prepared for transplanting.

C. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.
   1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container-grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4-inch caliper size, and 12 inches above the root flare for larger sizes.
   2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

D. Plant Material Observation: Architect may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Architect may also observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and may reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.
   1. Notify Architect of sources of planting materials seven (7) days in advance of delivery to site.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws if applicable.
B. Bulk Materials:
   1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
   2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
   3. Accompany each delivery of bulk materials with appropriate certificates.
C. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, 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 plants during shipping and delivery. Do not drop plants during delivery and handling.
D. Handle planting stock by root ball.
E. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), 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.
F. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.
G. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or 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 plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly wet condition.

1.10 FIELD CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Planting Restrictions: Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.
   1. Spring Planting: April 15th to September 15th.
   2. Fall Planting: November 15th to February 15th for trees only.

C. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

1.11 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner.
      b. Structural failures including plantings falling or blowing over.
      c. Faulty performance of tree stabilization.
      d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
   2. Warranty Periods: From date of Substantial Completion.
      a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.
      b. Ground Covers, Biennials, Perennials, and Other Plants: 12 months.
   3. Include the following remedial actions as a minimum:
      a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
      b. Replace plants that are more than 25% dead or in an unhealthy condition at end of warranty period.
      c. A limit of one (1) replacement of each plant is required except for losses or replacements due to failure to comply with requirements.
      d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
   1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch in diameter; or with stem girdling roots are unacceptable.
   2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

D. Labeling: Label each plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant.

2.2 FERTILIZERS

A. Planting Tablets: Tightly compressed chip-type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.

1. Size: 5-gram tablets.
2. Nutrient Composition: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.

2.3 MULCHES

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one (1) of the following:

1. Type: Shredded hardwood.
2. Size Range: 3 inches maximum, 1/2 inch minimum.
3. Color: Natural.
4. Contractor shall excavate tree planting beds 4 inches and install weed barrier fabric to allow for mulch installation by Owner.

2.4 WEED-CONTROL BARRIERS

A. Nonwoven Geotextile Filter Fabric: Polypropylene or polyester fabric, 3 oz/sq yd minimum, composed of fibers formed into a stable network so that fibers retain their relative position. Fabric shall be inert to biological degradation and resist naturally encountered chemicals, alkalis, and acids.

2.5 PESTICIDES

A. General: Pesticide registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

2.6 TREE-STABILIZATION MATERIALS

A. Trunk-Stabilization Materials:
   1. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal by length indicated, pointed at one end.
   2. Guys and Tie Wires: ASTM A641/A641M, Class 1, galvanized-steel wire, 2-strand, twisted, 0.106 inch in diameter.
   3. Tree-Tie Webbing: UV-resistant polypropylene or nylon webbing with brass grommets.
   4. Guy Cables: Five-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.
   5. Flags: Standard surveyor's plastic flagging tape, white, 6 inches long.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plants, with Installer present, for compliance with requirements and conditions affecting installation and performance of the Work.
   1. Verify no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
   2. Verify plants and vehicles loaded with plants can travel to planting locations with adequate overhead clearance.
   3. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
   4. Uniformly moisten excessively dry soil that is not workable or which is dusty.
B. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.
B. Install 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 plantings. Stake locations, outline areas, adjust locations when requested, and obtain Architect acceptance of layout before excavating or planting. Make minor adjustments as required.

3.3 PLANTING AREA ESTABLISHMENT

A. Placing Planting Soil: Place and mix planting soil in-place over exposed subgrade.
B. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits.
   1. Excavate planting pits with sides sloping inward at a 45° angle. Excavations with vertical sides are unacceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
   2. Excavate approximately three times as wide as ball diameter.
   3. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
   4. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
   5. Maintain angles of repose of adjacent materials to ensure stability. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
   6. Maintain supervision of excavations during working hours.
   7. Keep excavations covered or otherwise protected when unattended by Installer's personnel.

B. Backfill Soil: Subsoil and topsoil removed from excavations may be used as backfill soil unless otherwise indicated.

C. Obstructions: Notify Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.
   1. Hardpan Layer: Drill 6-inch-diameter holes, 24 inches apart, into free-draining strata or to a depth of 10 feet, whichever is less, and backfill with free-draining material.

D. Drainage: Notify Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.5 TREE, SHRUB, AND VINE PLANTING

A. Inspection: At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Balled and Burlapped Stock: Set each plant plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.
   1. Backfill: Planting soil. For trees, use excavated soil for backfill.
   2. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and 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.
   3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.

4. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
    a. Quantity: As required by soil analysis report.
5. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. Container-Grown Stock: Set each plant plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.
1. Backfill: Planting soil. For trees, use excavated soil for backfill.
2. Carefully remove root ball from container without damaging root ball or plant.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately half-filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Place planting tablets equally distributed around each planting pit when pit is approximately half-filled. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
    a. Quantity: As recommended in the soil analysis report.
5. Continue backfilling process. Water again after placing and tamping final layer of soil.

E. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.6 TREE, SHRUB, AND VINE PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.
B. Prune, thin, and shape trees, shrubs, and vines as directed by Architect.
C. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.
D. Do not apply pruning paint to wounds.

3.7 TREE STABILIZATION

A. Trunk Stabilization by Upright Staking and Tying: Install trunk stabilization as follows unless otherwise indicated:
1. Upright Staking and Tying: Stake trees of 2- through 5-inch caliper. Stake trees of less than 2-inch caliper only as required to prevent wind tip out. Use a minimum of two 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.
2. Support trees with bands of flexible ties at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.
3. Support trees with two (2) strands of tie wire, connected to the brass grommets of tree-tie webbing at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.

3.8 GROUND COVER AND PLANT PLANTING

A. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated on Drawings in even rows with triangular spacing.
B. Use planting soil for backfill.
C. Dig holes large enough to allow spreading of roots.
D. For rooted cutting plants supplied in flats, plant each in a manner that minimally disturbs the root system but to a depth not less than two (2) nodes.
E. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
F. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
G. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.9 PLANTING AREA MULCHING

A. Install weed-control barriers before mulching according to manufacturer's written instructions. Completely cover area to be mulched, overlapping edges a minimum of 6 inches and secure seams with galvanized pins.

3.10 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.
B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.
C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.11 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents according to authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.
B. Pre-Emergent Herbicides (Selective and Nonselective): Apply to tree, shrub, and ground-cover areas according to manufacturer's written recommendations. Do not apply to seeded areas.
C. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.12 REPAIR AND REPLACEMENT

A. General: Repair or replace existing or new trees and other plants that are damaged by construction operations, in a manner approved by Architect.
   1. Submit details of proposed pruning and repairs.
   2. Perform repairs of damaged trunks, branches, and roots within 24 hours, if approved.

3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Architect.

B. Remove and replace trees that are more than 25% dead or in an unhealthy condition or are damaged during construction operations that Architect determines are incapable of restoring to normal growth pattern.

1. Provide new trees of same size as those being replaced.

3.13 CLEANING AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

C. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

D. After installation and before Substantial Completion, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

E. At time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

3.14 MAINTENANCE SERVICE

A. Maintenance Service for Trees and Shrubs: Provide maintenance by skilled employees of landscape Installer. Maintain as required in "Plant Maintenance" Article. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:

1. Maintenance Period: 12 months from date of Substantial Completion.

B. Maintenance Service for Ground Cover and Other Plants: Provide maintenance by skilled employees of landscape Installer. Maintain as required in "Plant Maintenance" Article. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:

1. Maintenance Period: 12 months from date of Substantial Completion.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. This section of the specifications covers all of the work required for constructing the concrete retaining wall, foundations and concrete pavement.
   2. Concrete for this project shall conform to the requirements of this section. The Contractor shall furnish all materials, equipment, tools, labor, superintendence, and incidentals necessary to perform the work in accordance with the drawings and these specifications.

B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Excavation or filling for concrete structures and other miscellaneous concrete work shall conform to the lines and grades as shown on the plans or as established in the field and shall be as specified in Section 02201 – Excavation, Grading and Subgrade Preparation.

1.2 GOVERNING REFERENCE SPECIFICATIONS

A. The latest editions of the following specifications and references govern work of this section and constitute minimum requirements. Where specific requirements in this section of the Specifications are more stringent, they shall supersede the corresponding requirements of these Referenced Specifications.

B. American Concrete Institute (ACI)
   1. ACI 301 - Specifications for Structural Concrete Buildings.
   2. ACI 301 - Manual of Standard Practice for Detailing Reinforced Concrete Structures.
   3. ACI 318 - Building Code Requirements for Reinforced Concrete.
   4. ACI 347 - Recommended Practice for Concrete Formwork.
   5. ACI 613 - Recommended Practice for Concrete Formwork.
   6. ACI 614 - Recommended, Practice for Measuring, Mixing, and Placing Concrete.
   7. ACI Comm. - Selection and Use of Aggregates for Concrete 621.
   8. SP-7 ACI - Manual of Concrete Inspection.
   9. ACI 305R - Hot Weather Concreting.

C. American Society for Testing Materials (ASTM)
   1. ASTM A-82 - Cold Drawn Steel Wire for Concrete Reinforcement.
   2. ASTM A-615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
   3. ASTM A-616 - Rail-Steel Deformed and Plain Bars for Concrete Reinforcement.
   4. ASTM A-706 - Low-Alloy Steel Deformed Bars for Concrete Reinforcement.
   5. ASTM C-31 - Making & Curing Concrete Compression and Flexure Test Specimens in the Field.
   6. ASTM C-33 - Concrete Aggregates.
   7. ASTM C-39 - Compressive Strength of Molded Concrete Cylinders.
   8. ASTM C-40 - Organic Impurities In Fine Aggregates for Concrete.

9. ASTM C-42 - Standard Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
10. ASTM C-94 - Standard Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
11. ASTM C-136 - Standard Method of Test for Sieve or Screen Analysis of Fine and Coarse Aggregate.
12. ASTM C-138 - Standard Method of Test for Weight per Cubic Foot, Yield and Air Content (Gravimetric) of Concrete.
13. ASTM C-143 - Standard Method of Test for Slump of Portland Cement Concrete.
14. ASTM C-150 - Standard Specification for Portland Cement.
15. ASTM C-171 - Sheet Material for Concrete Curing.
16. ASTM C-172 - Standard Method of Sampling Fresh Concrete.
17. ASTM C-173 - Air Content of Freshly Mixed Concrete by the Volumetric Method.
18. ASTM C-192 - Standard Method of Making and Curing Concrete Compression and Flexure Test Specimens in the Laboratory.
19. ASTM C-231 - Standard Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method.
20. ASTM C-260 - Air-Entraining Admixture for Concrete.
21. ASTM C-309 - Liquid Membrane-Forming Compounds for Curing Concrete.
22. ASTM C-494 - Chemical Admixtures for Concrete.
23. ASTM C-618 - Fly Ash and Raw od Calcined Natural Pozzolan for use as a Mineral Admixture in Portland Cement Concrete.

D. Portland Cement Association (PCA)
   1. Design and Control for Concrete Mixtures.

E. American Welding Society (AWS)
   1. AWS D12.1 - Recommended Practices for Welding Reinforcing Steel, Metal Inserts and Connections in Reinforced Concrete Construction.

F. U.S. Army Corps of Engineers
   1. CRD C-572 - Specification of Water Stops.

G. Texas Department of Transportation
   1. Standard Specifications for Construction of Highways, Streets and Bridges.

H. Latest Edition of each of the above Governing Standards shall apply

PART 2 - PRODUCTS

2.1 CEMENT

A. Portland cement shall conform to latest revisions of ASTM C-150, Type II, and shall be an approved brand. Only one (1) brand of cement permitted in any one (1) structure. Plant tests and certificates of conformity with specification furnished with each cement carload.

2.2 FINE AGGREGATE

A. Fine aggregate shall consist of hard, strong, durable and uncoated particles of natural sand, washed and screened. The aggregate shall be free from injurious amounts of clay, soft or flaky materials, loam or organic impurities and the grading shall conform to the following:

Percentage Passing Square Openings				
No. 4	No. 16	No. 50	No. 100	No. 200
95-100	45-70	15-30	3-8	0-3

B. Fineness modulus shall not vary more than ±0.20 from that of approved sample, which shall be between 2.20 and 2.90.

2.3 COARSE AGGREGATE

A. Coarse aggregate shall consist of hard, tough, durable and uncoated particles of washed and screened gravel or crushed stone. It shall be free of vegetation, soft, friable, thin, or elongated particles.
B. Maximum size of coarse aggregate shall be governed by the conditions of placement of the concrete and shall not be greater than 3/4 of the distance between reinforcing bars. In no case shall the maximum size be greater than 1 inch. All aggregates shall be approved before use.

2.4 WATER

A. Water shall be clean, clear, free from oil, acid or organic matter and free from injurious amounts of alkali, salts, or other chemicals.

2.5 SHOP DRAWINGS

A. Submit shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315 showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Include special reinforcement required at the openings through structures. Provide full wall and beam elevations of concrete and walls showing all embedments, vertical and horizontal reinforcing and all special reinforcement. Fabrication, bar bending, cutting, etc., shall be in accordance with the requirements as specified herein.
B. Submit manufacturers product data with application and installation instructions for proprietary materials and items including reinforcement and forming accessories, admixtures, patching compounds, joint systems, bituminous damp-proofing, curing compounds and others as requested by the Engineer. Submit manufacture's certificate of conformance with these Specifications for all proprietary materials and products.

2.6 FORMS

A. The forms shall be of wood or metal and shall be of sufficient strength to support the concrete without bulging between supports and sufficiently water tight to hold the concrete mortar. The forms shall be constructed such that the finished concrete shall be of the form and dimensions shown on the plans. All form work for exposed surfaces shall be of such material and so constructed as to produce a smooth, even surface when the concrete is placed. All forms shall be oiled before use. In general, wall forms may be removed after the concrete has been in place for 24 hours. All exposed edges shall have a 3/4-inch chamfer whether or not shown on the details. Immediately upon removal of the forms, any honeycombed sections shall be repaired as directed. Only the foundation bottom shall be cast against subgrade. All other surfaces shall be formed.
B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
    1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

D. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
   1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of the exposed concrete surface.
   2. Furnish ties that, when removed, will leave holes not larger than 1 inch in diameter in concrete surface.

2.7 CONCRETE MIX – CONCRETE PAVING

(Reference Item 2.8 for Retaining Walls and Guard Shack Slab.)

A. Class "A" concrete shall contain not less than 5.5 sacks of cement per cubic yard. No more water shall be used than is required to produce a workable mix and in no case will the water content exceed 5.0 gallons per sack of cement. The proportioning of the constituents of the concrete shall be such as to produce a dense, and workable mixture, and the mix shall be approved before any concrete is placed.
B. The minimum 28-day compressive strength for Class A concrete shall be 4000 psi.
C. The minimum 28-day compressive strength for Class A concrete for pavement shall be 4400 psi.
D. Pipe embedment concrete shall contain not less than 4 sacks of cement per cubic yard. No more water than 8 gallons of water per sack of cement shall be used. The proportioning of the constituents of the concrete shall be such as to produce a dense and workable mixture, and the mix shall be approved before any concrete is placed.
E. Cement Stabilized Backfill for backfill stabilization shall contain a minimum 2 sacks of cement per cubic yard. No more water than 10 gallons per sack of cement shall be used.

2.8 CONCRETE MIXES – RETAINING WALLS AND GUARD SHACK SLAB

(Reference Item 2.7 for Concrete Paving.)

A. Prepare design mixes for each type and strength of concrete determined by either laboratory trial mix or field test data bases, as follows:
   1. Proportion normal-weight concrete according to ACI 211.1 and ACI 301.
   2. For each design mix submitted that includes the use of fly ash, an alternate design mix shall be submitted excluding fly ash. The alternate design mix shall be provided for concrete placements that occur during cold weather as defined by ACI 306.1.
B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the laboratory trial mix basis.
C. Proportion normal-weight concrete mix as follows:
   1. Compressive Strength (28 Days): 3000 psi.
   2. Minimum Slump: 3 inches.
   3. Maximum Slump: 6 inches.
   4. Maximum Slump for Concrete Containing High-Range Water-Reducing Admixture: 8 inches after admixture is added to concrete with 2- to 4-inch slump.
   5. Maximum water–cementitious material ratio: 0.55.
   6. Cementitious material shall not exceed 20% fly ash by weight.
D. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than Portland cement in concrete as follows:
   1. Fly Ash: 20%.

E. Air Content: Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows within a tolerance of plus 1 or minus 1.5 percent, unless otherwise indicated:
   1. Air Content: 5.5% for 1-1/2-inch nominal maximum aggregate size.
   2. Air Content: 6% for 1-inch nominal maximum aggregate size.
   3. Air Content: 6% for 3/4-inch nominal maximum aggregate size.
F. Admixtures with chloride-ions are prohibited.
G. Admixtures: Use admixtures according to manufacturer's written instructions.
   1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.
   2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

2.9 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A615, Grade 60, deformed.

2.10 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, and spacers for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Manufacture bar supports according to CRSI - Manual of Standard Practice, from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:
   1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected or CRSI Class 2 stainless-steel bar supports.

2.11 CONCRETE MATERIALS – RETAINING WALLS AND GUARD SHACK SLAB

A. Portland Cement: ASTM C150, Type I/II.
   1. Fly Ash: ASTM C618, Class C.
B. Normal-Weight Aggregate: ASTM C33, uniformly graded, and as follows:
   1. Class: Moderate weathering region, but not less than 3M.
   2. Nominal Maximum Aggregate Size: 3/4 inch.
   3. Combined Aggregate Gradation: Well-graded from coarsest to finest with not more than 18% and not less than 8% retained on an individual sieve, except that less than 8% may be retained on coarsest sieve and on No. 50 sieve, and less than 8% may be retained on sieves finer than No. 50.
C. Water: Potable and complying with ASTM C94.

2.12 ADMIXTURES – RETAINING WALLS AND GUARD SHACK SLAB

A. General: Admixtures certified by manufacturer to contain not more than 0.1% water-soluble chloride ions by mass of cementitious material and to be compatible with other admixtures and cementitious materials. Do not use admixtures containing calcium chloride.
B. Air-Entraining Admixture: ASTM C260.
C. Water-Reducing Admixture: ASTM C494, Type A.
D. High-Range, Water-Reducing Admixture: ASTM C494, Type F.
E. Water-Reducing and Retarding Admixture: ASTM C494, Type D.

2.13 RELATED MATERIALS

A. Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber.
B. Bonding Agent: ASTM C1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
C. Epoxy-Bonding Adhesive: ASTM C881, 2-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class and grade to suit requirements, and as follows:
   1. Type II, non-load bearing, for bonding freshly mixed concrete to hardened concrete.
   2. Types I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
   3. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.14 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI - Manual of Standard Practice.

PART 3 - EXECUTION

3.1 MIXING

A. All aggregates shall be accurately weighed or measured by volume. The concrete shall be mixed in an approved batch mixer equipped with an accurate water measuring tank, and shall be mixed for 1.5 minutes after all materials are in the mixer. "Ready Mixed" or "Transit Mix" concrete may be used. If used, it shall conform to these specifications and the "Standard Specifications for Ready Mixed Concrete", ASTM C 94.
B. 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 dispatched until the specified mixing time is elapsed. Truck mixers, shall be equipped with means by which the number of revolutions of the drum blades, or paddles may be readily verified.
C. 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 satisfactorily 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 placement 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 to wear of blades.
D. Truck mixers shall have adequate water supply and metering devices. No water can be added to the concrete after the initial mixing without the permission of the Engineer.
E. After mixing, the concrete shall be transported to the forms in a manner which will prevent separation or segregation of the aggregates and shall be placed without undue delay. It shall be deposited as nearly as practicable in its final position in order to avoid rehandling or flowing of the concrete. As the concrete is placed, it shall be vibrated by means of a vibrator of the type which is submerged in the concrete.
F. Mixing at 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 or more

revolutions of the drum. For partial mixing in the truck each batch shall be mixed not 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.

G. The maximum time interval between the introduction of the mixing water to the cement and aggregates, and the placing of the concrete in the forms shall not exceed the following:

AIR OR CONCRETE TEMPERATURE (Whichever is Higher)	MAXIMUM TIME
90°F or above (Air Only)	45 minutes
75°F to 89°F	60 minutes
35°F to 74°F	90 minutes

H. Concrete shall not be placed when the ambient temperature is less than 40°F and falling, but may be placed if the temperature is 40°F and rising. Concrete shall not be placed when the temperature will drop below 35°F within 24 hours after placement as projected by the National Weather Service unless properly protected. The temperature of the concrete at the time of placement in the forms shall not be less than 50°F nor more than 90°F. When placing concrete in freezing weather, means shall be provided for keeping the concrete at a temperature of at least 50°F for not less than 72 hours after placing or until the concrete has thoroughly hardened. Concrete shall not be placed when weather conditions are unsuitable for such work.

3.2 TRANSPORTING

A. Concrete shall be handled from the mixer to the place of final deposit in a manner that 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 hoists, by spout, by trough, or 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. Runways for carts or buggies shall not bear upon the reinforcing or fresh concrete. Pumping and conveying of concrete shall be done only after approval by the Engineer and with equipment that will insure a continuous flow without segregation.

3.3 PLACING

A. Concrete shall not be placed until all reinforcement is securely and properly fastened in its correct position. Form ties shall be checked and re-tightened where necessary. Forms and reinforcement shall be inspected and approved by the Engineer prior before beginning placement of concrete. All embedded items shall be in place and clean-out openings closed before such inspection. A procedure for inspection of forms reinforcing, inserts, etc., prior to all concrete placement will be instituted and coordinated by the Engineer. At least 24 hours prior to concrete placement the Contractor shall submit an inspection sheet to the Engineer. The inspection sheet, to be developed shall show the location and quantity of concrete to be placed, the time and date schedule for placement and shall be signed by the Contractor's representative. Signing of this sheet will certify that all of the items necessary have been inspected, and that the area is ready for final review by the Engineer. If the

Engineer determines that the corrections are excessive, the placement should be rescheduled and the Engineer notified 12 hours before scheduled placement after the corrections are made. A representative of the Engineer will be on the job during the placement of concrete and concrete shall not be placed unless the Engineer or his representative is present.

B. Concrete shall be placed in a manner that 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 4 feet. Points of depositing the concrete shall be spaced so that the concrete surfaces can be kept level without using vibrators or other equipment to cause it to flow into place.

C. Concrete shall be placed with the aid of approved mechanical vibrating equipment. Vibration shall be applied to the concrete and shall be of sufficient intensity and duration to cause flow or settlement of the concrete, thoroughly compacting, 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.

D. Excessive spading or vibrating causing undue water gain or segregation will not be permitted. If moderate working causes excessive water gain the mix shall be adjusted. Excess water shall be removed when it appears. When concrete in floors or slabs are deposited on the ground, the subgrade shall be thoroughly compacted and moistened before placement. A grill tamp shall be used on floor slabs. Completed sections shall conform to the details on the contract drawings and the concrete shall be dense, uniform and free of aggregate pockets or honeycomb.

E. Concrete in vertical walls shall be placed in continuous horizontal layers approximately 18 inches in depth. Not more than one (1) hour shall elapse between the placing of successive layers of concrete in any portion of a structure included in a continuous placement.

F. The contractor shall adhere to the requirements ACI 306 and ACI 605 for cold and hot weather concreting respectively.

G. Concrete shall generally not be placed during high winds with blowing dust that will contaminate the surface and cause entrapment of sand and dust particles in the finished surfaces.

3.4 SLUMP

A. The slump of all concrete shall be 3 to 6 inches with the condition of placement governing the slump to be used. In all cases the Engineer shall specify the slump to be used prior to placement. When a 3-inch slump is specified, the allowable tolerance shall be 1/2 inch. When the specified tolerance is greater than 3 inches, the tolerance shall be 1 inch. In general flat work will require a slump of approximately 3 inches and concrete for vertical members, i.e. walls columns, etc. shall be 5 inches. Slump for concrete to be added to CMU units shall be 6 inches.

3.5 MIXING CONCRETE

A. Mixed concrete from plant shall be transported in truck mixers. The elapsed time from the addition of cementitious material to the mix until the concrete is deposited in place at the work site shall not exceed 90 minutes when the concrete is hauled in truck mixers. Retempering concrete by adding water or by other means will not be permitted. With

transit mixers additional water may be added to the batch materials and additional mixing performed to increase the slump to meet the specified requirements provided the addition of water is performed within 45 minutes after the initial mixing operations and provided the water/cementitious ratio specified in the approved mix design is not exceeded and approved by the Engineer

B. No concrete shall be mixed, placed or finished when the natural light is insufficient, unless an adequate and approved artificial lighting system is operated.

C. Cold Weather

1. Unless authorized in writing by the Engineer; mixing and concreting operations shall be discontinued when a descending air temperature in the shade and away from artificial heat reaches 40°F and shall not be resumed until an ascending air temperature in the shade and away from artificial heat reaches 35°F.
2. The aggregate shall be free of ice, snow and frozen lumps before entering the mixer. The temperature of the mixed concrete shall not be less than 50°F at the time of placement. Concrete shall not be placed on frozen material nor shall frozen aggregates be used in the concrete.
3. When concreting is authorized during cold weather, water and/or the aggregates may be heated to not more than 150°F. The apparatus used shall heat the mass uniformly and shall be arranged to preclude the possible occurrence of overheated areas which might be detrimental to the materials.

D. Hot Weather: During periods when the maximum daily air temperature exceeds 90°F, the Contractor shall perform all concrete placement during the night time hours unless temperature controls are implemented and approved by the Engineer. During the periods of hot weather when the maximum daily air temperature exceeds 85°F the following precautions shall be taken.

1. The forms and/or the underlying surface shall be sprinkled with water immediately before placing the concrete. The concrete shall be placed at the coolest temperature practicable and in no case shall the temperature of the concrete when placed exceed 90°F. The aggregates and/or mixing water shall be cooled as necessary to maintain the concrete temperature at or not more than the specified maximum. If concrete temperature exceeds 95°F as measured in accordance with ASTM C1064, it shall be rejected.
2. The finished surfaces of the newly laid concrete surface shall be kept damp by applying a water-fog or mist with approved spraying equipment until the concrete surface is covered by the curing medium. If necessary wind screens shall be provided to protect the concrete from an evaporation rate in excess of 0.2 lbs/sq ft/hour as determined in accordance with Figure 2.1.5 in ACI 305R, Hot Weather Concreting, which takes into consideration relative humidity, wind velocity, and air temperature. When conditions are such that problems with plastic cracking can be expected and particularly if any plastic cracking begins to occur, the Contractor shall immediately take such additional measures as necessary to protect the concrete surface. Such measures shall consist of wind screens, more effective fog sprays and similar measures commencing immediately behind the concrete placement. If these measures are not effective in preventing plastic cracking concreting operations shall be immediately stopped.
3. The Contractor shall submit a Hot Weather Concrete Construction Plan and have it reviewed by the Engineer 30 calendar days prior to concrete placements when the ambient temperature exceeds 85°F. This plan shall conform to ACI 305R and other requirements specified herein and shall include, but not be limited to the demonstration of how the concrete temperature during batching and mixing will be

kept below 90°F, how the concrete will be protected from the rapid evaporation of surface moisture, the proper use of water reducers with re-dosing charts and procedures, and curing procedures.

4. Concrete placement shall be limited to night time hours when the average daily air temperature is or is forecasted to exceed 90°F.
5. Prior to the start of concreting operation for each day of placement, the Contractor shall provide the Engineer with a Temperature Management Program for the concrete to be placed to assure that uncontrolled cracking is avoided. As a minimum the program shall address the following items:
   a. Anticipated tensile strains in the fresh concrete as related to heating and cooling of the concrete material.
   b. Anticipated weather conditions such as ambient temperatures, wind velocity and relative humidity.
   c. Anticipated timing of initial sawing of joints, when specified.

E. Protection of Concrete from Plastic Cracking

1. The finished surfaces of the newly laid concrete shall be kept damp by applying a water-fog or mist with approved spraying equipment until the concrete is finished and is covered by the curing medium. When the evaporation rate is less than 0.2 lbs/sq ft/hour, one (1) coat of liquid concrete curing compound shall be applied at a minimum rate of 150 sq ft/gallon. When the evaporation rate is from 0.2 to 0.4 lbs/sq ft/hour, one (1) coat of liquid concrete curing compound shall be applied, at a minimum rate of 100 lbs/sq ft/gallon. When the evaporation rate is greater than 0.4 but less than 0.6 lbs/sq ft/hour, two (2) coats of liquid concrete curing compound shall be applied each coat at 100 sq ft/gallon. When the evaporation rate is 0.6 lbs/sq ft/hour, concreting operations shall be terminated or not be initiated. The evaporation rates shall be determined in accordance with Figure 305R which takes into consideration relative humidity, wind velocity and air temperature.
2. The forms and/or the underlying surface shall be sprinkled with water immediately before placing the concrete. The concrete shall be placed at the coolest temperature practicable and in no case shall the-temperature of the concrete when placed exceed 90°F. The aggregates and/or mixing water shall be cooled as necessary to maintain the concrete temperature at or not more than the specified maximum. Chilled water shall be used to ensure the concrete temperature is below 90°F.
3. When conditions are such that problems with plastic cracking can be expected and particularly if any plastic cracking begins to occur, the Contractor shall immediately take such additional measures as necessary to protect the concrete surface. Such measures shall consist of the requirements as shown in Table 3. If these measures are not effective in preventing plastic cracking, concreting operations shall be immediately stopped, and all Portland cement concrete that is cracked, shall be removed and replaced by the Contractor at no additional cost to the City of El Paso.
4. Based on the results of the Contractor's Quality control data, as collected and documented from the portable weather station, the following criteria shall apply:

TABLE 3 – CURING COMPOUND REQUIREMENTS FOR CONCRETE

Evaporation Rate (Pounds per Square Foot Per Hour)	Minimum Curing Requirements
Less than 0.20	One (1) coat membrane, each at 150 sq ft/gallon
0.20 to 0.40	One (1) coat membrane, each at 100 sq ft/gallon
0.40 to 0.60	Two (2) coats membrane, each at 100 sq ft/gallon
Greater than 0.60	Paving operations shall be terminated or not be initiated if conditions are anticipated or measured.

3.6 FINISHING

A. Exposed Vertical Surfaces
   1. Such surfaces shall have all tie rod holes filled, fins and rough edges removed and all defects removed or patched. Following this the surfaces shall be rubbed with carborundum stones and clean, clear water until a smooth surface, uniform in color and texture has been obtained. This finishing shall be done as soon as is practical after removal of forms.

B. Unexposed Vertical Surfaces
   1. Such surfaces shall be finished as specified for exposed vertical surfaces except that no rubbing will be required.

C. Concrete Pavement
   1. Concrete pavement and other drivable surfaces shall be troweled, after floating, and then lightly brushed to provide a "non-skid" surface.

3.7 EMBEDDED ITEMS

A. All bolts, pipe, pipe sleeves, inserts or other fixtures required by the plans or these specifications to be embedded in the concrete, shall be set accurately in place and maintained in such positions during concreting operations.

3.8 TESTS

A. Test certificates for cement shall be furnished as specified in Item 2.1 above. The Contractor shall furnish results of tests made by a competent commercial laboratory on each material source he proposed to use before start of construction and material shall not be shipped until such results have been examined by the Engineer and the source of material approved. Laboratory mix designs and conformation cylinders will not be required for this project. <u>However, the proposed mix for each class of concrete shall be submitted to the Engineer for approval prior to placing any concrete</u>. 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.

B. 7-day and 28- day compressive tests shall be conducted on all cylinders. A set of four (4) cylinders shall be taken for each placement of 50 cubic yards, or portion thereof. The Owner will pay for quality assurance testing. For any failing tests the Contractor shall correct the work, then pay for retesting.

3.9 BAR REINFORCING

A. 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 A615 Grade 60. Plain steel bars including 1/4 inch diameter bars shall conform to the requirements of ASTM A307, grade 60. Weldable reinforcing bars shall conform to ASTM-A-706.

3.10 WELDED WIRE FABRIC

A. Welded wire fabric shall be as designated on the drawings and shall conform to the requirements of the TxDOT - Standard Specifications for Construction of Highways, Streets and Bridges, Item 440.2 Materials.

3.11 STORING REINFORCING

A. Reinforcing stored at the site shall be protected from 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 when incorporated in the structures.

3.12 FABRICATION AND PLACING

A. Reinforcement shall be accurately fabricated to the dimensions and shapes shown on the plans in accordance with the ACI Manual of Standard Practice unless variations are specifically shown on the plans.
B. Reinforcement shall be accurately placed and adequately supported by concrete, metal or other approved chairs, spacers, or ties and shall be secured against displacement. Reinforcement shall be placed in specified positions within the following tolerances:
C. Depth in structural slabs, flexural members, walls and columns: $\pm$ 1/4 inch.
D. Longitudinal location of bends and ends of bars: $\pm$ 2 inches except that the required concrete cover at ends of members shall not be reduced.
E. Unless noted otherwise on the Contract Drawings, the concrete cover for reinforcing shall be in accordance with the requirements of the ACI Building Code Requirements for Reinforced Concrete (ACI 318).
F. Splices shall be made as shown on the Contract Drawings 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 Requirements for Reinforced Concrete (ACI 318).
G. Reinforcing bars partially embedded in concrete shall <u>not</u> be field bent, except as indicated on the Contract Documents or permitted by the Engineer.
H. Torch cutting of reinforcing bars will not be allowed.
I. Mats of wire fabric shall overlap each other sufficiently to maintain a uniform strength and shall be fastened securely at the ends and edges.

3.13 JOINTS - GENERAL

A. Construction and expansion joints shall be constructed at the locations and in accordance with the details shown on the drawings. If it becomes necessary to stop placement of concrete between joints, or if the Contractor desires for his own convenience to construct joints other than those shown, such joints shall be made only at locations approved by the

Engineer and all such joints shall be constructed in accordance with the plans and specifications.

B. All horizontal joints shown on the plans shall be made truly horizontal and chamfered. Vertical joints shall be truly vertical.

C. Before concreting operations are resumed at any construction joint, or wherever fresh concrete is to be bonded to hardened concrete, the surface of the hardened concrete shall be cut or chipped to remove laitance and expose aggregate. The surface of the concrete shall be thoroughly cleaned, saturated, then sloshed with a coating of neat cement grout against which the fresh concrete shall be placed before the grout has attained initial set. Care shall be taken to insure that the first layer of new concrete contains sufficient mortar for adequate bond.

3.14 EXPANSION JOINT MATERIALS

A. Where pre-molded expansion joint material is shown on the plans such material shall be 1/2- or 3/4-inch bituminous type preformed joint filler, AASHTO M-33 as shown on the drawings. Contractor shall submit on proposed expansion joint material and submit documentation that certifies it meets AASHTO M-33 requirements.

3.15 JOINT CONSTRUCTION

A. All joints shall be constructed in a workman like manner with joints truly vertical or horizontal, as required, and at right angles to the axis of the member in which the joint occurs. Expansion joint material shall be accurately positioned and nailed onto existing concrete to the lines and dimensions shown on the drawings so that the expansion joint material is accurately held in place during placement of new concrete.

3.16 WATERSTOPS - GENERAL

A. Where waterstop is shown or required it shall be of the materials specified herein and of the dimensions shown on the drawings. All installation of waterstop, including splicing joints shall be in strict accordance with the manufacturer's recommendations and as approved by the Engineer.

3.17 PVC WATERSTOP

A. PVC Waterstop shall be 6-inch, single-bulb type with minimum thickness of 3/8-inch and minimum bulb diameter of 3/4-inch and shall be of the serrated type, 6-inches wide weighing not less than 110 pounds per 100 linear feet.

B. The waterstop shall be fabricated from a plastic compound, the basic resin of which is polyvinyl chloride, with additional resins, plasticizer, stabilizers or other materials such that, when compounded shall conform to the requirements of Corps of Engineers Specification CRD-C-572-63. No reclaimed PVC, nor any PVC compound other than that specified herein shall be used. The manufacturer shall, furnish an affidavit certifying compliance with this specification.

C. All installation, including splicing joints, and intersections, shall be in strict accordance with the manufacturer's recommendations, as approved by the Engineer. All splices must be made with an electrical welding appliance specifically fabricated for use in the welding of PVC waterstop joints. Devices utilizing externally applied heat will not be permitted.

3.18 COLD-JOINT WATERSTOPS

A. Cold-Joint water stops shall be as manufactured by Synkoflex Products, Inc or approved equal. The material property shall conform to ASTM D71, D217 and Federal Specifications SS-S-210A. Provide the cold-joint waterstops as indicated on the drawings. Contractor shall submit manufacturer product information for approval. Installation shall be per the manufacturer's instructions.

3.19 CURING AND PROTECTING

A. All concrete shall be cured by applying a liquid membrane coating to all exposed surfaces, provided the materials and method of application are first approved by the Engineer. See Item 3.5.E. The coating shall conform to ASTM C309. Care shall be taken to prevent mechanical injury to concrete work during the curing period and until the work is accepted. Any work damaged prior to acceptance shall be repaired to the satisfaction of the Engineer.

B. All concrete work shall be protected until such time as it has set up sufficiently to prevent damage by vandals.

C. Suitable means shall be provided to prevent concrete from freezing for not less than 72 hours after placing. Any concrete damaged by freezing shall be removed and replaced by the Contractor at his expense. The addition of any admixture of chemicals to the concrete to prevent freezing shall not be allowed, unless specifically approved by the Engineer.

3.20 DEFECTIVE WORK

A. Any defective work disclosed after the forms have been removed shall be immediately removed and replaced. If any dimensions are deficient, or if any section is not constructed to the proper grade, or if the surface of the concrete is bulged, uneven, or shows honeycomb, which in the opinion of the Engineer cannot be repaired satisfactorily, the entire section shall be removed and replaced at the expense of the Contractor.

3.21 FORMWORK REMOVAL

A. Forms may be removed only upon approval by the ENGINEER. In general, removal of wall forms within 24-hours. Adequate reshoring shall be placed when forms are removed and backfilling is begun, and shall remain in place until the design 28-day compressive strength is attained. The attained strength shall be determined from standard test cylinders molded, cured and broken in accordance with ASTM C31. The strength of the concrete shall be assumed to be the average strength of the two cylinders tested. If the Contractor wishes to determine the strength of the concrete prior to the 28-day tests, the Contractor shall bear the cost as well as the responsibility of obtaining additional cylinders as well as the tests.

B. It shall be the responsibility of the Contractor, in all form removal, to prevent damage or marring of the concrete surfaces.

3.22 BACKFILLING

A. Backfill behind and adjacent to all concrete work shall be made from good quality topsoil. This material shall be free from organic material such as leaves, grass, roots and other

unsuitable materials and free of rocks or stones. The Contractor shall provide a smooth, even slope between the existing ground and the top of curb or other concrete structure.

B. 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. Any damaged concrete will be removed and replaced at the expense of the Contractor.

3.23 PAYMENT

A. Payment will be made for all work covered in this section at the contract unit price per unit or will be included in the lump sum price per job for items, as shown on the proposal. Such payments shall be complete compensation for the complete performance of the work in accordance with the drawings and the provisions of these specifications.

END OF SECTION

SECTION 05400

COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Types of cold-formed metal framing units include the following:
      a. C-shaped steel studs.
B. Related Section:
   1. Division 01 Specification Sections apply to Work of this Section.

1.2 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 01 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.

1.3 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. AllSteel & Gypsum Products, Inc.
   2. California Expanded Metal Products Company (CEMCO).
   3. Clark Dietrich™ Building Systems.
   4. Consolidated Fabricators Corp.; Building Products Division.
   5. Craco Mfg., Inc.
   6. Custom Stud Inc.
   7. Design Shapes in Steel.
   8. Marino WARE.

9. Olmar Supply, Inc.
10. SCAFCO Corporation.
11. State Building Products, Inc.
12. Steel Construction Systems.
13. Super Stud Building Products, Inc.
14. Telling Industries, LLC.

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 A525 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 A780.

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

SECTION 05500

METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Shop fabricated ferrous metal items, prime painted and galvanized.
B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 06114 - Wood Blocking and Curbing: Wood blocking for support of accessories.
   3. Section 09250 - Gypsum Board Systems: Placement of anchors in stud wall construction.
   4. Section 09912 - Interior Painting.

1.2 QUALITY ASSURANCE

A. Welders' Certificates: Submit certificates certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.

1.3 REFERENCES

A. AASHTO - Standard Specification for Highway Bridges.
B. ASME – Standards on Fasteners
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. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
K. ASTM A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
L. ASTM A569 - Steel, Carbon (0.15 Maximum, Percent) Hot Rolled Sheet and Strip, Commercial Quality.
M. ASTM A653 - Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
N. AWS A2.0 - Standard Welding Symbols.
O. AWS D1.1 - Structural Welding Code.
P. FS FF-S-325 - Shield, Expansion; Nail Expansion; and Nail, Drive Screw (Devices, Anchoring, Masonry).
Q. SSPC - Steel Structures Painting Council.

1.4 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, plans, elevations, sections, and details where applicable.
3. Provide templates for anchors and bolts specified for installation under other Sections.
4. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.
5. Indicate adjacent construction and required anchorages to be provided by other sections.
6. Submit manufacturer's standard printed descriptive product literature for manufactured items.

B. Certification: Submit Welder's certificate verifying AWS qualification within the previous 12 months.

1.5 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings and as instructed by manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General
1. Steel Sections: ASTM A36.
2. Steel Tubing: ASTM A500, Grade B.
3. Steel Plates: ASTM A283.
4. Steel Pipe: ASTM A53, Grade B Schedule 40.
5. Fasteners: FS-S-325, type as required by condition indicated.
6. Bolts, Nuts, and Washers: ASTM A307 galvanized to ASTM A153 for galvanized components.
7. Welding Materials: AWS D1.1; type required for materials being welded.
8. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.
9. Touch-Up Primer for Galvanized Surfaces: Zinc rich type.

B. Pipe Bollards: ASTM A53, Grade B Schedule 40, 8-inch outside diameter, unless otherwise indicated.

C. Resin Filled/Screen Anchors: Acceptable product, Hilti HIT C-20.

D. Concrete: Normal weight, air-entrained concrete with a minimum 28-day compressive strength of 3000 psi.

2.2 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.

2.3 PIPE BOLLARDS

A. Fabricate bollards from Schedule 40 steel pipe.
B. Fabricate bollards for concrete anchorage as detailed.
C. Prime bollards with zinc-rich primer as specified.

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. Prime paint items specified/scheduled to field paint as specified in Section 09912, two (2) coats.
D. Galvanized items specified/scheduled to galvanize with 1.25 oz/sq ft zinc coating according to ASTM A386.

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 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. Pipe Bollards
    1. Anchor bollards in place with concrete footings. Center and align bollards in holes 3 inches above excavation bottom. Place concrete and vibrate or tamp for consolidation. Support and brace bollards in position until concrete has cured.
    2. Fill bollards solidly with concrete, mounding top surface to shed water.

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.

END OF SECTION

SECTION 06114

WOOD BLOCKING AND CURBING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. 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.
   2. Telephone and electrical panel back boards.
   3. Preservative treatment of wood.

B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 01300 – Submittal Procedures: Product data.
   3. Section 01600 – Progress Schedules: Product requirements.
   4. Section 05500 - Metal Fabrications: Placement of steel fabrications embedded into masonry.
   5. Section 08110 – Hollow Metal Doors and Frames: Door openings to receive wood blocking.
   6. Section 09250 – Gypsum Board Systems: Gypsum board systems.

1.2 REFERENCES

A. ALSC (American Lumber Standards Committee) - Softwood Lumber Standards.
B. APA/EWA (APA/The Engineered Wood Association) - Certification.
C. ASTM A153 - Zinc Coating (Hot Dip) of Iron and Steel Hardware.
D. ASTM A563 Carbon and Alloy Steel Nuts.
E. ASTM F568 Carbon and Alloy Steel Externally Threaded Fasteners.
F. AWPA C1 (American Wood Preservers Association) - All Timber Products - Preservative Treatment by Pressure Process.
G. AWPA C9 Plywood, Pressure Treatment.
H. AWPA C20 (American Wood Preservers Association) - Structural Lumber Fire Retardant Treatment by Pressure Process.
I. AWPA C27 Plywood, Fire-Retardant Pressure Treatment.
J. FS FF-N-105B Nails, Brads, Staples and Spikes: Wire, Cut and Wrought.
K. SPIB (Southern Pine Inspection Bureau) - Lumber Grading Rules.
L. WCLIB (West Coast Lumber Inspection Bureau) - Lumber Grading Rules.
M. NLGA (National Lumber Rules Authority).
N. WWPA (Western Wood Products Association).

1.3 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: NFPA, SPIB, WCLIB, or WWPA.

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.

1.4 SUBMITTALS

A. Submit following in accordance with Section 01300:
1. Product Data
a. Provide technical data on wood preservative materials, application instructions.
B. Manufacturer's Certificate: Certify that products conform to specified requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Section 01550 – 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% maximum moisture content, pressure preservative treat.
C. Plywood: APA Structural I, Grade B-C; Exposure Durability 1; sanded.
D. Telephone and Electrical Panel Boards: Plywood Exterior, Structural I. Use 3/4-inch thickness minimum. Treat all plywood sheathing unless otherwise indicated.

2.2 ACCESSORIES

A. Fasteners and Anchors:
1. Fasteners: ASTM F568 and FS FF-N-105B, Hot-dipped or Electro-galvanized steel.
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 Mortar Joints: Expansion type anchors equal to Rawl wedge anchors.
c. At Hollow Masonry: Resin injected screen anchors equal to Hilti HIT C20.
d. At Grout Filled Masonry and Concrete: Expansion bolts or self-tapping masonry anchors as required by project conditions.
e. At Drywall: Equal to Hilti Togglers.
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): AWPA Treatment C1 using water borne preservative with 0.25% retainage.
C. Brush apply two (2) coats of preservative treatment on wood in contact with cementitious materials, roofing and related metal flashings and other exterior locations.

PART 3 - EXECUTION

3.1 SITE-APPLIED WOOD TREATMENT

A. Brush apply two (2) 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. Space framing and furring 16 inches o.c. unless otherwise indicated.
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% 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 07210

BUILDING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Batt insulation in exterior wall construction.
   2. Acoustical insulation.
B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 01550 – Material and Equipment.
   3. Section 09250 - Gypsum Board Systems.

1.2 REFERENCES

A. ASTM C208 - Cellulosic Fiber Insulating Board.
B. ASTM C552 - Cellular Glass Thermal Insulation.
C. ASTM D2842 - Test Method for Water Absorption of Rigid Cellular Plastics.
D. ASTM E 84-87 Test Method for Surface Burning Characteristics of Building Materials.
E. ASTM E 90-87 Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
F. ASTM E96 - Test Methods for Water Vapor Transmission of Materials.
G. ASTM E 119-83 Fire Tests of Building Construction and Materials.
H. ASTM E 413-87 Determination of Sound Transmission Class.
I. NFPA 255 - Test of Surface Burning Characteristics of Building Materials.
J. UL 723 - Tests for Surface Burning Characteristics of Building Materials.

1.3 QUALITY ASSURANCE

A. Insulation k Values
   1. k values indicated are based on 75°F.
   2. Where scheduled, provide insulations with conditioned k values complying with RIC/TIMA 281-1 Conditioning Procedure.

1.4 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.

1.5 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.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Do not install adhesives when temperature or weather conditions are detrimental to successful installation.

1.7 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 01550.

2.2 MATERIALS

A. Flexible Thermal Insulation
   1. Conformance: ASTM C665, Type I, glass fiber batt.
   2. Thermal Resistance: R19 minimum; provide for thickness insulation to fit depth of stud.
   3. Size: To fit framing spacing.
   4. Facing: Unfaced.
B. Flexible Acoustical Insulation
   1. Conformance: ASTM C665, Type I, glass or mineral fiber batt.
   2. Thermal Resistance: R11.
   3. Size: To fit framing spacing.
   4. Facing: Unfaced.

2.3 ACCESSORIES

A. Wire Mesh: Galvanized steel, hexagonal wire mesh.
B. Impaling Clips: Galvanized steel with washer retainer and clips, to be adhered or 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 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.
   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 Thermal Insulation
   1. Place between and tight to framing members.
   2. Retain in place with spindle fasteners at 6 inches oc

C. Flexible Acoustical Insulation
   1. Place between and tight to framing members.
   2. Retain in place with spindle fasteners at 6 inches oc.

3.3 SCHEDULES

A. Flexible Thermal Insulation
   1. Walls: Install in stud space from floor to bottom of roof deck above in all exterior walls
   2. Ceilings: Install over top of ceiling where indicated.

B. Flexible Acoustical Insulation
   1. Walls: Install in stud space from floor to bottom of roof deck above in all walls where indicated on floor plan.
   2. Ceilings: Install four feet wide over top of partitions separating all enclosed spaces.

END OF SECTION

SECTION 07900

JOINT SEALERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Preparing sealant substrate surfaces.
   2. Elastomeric sealant.
B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 03300 – Cast-in-Place Concrete.

1.2 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).

1.3 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.
B. Samples
   1. Submit a sample kit in the form of the 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. If sample panel is accepted it may 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.

1.4 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum ten (10) years' documented experience.
B. Applicator: Company specializing in applying the work of this Section with minimum five (5) 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 or Engineer.
   2. Conduct field tests for each type of elastomeric and non-elastomeric sealant joint substrate indicated.
   3. Notify Architect or Engineer one (1) week in advance of the dates and times when mock-ups will be erected.
   4. Test Method: Test joint sealants by the manufacturer's recommended field test. Sealant may not be used if it fails the adhesion test to the substrate.
E. 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.

1.5 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 multi-component 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.

1.6 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.

1.7 SEQUENCING AND SCHEDULING

A. Coordinate the work of this Section with all Sections referencing this Section.

1.8 WARRANTY

A. Provide 5-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 C920.
   2. Types
      a. S-1: Type M, Grade P, Class 100/50 use T.
      b. S-2: Type S, Grade P, Class 100/50, use T.
      c. S-3: Type M, Grade NS, Class 100/50, use T.
      d. S-4: Type S, Grade NS, Class 100/50, use T.
   3. Color: As selected by Architect or Engineer from manufacturer's full range of standard colors.
B. 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.
   3. Joint Backing: ANSI/ASTM D1056; round, closed cell polyethylene foam rod; oversized 30% to 50% larger than joint width.

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. Perform preparation in accordance with ASTM C1193.

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. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
E. 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. Horizontal Concrete Joints – Type S1 or S2 Elastomeric Sealant.
B. Vertical Concrete Joints – Type S3 or S4, Elastomeric Sealant.

3.7 PAYMENT

A. Payment will be made for all work covered in this section at the contract unit price per unit or will be included in the lump sum price per job for items shown in the proposal. Either payment shall be complete compensation for the complete performance of the work in accordance with the drawings and the provisions of these specifications. No separate payment will be made for compliance with this section.

END OF SECTION

SECTION 08110

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Standard non-rated and fire rated hollow metal doors and frames.

B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 08700 –Hardware.
   3. Section 09912 – Interior Painting.

1.2 REFERENCES

A. Architectural and Transportation Barriers Compliance Board - 36 CFR Part 1191, Accessibility Guidelines for Buildings and Facilities.

B. ANSI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frame Anchors and Hardware Reinforcings.

C. ANSI- A250.6 – Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.

D. ANSI A250.8/SDI-100 - Recommended Specifications for Standard Steel Doors & Frames.

E. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.

F. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames

G. ANSI/UL 1784 - Air Leakage Test of Door Assemblies

H. ASTM A568 – Carbon and High-Strength Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements.

I. ASTM A1008 – Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High Strength Low-Alloy and High Strength with Improved Formability.

J. ASTM A1011 – Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength

K. ASTM E1423 - Standard Practice for Determining Steady State Thermal Transmittance of Fenestration Systems

L. SDI-113 – Standard Practice for Determining the Steady State Thermal Transmittance of Steel Door and Frame Assemblies.

M. SDI-117 – Manufacturing Tolerances Standard Steel Doors and Frames.

1.3 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 types and spacings.
   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.

1.4 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.

1.5 WARRANTY

A. Provide manufacturer's 5-year warranty.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Interior Doors and Frames
1. Stretcher level steel conforming to ASTM A568 and ASTM A1008 or A1011.

B. Exterior Doors and Frames
1. Stretcher level steel conforming to ASTM A568 and ASTM A1008 or A1011.

C. Protective Coatings
1. Bituminous Coating: Specified in Section 09912 – Interior 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. Steel Stud Construction: Z type, same gage and material as frame.
2. Silencers: As specified in Section 08700 - Hardware.
3. Glazing Stops: Rolled steel, square profile, square butted corners; prepared for countersunk style flat head sheet metal screws.
4. Door Glazing Frames: Rolled steel, square profile, mitered corners; prepared for countersunk style thru-bolts at fire-rated doors and flat head sheet metal screws at non-fire rated doors.

2.2 FABRICATION

A. General
1. Fabricate doors and frames to sizes and profiles indicated and in conformance with, except as otherwise specified, ANSI A250.3, ANSI A250.4, ANSI A250.8, ANSI A250.10, SDI-112, SDI-116, and SDI-128.
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 face welded frames with temporary steel spreader bars.
4. 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. Close top edge of doors with flush steel channel closure. Seal joints watertight.
   3. Close bottom edge of doors with inverted steel channel closure.
   4. Door Edges: Beveled Square Edge.
   5. Core Construction, Exterior Doors
      a. Full thickness polystyrene or polyurethane core, foamed in place or slab permanently bonded to face sheets with manufacturer's standard adhesive.
      b. Thermal Value: As specified in Performance Requirements.

C. Frames
   1. Exterior Frames: Level 3, 14 gage.
   2. Interior Frames: Level 3, 14 gage STC 38 where scheduled.
   3. Weld Z and U anchors to frame.
   4. Reinforce frames wider than 48 inches with roll formed steel channels fitted tightly into frame head, flush with top.
   5. 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.
   6. Provide minimum 14 gage steel floor angle clips welded to each jamb.
   7. Removable Stops: Roll formed channel shape, mitered corners; prepared for countersunk style screws.

2.3 FINISH

A. Finish: As Specified in Section 09912 – Interior Painting.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General
   1. Install frames in accordance with ANSI A250.1, NFPA 80 and manufacturer's written instructions.
   2. Coordinate with 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. Coordinate installation of glass and glazing.
   5. Install field applied hardware in accordance with SDI-109.
   6. Touch-up damaged shop finishes.

3.2 REPAIR OF EXISTING DOORS AND FRAMES

A. Install door and frame manufacturer’s standard filler plates at abandoned hinge and strike mortises.
   1. Weld in place and grind smooth with invisible edges.

B. Fill abandoned screw holes in doors and frames with body putty. Sand smooth with feathered, invisible edges.
   1. New hardware reinforcements
      a. Make cut-outs in frames with straight lines and square corners.
      b. Maintain maximum 1/16 inch between edge of new cut-out and new hardware.

c. Provide hardware reinforcements to comply with requirements of referenced standards.
d. Weld reinforcements in place and grind smooth with invisible edges.

3.3 TOLERANCES

A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.4 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.

3.5 SCHEDULE

A. Refer to Door Schedule in Drawings.

END OF SECTION

SECTION 08211

FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Non-rated and fire-rated flush wood doors to receive transparent and paint finish.
   2. Cut outs for wood and glass panels.
   3. Metal door lite surround frames.
B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 01039 – Coordination and Meetings.
   3. Section 08110 – Hollow Metal Doors and Frames: Steel doors and frames.
   4. Section 09912 – Interior Painting: Site finishing doors.

1.2 REFERENCES

A. ANSI A135.4 - Basic Hardboard.
B. ANSI/HPMA HP - Hardwood and Decorative Plywood.
C. ASTM E413 - Classification for Determination of Sound Transmission Class.
D. NFPA 80 - Fire Doors and Windows.
E. NWWDA - National Wood Window and Door Association.

1.3 SUBMITTALS

A. Submit under provisions of Section 01300.
B. Shop Drawings and Product Data
   1. Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special blocking for hardware, and identify cutouts for glazing.
   2. Indicate door core materials and construction; veneer species, type and characteristics; factory machining criteria and hardware preparation.
C. Samples
   1. Samples: Submit two (2) samples of door veneer, 4- x4-inch in size illustrating wood grain, stain color, and sheen.
D. Manufacturer's Installation Instructions
   1. Indicate special installation instructions.
E. Manufacturer's Certificates
   1. Certify that doors meet or exceed specified requirements and requirements of NWWDA standards referenced.
   2. Certify that doors meet or exceed adhesive bond test of NWWDA T.M.-6.

1.4 QUALITY ASSURANCE

A. Perform work in accordance with NWWDA Industry Standard I.S. 1-A for Flush Wood Doors

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum five (5) years' documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products to site under provisions of Section 01550.
B. Protect doors with manufacturer's standard sealed resilient packaging.
C. Handle doors with clean hands or while wearing clean gloves.
D. Store doors in flat position, raised above floor, not in damp or wet areas or in areas where sunlight might bleach veneer.
E. Seal top and bottom edges if stored more than one week. Break seal on-site to permit ventilation.

1.7 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings.

1.8 COORDINATION

A. Coordinate work under provisions of Section 01039 – Coordination and Meetings.
B. Coordinate the work with door opening construction, door frame and door hardware installation.

1.9 WARRANTY

A. Provide warranty under provisions of Section 01700 to the following term:
   1. Interior Doors: Life of Installation - two (2) years.
B. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Doors
   1. Algoma Hardwoods, Inc.; Algoma, WI.
   2. Eggers Industries, Inc.; Two Rivers, WI.
   3. VT Industries, Inc.; Holstein, IA.
   4. Weyerhaeuser; Marshfield, WI.
B. Substitutions: Under provisions of Section 01550.

2.2 MATERIALS

A. Lumber
   1. Paint Finish: NHLA first grade or WWPA, Clear Door grade, kiln dried to maximum 10% moisture content.

B. Cores
   1. Solid Core
      a. Non-Fire Rated: ANSI 208.1, grade 1-LD2 particleboard, minimum 40 pounds per cubic foot density.
C. Veneers
   1. Paint Finish: AHA A-135.4, 0.125 inch thick Medium Density Overlay.

2.3 FABRICATION

A. General
   1. Fabricate doors to thickness scheduled.
   2. Hardware
      a. Factory machine doors for finish hardware in accordance with templates furnished by hardware supplier at locations indicated in NWWDA I.S.1.7-87 - Hardware Locations for Wood Flush Doors.
      b. Do not machine for surface hardware.
      c. Provide solid blocking for through bolted hardware.
   3. Factory pre-fit doors for frame opening dimensions identified on shop drawings with pre-fit clearances specified in NWWDA I.S. 1-A.
B. Flush Face Doors
   1. Solid Core: Fabricate in accordance with NWWDA I.S. 1 and 1-A for 5-ply construction except as otherwise specified, with finish as scheduled.

2.4 FINISH

A. As specified in Section 09912 – Interior Painting.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify frame opening conditions under provisions of Section 01300 – Administrative Requirements.
B. Verify 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 doors in accordance with manufacturer's instructions.
B. Trim non-rated door width by cutting equally on both jamb edges.
C. Trim door height by cutting bottom edges to a maximum of 3/4 inch.
D. Pilot drill screw and bolt holes.
E. Machine cut for hardware. Core for handsets and cylinders.
F. Coordinate installation of doors with installation of frames specified in Section 08110 and hardware specified in Section 08700.
G. Coordinate installation of glass and glazing.
H. Install door louvers, plumb and level.

3.3 INSTALLATION TOLERANCES

A. Conform to NWWDA I.S. 1-A requirements for fit and clearance tolerances, maximum diagonal distortion, telegraphing and warp.

3.4 ADJUSTING

A. Adjust work under provisions of Section 01700.
B. Adjust door for smooth and balanced door movement.

END OF SECTION

SECTION 08305

ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Access doors and frames for walls and ceilings.
B. Related Section:
   1. Division 01 Specification Sections apply to Work of this Section.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
C. Schedule: Types, locations, sizes, latching or locking provisions, and other data pertinent to installation.

PART 2 - PRODUCTS

2.1 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to:
   1. Babcock-Davis.
   2. Dur-Red Products.
   3. Elmdor/Stoneman Manufacturing Co.; Div. of Acorn Engineering Co.
   4. Jensen Industries; Div. of Broan-Nutone, LLC.
   5. J. L. Industries, Inc.; Div. of Activar Construction Products Group.
   6. Larsen's Manufacturing Company.
   7. Metropolitan Door Industries Corp.
   8. MIFAB, Inc.
   9. Milcor Inc.
   10. Nystrom, Inc.
B. Source Limitations: Obtain each type of access door and frame from single source from single manufacturer.
C. Flush Access Doors with Concealed Flanges:
   1. Assembly Description: Fabricate door to fit flush to frame. Provide frame with gypsum board beads for concealed flange installation.
   2. Locations: Wall and ceiling.
   3. Door Size: 12- by 12-inch unless otherwise shown.
   4. Uncoated Steel Sheet for Door: Nominal 0.060 inch, 16 gage.
      a. Finish: Factory prime.
   5. Frame Material: Same material and thickness as door.
   6. Hinges: Manufacturer's standard.
   7. Hardware: Latch.
D. Hardware:
   1. Latch: Slam latch operated by screwdriver.

2.2 MATERIALS

A. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
B. Steel Sheet: Uncoated or electrolytic zinc-coated, ASTM A879/A879M, with cold-rolled steel sheet substrate complying with ASTM A1008/A1008M, Commercial Steel (CS), exposed.
C. Metallic-Coated Steel Sheet: ASTM A653/A653M, CS, Type B; with minimum G60 or A60 metallic coating.
D. Frame Anchors: Same type as door face.
E. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A153/A153M or ASTM F2329.

2.3 FABRICATION

A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
B. Metal Surfaces: For metal surfaces exposed to view in completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access doors to types of supports indicated.
D. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.

2.4 FINISHES

A. Comply with NAAMM - Metal Finishes Manual for Architectural and Metal Products, for recommendations for applying and designating finishes.
B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
D. Steel and Metallic-Coated-Steel Finishes:
   1. Factory Finished: Apply manufacturer-standard, baked enamel or powder coat finish immediately after surface preparation and pretreatment, with a minimum dry-film thickness of 1 mil for topcoat. White color.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with manufacturer's written instructions for installing access doors and frames.
B. Install doors flush with adjacent finish surfaces.

3.2 ADJUSTING

A. Adjust doors and hardware, after installation, for proper operation.
B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION

SECTION 08700

HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. All finish hardware necessary for completion of project.
B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 08110 – Hollow Metal Doors and Frames.
   3. Section 08211 – Flush Wood Doors.

1.2 QUALITY ASSURANCE

A. Manufacturers Qualifications
   1. Companies specializing in manufacturing door hardware with minimum three (3) years' experience.

1.3 REFERENCES

A. 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 A156.12 Interconnected Locks & Latches.
   10. ANSI A156.13 Mortise Locks & Latches.
   11. ANSI A156.15 Closer Holder Release Devices.
   12. ANSI A156.16 Auxiliary Hardware.
   13. ANSI A156.17 Self-Closing Hinges and Pivots.
   14. ANSI A156.18 Materials and Finishes.
   15. ANSI A156.21 Thresholds.
   16. ANSI A156.22 Door Gasketing Systems.
   17. ANSI A156.23 Electromagnetic Locks.
   18. ANSI A156.24 Delayed Egress Locks.
   19. ANSI A156.26 Continuous Hinges.
   20. ANSI A156.36 Auxiliary Locks.
B. American Society for Testing & Materials (ASTM)
   1. ASTM F883 Padlocks.
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.
4. BHMA Directory of Certified Electromagnetic and Delayed Egress Locks.

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.
4. DHI-05 Recommended Locations for Builders' Hardware for Standard Steel Doors and Frames.
5. DHI A115 Wood Door Preparation Standards.

F. Steel Door Institute (SDI)
1. SDI-107 Hardware on Steel Doors (Reinforcement and Application).

G. Texas Civil Statutes, Article 9102, Architectural Barriers Act, Texas Accessibility Standards (TAS)
1. TAS 404.2.5 Door Thresholds.
2. TAS 404.2.7 Door Hardware.
3. TAS 404.2.8 Door Closers.

H. Underwriter’s Laboratories, Inc. (UL)
1. Building Materials Directory.

1.4 SUBMITTALS

A. Product Data
1. Provide product data on specified hardware.
2. Submit manufacturer's parts lists, templates, and installation instructions.
3. Provide wiring diagrams, electrical characteristics, and product data on all electrically controlled devices.

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 using same opening numbers as indicated on the drawings; lock trim material thicknesses; lock trim material evaluation test results; corresponding ANSI/ BHMA standard type number or function number from manufacturer's catalog if not covered by ANSI/ BHMA; and list of abbreviations.
2. Indicate locations and mounting heights of each type of hardware.
3. Indicate lock side of single cylinder doors.
4. Include master cross-reference list indicating door numbers in numerical sequence and associated hardware set.
   a. If, for any reason, any door is moved from the hardware set indicated in the schedule at the end of this section, provide a master cross-reference list, in numerical sequence, indicating door number, original hardware set and new hardware set for every opening.

C. Keying Schedule
1. Hold a keying conference with the Owner or Owner's representative to develop a keying schedule.
2. Develop schedule in accordance with DHI-03.
3. Obtain keying system approval before delivering hardware to project.

4. Unless otherwise indicated or requested, provide keying as follows:
    a. Key all doors different and key all doors to the same room alike.
    b. Key all exterior doors alike.
    c. Master key all doors except mechanical room doors to one (1) key.
    d. Key mechanical room doors to utilities master key system.

D. Certificates of Compliance
1. Submit certificates of compliance attesting that hardware items conform to the NFPA, CFR and ANSI/ BHMA standards specified.

E. Closeout Submittals
1. Submit in accordance with Section 01700.
2. Provide list of actual locations of installed cylinders and their master key code.
3. Submit data on operating hardware, lubrication requirements adjustment methods and inspection procedures related to preventative maintenance.
4. Furnish spare parts data, including a complete list of parts and supplies and source of supply, for locksets, exit devices, closers, electronic locking devices and electromagnetic closer holder release devices.
5. Submit special tools required for hardware adjustment or control.
6. Maintenance Instructions: Furnish six (6) complete copies of maintenance instructions listing routine maintenance procedures, possible breakdowns and repairs, and trouble-shooting guides.
7. Submit simplified “as installed” diagrams for electronic locking devices and electromagnetic closer holder release devices.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, and handle hardware to site in accordance with provisions of Section 01550.
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.

1.6 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.

1.7 WARRANTY

A. Provide 5-year warranty for door closers.

1.8 EXTRA MATERIAL

A. Blank keys: Provide one (1) for each lock scheduled.
B. Provide ten (10) extra cylinder cores for each master key group.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Hinges
   1. Bommer Industries; Landrum, SC.
   2. Hager Companies; St. Louis, MO.
   3. McKinney Products Company; Scranton, PA.
   4. Stanley Hardware Division, Stanley Works; New Britain, CT.

B. Lock and Latches
   1. Adams Rite Manufacturing Co.; City of Industry, CA.
   2. Baldwin Hardware Corp.; Rwading, PA.
   3. Best Lock Corporation; Indianapolis, IN.
   4. Corbin/Russwin Architectural Hardware; Berlin, CT.
   5. PDQ Industries, Inc.; Leola, PA.
   6. Sargent Division, ESSEX Industries, Inc.; New Haven, CT.
   7. Schlage Lock Co.; San Francisco, CA.

C. Push/Pulls
   1. Elmes Door Hardware, Teramura International Corporation; Torrance, CA.
   2. Hager Companies; St. Louis, MO.
   3. Rockwood Manufacturing Co.; Rockwood, PA.
   4. Triangle Brass Manufacturing Co.; Los Angeles, CA.

D. Exit Devices
   1. Corbin/Russwin Architectural Hardware; Berlin, CT.
   2. Sargent Division ESSEX Industries Inc.; New Haven, CT.
   3. Von Duprin, Inc.; Indianapolis, IN.

E. Closers
   1. Corbin/Russwin Architectural Hardware; Berlin, CT.
   2. LCN Closers Division, Schlage Lock Co.; Princeton, IL.
   3. Norton Door Controls; Charlotte, NC.

F. Overhead Holders
   1. ABit Manufacturing; Itasca, IL.
   2. Rixson Architectural Hardware; Charlotte, NC.

G. Manual and Automatic Bolts
   1. H.B. Ives, Harrow Co; Wallingford, CT.
   2. Rockwood Manufacturing; Rockwood, PA.
   3. Triangle Brass Manufacturing Co.; Los Angeles, CA.

H. Gasketing/Threshholds
   1. Hager Companies; St. Louis, MO.
   2. Pemko Manufacturing Co.; Memphis, TN.
   3. Reese Enterprises, Inc.; Rosemount, MO.
   4. Zero International, Inc.; Bronx, NY.

I. Protection Plates and Door Edgings
   1. Hager Companies; St. Louis, MO.
   2. Rockwood Manufacturing; Rockwood, PA.
   3. Triangle Brass Manufacturing Co.; Los Angeles, CA.

J. Door Stops/Bumpers
   1. Hager Companies; St. Louis, MO.
   2. H.B. Ives, Harrow Co.; Wallingford, CT.

3. Rockwood Manufacturing; Rockwood, PA.
4. Triangle Brass Manufacturing Co.; Los Angeles, CA.

K. Door Silencers
1. H.B. Ives, Harrow Co.; Wallingford, CT.
2. Rockwood Manufacturing; Rockwood, PA.
3. Triangle Brass Manufacturing Co.; Los Angeles, CA.

L. Substitutions: Under provisions of Section 01600.

2.2 COMPONENTS

A. General
1. Provide hardware components as indicated on the Drawings and schedules.
2. Schedule is based on products manufactured by McKinney, H.E.S., Corbin/Russwin and Pemko. Components of other manufacturers will be acceptable if they comply with the ANSI/BHMA standards for Grade 1 products and are listed in the latest edition of the BHMA Directories of certification.
3. Regardless of whether or not the item is shown or scheduled for each opening, provide all components required to make every opening functional based on hardware scheduled for similar openings and the referenced codes.

B. Locksets
1. Furnish locksets compatible with specified cylinders.
2. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt. Match cutouts provided in metal frames.
   a. Mortise Locksets: ANSI A156.13, Series 1000, Grade 1 unless otherwise indicated.
   b. Bored (Cylindrical) Locksets
      1) ANSI A156.2, Series 4000, Grade 1 unless otherwise indicated.
      2) Typical 2-3/4 inch backset.
   c. Preassembled (Unit) Locksets: ANSI A156.12, Series 2000, Grade 1 unless otherwise indicated.
   d. Interconnected Locksets: ANSI A156.12, Series 5000, Grade 1 unless otherwise indicated.
   e. Auxiliary Locksets: ANSI A156.36, Grade 1, locks unless otherwise indicated.

C. Latch Sets:
1. Typical 2-3/4 inch backset.
2. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt. Match cutouts provided in metal frames.
   a. Mortise Latch Sets: ANSI A156.13, Series 1000, Grade 1 unless otherwise indicated.
   b. Bored (Cylindrical) Latch Sets: ANSI A156.2, Series 4000, Grade 1 unless otherwise indicated.

D. Exit Devices and Exit Device Accessories
1. General
   a. Provide dust proof floor strikes for vertical rod devices.
   b. Provide manufacturer’s standard filler to extend exit device beyond door lite frames where door lites extend below exit device. Factory cut or form filler to match profile of exit device trim.

E. Closers
1. Closers for outswinging exterior doors: Size one (1) size larger than manufacturer's published recommendations, but not less than size five (5).

2. Size requirements for other closers: Conform to manufacturer's published recommendations, except as specified otherwise.
3. Operating Pressure: Provide closers with maximum operating pressure as follows:
   a. Interior Doors: Set closing force on doors accessible to the physically-handicapped for a push-pull of 5 lbs applied at knob or handle.
   b. Exterior Doors: Maximum 8.5 lbs.

F. Protection Plates
1. Conformance: ANSI A156.6, category J100.
2. Fabrication
   a. Metal Plates
      1) Fabricate from 0.062 inch thick aluminum.
      2) Bevel all edges.
      3) Countersink screw holes for flat head screws.
3. Size
   a. Width: 2 inches less in width than door width for single doors and 1 inch less for pairs of doors.
   b. Height
      1) Armor Plates: 36 inches.
      2) Kick Plates: 10 inches except where bottom rail is less than 10 inches, extend plate extend to within 1/2-inch of panel mold or glass bead.
      3) Mop Plates: 4 inches.

G. Door Edge Guards
1. Conformance: ANSI A156.6, category J200, mortise type.
2. Fabrication
   a. Fabricate from 0.050 inch thick stainless steel.
   b. Provide cut-outs for butts.
   c. Fabricate to minimum 36-inch height above bottom of door and to top of armor plate on doors scheduled to have armor plates.
   d. Provide screws to match edging finish.

H. Miscellaneous
1. Metal Thresholds
   a. Conformance: ANSI A156.21.
   b. Style: As indicated on drawings or in schedule.
   c. Where required, modify thresholds to receive projecting bolts of flush bolts and exit devices.
   d. Thresholds for doors accessible to handicapped: Raised thresholds, corrugated, beveled with slopes not exceeding 1:2, and with height not exceeding 1/2-inch. Bevel not required where height is less than 1/2-inch.

I. Accessories
1. Special Tools: Provide special tools such as spanner and socket wrenches and dogging keys, required to adjust hardware items.

J. Fastenings
1. Provide proper type, size, quantity, and finish with each article of hardware.
2. Gypsum Wallboard: Provide nylon or derlin expansion anchors equal to Hilti “Togglers”.
3. Fastenings exposed to weather and in finished work: brass, bronze, or stainless steel.
4. Provide 1-way or tamperproof screws on exterior doors equipped with half or full surface hinges.

K. Finishes
   1. Plated or Exposed Metal: Provide BHMA #630 (US32D), satin stainless steel finish unless otherwise approved.
L. Keying
   1. Provide a great master keying system, an extension of Owner's keying system, unless otherwise directed by Owner or Architect.
   2. Key locks in sets or subsets.
   3. Furnish locks with the manufacturer's standard construction key system.
   4. Send keys directly from lock manufacturer to Owner by registered mail or other approved means.
   5. Supply keys in following quantities:
      a. Two (2) keys for each lock.
      b. Three (3) master keys.
      c. Three (3) grand master keys.
      d. Three (3) great grand master keys.
      e. Six (6) construction keys.
      f. Two (2) control keys.
   6. Furnish keys to Owner arranged in a container for key control system storage in sets or subsets as scheduled.

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify doors and frames are ready to receive work and dimensions as indicated on shop drawings.
B. Verify power supply is available to power operated devices.
C. Beginning of installation means acceptance of existing conditions.

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 exterior doors such as closers and holders to doors with thru bolts such as sex bolts and nuts.
   5. Conform to 36CFR Part 1191 and Texas Accessibility Standards (TAS) for positioning requirements for handicapped.
B. Locks and Latches
   1. Adjust for latching without binding.
C. Door-Closing Device
   1. Install and adjust in accordance with templates and printed instructions supplied by manufacturer.
   2. Install on solid doors with thru bolts and grommet nuts.
   3. Insofar as practicable, mount closers as follows:
      a. Exterior Doors: Mount closer on interior side of all exterior doors. Provide parallel arms or top jam mount closers.

b. Interior Doors
1) Mount on room side of door for doors opening to or from halls and corridors.
2) Where a door, in the open position, is too close to a wall to prevent the door from opening 90 degrees, or if the closer would hit the wall before contacting the door stop, provide a parallel arm closer.

D. Key Control Storage System
1. Install where directed by Architect.

E. Armor, Kick and Mop Plates
1. Armor Plates: Where scheduled, install on push side of single-acting doors and on both sides of double-acting doors.
2. Kick Plates: Where scheduled, install on push side of single-acting doors and on both sides of double-acting doors.
3. Mop Plates
a. Where scheduled, install on pull side of single-acting doors where door is scheduled to receive armor or kick plate on one side only.

F. Door Edgings
1. Install on stop face of butt edge of door unless otherwise scheduled.

G. Auxiliary Hardware
1. Install lever extension flush bolts at top and bottom of inactive leaf of pairs of doors.
2. Install dust-proof floor strike or threshold, cut-out for bottom bolt.

H. 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.

I. 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.

J. Gasketing
1. Install at inside edge of hinge, head and latch side of door frame.

END OF SECTION

SECTION 09250

GYPSUM BOARD SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Metal stud wall framing.
   2. Framing accessories.
   3. Gypsum board.
   4. Cementitious backer board.
   5. Taped and sanded joint treatment.
   6. Texture finish.

B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 05400 - Cold Formed Metal Framing.
   3. Section 06114 - Wood Blocking and Curbing: Wood blocking for support of surface mounted accessories specified in other sections.
   4. Section 07210 - Building Insulation: Thermal and acoustical insulation.
   5. Section 07900 – Joint Sealers: Acoustical sealants.
   6. Section 08110 – Hollow Metal Doors and Frames.
   7. Section 08305 - Access Doors and Frames: Metal access panels.
   8. Section 09912 – Interior Painting.

1.2 REFERENCES

A. ANSI A118.9 - Cementitous Backer Units.
B. ASTM C475 - Joint Compound and Joint Tape for Finishing Gypsum Board.
C. ASTM C645 – Nonstructural Steel Framing Members.
D. ASTM C754 - Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
E. ASTM C840 - Application and Finishing of Gypsum Board.
F. ASTM C919 - Use of Sealants in Acoustical Applications.
G. 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.
H. ASTM C1002 – Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
I. ASTM C1047 - Accessories for Gypsum Wallboard and Gypsum Veneer Base.
J. ASTM C1278 – Standard Specification for Fiber-Reinforced Gypsum Panel.
K. ASTM C1311 - Solvent-Release Sealants.
L. ASTM C1325 – Non-Asbestos Fiber-Mat Reinforced Cement Substrate Sheets.
M. ASTM C1396 – Standard Specification for Gypsum Board.
N. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
O. ASTM E96 – Water Vapor Transmission of Materials.
P. ASTM E119 - Fire Tests of Building Construction and Materials.
Q. ASTM E336 – Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
R. ASTM E1190 - Strength of Power-Actuated Fasteners Installed in Structural Members.

S. FM 1-21 - Fire Resistance of Building Assemblies.
T. FS FF-P-395 (Rev. C) - Pin, Drive Guided and Pin Driver, Powder Actuated (Fasteners for Powder Actuated and Hand Actuated Fastening Tools).
U. GA-214 - Levels of Gypsum Board Finish.
V. GA-600 - Fire Resistance Design Manual.
W. UL - Fire Resistance Directory and Building Material Directory.

1.3 SYSTEM DESCRIPTION AND PERFORMANCE

A. Acoustical Attenuation for Identified Interior Partitions: STC-rated accordance to ASTM C336 and as indicated on the drawings.
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 C754 under maximum deflection and lateral loading conditions:
    1. Interior Partitions
        a. Maximum Deflection: L/120 at 5 lbf/sq ft; maximum spacing of 16 inches on center unless otherwise indicated.
    2. Ceiling Component Sizes and Spacings: As indicated but not less than required to comply with ASTM C754, maximum deflection of L/240 and deadload of 5 lbf/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.

1.4 SUBMITTALS

A. Submit following in accordance with provisions of Section 01300:
    1. Shop Drawings
        a. Interior Metal Framing: Indicate special details associated with fireproofing and acoustical seals.
    2. Product Data: Provide data on metal framing, gypsum board, and joint compounds.

1.5 QUALITY ASSURANCE

A. Qualifications
    1. Applicator: Company specializing in performing the work of this section with minimum five (5) years' documented experience.
B. Regulatory Requirements
    1. Conform to applicable code for fire rated assembly requirements.
C. Field Samples
    1. On actual gypsum board assemblies, prepare field samples of at least 100 sq ft in surface area for the following applications. Simulate finished lighting conditions for review of in-place unit of Work.
        a. Wall surfaces indicated to receive non-textured paint finishes.
        b. Ceiling surfaces indicated to receive non-textured paint finishes.
D. 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.

1.6 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.

1.7 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 recommendations.
2. Room Temperatures
a. For non-adhesive attachment of gypsum board to framing, maintain not less than 40°F.
b. For adhesive attachment and finishing of gypsum board, maintain not less than 50°F for 48 hours prior to application and continuously after until dry.
c. Do not exceed 95°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. AllSteel & Gypsum Products, Inc.
2. California Expanded Metal Products Company (CEMCO).
3. Clark Dietrich™ Building Systems.
4. Consolidated Fabricators Corp.; Building Products Division.
5. Craco Mfg., Inc.
6. Custom Stud Inc.
7. Design Shapes in Steel.
8. Marino WARE.
9. Olmar Supply, Inc.
10. SCAFCO Corporation.
11. State Building Products, Inc.
12. Steel Construction Systems.
13. Super Stud Building Products, Inc.
14. Telling Industries, LLC.
B. Gypsum Board
1. American Gypsum.
2. BPB America, Inc.
3. CertainTeed/Saint-Gobain.
4. Georgia-Pacific Gypsum LLC.

5. National Gypsum Co.
6. PABCO Gypsum.
7. Temple-Inland.
8. USG Corp.

C. Cement Backer Board
1. BED-ROC Industries.
2. CertainTeed/Saint-Gobain.
3. Custom Building Products.
4. James Hardie Industries.
5. Select Engineering, Inc.
6. Smartboard Building Products, Inc.
7. U.S. Architectural Products.
8. USG Corp.

D. Accessories
1. Celotex Building Products.
2. Flex-Ability Concepts.
3. Georgia-Pacific Gypsum LLC.
4. National Gypsum Co.
5. The Steel Network, Inc.
6. USG Corp.

E. Substitutions: Not Permitted.

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.
2. Bottom Tracks: ASTM C645; galvanized sheet steel, same as studs, C-shape, with knurled faces. Provide shop fabricated flexible track for curved and radiused partitions.
3. Top Tracks
a. Partitions Not Extending to Bottom of Deck or Structure: Same material and construction as bottom track.
4. Furring, Framing and Accessories: ASTM C645.
5. Interior Channels: ASTM C645; Hot- or cold-rolled steel, rust inhibitive coating.

B. Gypsum Board
1. Fire-Rated Gypsum Board: ASTM C1396; fire-resistive type, UL-rated; 5/8 inch thick except where otherwise scheduled, maximum permissible length; ends square cut, tapered and beveled edges.
2. Moisture Resistant Gypsum Board: ASTM C1396; 5/8 inch thick except where otherwise scheduled, maximum permissible length; ends square cut, tapered and beveled edges.
3. Cementitious Backing Board: ASTM C1325/ANSI A 118.9, high density, glass fiber-reinforced, 1/2 inch (nominal) thick.

C. Accessories
1. Trim:
a. Corner Beads: ASTM C1047; Galvanized steel with knurled faces, 1-1/4 inch wide flanges.
b. Edge Trim: ASTM C1047; Galvanized steel with knurled faces, types as indicated.
2. Joint Materials: ASTM C475; reinforcing tape, joint compound, adhesive, and water.
3. Wall and Ceiling Texture: Latex based non-aggregated texturing material.
4. Cementitious Backing Board Tape: Manufacturer's standard 2 inch wide, coated glass fiber tape for joints and corners.
5. 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.
6. Tie and Hanger Wire: ASTM A641, Class 1 zinc coating, soft temper, with capability to sustain, without failure, a load equal to ten (10) times that imposed by ceiling construction, as determined by testing per ASTM E1190 conducted by a qualified testing agency.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify site conditions under provisions of Section 01300.
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) except where otherwise indicated.
2. Form all corners and intersections using conventional 3-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, extending above ceiling only, 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 20 gage 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. Bolt or screw steel channels to studs. Install blocking for support of plumbing fixtures, wall cabinets, toilet accessories, hardware, and where otherwise required for secure mounting of heavy elements.
6. Coordinate installation of wood bucks, anchors, and wood blocking with electrical and mechanical work to be placed within or behind stud framing.

B. Ceiling Framing
1. Install in accordance with ASTM C754 and Manufacturer's instructions.
2. Install ceiling framing independent of walls, columns, and above ceiling work.
3. 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.

C. Acoustical Accessories
1. Install resilient channels at maximum 24 inches on center. Locate joints over framing members.
2. Place acoustical 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.
3. Install acoustical sealant within partitions in accordance with ASTM C919, ASTM E497, and Manufacturer's instructions.
4. Caulk all penetrations of partitions by conduit, pipe, duct work, and rough-in boxes in conformance with ASTM C919.

D. Gypsum Board
1. Install gypsum board in accordance with ASTM C840 and Manufacturer's instructions.
2. Erect single layer gypsum board in most economical direction, with ends and edges occurring over firm bearing.
3. Erect single layer fire-rated gypsum board vertically, with edges and ends occurring over firm bearing.
4. Use screws when fastening gypsum board to metal furring or framing.
5. Treat cut edges and holes in moisture resistant gypsum board with sealant.
6. 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.
7. 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.
8. Install backing board over metal studs in accordance with Manufacturer's instructions.
9. Unless otherwise indicated or directed, install Moisture Resistant Gypsum Board at all walls in high humidity areas such as toilet rooms, janitor’s closets, and kitchens.
10. Install Cementitious Backing Board full height on all plumbing chase walls.

E. 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.

F. Texture Finish
   1. Walls: Spray apply light or medium finish texture coating in accordance with Manufacturer's instructions and Architect's approved sample, to all surfaces scheduled to receive paint.
   2. Ceilings: Spray apply light or medium finish texture coating in accordance with Manufacturer's instructions and approved samples.

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 4: All gypsum board surface scheduled to receive flat paint. Unless otherwise indicated, typical gypsum board walls are to receive a light "Orange Peel" texture.

END OF SECTION

SECTION 09650

RESILIENT FLOORING AND BASE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Vinyl composition floor tile.
   2. Resilient base.
   3. Resilient termination edging.
B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 03300 - Cast-in-Place Concrete: Slab construction.
   3. Section 07900 - Joint Sealers: Cove trim sealant.
   4. Section 09250 - Gypsum Board Systems: Wall materials to receive base.

1.2 REFERENCES

A. ASTM D2047 - Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine.
B. ASTM D4078 - Water Emulsion Floor Polish.
C. ASTM E84 - Surface Burning Characteristics of Building Materials.
D. ASTM E648 - Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
E. ASTM F1066 Vinyl Composition Floor Tile.
F. Rubber Manufacturers Association - Moisture Emission Test Unit.
G. FS SS-T-312- Tile, Floor: Asphalt, Rubber, Vinyl and Vinyl Composition.

1.3 REGULATORY REQUIREMENTS

A. Conform to applicable code as indicated on drawings for fire performance ratings as follows:
   1. Flooring, critical radiant flux (CRF): Minimum 0.45 watt/sq cm, per ASTM E648.
   2. Flooring, smoke density: Maximum 450, per ASTM E662.
   3. Wall base: Flame spread maximum 75, smoke developed maximum 450 per ASTM E84.

1.4 SUBMITTALS

A. Shop Drawings: For each type of floor tile, include floor tile layouts, edges, columns, doorways, enclosing partitions, cabinets, and cut-outs.
B. Product Data
   1. Provide product data on specified products, describing physical and performance characteristics, sizes, patterns, and colors available.
C. Manufacturer's Instructions
   1. Submit Manufacturer's standard printed installation instructions.
D. Samples
   1. Submit Manufacturer’s complete set of color samples for initial color selection.

2. Submit four (4) samples 12 x 12 inches in size, illustrating color and pattern for each floor material specified.
3. Submit four samples 12 inches long for each base and stair material.

E. Closeout Submittals
1. Submit in accordance with Section 01700.
2. Include maintenance procedures, recommended maintenance materials, and suggested methods and schedule for cleaning, stripping, and re-waxing.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three (3) years' documented experience.
B. Installer Qualifications: Company specializing in performing Work of this section with minimum three (3) years' documented experience.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70°F to achieve temperature stability. Thereafter, maintain conditions above 55°F.
B. Maintain ambient temperature required by adhesive manufacturer three (3) days prior to, during, and 24 hours after installation of materials.

1.7 EXTRA MATERIALS

A. Provide one (1) box of each color of tile, 66 sq ft of each color and type of flooring, and 50 lineal feet of base for each material specified.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Tile Flooring
1. Armstrong World Industries, Inc., Lancaster, PA.
2. Azrock Industries, Inc., Lancaster, PA.
3. Tarkett, Inc., Parsippany, NJ.

B. Resilient Base, Trim, and Accessories
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.

C. Accessories: As recommended by flooring Manufacturer.
D. Substitutions: Under provisions of Section 01600.

2.2 MATERIALS

A. Vinyl composition tile, ASTM F1066; 12- x 12-inch size, 1/10-inch thick; equal to design and color indicated on drawings or as selected by Architect.
   1. Conformance: ASTM F1066, Class 2.
   2. Color/Pattern: Color and pattern through total thickness. Color equal to design and color indicated on drawings, or as selected from manufacturer's full range.

B. Base
   1. Compliance: FS SS-W-40, Type I rubber; Style A.
   2. Size: 4-inch high; 1/8 inch thick; Group 1 colors as selected by Architect.
   3. Length: 4-foot sections.
   4. Accessories: Premolded end stops and external corners, of same material, size, and color as base.

C. Accessories
   1. Subfloor Filler: Premix latex; type recommended by Adhesive Material Manufacturer.
   2. Primers and Adhesives: Waterproof; types recommended by Flooring Manufacturer.
   3. Edge (Reducer) Strips: Same material as flooring.
   4. Filler for Coved Base: Plastic.
   5. Sealer and Wax: Types recommended by Flooring Manufacturer.
   6. Adhesives: Water-resistant type recommended by Manufacturer.
      a. Use adhesives with a VOC content of not more than 50 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify surfaces are smooth and flat with maximum variation of 1/8 inch in 10 feet, and are ready to receive Work.

B. Verify concrete floors exhibit negative alkalinity, carbonization, or dusting.

C. Verify that concrete floors are dry to a maximum moisture content as recommended by Manufacturer as follows:
   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/ 1000 sq ft/ 24 hours.
   3. Test Quantities: Minimum of four (4) tests for areas up to 5,000 sq ft and one (1) 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.
   5. Apply resilient flooring when tests show that the adhesive adheres tightly to the floor surface.
   6. If concrete floors are in contact with the ground, use small patches of primer in lieu of adhesive to test for moisture.

D. Verify floor and lower wall surfaces are free of substances that may impair adhesion of new adhesive and finish materials.

E. Beginning of installation means acceptance of existing substrate and site conditions.

3.2 PREPARATION

A. Remove subfloor ridges and bumps.
B. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.
C. Apply, trowel, and float filler to leave a smooth, flat, hard surface.
D. Prohibit traffic from area until filler is cured.
E. Vacuum clean substrate.
F. Apply primer as required to prevent "bleed-thru" or interference with adhesion by substances that cannot be removed.

3.3 INSTALLATION

A. General
   1. Spread only enough adhesive to permit installation of materials before initial set.
   2. Set flooring in place, press with heavy roller to attain full adhesion.
   3. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar.
   4. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated. Secure resilient strips by adhesive.
   5. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
   6. Maintain reference markers, holes, and openings in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, nonstaining marking device.
   7. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
B. Tile Flooring
   1. Mix tile from container to ensure shade variations are consistent when tile is placed.
   2. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.
   3. Allow minimum 1/2 full size tile width at room or area perimeter.
   4. Install tile to basket weave pattern.
C. Base
   1. Fit joints tightly and make vertical. Maintain minimum dimension of 24 inches between joints.
   2. Miter internal corners.
   3. At external corners, use premolded units.
   4. At exposed ends, use premolded units.
   5. Install base on solid backing. Bond tightly to wall and floor surfaces.
   6. Scribe and fit to door frames and other interruptions.

3.4 TOLERANCES

A. Subfloor Flatness: Maximum 1/8 inch deviation in 10 feet.
B. Vertical Alignment (Offset from edge of tile to edge of tile): None allowed.
C. Horizontal Alignment (Offset from a straight line): ±1/16 inch in any length.

3.5 CLEANING

A. Section 01700 – Contract Closeout: Final cleaning.
B. Remove excess adhesive from floor, base, and wall surfaces without damage.
C. Clean, seal, and wax floor and base surfaces in accordance with Manufacturer's instructions.

3.6 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 01700 – Contract Closeout: Protecting installed construction.
B. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

SECTION 09912

INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Surface preparation and the application of paint systems on interior substrates.
B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 05500 – Metal Fabrications: Shop priming and painting of metal substrates.
   3. Section 08110 – Hollow Metal Doors and Frames: Surface preparation and the application of paint systems on metal doors and frames.
   4. Section 09250 – Gypsum Board Systems: Finishing of gypsum board substrates.

1.2 DEFINITIONS

A. Gloss Level 1: Not more than five (5) units at 60° and ten (10) units at 85°, according to ASTM D523, a matte flat finish.
B. Gloss Level 2: Not more than ten (10) units at 60° and ten (10) to 35 units at 85°, according to ASTM D523, a high-side sheen flat, velvet-like finish.
C. Gloss Level 3: Ten (10) to 25 units at 60° and ten (10) to 35 units at 85°, according to ASTM D523, an eggshell finish.
D. Gloss Level 4: 20 to 35 units at 60° and not less than 35 units at 85°, according to ASTM D523, a satin-like finish.
E. Gloss Level 5: 35 to 70 units at 60°, according to ASTM D523, a semi-gloss finish.
F. Gloss Level 6: 70 to 85 units at 60°, according to ASTM D 23, a gloss finish.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.
B. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
   1. Submit samples on rigid backing, 8 inches square.
   2. Step coats on samples to show each coat required for system.
   3. Label each coat of each sample.
   4. Label each sample for location and application area.
C. Product List: For each product indicated, include the following:
   1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
   2. VOC content.

1.4 CLOSEOUT SUBMITTALS

A. Coating Maintenance Manual: Provide coating maintenance manual including area summary with finish schedule, area detail designating location where each product/color/finish was used, product data pages, material safety data sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and are packaged with protective covering for storage and identified with labels describing contents.
   1. Paint: 5%, but not less than 5 gallons of each material and color applied.

1.6 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Architect will select one (1) surface to represent surfaces and conditions for application of each paint system specified in Part 3.
   2. Final approval of color selections will be based on mockups.
      a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
   3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Handling: Deliver products to Project site in an undamaged condition in manufacturer's original sealed containers, complete with labels and instructions for handling, storing, unpacking, protecting, and installing. Packaging shall bear Manufacturer label with the following information:
   1. Product name and type (description).
   2. Batch date.
   3. Color number.
   4. VOC content.
   5. Environmental handling requirements.
   6. Surface preparation requirements.
   7. Application instructions.

B. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45°F.
   1. Maintain containers in clean condition, free of foreign materials and residue.
   2. Remove rags and waste from storage areas daily.

1.8 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50°F and 95°F.
B. Do not apply paints when relative humidity exceeds 85%; at temperatures less than 5°F above the dew point; or to damp or wet surfaces.
C. Lead Paint: Lead paint may be present in buildings and structures to be painted. A report on the presence of lead paint is on file for review and use. Examine report to become aware of locations where lead paint is present.
   1. Do not disturb lead paint or items suspected of containing hazardous materials except under procedures specified.
   2. Perform preparation for painting of substrates known to include lead paint in accordance with EPA Renovation, Repair and Painting Rule and additional requirements of authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Sherwin-Williams Company products indicated or comparable product from one (1) of the following:
   1. Benjamin Moore & Co.
   2. Dunn Edwards.
   3. Glidden Professional, Division of PPG Architectural Finishes, Inc.
   4. Kelly Moore.
   5. Kwal, Division of Sherwin-Williams.
   6. PPG Architectural Finishes, Inc.
B. Source Limitations: Obtain paint materials from single source from single listed manufacturer.
   1. Manufacturer's designations listed on a separate color schedule are for color reference only and do not indicate prior approval.

2.2 PAINT, GENERAL

A. Standards: Provide products that comply with Manufacture's Premium 1st Quality standards indicated and like VOC limits.
B. Material Compatibility:
   1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
   2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
C. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
   1. Flat Paints and Coatings: 50 g/L.
   2. Nonflat Paints and Coatings: 150 g/L.
   3. Dry-Fog Coatings: 400 g/L.

4. Primers, Sealers, and Undercoaters: 200 g/L.
5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
7. Pretreatment Wash Primers: 420 g/L.
8. Floor Coatings: 100 g/L.
9. Shellacs, Clear: 730 g/L.
10. Shellacs, Pigmented: 550 g/L.

D. Low-Emitting Materials: Interior paints and coatings 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."

E. Colors: As indicated in a color schedule in the drawings.
   1. 30% of surface area will be painted with deep tones.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers. Where acceptability of substrate conditions is in question, apply samples and perform in-situ testing to verify compatibility, adhesion, and film integrity of new paint application.
   1. Report, in writing, conditions that may affect application, appearance, or performance of paint.

B. Substrate Conditions:
   1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
      a. Concrete: 12%.
      b. Masonry (Clay and CMU): 12%.
      c. Wood: 15%.
      d. Gypsum Board: 12%.
   2. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
   3. Spray-Textured Ceiling Substrates: Verify surfaces are dry.

C. Proceed with coating application only after correcting unsatisfactory conditions; application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with Manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
   1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
   1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
   1. Concrete Floors: Remove oil, dust, grease, dirt, and other foreign materials. Comply with SSPC-SP-13/NACE 6 or ICRI 03732.
E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in Manufacturer's written instructions.
F. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by Paint Manufacturer but not less than:
   1. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly-etched surfaces that promote adhesion of subsequently applied paints.
I. Aluminum Substrates: Remove loose surface oxidation.
J. Wood Substrates:
   1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
   2. Sand surfaces exposed to view, and dust off.
   3. Prime edges, ends, faces, undersides, and backsides of wood.
   4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
K. Cotton or Canvas Insulation Covering Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 APPLICATION

A. Apply paints according to Manufacturer's written instructions and to recommendations in "MPI Manual."
   1. Use applicators and techniques suited for paint and substrate indicated.
   2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
   3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
   4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
   5. Primers specified in painting schedules may be omitted on items factory-primed or factory-finished if acceptable to topcoat manufacturers.
B. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
C. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

D. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
   1. Paint the following work where exposed in equipment rooms:
      a. Equipment, including panelboards and switch gear.
      b. Uninsulated metal piping.
      c. Uninsulated plastic piping.
      d. Pipe hangers and supports.
      e. Metal conduit.
      f. Plastic conduit.
      g. Tanks that do not have factory-applied final finishes.
      h. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
   2. Paint the following work where exposed in occupied spaces:
      a. Equipment, including panelboards.
      b. Uninsulated metal piping.
      c. Uninsulated plastic piping.
      d. Pipe hangers and supports.
      e. Metal conduit.
      f. Plastic conduit.
      g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
      h. Other items as directed by Architect.
   3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
   1. Contractor shall touch up and restore painted surfaces damaged by testing.
   2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces:
   1. Water-Based Light Industrial Coating System:
      a. Prime Coat: Primer sealer, latex, interior: S-W Loxon Concrete & Masonry Primer Sealer, A24W8300, at 8.0 mils wet, 3.2 mils dry.
      b. Intermediate Coat: Light industrial coating, interior, water-based, matching topcoat.
      c. Topcoat: Light industrial coating, interior, water-based, eggshell, (Gloss Level 3): S-W Pro Industrial Pre-Catalyzed Water-Based Epoxy, K45-151 Series, at 4.0 mils wet, 1.5 mils dry, per coat.

B. Metal Substrates (Aluminum, Steel, Galvanized Steel):
   1. Water-Based Light Industrial Coating System:
      a. Prime Coat: Primer, rust-inhibitive, water-based: S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series, at 5.0 to 10.0 mils wet, 2.0 to 4.0 mils dry.
      b. Intermediate Coat: Light industrial coating, interior, water-based, matching topcoat.
      c. Topcoat: Light industrial coating, interior, water-based, eggshell, (Gloss Level 3): S-W Pro Industrial Pre-Catalyzed Water-Based Epoxy, K45-151 Series, at 4.0 mils wet, 1.5 mils dry, per coat.

C. Wood Substrates: Including exposed wood items not indicated to receive shop-applied finish.
   1. Water-Based Light Industrial Coating System:
      a. Prime Coat: Primer sealer, latex, interior: S-W PrepRite ProBlock Primer Sealer, B51-620 Series, at 4.0 mils wet, 1.4 mils dry.
      b. Intermediate Coat: Light industrial coating, interior, water-based, matching topcoat.
      c. Topcoat: Light industrial coating, interior, water-based, eggshell, (Gloss Level 3): S-W Pro Industrial Pre-Catalyzed Water-Based Epoxy, K45-151 Series, at 4.0 mils wet, 1.5 mils dry, per coat.

D. Gypsum Board and Spray-Texture Ceiling Substrates (except Toilet Room interior):
   1. Latex System:
      a. Prime Coat: Primer, latex, interior: S-W ProMar 200 Zero VOC Latex Primer, B28W2600, at 4.0 mils wet, 1.5 mils dry.
      b. Intermediate Coat: Latex, interior, matching topcoat.
      c. Topcoat: Latex, interior, flat, (Gloss Level 1): S-W ProMar 200 Zero VOC Latex Flat, B30-2600 Series, at 4.0 mils wet, 1.6 mils dry, per coat.

E. Gypsum Board Wall and Ceiling Substrates in Toilet Room:
   1. Pre-Catalyzed Water-based Epoxy System:
      a. Prime Coat: Primer sealer, latex, interior; S-W ProMar 200 Zero VOC Interior Latex Primer, B28 Series, at 1.0 mils dry, per coat.
      b. Topcoat: Epoxy-modified latex, interior, satin (Gloss Level 4): S-W Pro Industrial Pre-Catalyzed Water-based Epoxy Satin, K45 Series, at 1.5 mils dry, per coat.
      c. Topcoat: Epoxy-modified latex, interior, semi-gloss (Gloss Level 5): S-W Pro Industrial Pre-catalyzed Water-based Epoxy Semi-Gloss, K46 Series, at 1.5 mils dry, per coat.

END OF SECTION

SECTION 10522

FIRE EXTINGUISHERS AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Fire Extinguisher Brackets.
2. Fire Extinguishers.
3. Accessories.

B. Related Sections:
1. Division 01 Specification Sections apply to Work of this Section.
2. Section 06114 - Wood Blocking and Curbing: Roughed-in wall openings.
3. Section 09912 – Interior Painting.

1.2 QUALITY ASSURANCE

A. Conform to NFPA 10 requirements for extinguishers.

1.3 REFERENCES

A. NFPA 10 - Portable Fire Extinguishers.

1.4 SUBMITTALS

A. Product Data
1. Submit Manufacturer's standard printed installation instructions.
2. Submit Manufacturer's standard printed operation and maintenance data.
a. Include test, refill or recharge schedules, procedures, and re-certification requirements.

1.5 PROJECT CONDITIONS

A. Do not install extinguishers when ambient temperatures may cause freezing.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Fire Extinguishers and Brackets
1. J. L. Industries, Bloomington, Minnesota.
2. Larsen's Manufacturing Co., Minneapolis, Minnesota.
3. Potter-Rommer, Inc., Cerritos, Calif.

B. Substitutions: In accordance with Section 01600.

2.2 EQUIPMENT

A. Fire Extinguishers
   1. Type I
      a. Fire Class: A,B,C.
      b. Type: Multi-purpose Dry Chemical.
      c. Capacity: 10 lbs.
      d. Range: 15 feet.
      e. UL Rating: 4A- 60B:C.
      f. Shell Material: Enameled Steel.
      g. Weight: 17 lbs.
B. Fire Extinguisher Brackets: Formed 16 gage galvanized sheet steel.

2.3 FABRICATION

A. Fire Extinguisher Brackets
   1. Fabricate to fit extinguisher specified.
   2. Fabricate with integral spring type band and retaining clip.
   3. Provide pre-drilled mounting holes.

2.4 FINISHES

A. Extinguishers: Baked red enamel.
B. Brackets: Baked red enamel.

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify rough openings for cabinet are correctly sized and located.
B. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION

A. Brackets
   1. Install one (1) bracket at each location noted on drawings.
   2. Install plumb and level.
   3. Mounting height from finished floor in accordance with NFPA 10.

3.3 FIRE EXTINGUISHER SCHEDULE

A. Brackets
   1. Install one (1) Type I fire extinguisher at each bracket location as indicated.

END OF SECTION

SECTION 10800

TOILET ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Toilet accessories.
   2. Attachment hardware.

B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 06114 - Wood Blocking and Curbing: In wall blocking and framing for support of accessories.
   3. Section 09250 – Gypsum Board Systems.

1.2 QUALITY ASSURANCE

A. Regulatory Requirements
   1. Conform to 36 CFR Part 1190 for location and mounting height of accessories.

1.3 REFERENCES

A. Architectural and Transportation Barriers Compliance Board - 36 CFR Part 1191, Accessibility Guidelines for Buildings and Facilities.
B. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible To and Usable by Physically Handicapped People.
C. ANSI/ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars and Strips.
D. ASTM A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
E. ASTM A269 - Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
F. ANSI/ASTM A366 - Steel, Carbon, Cold-Rolled Sheet, Commercial Quality.
G. ANSI/ASTM A386 - Zinc Coating (Hot-Dip) on Assembled Steel Products.
H. ANSI/ASTM B456 - Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
I. ASTM A500 - Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
J. ANSI/BHMA A156.16 - Auxiliary Hardware.
K. FS CID A-A-2380 Dispenser, Paper Towel.
L. FS DD-M-00411 Mirrors, Glass.
M. FS WW-D-1908 Dispenser, Toilet Paper, Cabinet.
N. FS WW-H-1911 Holder, Toilet Paper (Single Roll).
O. FS WW-P-541 Plumbing Fixtures (Accessories, Land Use) (Detail Specification).
P. NHLA - Rules for the Measurement & Inspection of Hardwood & Cypress.

1.4 PERFORMANCE REQUIREMENTS

A. Install grab bars in conformance with structural strength requirements of 36 CFR 1191 without damage to supporting structure or finishes.

1.5 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.
   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.

1.6 KEYING

A. Supply six (6) keys for each accessory to Owner.
B. Master key all accessories.

1.7 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. A&J Washroom Accessories, Inc.
B. American Specialties, Inc.; ASI Group.
C. Bobrick Washroom Equipment, Inc.
D. Bradley Corporation.
E. McKinney/Parker.
F. 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. Primer: Zinc Chromate.

2.3 ACCESSORIES

A. Grab Bar
   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. Paper Towel Dispenser (PTD)
   1. Conformance: CID A-A-2380, Type III.
   2. Capacity: 400 C-fold or 525 multi-fold towels.
   3. Size: Approximately 11-inches wide, 4-inches deep and 15-1/4-inches tall.
   4. Acceptable product: Bradley #250-15.
C. Sanitary Napkin and Tampon Disposer (SND)
   1. Conformance: FS WW-P-541/8, Type I, Style S (surface-mounted), stainless steel, disposable liner type.
   2. Size: Approximately 10-3/4-inches wide, 4-inches deep and 15-1/8-inches tall.
      a. Surface Mounted: Approximately 10-3/4" wide, 4" deep & 15-1/8" tall.
   3. Acceptable product: Bradley #4722-15.
D. Toilet Tissue Dispenser (TTD)
   1. Conformance: FS WW-D-1908A, Type II, stainless steel surface-mounted-dual roll.
   2. Size: Approximately 7-5/8 inches wide x 5-1/4 inches deep and 12-3/8 inches tall.
   3. Acceptable product:
      a. Surface mounted dual roll: Bradley #5402.
E. 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.
F. Mirrors (M)
   1. Conformance: FS DD-M-411C, Class 2, Style E.
   2. Size: 18 inches x 36 inches.
   3. Acceptable product: Bradley #700 series.

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.
   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 1-piece flange covers fabricated to fit over wall anchors and fixed by means of not less than three (3) set screws.
   4. Fabricate bends in conformance with 36 CFR Part 1191.

5. Stainless Steel: Either 302 or 304 L, 16 gauge (.064-inch) minimum for 13 inches for 12-inch O.D. bars and 18 gauge (.050-inch) minimum for 1-inch 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 1-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. 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.

D. 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.

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 (1) coat primer and minimum two (2) 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 site conditions are ready to receive work and dimensions 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.

END OF SECTION

SECTION 15000

GENERAL MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.

1.2 DESCRIPTION

A. Work covered by this Division shall consist of furnishing all labor, equipment, supplies and materials and in performing all operations necessary for the installation of complete and operating mechanical systems as required by these specifications and/or shown on the drawings, subject to the terms and conditions of the contract. The work shall also include the completion of such mechanical and electrical details not mentioned or shown which are necessary for the successful operation of all systems described on the drawings or required by these specifications; this includes the furnishing all materials for the filling the systems to make them operable, including water, refrigerant, oil and grease. Prove satisfactory operation of all equipment and controls to the Engineer on request.

B. Work Not Included: Certain labor, material and equipment may be furnished and/or installed under other divisions of these specifications. This Contractor shall coordinate with other trades and arrange his work to make the part fit together. The following items are to be accomplished under other divisions of these specifications:
   1. Temporary Heat: Refer to paragraph in this Section.
   2. Temporary Water and Toilet: Refer to General Conditions.
   3. Roof Curbs: Refer to paragraph in this Section.
   4. Electrical Equipment and Wiring: Refer to paragraph in this Section.
   5. Concrete: Refer to paragraph in this Section.

C. Equipment Furnished by Owner: Rough-in services pipes to locations as required by architectural and mechanical drawings and equipment shop drawings. Provide service valves on all pipes except waste and vent pipes. Final Connection to equipment will be made by this Contractor.

1.3 BIDDING

A. All mechanical equipment shall be new unless specified otherwise in the specifications or on the drawings.

B. All bids must be based only on the equipment and materials as scheduled on the drawings and as specified or on equivalent equipment and materials. Any Contractor who assumes equivalence of products and who bases his proposal on that assumption does so at his own risk.

C. A listing of approved alternative manufacturers does not mean that all products of a particular alternative manufacturer are acceptable alternative to the scheduled items. All fixtures and devices must still be submitted according to the prescribed procedures. In addition, some items that have an important visual affect, e.g. electric water coolers, may be required to receive Owner's or Architectural approval also.

1.4 EXISTING UTILITIES

A. The drawings indicate the locations, type and sizes of various utilities within the site where known. These utilities are indicated as accurately as possible. If the Contractor encounters any utilities during construction which are not shown on the drawings, they shall ask for written instructions from the Architect. Any relocation or remodeling required will then be directed by a change order. This Contractor shall assume all responsibility for protection of all utilities, shown or not, and for repair required by this construction.

B. Contractor shall verify location, size, elevation, pressure and any other pertinent data of the existing utilities. Additional costs incurred due to failure to verify such data and to coordinate associated work with respective utility providers shall not be the Owner's responsibility but shall be borne by the Contractor.

C. All costs associated with providing utilities including, but not limited to, connection fees, boring under roads, etc., shall be included in the Contractor's proposal price whether such costs are incurred by Contractor or charged by the utility company.

D. Submission of a proposal by the Contractor shall be considered an acknowledgment by the contractor of his compliance with this section.

1.5 CODES, PERMITS AND FEES

A. Contractor shall comply with all local, state and national codes and shall pay for all applicable costs, fees, permits, licenses and inspections for this division.

1.6 TEMPORARY HEAT

A. Temporary heat will be furnished by the General Contractor. Use of the permanent heating system will not be allowed without written authorization from the Engineer, Architect and Owner. In case the permanent heating system is used for temporary heat, the General Contractor shall pay all the costs until acceptance by the Owner. Warranty of equipment shall not start until acceptance by the Owner.

1.7 DRAWINGS

A. Contract drawings are diagrammatic only and are not intended to be scaled for dimensions. All dimensions shall be taken from Architectural drawings, certified equipment drawings and from the structure itself before fabricating and work. All space requirements and equipment locations shall be verified, coordinated with other trades, as it is the various Contractor's responsibility to install the systems complete in the space provided without extra charges to the Owner.

B. It is intended that anything, whether labor and materials, which is usually furnished as part of any equipment specified and which is necessary for operation shall be furnished as part of the Contract without additional cost, whether or not shown or described.

C. All piping in finished areas of the building shall be concealed except where otherwise noted on the drawings.

D. All equipment shall be installed in accordance with manufacturer's recommendations, unless approval is given in writing by the Consulting Mechanical Engineer for deviation.

1.8 REQUIREMENTS OF REGULATORY AGENCIES

A. The mechanical work shall be performed in strict accordance with the local and state codes, ordinances, and regulations governing the particular work involved. Furnish, without extra charge, any additional material and labor when and where required to comply with these Rules and Regulations, though the work is not mentioned in the Specifications or shown on the Drawings. When the Specifications or Drawings call for or describe materials or construction of a better quality or larger sizes than required by the above mentioned Rules and Regulations, the provisions of these Specifications and accompanying Drawings shall take precedence.

1.9 QUALIFICATIONS

A. All mechanics shall be capable journeymen, skilled in the work assigned to them with licensing required by the inspecting authority. All welders must have been certified within the past three years to perform the work, which they are doing.

1.10 WARRANTY

A. All materials and equipment shall be new unless otherwise specified.
B. Guarantee all workmanship, material and equipment and replace any found defective without cost to the Owner, for one (1) year after final acceptance, as defined in General Conditions.
C. Each warranty for longer than one (1) year as described (that comes with equipment used on the job) shall be passed into the Owner in the Operation and Maintenance Manual, along with the dates of start and end of warranty.
D. Refer to General Conditions for additional information regarding specific warranty requirements.

1.11 PROJECT RECORD DOCUMENTS

A. Before final payment, provide the Architect with one clean set of drawings and specifications corrected up-to-date as job progress. These documents shall reflect the As-Built conditions. Refer to General Conditions for additional information.

1.12 SUBMITTALS

A. The intent of this section is to give general submittal information, refer to specific submittal information in the subsequent mechanical sections.
B. Sale of Electronic CADD Files
   1. Refer to Architectural specification Section 01300 – Submittal Procedures, OR call the Parkhill, Smith & Cooper, Inc., office issuing this project and request the pricing for electronic files.
C. Within ten (10) days after award of the contract, and before orders are placed, Contractor shall submit specific information on list of equipment and principal materials specified. Contractor shall indicate and/or provide names of manufacturers, catalog and model numbers, cut sheets, and such other supplementary information as necessary for evaluation. Submittal shall be electronic using .pdf file extension.
D. Requirements for each Submittal:
   1. Bear a dated stamp or specific written indication that the Contractor has reviewed and approved all submittal prior to submission to Engineer,

2. Have all information deleted by Contractor that pertains to the means and methods of construction or to fabrication by Contractor that pertains to the means and methods of construction or to fabrication, assembly, installation, or erection (approval by Engineer shall not extend to the these areas unless specifically noted by Engineer),
3. Be clearly and SPECIFICALLY marked as to which specific piece of equipment is being submitted, bye use of a permanent marker, stamp, etc., so as to distinguish it from other pieces of equipment that may occur on the same page,
4. Be clearly marked as to which available options are being submitted that are associated with a piece of equipment, and
5. Be complete with respect to quantities, dimensions, specific performance, materials, and similar data to enable the Engineer to review the proposed equipment.

E. Omission by Contractor of any of the above requirements or submittals will subject submittal to automatic rejection without review.

F. Any submittals received by Engineer that were not requested shall be returned without review of any kind.

G. Installation Instructions - For certain products or systems as identified in subsequent specifications sections or on the drawings, the Contractor shall be required to provide copies of manufacturer's installation instructions with the submittal. When required as such, the installation instructions are considered part of the submittal and their omission may result in automatic rejection of the submittal. Where more than one (1) identical device are scheduled, only one (1) set of installation instructions needs to be submitted, e.g. if seven (7) 5-ton split systems air conditions are scheduled, only one (1) 5-ton unit installation instruction needs to be submitted. Similarly, if one (1) set of installation instructions is identified by the manufacturer and on the instructions to be applicable to more than one (1) type or size of devices, e.g. if one (1) set of air conditioner instructions is good for 3-, 4-, 5-ton units, then only one (1) instruction set is required for these devices.

1.13 SUBSTITUTED PRODUCTS

A. Material or equipment specified by Manufacturer's name is being used as a basis of standard, unless otherwise noted. The Engineer will be the sole judge on the equivalence of substituted equipment and materials.

B. It shall be the Contractor's responsibility to verify that submitted substitute equipment will fit in space available. The contractor's submittal for acceptance of the substitute shall include a written statement of whether or not such acceptance would require any subsequent or associated changes to the drawings or specifications. Any such changes shall be described in writing, briefly but complete.

C. The Contractor shall be responsible for the costs of any such modifications due to substitution of materials or equipment for that which was specified or scheduled. The cost shall be complete, that is, it shall include the cost affect of any and all other trades.

D. The Engineer may request detailed shop drawing or plan layouts of mechanical rooms or systems of the substituted equipment.

1.14 SAFETY

A. General: Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work, and Contractor shall comply with all laws governing safety, specifically the "Occupational Safety and Health Standards" and the "Safety and Health Regulations for Construction", state and federal.

B. According to OSHA, a hazardous chemical is any chemical, which is a physical hazard or a health hazard. This may include items such as paints, solvents, adhesives, sealants, cleaners, etc. If a contractor produces, uses, or stores hazardous chemicals at the workplace, then contractor shall develop, implement, and maintain a hazard communication program in compliance with the latest OSHA requirements. In projects with multiple tenants in which the building is partially occupied during all or part of the project, Contractor shall inform the building manager or Owner, according to OSHA guidelines, of any hazardous chemicals being produced, stored, or used in the building so that other tenants may be notified. Contractor shall employ required methods of training, information, handling, ventilation, labeling, storing, disposal, and removal of hazardous chemicals.

1.15 LABELING

A. Each device for which an independent testing authority has established a standard shall have affixed a label indicating its compliance and listing. Refer to General Conditions for list of such independent testing authorities.

1.16 SITE VISIT REPORTS

A. During the course of the job, the Engineer will make site visits to observe work in progress and will subsequently prepare a written site visit report, which will be sent to the Contractor and to whomever else the Engineer desires. The Contractor shall prepare a written and typed response within seven (7) calendar days of his receiving the site visit report. The General Contractor shall include in his response the following information.
   1. Date of site visit by the Engineer,
   2. Date of receipt of the site visit report,
   3. Name and title of the preparer of the response,
   4. An item number referenced to the site report,
   5. A brief 3- or 4-word description of the item,
   6. The Contractor or Subcontractor affected,
   7. The proposed course of action, and
   8. An expected time of completion of the action.

1.17 CUTTING AND PATCHING

A. No joists, beams, girders, columns, slabs, or other structural elements shall be cut, drilled, or altered in any way by the Contractor without first obtaining written permission and instructions from the Engineer and Architect.

B. Where it is necessary to cut through any non-structural elements of walls, floors, or ceilings to permit the installation of any work under this contract, or to repair any defects that may appear up to the expiration of the guarantee, such cutting shall be done by Contractor with as little damage as reasonably possible to the element being cut or to adjacent elements.

C. After the necessary work has been completed, the damage shall be repaired by the respective Contractor, who shall pay all costs of such cutting, repairs and patching. All patching or sealing of cuts, penetrations, etc., including final appearance of same, shall be done to the approval of the Engineer and Architect.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All materials shall be new and of specified quality, unless specifically noted otherwise. Materials shall be free from defects. Where manufacturer names are mentioned in the specifications or on the drawings, it has been done in order to establish a standard of quality and construction.

B. Contractor will be responsible for transportation of his material to and from the job site, and will be responsible for the storage and protection of his materials and work until the final acceptance of the job. At the end of each day of work, each Contractor is responsible for covering or protecting his work and/or materials that may be susceptible to damage even if such damage is the result of unforeseen causes, e.g. an overnight thunderstorm. Failure to do so will be sufficient cause for rejection of any item in question, and any such item shall be replaced by Contractor at no cost to the Owner.

C. Contractor shall verify that all pieces of equipment will fit through available openings in the building and that all equipment can be installed without modification of building structure.

2.2 EQUIPMENT SCHEDULE

A. All equipment major items are specified in the equipment schedules on the drawings and shall be new and furnished complete with all accessories normally supplied with the catalog item listed and all other accessories necessary for a complete and satisfactory installation.

B. Equipment items so noted will require start-up by factory trained personnel. Equipment items so noted will require factory approved service personnel who shall provide all service, including all parts and all labor, as requested by the Owner, during the full period of equipment warranty.

2.3 EQUIPMENT RATINGS

A. Equipment capacities as scheduled on the drawings are at project site altitude. Capacities of submitted equipment must be corrected for project site altitude unless otherwise noted.

2.4 WORKMANSHIP

A. The workmanship shall, in all respects, be of the highest grade, and all construction shall be done according to the best practices of the trade. Piping, ducting and conduit shall be concealed unless otherwise noted, and installed square to the building lines. Any work not meeting this requirement shall be replaced or rebuilt without extra expense to the Owner.

2.5 V-BELT DRIVES

A. V-belt drives shall be of fabric and rubber construction of approved manufacture. Multiple belts shall be matched and all belts shall be adjusted to drive the apparatus properly and to prevent slippage and undue wear in starting motor nameplate rating.

2.6 BELTGUARDS

A. The Contractor shall provide for each V-belt drive a painted steel belt guard, which shall be constructed around an angle iron frame, securely bolted to the floor or apparatus. The guard shall completely enclose drives and pulleys and be constructed to comply with all safety requirements. Hinged access doors not less than 6 inches x 6 inches shall be provided for access to motors and fan shaft for test purposes.

2.7 ELECTRICAL WIRING AND CONTROL EQUIPMENT

A. All disconnects, motor starters, relays, wiring, etc. shall comply with all requirements of 16000 Sections of the electrical specifications.

B. The Mechanical Contractor must refer to the electrical control equipment and wiring shown on the Electrical Drawings. Any changes or additions required by specified or substituted equipment furnished shall be the complete responsibility of the Contractor furnishing the equipment.

C. All electrical equipment characteristics (voltage, etc.) must be **VERIFIED** by the Mechanical Contractor prior to ordering. It is imperative that voltage and phase characteristics are checked with the electrical drawings.

D. All motors shall be built in accordance with the current applicable IEEE, ASA and NEMA standards. All general-purpose motors shall be open drip-proof machines for installation indoors and/or in protected locations. Totally enclosed fan cooled (TEFC) motors shall be used in all areas of exposure to weather or other environmental contamination. Motors shall be rated explosion-proof when located in hazardous atmospheres. Type II weather-protected motors may be used in lieu of TEFC motors on roof fan units and similar equipment. Motors mounted in direct sun shall be provided with a shield to forbid direct radiation from the sun when the sun is 45 degrees or greater above the horizon.

E. Unless indicated otherwise, motors shall be NEMA design B with a service factor of 1.15 with 40°C rise and total temperature rise of 65°C ambient and when powered from the system voltage feeding the motor. TEFC motors shall have a service factor of 1.00 with total temperature rise of 65°C in the above conditions. Single-phase motors shall be NEMA Type N split phase induction motors with built-in thermal protectors. Single-phase motors connected on loads requiring high starting torque shall be capacitor-start induction motors.

F. All motors shall be all copper wound, high power factor, high efficiency motors. Electric motors shall be an energy efficient type as defined in the latest edition of NEMA document no. MG1. Motor efficiency shall be made available to the Engineer as required.

G. If there is not a separate “Controls Contractor” for this project, the mechanical Contractor is responsible for providing and installing all control wiring. Wiring and conduit is to be provided and installed as directed under the Division 16 specifications.

2.8 EQUIPMENT AND PIPING SUPPORTS

A. All supporting systems for piping, equipment, and materials supported by the building structure shall be submitted to the Engineer for approval prior to purchase and installation.

B. Roof Supports

1. Contractor shall provide and install roof supports for all uninsulated piping routed on the roof.

   a. For single pipes through 5 inches in size, such as gas pipes, etc., the roof support shall be a MAPA, MS-4RA or MS-5RA, which consists of a 1-piece combination roof deck base, adjustable height pipe supports, and hard cast rubber roller with

nylon bushings. Provide walk pad under pipe support as recommended by the pipe support manufacturer. Mob pad and support to roof.

b. Manufacturer's installation recommendations vary depending on roof types, but the Contractor is responsible for verifying the roof type and adhering strictly to the appropriate set of manufacturer's installation instructions.

c. Spacing of roof supports shall be as recommended by the manufacturer.

2.9 ROOF PENETRATIONS

A. Piping

1. Penetration shall be accomplished with factory-made assemblies designed specifically for the purpose. The use of pitch pans or pitch pockets is not allowed. Contractor shall provide a factory-made penetration assembly as follows:

   a. For pipes, conduits, etc. up to 3-inches in diameter that can or are intended to be turned to horizontal after passing through the roof (e.g. small electrical conduit, gas piping, refrigerant lines, water pipes, etc.) the device shall consist of a curb assembly with a welded 18 gauge galvanized steel shell and base, 1-1/2 inches thick 3 pcf rigid insulation, 0.50-inch aluminum or 20 gauge galvanized cap with minimum 3-inch overhang and 1-inch rigid insulation, and 2- x 6-inch wood nailer. Product shall be Custom Curb Model CPC, ThyCurb Model RP-2 with TC-1, 2, or 3 curb, or approved equivalent.

B. Ductwork without Equipment

1. Penetration shall be accomplished with a factory-made insulated roof curb. Curb shall be made of welded 18 gauge galvanized steel shell and base plate, shall be lined with 1-1/2-inch 3 pcf rigid insulation, shall have minimum 2- x 2-inch wood nailer, and shall be reinforced with 1-inch x 1-inch x 1-foot-8-inch steel angle on sides 24 inches and larger. Product(s) shall be manufactured by Custom Curb, Inc., ThyCurb, Roof Products and Systems, Pate, or approved equivalent.

C. Ductwork with Equipment

1. Each piece of roof mounted equipment such as exhaust or supply fans, relief or intake hoods, packaged rooftop air conditioners, air handlers, etc., shall be provided and installed with an insulated roof curb designed to mate with the equipment and provide a weatherproof enclosure. In the event that a preinsulated curb is not available, an uninsulated curb is acceptable if the Contractor provides and installs field insulation per the manufacturer's instructions. Contractor shall provide the roof curb(s) to the Roofing Contractor for installation.

D. General

1. All roof flashing assemblies and roof curbs shall be closely coordinated with other work through the Roofing Contractor to insure that the flashing, canting, insulation type and location, etc., is correct and appropriate for the particular roof construction type.
2. Each roof curb shall be selected and provided so that the top of the curb shall be level after installation. Provide tapered curb as required to match roof slope. The curb shall provide a minimum clearance of 10 inches between the top of the finished roof surface and the top of the wood nailer, continuous around the curb perimeter.
3. Each roof penetration location shown on the drawing is approximate. Refer to the Architectural and Structural drawing for the structural openings. Refer to CUTTING AND PATCHING section of this specification for more information.
4. Provide each roof curb with other options as scheduled on the drawings.

2.10 ACCESSIBILITY

A. Access Panels
   1. Access panels shall be provided wherever necessary for possible future replacement, adjustment, or maintenance of operating devices such as machinery, valves, dampers, switches, relays, etc., or to other critical non-operating devices such as pull boxes, inspection parts, gauges, etc. Such access panels shall be provided and install by Contractor, whether or not shown on the drawings, and shall be brought to the attention of the Engineer for approval of type, color, etc. Where access is provided in rated members, the access panels shall be of a type that maintains the integrity of the member penetrated.

B. Access to Equipment
   1. All pipes, tubing, conduit, etc. including, but not limited to, draining piping of any type, electrical conduit, wiring not in conduit, and pneumatic control tubing shall be installed in such a way so as not to prevent and/or not to make necessary difficult the removal, operation, use, or maintenance of equipment, access panels or doors, pathways (especially in attics or crawlspaces), observation ports, measurement or balancing devices, junction boxes.
   2. If access for these purposes is prevented or made unreasonably difficult in the opinion of the Engineer, then the Contractor shall make modifications or repairs at no cost to anyone except the Contractor. Such modifications or repairs shall be considered neither complete nor adequate until the Engineer is satisfied that access for the above purpose is achieved.

2.11 PROTECTION OF PENETRATION

A. All penetrations of fire or smoke barriers shall be sealed, sleeves (if any), insulation (if any), and vibration isolation (if any) that maintain the fire or smoke resistance of the barrier in accordance with the latest edition of NFPA 101 Life Safety Code.

B. Contractor shall verify locations and type of all partitions penetrations from the drawings. Sealing material and methods shall be per UL recommendations.

2.12 BEDDING COURSE

A. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940; except with 100% passing a 1-inch sieve and not more than 8% passing a No. 200 sieve.

PART 3 - EXECUTION

3.1 STORAGE

A. Provide for proper storage of all materials and equipment and assume responsibility for losses due to any cause. All storage shall be within the contract limits of the building site or in a bonded warehouse. All equipment and materials must be covered and stored out of the elements; any item, which has become rusted, will not be permitted to be used.

B. Each Contractor shall provide temporary storage facilities suitable for equipment stored at the job site. Storage facilities shall be rainproof and lockable as required. Materials or equipment stored on site but not in a lockable rainproof storage facility shall be stored above ground or above slab. Contractor shall take necessary precautions to prevent entry of and/or damage from

dirt, trash, water, or vermin. Equipment not properly stored and protected shall be, at the discretion of the Engineer, replaces at no cost to the Owner. Roofs are not acceptable storage areas unless specifically allowed in writing by the Engineer.

3.2 INSTALLATION AND ARRANGEMENT

A. Install all work to permit removal (without damage to other parts) of coils, heat exchanger bundles, boiler tubes, fan shafts and wheels, filters, belt guards, sheaves and drives and all other parts which might require periodic replacement or maintenance. Arrange pipes, ducts and equipment to permit ready access to valves, traps, starters, motors, control components and to clear opens of doors and of access panels.

B. Offsets, transitions and changes in direction in pipes and ducts shall be made as required to maintain proper head room and pitch of sloping pipes whether or not indicated on the drawings. Furnish and install all traps, air vents, sanitary vents, etc., as required to affect these offsets, transitions and changes in direction.

C. Duct transitions and offsets required to connect ductwork to equipment shall be made as required whether or not indicated on the drawings.

3.3 PROTECTION OF WORK AND PROPERTY

A. Where there are existing facilities, be responsible for protection thereof, whether or not such facility is to be removed or relocated or remain as installed. Moving or removing any facility must be done so as not to cause interruption the work or Owner's Operation.

B. All pipe and duct openings shall be closed with caps or plugs during installation. All fixtures shall be covered and protected against injury. At final completion, all work shall be cleaned and delivered in an unblemished condition, or refinished and repainted at the discretion of the Architect.

3.4 CONCEALED AND EXPOSED WORK

A. "Concealed" means within spaces like pipe chases and trenches, above plaster ceilings, in walls, and buried pipe - inaccessible when building is completed. "Exposed" means within equipment rooms, unfinished spaces, above "pushup" ceilings, accessible pipe tunnels, etc., where pipe is accessible.

3.5 CONCRETE

A. Mechanical Contractor shall coordinate all requirements for concrete. All concrete shall be furnished under the Architectural Divisions of these specifications.

3.6 FIELD MEASUREMENTS

A. The Contractor shall verify the dimensions and conditions governing work at the project site. He shall examine adjoining work on which his work is dependent, for perfect efficiency, and shall report any work, which must be corrected.

3.7 LUBRICATION

A. The Contractor shall provide all oil and grease for the operating of all equipment until acceptance. The Contractor shall be held responsible for all damage to bearings while the equipment is being operated by him up to the date of acceptance of the equipment. The

Contractor shall protect all bearings and shafts during installation and shall thoroughly grease the steel shafts to prevent corrosion.

3.8 MANUFACTURER'S DIRECTION

A. The Contractor shall install all equipment in strict accordance with all directions and recommendations furnished by the manufacturer. Where such directions are in conflict with the plans and specifications, the Contractor shall report such conflicts to the Engineer who shall make changes deemed necessary and desirable.

3.9 FLUSHING, CLEANING, AND STERILIZING

A. Before final connections are made in the piping systems, all piping shall be blown out with air and then completely washed out with cleaning compounds. The systems shall be flushed for complete removal of all foreign materials. Furnish all temporary connections, valves, etc., required for this purpose.
B. After flushing, sterilize the domestic water systems with an approved chlorinating agent to provide a dosage on not less than 50 ppm. After minimum contact period of eight (8) hours, the system shall be flushed with clean water until the residual chlorine is no greater than the city water.

3.10 TESTS

A. Test all new storm drain, vent and waste lines with standing water test of 12 feet of head. Test to be held for a minimum of two (2) hours, or as required by local code.
B. Test all new domestic cold, hot and recirculating hot water service lines at 50 psig above operating pressure, without exceeding the pressure rating of the piping materials. Test to be held for a minimum of two (2) hours, or as required by local code.
C. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
D. All tests shall be witnessed and approved by the Engineer and the local authority having jurisdiction before covering or insulating. The satisfactory operation of equipment shall be demonstrated to the Engineer.
E. Furnish all instruments, pumps, blowers and equipment required for the testing.
F. Provide written copies of these test reports for inclusion on the Operations and Maintenance Manuals and submit one copy to Mechanical Engineer.

3.11 PAINTING

A. Surfaces of all equipment and material not provided with a factory finish coat shall be thoroughly cleaned, primed (if not factory primed) and finish coated with a high quality alkyd industrial enamel of a color chosen by the Owner.

3.12 SPECIAL OPENINGS

A. The contractor shall attempt to schedule delivery of all large equipment requiring special openings for installation prior to enclosing of area. Where this is not possible written notice of required openings which must be provided shall be listed by size and location and submitted to the General Contractor prior to enclosing of areas involved. Work required to construct openings and the associated cost of enclosing them shall be done at no additional cost to the Owner.

3.13 PLACING IN OPERATION

A. All ducts, pipes, equipment, controls, etc., shall be cleaned of plaster and other foreign debris
B. Before final acceptance, all strainers shall be thoroughly cleaned or replaced, all bearings shall be oiled or greased and all drains shall be cleaned out and primed. All permanent filters shall be cleaned; throwaway type filters shall be replaced with new filters.
C. The systems shall be placed in operation.
D. The contractor shall verify that all controls are set to meet operating conditions specified.
   1. Example: Boiler operating control set at 180°F. Limit control set at 200°F.
E. The Contractor shall verify that all pieces of equipment are operable and that all sequence of controls are being met.
F. Contractor to adjust seating through the first year as required by Engineer.

3.14 BALANCING, TESTING, AND ADJUSTING THE MECHANICAL SYSTEMS

A. The Contractor shall be responsible to perform testing, adjusting, and balancing (TAB).

3.15 OPERATION AND MAINTENANCE INSTRUCTIONS

A. Contractor shall prepare and provide six (6) copies of operating and maintenance manuals. Contractor shall deliver the six bound sets to the Engineer for approval. Each manual shall be in a ring binder and shall be indexed with dividers for each section. Delivery of required documents is a condition of final acceptance.
B. Each manual shall contain, but not limited to, the following general sections:
   1. Certificates of acceptance from the inspecting authorities,
   2. Waiver of all liens,
   3. Warranties with starting dates and end dates for each pieces of equipment and/or for each system (warranties shall begin on date of substantial completion and acceptance by the Owner),
   4. Names, telephone and fax numbers and addresses of all subcontractors, vendors, manufacturer's representatives, and warranties providers,
   5. Certification letters from each Contractor that each system furnished and installed by that contractor and/or subcontractors is started-up, balanced, adjusted and checked for proper operation in accordance with the intent of the contract documents,
   6. Spare parts lists for each piece of equipment,
   7. Lubrication charts showing type of lubrication and application methods and frequencies,
   8. Filter cleaning or replacement schedule (On Contractor's letterhead stationary),
   9. Preventative maintenance schedule for checking all items such as belt drives, safety controls, oil and refrigerant charges, and seasonal changer over recommendations. Cleaning of all strainers, traps, coils, tower pans, tubes, sprays, etc. (on Contractor's letterhead stationary),
   10. Normal operating instructions including a sequence of operations (on Contractor's letterhead stationary),
   11. Instructions as to procedures to be followed for emergency situations, such as alarms or safety items being tripped. (on Contractor's letterhead stationary),
   12. Instruction on who to call for service during guarantee period, (on Contractor's letterhead stationary),
   13. Copies of as-built drawings on reproducible vellum as produced by a Xerox or photographic process and,

14. Copies of all approved shop drawing submittals including nameplate date, design parameters, name, telephone and fax numbers, address of vendor, manufacturer's representative and warrantee provider.

C. Approval will not be given for final payment until the tests, balancing and operating instruction portions have been completed.

3.16 INSTRUCTIONS TO THE OWNER

A. Contractor shall instruct the Owner's operating personnel in the operations and maintenance of all mechanical systems and equipment. There shall be a minimum of eight (8) hours of training. Contractor shall furnish any special servicing tools required for maintenance.

B. Contractor shall conduct a demonstration of the installation upon completion and final acceptance of the work. There shall be a minimum 8-hour demonstration. Prior to this all work shall have been completed, tested, balanced and placed in operation. Qualified personnel must be present at the demonstration to operate all the systems and prove the performance of the equipment. The schedule for this demonstration shall be coordinated with the Engineer.

3.17 EXCAVATION FOR PIPE AND CONDUIT

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

B. Excavate trenches to uniform widths to provide a working 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.

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. Level bottom of all trenches and cover all PVC pipe with processed chat.

1. For pipes and conduit less than 6 inches in nominal diameter and flat-bottomed, multiple-duct conduit units, 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 circumference. Fill depressions with tamped sand backfill.
3. Excavate trenches 4 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. 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.

E. All piping and conduit trenches across pavement shall be backfilled with 2-sack concrete to within 12inches of finished grade.

F. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D698:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill material at 95%.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 92%.
3. Under lawn or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 85%.

G. Install detectable warning tape above conduits and pipe, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

H. Protection
   1. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
   2. 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.
      a. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.
   3. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
      a. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

I. Disposal of Surplus and Waste Materials
   1. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property unless otherwise directed by Owner.
   2. Repair: Any damage to shrubs, grass or structures shall be repaired to previous condition by Contractor at no additional expense to Owner.

J. Bracing and Sheeting: Open cut trenches shall be sheeted and braced as required by OSHA and the requirements of the State of Texas as necessary for the safety of workmen or the protection of property.

END OF SECTION

SECTION 15050

BASIC MECHANICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. The following basic mechanical materials and methods to complement other Division 15 Sections.
      a. Piping materials and installation instructions common to most piping systems.
      b. Concrete equipment base construction requirements.
      c. Equipment nameplate data requirements.
      d. Labeling and identifying mechanical systems and equipment is specified in Section 15075 - Mechanical Identification.
      e. Nonshrink grout for equipment installations.
      f. Field-fabricated metal and wood equipment supports.
      g. Installation requirements common to equipment specification Sections.
      h. Cutting and patching.
      i. Touchup painting and finishing.
   2. Pipe and pipe fitting materials are specified in piping system Sections.
B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 15000 – General Mechanical Requirements.
   3. Section 15075 – Mechanical Identification.

1.2 DEFINITIONS

A. Pipe, pipe fittings, and piping include tube, tube fittings, and tubing.
B. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below the roof, spaces above ceilings, unexcavated spaces, crawl spaces, and tunnels.
C. Exposed Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
D. Exposed Exterior Installations: Exposed to view outdoors, or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
E. Concealed Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.
F. Concealed Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants, but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.3 SUBMITTALS

A. General: Submit according to the Conditions of the Contract and Division 01 and Section 15000 of the Specification.

B. Product data for following piping specialties:
   1. Mechanical sleeve seals.
   2. Dielectric Fittings.
   3. Access Doors.

1.4 QUALITY ASSURANCE

A. Qualify welding processes and operators for piping according to ASME - Boiler and Pressure Vessel Code, Section IX, "Welding and Brazing Qualifications."
   1. Comply with provisions of ASME B31 Series "Code for Pressure Piping."
   2. Certify that each welder has passed AWS qualification tests for the welding processes involved and that certification is current.
B. ASME A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.
C. Equipment Selection: Equipment of greater or larger power, dimensions, capacities, and ratings may be furnished provided such proposed equipment is approved in writing and connecting mechanical and electrical services, circuit breakers, conduit, motors, bases, and equipment spaces are increased. No additional costs will be approved for these increases, if larger equipment is approved. If minimum energy ratings or efficiencies of the equipment are specified, the equipment must meet the design requirements and commissioning requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver pipes and tubes with factory-applied end-caps. Maintain end-caps through shipping, storage, and handling to prevent pipe-end damage and prevent entrance of dirt, debris, and moisture.
B. Protect stored pipes and tubes from moisture and dirt. Elevate above grade. When stored inside, do not exceed structural capacity of the floor.
C. Protect flanges, fittings, and piping specialties from moisture and dirt.
D. Protect stored plastic pipes from direct sunlight. Support to prevent sagging and bending.

1.6 SEQUENCING AND SCHEDULING

A. Coordinate mechanical equipment installation with other building components.
B. Arrange for chases, slots, and openings in building structure during progress of construction to allow for mechanical installations.
C. Coordinate the installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.
D. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Coordinate installation of large equipment requiring positioning prior to closing in the building.
E. Coordinate connection of electrical services.
F. Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies.

G. Coordinate requirements for access panels and doors where mechanical items requiring access are concealed behind finished surfaces. Access panels and doors are specified in Section 08110 – Hollow Metal Doors and Frames.
H. Coordinate installation of identifying devices after completing covering and painting where devices are applied to surfaces. Install identifying devices prior to installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 PIPE AND PIPE FITTINGS

A. Refer to individual piping system specification Sections for pipe and fitting materials and joining methods.
B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.2 JOINING MATERIALS

A. Refer to individual piping system specification Sections in Division 15 for special joining materials not listed below.
B. Pipe Flange Gasket Materials: Suitable for the chemical and thermal conditions of the piping system contents.
   1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch maximum thickness, except where thickness or specific material is indicated.
      a. Full-Face Type: For flat-face, Class 125 cast-iron and cast-bronze flanges.
      b. Narrow-Face Type: For raised-face, Class 250 cast-iron and steel flanges.
   2. ASME B16.20 for grooved, ring-joint, steel flanges.
   3. AWWA C110, rubber, flat face, 1/8 inch thick, except where other thickness is indicated; and full-face or ring type, except where type is indicated.
C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, except where other material is indicated.
D. Plastic Pipe Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, except where other type or material is indicated.
E. Solder Filler Metal: ASTM B32.
   1. Alloy Sn95 or Alloy Sn94: Tin (approximately 95%) and silver (approximately 5%), having 0.10% lead content.
F. Brazing Filler Metals: AWS A5.8.
   1. BCuP Series: Copper-phosphorus alloys.
   2. BAg1: Silver alloy.
G. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
H. Solvent Cements: Manufacturer's standard solvents complying with the following:
   1. Acrylonitrile-Butadiene-Styrene (ABS): ASTM D2235.
   2. Chlorinated Poly (Vinyl Chloride) (CPVC): ASTM F493.
   3. Poly (Vinyl Chloride) (PVC): ASTM D2564.
   4. PVC to ABS Transition: Made to requirements of ASTM D3138, color other than orange.
I. Plastic Pipe Seals: ASTM F477, elastomeric gasket.
J. Flanged, Ductile-Iron Pipe Gasket, Bolts, and Nuts: AWWA C110, rubber gasket, carbon steel bolts and nuts.

K. Couplings: Iron body sleeve assembly, fabricated to match outside diameters of plain-end pressure pipes.
   1. Sleeve: ASTM A126, Class B, gray iron.
   2. Followers: ASTM A47 (ASTM A47M), Grade 32510 or ASTM A536 ductile iron.
   3. Gaskets: Rubber.
   4. Bolts and Nuts: AWWA C111.
   5. Finish: Enamel paint.

2.3 PIPING SPECIALTIES

A. Escutcheons: Manufactured wall, ceiling, and floor plates; deep-pattern type where required to conceal protruding fittings and sleeves.
   1. Inside Diameter: Closely fit around pipe, tube, and insulation.
   2. Outside Diameter: Completely cover opening.
   3. Cast Brass: One-piece, with setscrew.
      a. Finish: Rough brass.
      b. Finish: Polished chrome plate.
   4. Cast Brass: Split casting, with concealed hinge and setscrew.
      a. Finish: Rough brass.
      b. Finish: Polished chrome plate.
   5. Stamped Steel: 1-piece, with setscrew and chrome-plated finish.
   6. Stamped Steel: 1-piece, with spring clips and chrome-plated finish.
   7. Stamped Steel: Split plate, with concealed hinge, setscrew, and chrome-plated finish.
   8. Stamped Steel: Split plate, with concealed hinge, spring clips, and chrome-plated finish.
   9. Stamped Steel: Split plate, with exposed-rivet hinge, setscrew, and chrome-plated finish.
   10. Stamped Steel: Split plate, with exposed-rivet hinge, spring clips, and chrome-plated finish.
   11. Cast-Iron Floor Plate: 1-piece casting.

B. Dielectric Fittings: Assembly or fitting having insulating material isolating joined dissimilar metals to prevent galvanic action and stop corrosion.
   1. Description: Combination of copper alloy and ferrous; threaded, solder, plain, and weld neck end types and matching piping system materials.
   2. Insulating Material: Suitable for system fluid, pressure, and temperature.
   3. Dielectric Unions: Factory-fabricated, union assembly for 250-psig minimum working pressure at a 180°F temperature.
   4. Dielectric Flanges: Factory-fabricated, companion-flange assembly for 150- or 300-psig minimum pressure to suit system pressures.
   5. Dielectric-Flange Insulation Kits: Field-assembled, companion-flange assembly, full-face or ring type. Components include neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.
      a. Provide separate companion flanges and steel bolts and nuts for 150- or 300-psig minimum working pressure to suit system pressures.
   6. Dielectric Couplings: Galvanized-steel coupling, having inert and noncorrosive, thermoplastic lining, with threaded ends and 300-psig minimum working pressure at 225°F temperature.
   7. Dielectric Nipples: Electroplated steel nipple, having inert and noncorrosive thermoplastic lining, with combination of plain, threaded, or grooved end types and 300-psig working pressure at 225°F temperature.

C. Mechanical Sleeve Seals: Modular, watertight mechanical type. Components include interlocking synthetic rubber links shaped to continuously fill annular space between pipe and sleeve. Connecting bolts and pressure plates cause rubber-sealing elements to expand when tightened.

D. Sleeves: The following materials are for wall, floor, slab, and roof penetrations:
   1. Steel Sheet Metal: 24-gage or heavier galvanized sheet metal, round tube closed with welded longitudinal joint.
   2. Steel Pipe: ASTM A53, Type E, Grade A, Schedule 40, galvanized, plain ends.
   3. Cast-Iron: Cast or fabricated wall pipe equivalent to ductile-iron pressure pipe, having plain ends and integral water stop, except where other features are specified.
   4. Wall Penetration Systems: Wall sleeve assembly, consisting of housing, gaskets, and pipe sleeve, with one (1) mechanical-joint end conforming to AWWA C110 and one (1) plain pipe-sleeve end.
      a. Penetrating Pipe Deflection: 5% without leakage.
      b. Housing: Ductile-iron casting having waterstop and anchor ring, with ductile-iron gland, steel studs and nuts, and rubber gasket conforming to AWWA C111, of housing and gasket size as required to fit penetrating pipe.
      c. Pipe Sleeve: AWWA C151, ductile-iron pipe.
      d. Housing-to-Sleeve Gasket: Rubber or neoprene push-on type of manufacturer's design.
   5. Cast-Iron Sleeve Fittings: Commercially made sleeve having an integral clamping flange, with clamping ring, bolts, and nuts for membrane flashing.
      a. Underdeck Clamp: Clamping ring with setscrews.

2.4 GROUT

A. Nonshrink, Nonmetallic Grout: ASTM C1107, Grade B.
   1. Characteristics: Post-hardening, volume-adjusting, dry, hydraulic-cement grout, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
   2. Design Mix: 5000-psi 28-day compressive strength.
   3. Packaging: Premixed and factory-packaged.

2.5 ACCESS DOORS

A. Flush mounted steel access doors with 16 ga frame and 14 ga Panel. Prime coat finish. Concealed spring hinges, screwdriver cam-lock. Doors in fire rated surfaces shall be U.L. listed and labeled. Doors to be Milcor or approved equivalent.

PART 3 - EXECUTION

3.1 PIPING SYSTEMS--COMMON REQUIREMENTS

A. General: Install piping as described below, except where system Sections specify otherwise. Individual piping system specification Sections in Division 15 specify piping installation requirements unique to the piping system.

B. General Locations and Arrangements: Drawings (plans, schematics, and diagrams) indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design

considerations. Install piping as indicated, except where deviations to layout are approved on coordination drawings.

C. Install piping at indicated slope.

D. Install components having pressure rating equal to or greater than system operating pressure.

E. Install piping in concealed interior and exterior locations, except in equipment rooms and service areas.

F. Install piping free of sags and bends.

G. Install exposed interior and exterior piping at right angles or parallel to building walls. Diagonal runs are prohibited, except where indicated.

H. Install piping tight to slabs, beams, joists, columns, walls, and other building elements. Allow sufficient space above removable ceiling panels to allow for ceiling panel removal.

I. Install piping to allow application of insulation plus 1-inch clearance around insulation.

J. Locate groups of pipes parallel to each other, spaced to permit valve servicing.

K. Install fittings for changes in direction and branch connections.

L. Install couplings according to manufacturer's printed instructions.

M. Install pipe escutcheons for pipe penetrations of concrete and masonry walls, wall board partitions, and suspended ceilings according to the following:

1. Chrome-Plated Piping: Cast-brass, 1-piece, with setscrew, and polished chrome-plated finish. Use split-casting escutcheons, where required, for existing piping.
2. Uninsulated Piping Wall Escutcheons: Cast-brass or stamped-steel, with setscrew.
3. Uninsulated Piping Floor Plates in Utility Areas: Cast-iron floor plates.
4. Insulated Piping: Cast-brass or stamped-steel, with concealed hinge, spring clips, and chrome-plated finish.
5. Piping in Utility Areas: Cast-brass or stamped-steel, with setscrew or spring clips.

N. Sleeves are required for core drilled holes.

O. Install sleeves for pipes passing through concrete and masonry walls, concrete floor and roof slabs, and where indicated.

P. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, concrete floor and roof slabs, and where indicated.

1. Cut sleeves to length for mounting flush with both surfaces.
   a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 4 inches above finished floor level. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring where specified.
2. Build sleeves into new walls and slabs as work progresses.
3. Install large enough sleeves to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation. Use the following sleeve materials:
   a. Steel Pipe Sleeves: For pipes smaller than 6 inches.
   b. Steel Sheet-Metal Sleeves: For pipes 6 inches and larger that penetrate gypsum board partitions.
   c. Cast-Iron Sleeve Fittings: For floors having membrane waterproofing. Secure flashing between clamping flanges. Install section of cast-iron soil pipe to extend sleeve to 4 inches above finished floor level. Flashing is specified in Division 07.
      1) Seal space outside of sleeve fittings with nonshrink, nonmetallic grout.
4. Except for below-grade wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using elastomeric joint sealants specified in Division 07.

Q. Above Grade, Exterior Wall, and Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Size sleeve for 1-inch annular clear space between pipe and sleeve for installation of mechanical seals.
   1. Install steel pipe for sleeves smaller than 6 inches.
   2. Install cast-iron wall pipes for sleeves 6 inches and larger.
   3. Assemble and install mechanical seals according to manufacturer's printed instructions.

R. Below Grade, Exterior Wall, and Pipe Penetrations: Install cast-iron wall pipes for sleeves. Seal pipe penetrations using mechanical sleeve seals. Size sleeve for 1-inch annular clear space between pipe and sleeve for installation of mechanical seals.
   1. Below Grade, Exterior Wall, and Pipe Penetrations: Install ductile-iron wall penetration system sleeves according to manufacturer's printed installation instructions.

S. Fire Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestopping sealant material. Firestopping materials are specified in Division 07.

T. Verify final equipment locations for roughing in.

U. Refer to equipment specifications in other Sections for roughing-in requirements.

V. Piping Joint Construction: Join pipe and fittings as follows and as specifically required in individual piping system Sections.
   1. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
   2. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
   3. Soldered Joints: Construct joints according to AWS - Soldering Manual, "The Soldering of Pipe and Tube" chapter.
   4. Brazed Joints: Construct joints according to AWS - Brazing Manual, the "Pipe and Tube" chapter.
   5. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full inside diameter. Join pipe fittings and valves as follows:
      a. Note the internal length of threads in fittings or valve ends, and proximity of internal seat or wall, to determine how far pipe should be threaded into joint.
      b. Apply appropriate tape or thread compound to external pipe threads (except where dry seal threading is specified).
      c. Align threads at point of assembly.
      d. Tighten joint with wrench. Apply wrench to valve end into which pipe is being threaded.
      e. Damaged Threads: Do not use pipe or pipe fittings having threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
   6. Welded Joints: Construct joints according to AWS D10.12 - Recommended Practices and Procedures for Welding Low Carbon Steel Pipe, using qualified processes and welding operators according to the "Quality Assurance" Article.
   7. Flanged Joints: Align flange surfaces parallel. Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Assemble joints by sequencing bolt tightening to make initial contact of flanges and gaskets as flat and parallel as possible. Use suitable lubricants on bolt threads. Tighten bolts gradually and uniformly using torque wrench.

8. Plastic Pipe and Fitting Solvent-Cement Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join pipe and fittings according to the following standards:
    a. Comply with ASTM F402 for safe handling of solvent-cement and primers.
    b. Acrylonitrile-Butadiene-Styrene (ABS): ASTM D2235 and ASTM D2661.
    c. Chlorinated Poly (Vinyl Chloride) (CPVC): ASTM D2846 and ASTM F493.
    d. Poly (Vinyl Chloride) (PVC) Pressure Application: ASTM D2672.
    e. PVC Non-Pressure Application: ASTM D2855.
    f. PVC to ABS (Non-Pressure) Transition: Procedure and solvent cement described in ASTM D3138.
9. Plastic Pipe and Fitting Heat-Fusion Joints: Prepare pipe and fittings and join with heat-fusion equipment according to manufacturer's printed instructions.
    a. Plain-End Pipe and Fittings: Butt joining.
    b. Plain-End Pipe and Socket-Type Fittings: Socket joining.

W. Piping Connections: Except as otherwise indicated, make piping connections as specified below.
1. Install unions in piping 2 inches and smaller adjacent to each valve and at final connection to each piece of equipment having a 2-inch or smaller threaded pipe connection.
2. Install flanges in piping 2-1/2 inches and larger adjacent to flanged valves and at final connection to each piece of equipment having flanged pipe connection.
3. Dry Piping Systems (Gas): Install dielectric unions and flanges to connect piping materials of dissimilar metals.
4. Wet Piping Systems (Water): Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.2 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

A. Install equipment to provide the maximum possible headroom where mounting heights are not indicated.
B. Install equipment according to approved submittal data. Portions of the Work are shown only in diagrammatic form. Refer conflicts to the Architect.
C. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, except where otherwise indicated.
D. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. Connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location.
E. Install equipment giving right-of-way to piping systems installed at a required slope.

3.3 ACCESS DOORS

A. Furnish an access door for each pipe chase for each floor. This includes both toilet plumbing chases and pipe riser chases. Access doors assembly to be size 16 inches x 16 inches. Access doors are not shown on floor plans. Access door locations shall be field verified.
B. Also, furnish access doors in all non-removable ceiling and in partitions and walls where necessary access to plumbing cleanouts, shock absorbers, fire dampers, manual dampers, valves and other mechanical devices requiring access. Size these as required for access with minimum size of 12 inches x 12 inches.
C. Any access doors furnished for installation in fire rated surfaces or assembly shall carry an approved fire rating for that use.

D. Any access doors furnished for installation in glued on acoustical surfaces or assembly shall have recessed door to allow installation of tiles.
E. Provide all access doors to the General Contractor for them to construct into the building.

3.4 PAINTING AND FINISHING

A. Refer to Section 09912 for painting requirements.
B. Damage and Touch Up: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

3.5 CONCRETE BASES

A. Construct concrete equipment bases of dimensions indicated, but not less than 4 inches larger than supported unit in both directions. Follow supported equipment manufacturer's setting templates for anchor bolt and tie locations. Use 3000-psi, 28-day compressive strength concrete and reinforcement use fibrillated or monofilament polypropylene fibers engineered and designed for use in concrete, complying with ASTM C1116, Type III, 1/2 to 1-1/2 inches long. Uniformly disperse in concrete mix at manufacturer’s recommended rate, but not less than 1.5 lb/cu yd.

3.6 ERECTION OF METAL SUPPORTS AND ANCHORAGE

A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.
B. Field Welding: Comply with AWS D1.1 - Structural Welding Code-Steel.

3.7 ERECTION OF WOOD SUPPORTS AND ANCHORAGE

A. Cut, fit, and place wood grounds, nailers, blocking, and anchorage to support and anchor mechanical materials and equipment.
B. Select fastener sizes that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood members.
C. Attach to substrates as required to support applied loads.

3.8 CUTTING AND PATCHING

A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces necessary for mechanical installations. Perform cutting by skilled mechanics of the trades involved.
B. Repair cut surfaces to match adjacent surfaces.

3.9 GROUTING

A. Install nonmetallic nonshrink grout for mechanical equipment base bearing surfaces, pump and other equipment base plates, and anchors. Mix grout according to manufacturer's printed instructions.
B. Clean surfaces that will come into contact with grout.
C. Provide forms for placement of grout, as required.
D. Avoid air entrapment when placing grout.
E. Place grout to completely fill equipment bases.
F. Place grout on concrete bases to provide a smooth bearing surface for equipment.

G. Place grout around anchors.
H. Cure placed grout according to manufacturer's printed instructions.

3.10 DEMOLITION

A. Disconnect, demolish, and remove work specified under Division 15 and as indicated.
B. Where pipe, ductwork, insulation, or equipment to remain is damaged or disturbed, remove damaged portions and install new products of equal capacity and quality.
C. Accessible Work: Remove indicated exposed pipe and ductwork in its entirety.
D. Abandoned Work: Cut and remove buried pipe abandoned in place, 2 inches beyond the face of adjacent construction. Cap and patch surface to match existing finish.
E. Removal: Remove indicated equipment from the Project site.
F. Temporary Disconnection: Remove, store, clean, reinstall, reconnect, and make operational equipment indicated for relocation.

END OF SECTION

SECTION 15060

HANGERS AND SUPPORTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Pipe hangers and supports.
2. Hanger rods.
3. Equipment curbs.
4. Formed steel channel.
5. Equipment bases and supports.

B. Related Sections:
1. Division 01 Specification Sections apply to Work of this Section.
2. Section 0300 – Cast-in-Place Concrete.
3. Section 15000 – General Mechanical Requirements.
4. Section 15080 – Mechanical Insulation.
5. Section 09912 – Interior Painting.

1.2 REFERENCES

A. American Society of Mechanical Engineers:
1. ASME B31.1 - Power Piping.
2. ASME B31.5 - Refrigeration Piping.
3. ASME B31.9 - Building Services Piping.

B. ASTM International:
1. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
2. ASTM E119 - Method for Fire Tests of Building Construction and Materials.
3. ASTM E814 - Test Method of Fire Tests of Through Penetration Firestops.
4. ASTM F708 - Standard Practice for Design and Installation of Rigid Pipe Hangers.

C. American Welding Society:
1. AWS D1.1 - Structural Welding Code - Steel.

D. FM Global:
1. FM - Approval Guide, A Guide to Equipment, Materials & Services Approved By Factory Mutual Research For Property Conservation.

E. Manufacturers Standardization Society of the Valve and Fittings Industry:
1. MSS SP 58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
2. MSS SP 69 - Pipe Hangers and Supports - Selection and Application.
3. MSS SP 89 - Pipe Hangers and Supports - Fabrication and Installation Practices.

1.3 SUBMITTALS

A. Division 01 and Section 15000 - Submittals.

B. Shop Drawings: Indicate system layout with location including critical dimensions, sizes, and pipe hanger and support locations and detail of trapeze hangers.

C. Product Data:
1. Hangers and Supports: Submit manufacturers catalog data including load capacity.

D. Design Data: Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers.
E. Manufacturer's Installation Instructions:
   1. Hangers and Supports: Submit special procedures and assembly of components.
F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with State and local standards.
B. Perform Work in accordance with AWS D1.1 for welding hanger and support attachments to building structure.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three (3) years' experience.
B. Installer: Company specializing in performing Work of this section with minimum three (3) years' experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site in original factory packaging, labeled with manufacturer's identification.
B. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

1.7 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.8 WARRANTY

A. Section 15000: Product warranties.

PART 2 - PRODUCTS

2.1 PIPE HANGERS AND SUPPORTS

A. Plumbing Piping – DWV and Storm Drainage:
   1. Conform to ASME B31.9, ASTM F708, MSS SP58, MSS SP69, or MSS SP89.
   2. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron or carbon steel, adjustable swivel, split ring.
   3. Hangers for Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.
   4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
   5. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hook.
   6. Wall Support for Pipe Sizes 4 inches and Larger: Welded steel bracket and wrought steel clamp.
   7. Vertical Support: Steel riser clamp.
   8. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
   9. Copper Pipe Support: Copper-plated, carbon-steel adjustable, ring.

B. Plumbing Piping - Water:
   1. Conform to ASME B31.9, ASTM F708, MSS SP58, MSS SP69, or MSS SP89.
   2. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron or carbon steel, adjustable swivel, split ring.
   3. Hangers for Cold Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.
   4. Hangers for Hot Pipe Sizes 2 to 4 inches: Carbon steel, adjustable, clevis.
   5. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
   6. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hook.
   7. Wall Support for Pipe Sizes 4 inches and Larger: Welded steel bracket and wrought steel clamp.
   8. Vertical Support: Steel riser clamp.
   9. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
   10. Floor Support for Hot Pipe Sizes 4 inches and Smaller: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
   11. Copper Pipe Support: Copper-plated, Carbon-steel ring.

2.2 ACCESSORIES

A. Hanger Rods: Mild steel threaded both ends, threaded on one end, or continuous threaded.

2.3 EQUIPMENT CURBS

A. Fabrication: Unless otherwise noted, shall be welded 18 gage galvanized steel shell and base, mitered 3-inch cant, variable step to match roof insulation, 1-1/2 inch thick insulation, factory-installed wood nailer. Provide tapered curbs to match roof slope.

2.4 FORMED STEEL CHANNEL

A. Manufacturers:
   1. B-Line Systems.
   2. Unistrut Corp.
   3. Substitutions: See Section 15000.
B. Product Description: Galvanized (12 gage) thick steel. With holes 1-1/2 inches on center.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify the existing conditions before starting work.
B. Verify openings are ready to receive sleeves.

3.2 PREPARATION

A. Obtain permission from Architect before using powder-actuated anchors.
B. Do not drill or cut structural members without obtaining permission from Architect/Engineer.

3.3 INSTALLATION - PIPE HANGERS AND SUPPORTS

A. Install in accordance with ASME B31.1, ASME B31.5, ASME 31.9, ASTM F708, MSS SP 58, MSS SP 69, or MSS SP 89.
B. Support horizontal piping as scheduled.
C. Install hangers with minimum 1/2 inch space between finished covering and adjacent work.
D. Place hangers within 12 inches of each horizontal elbow.
E. Use hangers with 1-1/2 inch minimum vertical adjustment.
F. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.
G. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.
H. Where piping is installed in parallel and at same elevation, provide multiple pipe or trapeze hangers.
I. Support riser piping independently of connected horizontal piping.
J. Provide copper plated hangers and supports for copper piping.
K. Design hangers for pipe movement without disengagement of supported pipe.
L. Prime coat exposed steel hangers and supports. Refer to Division 09. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
M. Provide clearance in hangers and from structure and other equipment for installation of insulation. Refer to Section 15080.

3.4 INSTALLATION - EQUIPMENT BASES AND SUPPORTS

A. Provide housekeeping pads of concrete, minimum 4 inches thick and extending 6 inches beyond supported equipment. Refer to Division 03.
B. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment.
C. Construct supports of steel members, formed steel channel, or steel pipe and fittings. Brace and fasten with flanges bolted to structure.
D. Provide rigid anchors for pipes after vibration isolation components are installed.

3.5 INSTALLATION - FLASHING

A. Provide flexible flashing and metal Counterflashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.
B. Flash vent and soil pipes projecting 3 inches minimum above finished roof surface with lead worked 1 inch minimum into hub, 8 inches minimum clear on sides with 24 x 24 inches sheet size. For pipes through outside walls, turn flanges back into wall and caulk, metal counter-flash, and seal.
C. Flash floor drains in floors with topping over finished areas with lead, 10 inches clear on sides with minimum 36- x 36-inch sheet size. Fasten flashing to drain clamp device.
D. Seal floor drains watertight to adjacent materials.
E. Provide acoustical lead flashing around ducts and pipes penetrating equipment rooms for sound control.
F. Provide curbs for mechanical roof installations 10 inches minimum high above roofing surface. Flash and counter-flash with sheet metal; seal watertight. Attach Counterflashing mechanical equipment and lap base flashing on roof curbs. Flatten and solder joints.
G. Adjust storm collars tight to pipe with bolts; caulk around top edge. Use storm collars above roof jacks. Screw vertical flange section to face of curb.

3.6 FIELD QUALITY CONTROL

A. Inspect installed firestopping for compliance with specifications and submitted schedule.

3.7 CLEANING

A. Clean adjacent surfaces of firestopping materials.

3.8 PROTECTION OF FINISHED WORK

A. Protect adjacent surfaces from damage by material installation.

3.9 SCHEDULES

A. Pipe Hanger Spacing (or as required by local code)

PIPE SIZE	**MAX. HANGER SPACING**	**HANGER ROD DIAMETER**
Inches	Feet	Inches
1/2	6	3/8
3/4	6	3/8
1	6	3/8
1-1/4	6	3/8
1-1/2	10	3/8
2	10	3/8
2-1/2	10	1/2
3	10	1/2
4	10	5/8
5	10	5/8
6	10	3/4
8	10	3/4
PVC (All Sizes)	4	3/8
C.I. Bell and Spigot (or No-Hub) and at Joints	5	5/8

END OF SECTION

SECTION 15075

MECHANICAL IDENTIFICATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Nameplates.
   2. Tags.
   3. Stencils.
   4. Pipe markers.
   5. Ceiling tacks.
B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 09912 – Interior Painting.
   3. Section 15000 – General Mechanical Requirements.

1.2 REFERENCES

A. American Society of Mechanical Engineers:
   1. ASME A13.1 - Scheme for the Identification of Piping Systems.

1.3 SUBMITTALS

A. Division 1 and Section 15000: Submittals.
B. Product Data: Submit manufacturers catalog literature for each product required.
C. Manufacturer's Installation Instructions: Indicate installation instructions, special procedures, and installation.
D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of tagged valves; include valve tag numbers.

1.5 QUALITY ASSURANCE

A. Conform to ASME A13.1 for color scheme for identification of piping systems and accessories.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years' experience.
B. Installer: Company specializing in performing Work of this section with minimum three (3) years' experience.

1.7 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 NAMEPLATES

A. Manufacturers:
   1. Seton Identification Products.
   2. Substitutions: Section 15000.
B. Product Description: Laminated 3-layer plastic with engraved black letters on light contrasting background color.

2.2 TAGS

A. Metal Tags:
   1. Brass with stamped letters; tag size minimum 1-1/2 inches diameter with finished edges.
B. Tag Chart: Typewritten letter size list of applied tags and location in anodized aluminum frame.

2.3 STENCILS

A. Stencils: With clean cut symbols and letters of following size:
   1. Up to 2 inches Outside Diameter of Insulation or Pipe: 1/2 inch high letters.
   2. 2-1/2 to 6 inches Outside Diameter of Insulation or Pipe: 1-inch high letters.
   3. Over 6 inches Outside Diameter of Insulation or Pipe: 1-3/4 inches high letters.
   4. Equipment: 1-3/4 inches high letters.
B. Stencil Paint: As specified in Section 09912, semi-gloss enamel, colors and lettering size conforming to ASME A13.1.

2.4 PIPE MARKERS

A. Color and Lettering: Conform to ASME A13.1.
B. Plastic Pipe Markers:
   1. Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering. Larger sizes may have maximum sheet size with spring fastener.
C. Plastic Tape Pipe Markers:
   1. Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.
D. Plastic Underground Pipe Markers:
   1. Bright colored continuously printed plastic ribbon tape, minimum 6 inches wide by 4 mil thick, manufactured for direct burial service. Markers used on nonmetallic pipe shall contain tracer wire.

2.5 CEILING TACKS

A. Description: Steel with 3/4 inch diameter color-coded head.
B. Color code as follows:
   1. HVAC Equipment: Yellow.
   2. Fire Dampers/Smoke Dampers: Red.
   3. Plumbing Valves: Green.
   4. Heating/Cooling Valves: Blue.

PART 3 - EXECUTION

3.1 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.
B. Prepare surfaces in accordance with Section 09912 for stencil painting.

3.2 INSTALLATION

A. Apply stencil painting in accordance with Section 09912.
B. Install identifying devices after completion of coverings and painting.
C. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive.
D. Install tags using corrosion resistant chain. Number tags consecutively by location.
E. Install underground plastic pipe markers 8 to 10 inches below finished grade, directly above buried pipe.
F. Identify air handling units, pumps, heat transfer equipment, tanks, and water treatment devices with plastic nameplates or stencil painting. Identify in-line pumps and other small devices with tags.
G. Identify control panels and major control components outside panels with plastic nameplates.
H. Identify valves in main and branch piping with tags.
I. Identify air terminal units and radiator valves with numbered tags.
J. Tag automatic controls, instruments, and relays. Key to control schematic.
K. Identify piping, concealed or exposed, with plastic pipe markers, plastic tape pipe markers or stenciled painting. Use tags on piping 3/4 inch diameter and smaller. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure, and at each obstruction.
L. Provide ceiling tacks to locate valves or dampers above T-bar type panel ceilings. Locate in corner of panel closest to equipment.

END OF SECTION

SECTION 15080

MECHANICAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Insulation jackets.
2. Piping system insulation.
3. Insulation accessories including vapor retarders, jackets, and accessories.

B. Related Sections:
1. Division 01 Specification Sections apply to Work of this Section.
2. Division 07 – Thermal and Moisture Protection.
3. Section 15000 – General Mechanical Requirements.

1.2 REFERENCES

A. ASTM International:
1. ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
2. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
3. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
4. ASTM C195 - Standard Specification for Mineral Fiber Thermal Insulating Cement.
5. ASTM C449/C449M - Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement.
6. ASTM C518 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
7. ASTM C533 - Standard Specification for Calcium Silicate Block and Pipe Thermal Insulation.
8. ASTM C534 - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
9. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation.
10. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation.
11. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
12. ASTM C591 - Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
13. ASTM C592 - Standard Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type).
14. ASTM C610 - Standard Specification for Molded Expanded Perlite Block and Pipe Thermal Insulation.
15. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
16. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel.

17. ASTM C921 - Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation.
18. ASTM C1071 - Standard Specification for Thermal and Acoustical Insulation (Glass Fiber, Duct Lining Material).
19. ASTM C1126 - Standard Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation.
20. ASTM C1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
21. ASTM C1290 - Standard Specification for Flexible Fibrous Glass Blanket Insulation Used to Externally Insulate HVAC Ducts.
22. ASTM D1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
23. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
24. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
25. ASTM E162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source.
26. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

B. Sheet Metal and Air Conditioning Contractors:
   1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

1.3 SUBMITTALS

A. Division 01 and Section 15000 - Submittals.
B. Product Data: Submit product description, thermal characteristics and list of materials and thickness for each service, and location.
C. Manufacturer's Installation Instructions: Submit manufacturers published literature indicating proper installation procedures.
D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years' experience.
B. Applicator: Company specializing in performing Work of this section with minimum three (3) years' experience approved by manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.
B. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Install insulation only when ambient temperature and humidity conditions are within range recommended by manufacturer.
B. Maintain temperature during and after installation for minimum period of 24 hours.

1.7 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.8 WARRANTY

A. Section 15000 - Product warranties.

PART 2 - PRODUCTS

2.1 MAN MADE MINERAL FIBER

A. Manufacturers:
   1. Johns Manville.
   2. Knauf.
   3. Owens Corning.
   4. Substitutions: Section 15000 - Substitutions.
B. Insulation: ASTM C547 Mineral Fiber Pipe Insulation, Type I, 850°F.
C. Vapor Retarder Jacket:
   1. ASTM C921, White Kraft paper with glass fiber yarn, bonded to aluminized film.
   2. Moisture Vapor Transmission: ASTM E96; 0.02 perm-inches.
D. Tie Wire: 0.048-inch stainless steel with twisted ends on maximum 12-inch centers.
E. Vapor Retarder Lap Adhesive:
   1. Compatible with insulation.
F. Insulating Cement/Mastic:
   1. ASTM C195; hydraulic setting on mineral wool.
G. Glass Fiber Fabric:
   1. Cloth: Untreated; 9 oz/sq yd weight.
   2. Blanket: 1.0 lb/cu ft density.
   3. Weave: 10 x 10.
H. Indoor Vapor Retarder Finish:
   1. Cloth: Untreated; 9 oz/sq yd weight.
   2. Vinyl emulsion type acrylic, compatible with insulation, white color.
I. Insulating Cement:
   1. ASTM C449/C449M.

2.2 PIPE INSULATION AND EQUIPMENT JACKETS

A. PVC Plastic Pipe Jacket:
   1. Manufacturers:
      a. Johns Manville.
      b. Knauf.
      c. Owens Corning.
      d. Substitutions: Section 15000 - Substitutions.
   2. Product Description: ASTM D1784, 1-piece molded type fitting covers and sheet material, off-white color.
   3. Thickness: 15 mil.
   4. Connections: Brush-on welding adhesive.
B. PVC Plastic Equipment Jacket:
   1. Manufacturers:
      a. Johns Manville.

b. Knauf.
c. Owens Corning.
d. Substitutions: Section 15000 - Substitutions.

2. Product Description: Sheet material, off-white color.
3. Minimum Service Temperature: -40°F.
4. Maximum Service Temperature: 150°F.
5. Moisture Vapor Transmission: ASTM E96; 0.002 perm-inches.
6. Thickness: 15 mil.
7. Connections: Brush-on welding adhesive.

C. Covering Adhesive Mastic:
1. Compatible with insulation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify piping, equipment and ductwork has been tested before applying insulation materials.
B. Verify surfaces are clean and dry, with foreign material removed.

3.2 INSTALLATION

A. Exposed Piping: Locate insulation and cover seams in least visible locations.
B. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
C. Man made mineral fiber insulated pipes conveying fluids below ambient temperature:
1. Furnish factory-applied or field-applied vapor retarder jackets. Secure factory-applied jackets with pressure sensitive adhesive self-sealing longitudinal laps and butt strips. Secure field-applied jackets with outward clinch expanding staples and seal staple penetrations with vapor retarder mastic.
2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor retarder adhesive or PVC fitting covers.

D. Man made mineral fiber insulated pipes conveying fluids above ambient temperature:
1. Furnish factory-applied or field-applied standard jackets. Secure with outward clinch expanding staples or pressure sensitive adhesive system on standard factory-applied jacket and butt strips or both.
2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.

E. Inserts and Shields:
1. Application: Piping or Equipment 1-1/2 inches diameter or larger.
2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
3. Insert location: Between support shield and piping and under finish jacket.
4. Insert configuration: Minimum 6 inches long, of thickness and contour matching adjoining insulation; may be factory fabricated.
5. Insert material: Compression resistant insulating material suitable for planned temperature range and service.

F. Continue insulation through penetrations of building assemblies or portions of assemblies having fire resistance rating of one (1) hour or less. Provide intumescent firestopping when

continuing insulation through assembly. Finish at supports, protrusions, and interruptions. Refer to Division 07 for penetrations of assemblies with fire resistance rating greater than 1 hour.

G. Factory Insulated Equipment: Do not insulate.

H. Exposed Equipment: Locate insulation and cover seams in least visible locations.

I. Apply insulation close to equipment by grooving, scoring, and beveling insulation. Fasten insulation to equipment with studs, pins, clips, adhesive, wires, or bands.

J. Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapor retarder cement.

K. Insulated equipment containing fluids below ambient temperature: Insulate entire system.

L. Finish insulation at supports, protrusions, and interruptions.

M. Nameplates and ASME Stamps: Bevel and seal insulation around; do not insulate over.

N. Equipment Requiring Access for Maintenance, Repair, or Cleaning: Install insulation for easy removal and replacement without damage.

3.3 SCHEDULES

A. Plumbing Systems:
   1. Domestic Hot Water Supply:
      a. Man-made Mineral Fiber Insulation:
         1) Pipe Size Range: 1.5 inch or less.
            (a) Thickness: 1 inch.
         2) Pipe Size Range: Greater than 1.5 inch.
            (a) Thickness: 2 inch.
         3) Runout Piping 4 feet or less:
            (a) Pipe Size Range: 1 inch or less.
            (b) Thickness: 1/2 inch.
   2. Domestic Cold Water:
      a. Man-made Mineral Fiber Insulation:
         1) Pipe Size Range: All sizes.
            (a) Thickness: 1/2 inch.

END OF SECTION

SECTION 15140

DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Domestic water piping, buried within 5 feet of building.
2. Domestic water piping, above grade.
3. Unions and flanges.
4. Valves.

B. Related Sections:
1. Division 01 Specification Sections apply to Work of this Section.
2. Division 07 – Thermal and Moisture Protection.
3. Section 09912 – Interior Painting.
4. Section 15000 – General Mechanical Requirements.
5. Section 15050 – Basic Mechanical Materials and Methods.
6. Section 15060 – Hangers and Supports.
7. Section 15075 – Mechanical Identification.
8. Section 15080 – Mechanical Insulation.

1.2 REFERENCES

A. American National Standards Institute:
1. ANSI Z21.22 - Relief Valves for Hot Water Supply Systems.

B. American Society of Mechanical Engineers:
1. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
2. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
3. ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes.
4. ASME B31.9 - Building Services Piping.
5. ASME Section VIII - Boiler and Pressure Vessel Code - Pressure Vessels.
6. ASME Section IX - Boiler and Pressure Vessel Code - Welding and Brazing Qualifications.

C. American Society of Sanitary Engineering:
1. ASSE 1010 - Performance Requirements for Water Hammer Arresters.
2. ASSE 1011 - Performance Requirements for Hose Connection Vacuum Breakers.
3. ASSE 1012 - Performance Requirements for Backflow Preventer with Intermediate Atmospheric Vent.
4. ASSE 1013 - Performance Requirements for Reduced Pressure Principle Backflow Preventers and Reduced Pressure Fire Protection Principle Backflow Preventers.
5. ASSE 1019 - Performance Requirements for Wall Hydrants, Freezeless, Automatic Draining, AntiBackflow Types.

D. ASTM International:
1. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
2. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.

3. ASTM A395/A395M - Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures.
4. ASTM A536 - Standard Specification for Ductile Iron Castings.
5. ASTM B32 - Standard Specification for Solder Metal.
6. ASTM B42 - Standard Specification for Seamless Copper Pipe, Standard Sizes.
7. ASTM B88 - Standard Specification for Seamless Copper Water Tube.
8. ASTM B584 - Standard Specification for Copper Alloy Sand Castings for General Applications.
9. ASTM D1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
10. ASTM D1785 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
11. ASTM D2241 - Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).
12. ASTM D2464 - Standard Specification for Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
13. ASTM D2466 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
14. ASTM D2467 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
15. ASTM D2564 - Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
16. ASTM D2665 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings.
17. ASTM D2846/D2846M - Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Hot- and Cold-Water Distribution Systems.
18. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.
19. ASTM D3139 - Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
20. ASTM F437 - Standard Specification for Threaded Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.
21. ASTM F438 - Standard Specification for Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40.
22. ASTM F439 - Standard Specification for Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.
23. ASTM F441/F441M - Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80.
24. ASTM F442/F442M - Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe (SDR-PR).
25. ASTM F493 - Standard Specification for Solvent Cements for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe and Fittings.
26. ASTM F708 - Standard Practice for Design and Installation of Rigid Pipe Hangers.
27. ASTM F1282 - Standard Specification for Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure Pipe.
28. ASTM F1476 - Standard Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications.

E. American Welding Society:
1. AWS A5.8 - Specification for Filler Metals for Brazing and Braze Welding.

F. American Water Works Association:
   1. AWWA C104 - American National Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
   2. AWWA C105 - American National Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems.
   3. AWWA C110 - American National Standard for Ductile-Iron and Grey-Iron Fittings, 3 in. through 48 in., for Water and Other Liquids.
   4. AWWA C111 - American National Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
   5. AWWA C151 - American National Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water.
   6. AWWA C651 - Disinfecting Water Mains.
   7. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe, 4 in. through 12 in., for Water Distribution.
   8. AWWA C901 - Polyethylene (PE) Pressure Pipe and Tubing, 1/2 in. through 3 in., for Water Service.
G. Manufacturers Standardization Society of the Valve and Fittings Industry:
   1. MSS SP 58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
   2. MSS SP 67 - Butterfly Valves.
   3. MSS SP 69 - Pipe Hangers and Supports - Selection and Application.
   4. MSS SP 70 - Cast Iron Gate Valves, Flanged and Threaded Ends.
   5. MSS SP 71 - Cast Iron Swing Check Valves, Flanged and Threaded Ends.
   6. MSS SP 78 - Cast Iron Plug Valves, Flanged and Threaded Ends.
   7. MSS SP 80 - Bronze Gate, Globe, Angle and Check Valves.
   8. MSS SP 85 - Cast Iron Globe & Angle Valves, Flanged and Threaded.
   9. MSS SP 89 - Pipe Hangers and Supports - Fabrication and Installation Practices.
   10. MSS SP 110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.
H. Plumbing and Drainage Institute:
   1. PDI WH201 - Water Hammer Arrester Standard.

1.3 SUBMITTALS

A. Division 01 and Section 15000: Submittals.
B. Product Data:
   1. Piping: Submit data on pipe materials, fittings, and accessories. Submit manufacturer's catalog information.
   2. Valves: Submit manufacturers catalog information with valve data and ratings for each service.
   3. Domestic Water Specialties: Submit manufacturers catalog information, component sizes, rough-in requirements, service sizes, and finishes.
C. Manufacturer's Installation Instructions: Submit installation instructions for pumps, valves and accessories.
D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of valves and equipment.
B. Operation and Maintenance Data: Submit spare parts list, exploded assembly views and recommended maintenance intervals.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with State and local standards.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years' experience.
B. Installer: Company specializing in performing Work of this section with minimum three (3) years' experience.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Accept valves and equipment on site in shipping containers with labeling in place. Inspect for damage.
B. Provide temporary protective coating on cast iron and steel valves.
C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

1.8 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 DOMESTIC WATER PIPING, BURIED WITHIN 5 FEET OF BUILDING

A. Copper Tubing: ASTM B88 (ASTM B88M), Type K annealed.
   1. Fittings: ASME B16.18, cast copper, or ASME B16.22, wrought copper.
   2. Joints: Compression connection or Brazed, AWS A5.8 BCuP silver/phosphorus/ copper alloy with melting range 1190°F to 1480°F.

2.2 DOMESTIC WATER PIPING, ABOVE GRADE

A. Copper Tubing: ASTM B88, Type L, hard drawn.
   1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
   2. Joints: Solder, lead free, ASTM B32, 95-5 tin-antimony, or tin and silver, with melting range 430°F to 535°F or Braze, AWS A5.8 BCuP silver/phosphorus/ copper alloy with melting range 1190°F to 1480°F.
   3. Copper Press Fitting:
      a. Manufacturers:
         1) Viega.
         2) Ridge Tool Company.
         3) Substitutions: Not permitted.
      b. Press Fitting: Copper and copper alloy press fittings shall conform to material requirements of ASME B16.18 or ASME B16.22 and performance criteria of IAPMO PS117. Sealing elements for press fittings shall be EPDM. Sealing elements shall be factory installed or an alternative supplied by fitting

manufacturer. Press ends shall have SC (Smart Connect™) feature design (leakage path). In ProPress 1/2- to 4inch dimensions the Smart Connect Feature assures leakage of liquids and/or gases from inside the system past the sealing element of an unpressed connection. The function of this feature is to provide the installer quick and easy identification of connections which have not been pressed prior to putting the system into operation.

2.3 UNIONS AND FLANGES

A. Unions for Pipe 2 inches and Smaller:
   1. Copper Piping: Class 150, bronze unions with soldered or brazed joints.
   2. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.
B. Flanges for Pipe 2-1/2 inches and Larger:
   1. Copper Piping: Class 150, slip-on bronze flanges.
   2. Gaskets: 1/16 inch thick preformed neoprene gaskets.

2.4 BALL VALVES

A. Manufacturers:
   1. Apollo Valves.
   2. Milwaukee.
   3. NIBCO, Inc.
   4. Substitutions: Section 15000.
B. 2-1/2 inches and Smaller: MSS SP 110, 600 psi WOG, listed Lead Free-0.25% lead maximum, 2-piece bronze body, chrome plated brass ball, full port, Teflon seats, blow-out proof stem, solder or threaded ends with union and lever handle.

PART 3 - EXECUTION

3.1 PREPARATION

A. Ream pipe and tube ends. Remove burrs.
B. Remove scale and dirt, on inside and outside, before assembly.

3.2 INSTALLATION - HANGERS AND SUPPORTS

A. Install hangers and supports in accordance with Section 15060.

3.3 INSTALLATION – BURIED PIPING SYSTEMS

A. Verify connection to existing piping system size and location is as indicated on Drawings.
B. Establish elevations of buried piping with not less than 2 feet of cover.
C. Establish minimum separation of domestic water piping from sanitary sewer piping in accordance with local code.
D. Remove scale and dirt on inside of piping before assembly.
E. Excavate pipe trench in accordance with Section 15000.
F. Route pipe in straight line.
G. Install pipe to allow for expansion and contraction without stressing pipe or joints.
H. Metallic Piping: Install plastic ribbon tape continuous buried 6 inches below finish grade, above pipe line. Refer to Section 15075.

I. Non-Metallic Pipe: Install trace wire continuous buried 6 inches below finish grade, above pipe line. Refer to Section 15075.
J. Pipe Cover and Backfilling: Backfill trench in accordance with Section 15000.

3.4 INSTALLATION - ABOVE GROUND PIPING

A. Install non-conducting dielectric connections wherever jointing dissimilar metals.
B. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
C. Install piping to maintain headroom without interfering with use of space or taking more space than necessary.
D. Group piping whenever practical at common elevations.
E. Slope piping and arrange systems to drain at low points.
F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
G. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings. Refer to Section 15080.
H. Provide access where valves and fittings are not accessible.
I. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one (1) coat of zinc rich primer to welding.
J. Prepare exposed, unfinished pipe, fittings, supports, and accessories ready for finish painting. Refer to Section 09912.
K. Install domestic water piping in accordance with ASME B31.9.
L. Sleeve pipes passing through partitions, walls and floors. Refer to Section 15050.
M. Install firestopping at fire rated construction perimeters and openings containing penetrating sleeves and piping. Refer to Division 07.
N. Install unions downstream of valves and at equipment or apparatus connections.
O. Install valves with stems upright or horizontal, not inverted.
P. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.
Q. Install ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.
R. Install ball valves for throttling, bypass, or manual flow control services.
S. Install potable water protection devices on plumbing lines where contamination of domestic water may occur; janitor rooms, fire sprinkler systems, flush valves, and interior and exterior hose bibs.
T. Pipe relief from valves and drains to nearest floor drain.
U. Install water hammer arrestors complete with accessible isolation valve on hot and cold water supply piping as per PDI standards.
V. Install air chambers on hot and cold water supply piping to each fixture. Fabricate same size as supply pipe or 3/4 inch minimum, and minimum 18 inches long.
W. Press Connections: Copper press fittings shall be made in accordance with the manufacturer's installation instructions. The tubing shall be fully inserted into the fitting and the tubing marked at the shoulder of the fitting. The fitting alignment shall be checked against the mark on the tubing to assure the tubing is fully engaged (inserted) in the fitting. The joints shall be pressed using the tool approved by the manufacturer.

3.5 FIELD QUALITY CONTROL

A. Test domestic water piping system in accordance with applicable local code.

3.6 CLEANING

A. Prior to starting work, verify system is complete, flushed and clean. Clean piping as required by local code or as follows.
B. Verify pH of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
C. Inject disinfectant, free chlorine in liquid, powder and tablet or gas form, throughout system to obtain residual from 50 to 80 mg/L.
D. Bleed water from outlets to obtain distribution and test for disinfectant residual at minimum 15% of outlets.
E. Maintain disinfectant in system for 24 hours.
F. When final disinfectant residual tests less than 25 mg/L, repeat treatment.
G. Flush disinfectant from system until residual concentration is equal to incoming water or 1.0 mg/L.
H. Take samples no sooner than 24 hours after flushing, from 5% of outlets and from water entry, and analyze in accordance with AWWA C651.
I. Provide written verification of eyewitness of disinfection procedure and include in O & M.

END OF SECTION

SECTION 15150

SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Sanitary sewer piping buried within 5 feet of building.
2. Sanitary sewer piping above grade.

B. Related Sections:
1. Division 01 Specification Sections apply to Work of this Section.
2. Section 09912 – Interior Painting.
3. Section 15000 – General Mechanical Requirements.
4. Section 15060 – Hangers and Supports.
5. Section 15075 – Mechanical Identification.
6. Section 15080 – Mechanical Insulation.

1.2 REFERENCES

A. American Society of Mechanical Engineers:
1. ASME A112.14.1 - Backwater Valves.
2. ASME A112.21.1 - Floor Drains.
3. ASME B16.1 - Cast Iron Pipe Flanges and Flanged Fittings.
4. ASME B16.3 - Malleable Iron Threaded Fittings.
5. ASME B16.4 - Gray Iron Threaded Fittings.
6. ASME B16.23 - Cast Copper Alloy Solder Joint Drainage Fittings (DWV).
7. ASME B16.29 - Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV.
8. ASME B31.9 - Building Services Piping.

B. ASTM International:
1. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings.
2. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
3. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings.
4. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.
5. ASTM A395/A395M - Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures.
6. ASTM A536 - Standard Specification for Ductile Iron Castings.
7. ASTM A746 - Standard Specification for Ductile Iron Gravity Sewer Pipe.
8. ASTM B32 - Standard Specification for Solder Metal.
9. ASTM B42 - Standard Specification for Seamless Copper Pipe, Standard Sizes.
10. ASTM B43 - Standard Specification for Seamless Red Brass Pipe, Standard Sizes.
11. ASTM B75 - Standard Specification for Seamless Copper Tube.
12. ASTM B88 - Standard Specification for Seamless Copper Water Tube.
13. ASTM B251 - Standard Specification for General Requirements for Wrought Seamless Copper and Copper-Alloy Tube.
14. ASTM B302 - Standard Specification for Threadless Copper Pipe.

15. ASTM B306 - Standard Specification for Copper Drainage Tube (DWV).
16. ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
17. ASTM D1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
18. ASTM D1785 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
19. ASTM D2235 - Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.
20. ASTM D2241 - Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).
21. ASTM D2464 - Standard Specification for Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
22. ASTM D2466 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
23. ASTM D2467 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
24. ASTM D2564 - Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
25. ASTM D2665 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings.
26. ASTM D2729 - Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
27. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.
28. ASTM D3034 - Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
29. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
30. ASTM F708 - Standard Practice for Design and Installation of Rigid Pipe Hangers.
31. ASTM F1476 - Standard Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications.

C. Cast Iron Soil Pipe Institute:
1. CISPI 301 - Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications.
2. CISPI 310 - Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications.

D. Manufacturers Standardization Society of the Valve and Fittings Industry:
1. MSS SP 58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
2. MSS SP 69 - Pipe Hangers and Supports - Selection and Application.
3. MSS SP 70 - Cast Iron Gate Valves, Flanged and Threaded Ends.
4. MSS SP 71 - Cast Iron Swing Check Valves, Flanged and Threaded Ends.
5. MSS SP 80 - Bronze Gate, Globe, Angle and Check Valves.
6. MSS SP 89 - Pipe Hangers and Supports - Fabrication and Installation Practices.
7. MSS SP 110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.

E. Plumbing and Drainage Institute:
1. PDI G101 - Standard - Testing and Rating Procedure for Grease Interceptors.

1.3 SUBMITTALS

A. Division 01 and Section 15000: Submittals.
B. Product Data:
   1. Piping: Submit data on pipe materials, fittings, and accessories. Submit manufacturers catalog information.
   2. Sanitary Drainage Specialties: Submit manufacturers catalog information, component sizes, rough-in requirements, service sizes, and finishes.
C. Manufacturer's Installation Instructions: Submit installation instructions for material and equipment.
D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of equipment and clean-outs.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with State and local standards.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years' experience.
B. Installer: Company specializing in performing Work of this section with minimum three (3) years' experience.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Do not install underground piping when bedding is wet or frozen.

1.9 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.10 WARRANTY

A. Section 15000: Product warranties.

PART 2 - PRODUCTS

2.1 SANITARY SEWER PIPING, BURIED WITHIN 5 FEET OF BUILDING

A. Cast Iron Soil Pipe: ASTM A74, service weight, bell and spigot ends.
   1. Fittings: Cast iron, ASTM A74.
   2. Joints: Hub-and-spigot, CISPI HSN compression type with ASTM C564 neoprene gaskets or lead and oakum.

B. PVC Pipe: ASTM D2729, polyvinyl chloride (PVC) material, bell and spigot solvent sealed ends.
   1. Fittings: PVC, ASTM D2729.
   2. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent cement.
C. PVC Pipe: ASTM D3034, Type PSM, polyvinyl chloride (PVC) material, bell and spigot style rubber ring sealed gasket joint.
   1. Fittings: PVC, ASTM D3034.
   2. Joints: ASTM F477, elastomeric gaskets.
D. PVC Pipe: ASTM D1785, Schedule 40, polyvinyl chloride (PVC) material, bell and spigot style solvent sealed joint ends.
   1. Fittings: ASTM D2466, Schedule 40, PVC.
   2. Joints: ASTM D2855, solvent weld with ASTM D2564 Solvent cement.
E. Plastic Pipe: ASTM D2665, polyvinyl chloride (PVC) material.
   1. Fittings: PVC, ASTM D2665.
   2. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent cement.
F. CPVC Pipe: Schedule 40.
   1. Manufacturer: Charlotte – Corzan CPVC or approved equal.
   2. Pipe and Fittings: Corzan CPVC Type IV, Grade I compounds, ASTM Cell Classification 23447 for fittings and 24448 for pipe.
   3. Joints: Solvent Cement, ASTM F493.

2.2 SANITARY SEWER PIPING, ABOVE GRADE

A. Cast Iron Pipe: ASTM A74, service weight.
   1. Fittings: Cast iron, ASTM A74.
   2. Joints: ASTM C564, rubber gasket joint devices or lead and oakum.
B. Cast Iron Pipe: CISPI 301, hub-less.
   1. Fittings: Cast iron, CISPI 301.
   2. Joints: CISPI 310, neoprene gaskets and stainless steel clamp-and-shield assemblies.
C. Copper Tube: ASTM B306, DWV Type L.
   1. Fittings: ASME B16.23, cast bronze, or ASME B16.29, wrought copper.
   2. Joints: Solder, lead free, ASTM B32, 95-5 tin-antimony, or tin and silver, with melting range 430°F to 535°F.
D. PVC Pipe: ASTM D2729, polyvinyl chloride (PVC) material.
   1. Fittings: ASTM D2729, PVC.
   2. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent cement.
E. PVC Pipe: ASTM D2665, polyvinyl chloride (PVC) material.
   1. Fittings: ASTM D2665, PVC.
   2. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent cement.
F. PVC Pipe: ASTM D1785 Schedule 40, polyvinyl chloride (PVC) material.
   1. Fittings: ASTM D2466, Schedule 40, PVC.
   2. Joints: ASTM D2855, solvent weld with ASTM D2564 Solvent cement.
G. CPVC Pipe: Schedule 40.
   1. Manufacturer: Charlotte – Corzan CPVC or approved equal.
   2. Pipe and Fittings: Corzan CPVC Type IV, Grade I compounds, ASTM Cell Classification 23447 for fittings and 24448 for pipe.
   3. Joints: Solvent Cement, ASTM F493.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify excavations are to required grade, dry, and not over-excavated.

3.2 PREPARATION

A. Ream pipe and tube ends. Remove burrs.
B. Remove scale and dirt, on inside and outside, before assembly.
C. Prepare piping connections to equipment with flanges or unions.
D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

3.3 INSTALLATION – HANGERS AND SUPPORTS

A. Pipe Hangers and Supports.
   1. Install hangers in accordance with Section 15060.

3.4 INSTALLATION - BURIED PIPING SYSTEMS

A. Verify connection to existing piping system size, location, and invert are as indicated on Drawings.
B. Establish elevations of buried piping with not less than 2 feet of cover.
C. Establish minimum separation of sanitary sewer from other services piping in accordance with local code.
D. Remove scale and dirt on inside of piping before assembly.
E. Excavate pipe trench in accordance with Section 15000.
F. Install pipe to elevation as indicated on Drawings.
G. Route pipe in straight line.
H. Metallic Piping: Install plastic ribbon tape continuous over top of pipe. Refer to Section 15075.
I. Non-Metallic Piping: Install trace wire continuous over top of pipe. Refer to Section 15075.
J. Pipe Cover and Backfilling:
   1. Backfill trench in accordance with Section 15000.

3.5 INSTALLATION - ABOVE GROUND PIPING

A. Establish invert elevations, slope for drainage as required by local code. Maintain gradients.
B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Provide clearances at cleanout for snaking drainage system.
C. Encase exterior cleanouts in concrete flush with grade.
D. Install floor cleanouts at elevation to accommodate finished floor.
E. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
F. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
G. Install piping to maintain headroom. Do not spread piping, conserve space.
H. Group piping whenever practical at common elevations.

I. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
J. Provide clearance in hangers and from structure and other equipment for installation of insulation. Refer to Section 15080.
K. Provide access where valves and fittings are not accessible.
L. Install piping penetrating roofed areas to maintain integrity of roof assembly.
M. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
N. Prepare exposed, unfinished pipe, fittings, supports, and accessories ready for finish painting. Refer to Section 09912.
O. Install bell and spigot pipe with bell end upstream.
P. Sleeve pipes passing through partitions, walls and floors.
Q. Install firestopping at fire rated construction perimeters and openings containing penetrating sleeves and piping. Refer to Division 07.
R. Support cast iron drainage piping at every joint.
S. Do not install PVC piping within a return air plenum. PVC may be used if insulated with one layer of 1.5-inch FyreWrap Insulation.

3.6 FIELD QUALITY CONTROL

A. Test sanitary waste and vent piping system in accordance with applicable code.

END OF SECTION

SECTION 15410

PLUMBING FIXTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Section Includes:
   1. Water closets.
   2. Service sinks.
B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Division 07 – Thermal and Moisture Protection.
   3. Section 15000 – General Mechanical Requirements.

1.2 SUBMITTALS

A. Division 01 and Section 15000: Submittals.
B. Product Data: Submit catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.
C. Manufacturer's Installation Instructions: Submit installation methods and procedures.
D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.3 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit fixture, trim, exploded view and replacement parts lists.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with State and local standards.
B. Provide products requiring electrical connections listed and classified by Underwriters Laboratories Inc., as suitable for purpose specified and indicated.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years' experience.
B. Installer: Company specializing in performing Work of this section with minimum three (3) years' experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Accept fixtures on site in factory packaging. Inspect for damage.
B. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

PART 2 - PRODUCTS

2.1 FIXTURES

A. Refer to drawings Plumbing Fixture Schedule for fixture make, model numbers, and type.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify walls and floor finishes are prepared and ready for installation of fixtures.
B. Verify electric power is available and of correct characteristics.
C. Confirm millwork is constructed with adequate provision for counter top lavatory and sink installation.

3.2 PREPARATION

A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

3.3 INSTALLATION

A. Install Work in accordance with State and local standards.
B. Install each fixture with trap, easily removable for servicing and cleaning.
C. Provide chrome-plated rigid or flexible supplies to fixtures with stops, reducers, and escutcheons.
D. Install components level and plumb.
E. Install and secure fixtures in place with wall supports or wall carriers and bolts.
F. Seal fixtures to wall and floor surfaces with sealant as specified in Division 07, color to match fixture.
G. Solidly attach water closets to floor with lag screws. Lead flashing not intended to hold fixture in place.
H. For ADA accessible water closets, install flush valve with handle to wide side of stall.

3.4 INTERFACE WITH OTHER PRODUCTS

A. Review millwork shop-drawings. Confirm location and size of fixtures and openings before rough-in and installation.

3.5 ADJUSTING

A. Adjust stops/valves for intended waterflow rate to fixtures without splashing, noise, or overflow.

3.6 CLEANING

A. Clean plumbing fixtures and equipment.

3.7 PROTECTION OF INSTALLED CONSTRUCTION

A. Do not permit use of fixtures before final acceptance.

END OF SECTION

SECTION 15480

DOMESTIC WATER HEATERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Electric water heaters.
B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.

1.2 REFERENCES

A. American National Standards Institute:
   1. ANSI Z21.10.1 - Gas Water Heaters Vol. I Storage Water Heaters with Input Ratings of 75,000 Btu per Hour or Less.
   2. ANSI Z21.10.3 - Gas Water Heaters - Vol. III Storage, with Input Ratings above 75,000 Btu per Hour, Circulating and Instantaneous Water Heaters.
B. American Society of Mechanical Engineers:
   1. ASME PTC 25 - Pressure Relief Devices.
   2. ASME Section VIII - Boiler and Pressure Vessel Code - Pressure Vessels.
C. National Fire Protection Association:
   1. NFPA 54 - National Fuel Gas Code.

1.3 SUBMITTALS

A. Division 01 and Section 15000 - Submittals.
B. Product Data: Submit dimensioned drawings of water heaters indicating components and connections to other equipment and piping. Submit electrical characteristics and connection locations.
C. Manufacturer's Installation Instructions: Submit mounting and support requirements.
D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit replacement part numbers and availability.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with State and local standards.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years' experience.
B. Installer: Company specializing in performing Work of this section with minimum three (3) years' experience.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Accept water heaters on site in original labeled cartons. Inspect for damage.
B. Protect tanks with temporary inlet and outlet caps. Maintain caps in place until installation.

1.8 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.9 WARRANTY

A. Furnish 5-year manufacturer warranty for water heaters and storage tanks.

PART 2 - PRODUCTS

2.1 ELECTRIC WATER HEATERS

A. Manufacturers:
   1. Lochinvar.
   2. A.O. Smith.
B. Type: Factory-assembled and wired, electric, vertical storage.
C. Capacity: Refer to schedule.
D. Tank: Glass-lined welded steel; thermally-insulated with non-CFC foam encased in corrosion-resistant steel jacket; baked-on enamel finish.
E. Controls: Automatic water thermostat; externally adjustable temperature range from 120°F to 170°F, flanged or screw-in nichrome elements, high temperature limit thermostat.
F. Accessories: Brass water connections and dip tube, drain valve, magnesium anode, and ASME-rated temperature and pressure relief valve.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Maintain manufacturer's recommended clearances around and over water heaters.
B. Connect domestic hot water and domestic cold water piping to supply and return water heater connections.
C. Install discharge piping from relief valves and drain valves to nearest floor drain.
D. Install circulator and diaphragm expansion tank on water heater.
E. Install water heater trim and accessories furnished loose for field-mounting.
F. Install electrical devices furnished loose for field-mounting.
G. Install control wiring between water heater control panel and field-mounted control devices.

END OF SECTION

SECTION 15731

MINI-SPLIT SYSTEM AIR CONDITIONERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Split System air conditioners, with remote air cooled condensing units.
B. Related Section:
   1. Division 01 Specification Sections apply to Work of this Section.

1.2 REFERENCES

A. Air-Conditioning and Refrigeration Institute:
   1. ARI 210/240 - Unitary Air-Conditioning and Air-Source Heat Pump Equipment.
   2. ARI 270 - Sound Rating of Outdoor Unitary Equipment.
   3. ARI 340/360 - Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment.
B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
   1. ASHRAE 52.1 - Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter.
C. National Fire Protection Association:
   1. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems.

1.3 SUBMITTALS

A. Division 01 and Section 15000: Submittals.
B. Product Data: Submit data indicating:
   1. Cooling and heating capacities.
   2. Dimensions.
   3. Rough-in connections and connection requirements.
   4. Duct connections.
   5. Electrical requirements with electrical characteristics and connection requirements.
   6. Controls.
   7. Accessories.
C. Manufacturer's Installation Instructions: Submit assembly, support details, connection requirements, and include start-up instructions.
D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of controls separate from units.
B. Operation and Maintenance Data: Submit manufacturer's descriptive literature, operating instructions, installation instructions, and maintenance and repair data.

1.5 QUALITY ASSURANCE

A. Cooling capacity: Rate in accordance with ARI 210/240.
B. Sound Rating: Measure in accordance with ARI 270.
C. Insulation and adhesives: Conform to requirements of NFPA 90A.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years' experience.
B. Installer: Company specializing in performing Work of this section with minimum three (3) years' experience.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Accept equipment on site in factory packaging. Inspect for damage.
B. Protect equipment from damage by providing temporary covers until construction is complete in adjacent space.

1.8 WARRANTY

A. Furnish 5-year manufacturer’s warranty for compressors.

PART 2 - PRODUCTS

2.1 SPLIT SYSTEM AIR CONDITIONERS

A. Manufacturers:
   1. Carrier.
   2. Mitsubishi Electric.
   3. Trane.
   4. Substitutions: Section 15000.
B. Indoor Unit.
   1. General:
      The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, an emergency operation function and a test run switch. Indoor unit and refrigerant pipes will be charged with dry air instead of refrigerant before shipment from the factory.
   2. Unit Cabinet:
      a. The casing shall have a white finish.
      b. Multi directional drain and refrigerant piping offering four (4) directions for refrigerant piping and two (2) directions for draining shall be standard.
      c. There shall be a separate back plate which secures the unit firmly to the wall.
   3. Fan:
      a. The evaporator fan shall be an assembly with a line-flow fan direct driven by a single motor.
      b. The fan shall be statically and dynamically balanced and run on a motor with permanently lubricated bearings.

c. A manual adjustable guide vane shall be provided with the ability to change the airflow from side to side (left to right).
d. A motorized air sweep flow louver shall provide an automatic change in airflow by directing the air up and down to provide for uniform air distribution.
e. The indoor fan shall consist of three (3) speeds, High, Medium and Low.

4. Filter:
   a. Return air shall be filtered by means of an easily removable washable filter.
5. Coil:
   a. The evaporator coil shall be of nonferrous construction with smooth plate fins on copper tubing.
   b. The tubing shall have inner grooves for high efficiency heat exchange.
   c. All tube joints shall be brazed with phos copper or silver alloy.
   d. The coils shall be pressure tested at the factory.
   e. A condensate pan and drain shall be provided under the coil.
6. Electrical:
   a. The unit shall be powered from the outdoor unit.
   b. The indoor unit shall not have any supplemental electrical heat elements.
7. Control:
   a. This unit shall have a wireless controller to perform input functions necessary to operate the system.
   b. The controller shall consist of a Power On-Off switch, Mode Selector, Temperature Setting, Timer Control, Fan Speed Select and Auto Vane selector.
   c. Temperature changes shall be by 2°F increments with a range of 59°F - 89°F.
   d. The microprocessor located in the indoor unit shall have the capability of sensing return air temperature and indoor coil temperature, receiving and processing commands from the wireless controller, providing emergency operation and controlling the outdoor unit.
   e. The system shall be capable of automatic restart when power is restored after power interruption.
   f. Control system shall control the continued operation of the air sweep louvers, as well as provide on/off and system/mode function switching.

C. Outdoor Unit
1. General: The outdoor unit is designed specifically for use with the indoor units. The unit must have a powder coated finish. The outdoor unit shall be completely factory assembled, piped and wired. Each unit must be run tested at the factory.
2. Unit Cabinet:
   a. The casing shall be fabricated of galvanized steel, bonderized and finished with a powder coated baked enamel. Provide with manufacturers hail guard.
3. Fan:
   a. The unit shall be furnished with a direct drive propeller type fan.
   b. The motor shall have inherent protection, be permanently lubricated bearings.
   c. The fan motor shall be mounted for quiet operation.
   d. Provide fan with a raised guard to prevent contact with moving parts.
   e. The outdoor unit shall have a horizontal discharge airflow.
4. Coil:
   a. The condenser coil shall be of nonferrous construction with lanced or corrugated plate fins on copper tubing.
   b. The coil shall be protected with an integral metal guard.

c. Refrigerant flow from the condenser shall be controlled by means of a metering orifice.
d. Provide with either a factory installed or field installed hail screen.

5. Compressor:
   a. The compressor shall be a high performance rotary.
   b. The outdoor unit shall have an accumulator.
   c. The compressor will be equipped with an internal thermal overload.
   d. The outdoor unit must have the ability to operate with a maximum height difference of 25 feet and have refrigerant tubing length of 49 feet between indoor and outdoor units without the need for line size changes, traps or additional oil.
   e. The compressor shall be mounted to avoid the transmission of vibration.
   f. Heat pumps with reversing value.
6. Electrical:
   a. The unit electrical power shall be as scheduled.
   b. The outdoor unit shall be controlled by the microprocessor located in the indoor unit.

2.2 ELECTRICAL CHARACTERISTICS AND COMPONENTS

A. Electrical Characteristics: In accordance with Division 16.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify piping rough-in is at correct location.
B. Verify electrical rough-in is at correct location.

3.2 INSTALLATION

A. Install refrigerant piping from unit to remote condensing unit. Install refrigerant specialties furnished with unit.
B. Pipe condensate from drain pan to condensate drainage system. Refer to drawings.
C. Install accessories furnished loose for field mounting.
D. Install electrical devices furnished loose for field mounting.
E. Install control wiring between unit control panel and field mounted control devices.

3.3 CLEANING

A. After construction is completed, clean exposed surfaces of units.
B. Vacuum clean coils and inside of cabinets.
C. Touch up marred or scratched surfaces of factory finished cabinets, using finish materials furnished by manufacturer.

3.4 DEMONSTRATION

A. Demonstrate unit operation and maintenance.
B. Furnish services of manufacturer's technical representative for two (2) hours to instruct Owner's personnel in operation and maintenance of units. Schedule training with Owner, provide at least seven (7) days' notice to of training date.

3.5 PROTECTION OF FINISHED WORK

A. Protect finished surfaces of cabinets with protective covers during remainder of construction.

END OF SECTION

SECTION 15762

ELECTRIC RESISTANCE HEATERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Ceiling heaters with electric-resistance heating coils.
B. Related Section:
   1. Division 01 Specification Sections apply to Work of this Section.

1.2 REFERENCES

A. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
   1. ASHRAE 90.1 – Energy Standard for Buildings Except Low-Rise Residential Buildings.
   2. ASHRAE 33: Method of Testing Forced Circulation Air Cooling and Heating Coils.
B. National Fire Protection Association:
   1. NFPA 70: National Electrical Code.
   2. NFPA 90A: Standard for the Installation of Air Conditioning and Ventilating Systems.
   3. NFPA 90B: Standard for the Installation of Warm Air Heating and Air Conditioning Systems.
C. Underwriters Laboratories, Inc.:
   1. UL 823: Standard for Electric Heaters for Use in Hazardous (Classified) Locations.
   2. UL 1995: Heating and Cooling Equipment.
   3. UL 2021: Fixed and Location-Dedicated Electric Room Heaters.

1.3 SUBMITTALS

A. Division 01 and Section 15000 – Submittals.
B. Product Data: Submit manufacturer's literature and data indicating rated capacities, weights, accessories, electrical nameplate data, and wiring diagrams.
C. Manufacturer's Installation Instructions: Submit Indicate rigging and assembly.
D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts listing.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with State and local standards.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years' experience.
B. Installer: Company specializing in performing Work of this section with minimum three (3) years' experience.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Accept heaters and controls on site in factory packaging. Inspect for damage.

1.8 FIELD MEASURMENTS

A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.1 ELECTRIC RESISTANCE CEILING HEATERS

A. Manufacturers:
   1. Reznor.
   2. Substitutions: Section 15000 – Substitutions.
B. Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, heater exchanger, controls and accessories:
   1. Discharge Louvers: Flat ribbon wire, stamped-steel, or extruded aluminum grille.
   2. Control Voltage: 24 Volt, 60 Hertz.
   3. Location: Recessed ceiling mounted.
   4. Heat ON indicator light.
C. Cabinet: Galvanized steel, corrosion resistant baked enamel finish, easily removed and secured access panels, insulated or double panel construction, constructed to fit into a ceiling.
D. Supply Fan: Propeller type with direct drive.
E. Heat Exchanger: Nickel-chromium-wire heating element enclosed in metallic sheath mechanically bonded into fins, or stainless steel tubular elements with aluminum fins, with automatic, integrated high-temperature cutout and overheat reset sensor. Element supports shall eliminate thermal expansion noise.
F. Controls:
   1. Wall-Mounted Room Thermostat: Adjustable, low voltage, to control heat exchanger operation, and supply fan to maintain temperature setting.
G. Motor Type: Permanently lubricated, totally enclosed, thermally protected, continuous duty.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive unit heaters for compliance with requirements for installation tolerances and other conditions affecting performance.

3.2 INSTALLATION

A. Install units in accordance with NFPA 90B and NFPA 70.
B. Provide hangers and supports for suspended units. Refer Section 15060.
C. Provide operating controls.
D. Provide connection to electrical power systems. Refer to Division 16.

END OF SECTION

SECTION 15810

DUCTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Duct Materials.
2. Ductwork fabrication.

B. Related Sections:
1. Division 01 Specification Sections apply to Work of this Section.
2. Section 15000 – General Mechanical Requirements.

1.2 REFERENCES

A. ASTM International:
1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
2. ASTM A90/A90M - Standard Test Method for Weight Mass of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
3. ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
4. ASTM A568/A568M - Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for.
5. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
6. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
7. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
8. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
9. ASTM C14 - Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe.
10. ASTM C443 - Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
11. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

B. National Fire Protection Association:
1. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems.
2. NFPA 90B - Standard for the Installation of Warm Air Heating and Air Conditioning Systems.

C. Sheet Metal and Air Conditioning Contractors:
1. SMACNA - HVAC Air Duct Leakage Test Manual.
2. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

D. Underwriters Laboratories Inc.:
   1. UL 181 - Factory-Made Air Ducts and Connectors.

1.3 PERFORMANCE REQUIREMENTS

A. Variation of duct configuration or sizes other than those of equivalent or lower loss coefficient is not permitted except by written permission. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts.

1.4 SUBMITTALS

A. Division 01 and Section 15000 - Submittals.
B. Product Data: Submit data for duct materials and duct connectors.
C. Test Reports: Indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate, following SMACNA HVAC Air Duct Leakage Test Manual.
D. Manufacturer's Installation Instructions: Submit special procedures for glass fiber ducts.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with SMACNA - HVAC Duct Construction Standards, Metal and flexible.
B. Construct ductwork to NFPA 90A standards.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years' experience.
B. Installer: Company specializing in performing Work of this section with minimum three (3) years' experience.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Do not install duct sealant when temperatures are less than those recommended by sealant manufacturers.
B. Maintain temperatures during and after installation of duct sealant.

1.9 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.10 WARRANTY

A. Section 15000: Product warranties.

PART 2 - PRODUCTS

2.1 DUCT MATERIALS

A. Galvanized Steel Ducts: ASTM A653/A653M galvanized steel sheet, lock-forming quality, having G90 zinc coating of in conformance with ASTM A90/A90M.
B. Fasteners: Rivets, bolts, or sheet metal screws.
C. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one (1) end, or continuously threaded.

2.2 DUCTWORK FABRICATION

A. Fabricate and support rectangular ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible and as indicated on Drawings. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
B. Fabricate and support round ducts with longitudinal seams in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible (Round Duct Construction Standards), and as indicated on Drawings. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
C. Construct T's, bends, and elbows with minimum radius 1-1/2 times centerline duct width. Where not possible and where rectangular elbows are used, provide air foil turning vanes. Where acoustical lining is indicated, furnish turning vanes of perforated metal with glass fiber insulation.
D. Increase duct sizes gradually, not exceeding 15° divergence wherever possible; maximum 30° divergence upstream of equipment and 45° convergence downstream.
E. Fabricate continuously welded round and oval duct fittings two (2) gages heavier than duct gages indicated in SMACNA Standard. Minimum 4-inch cemented slip joint, brazed or electric welded. Prime coat welded joints.
F. Provide standard 45° lateral wye takeoffs. When space does not allow 45° lateral wye takeoff, use 90° tee connections.
G. Seal joints between duct sections and duct seams with welds, gaskets, mastic adhesives, mastic plus embedded fabric systems, or tape.
    1. Sealants, Mastics and Tape: Conform to UL 181A. Provide products bearing appropriate UL 181A markings.
    2. Do not provide sealing products not bearing UL approval marking.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify sizes of equipment connections before fabricating transitions.

3.2 INSTALLATION

A. Install and seal ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
B. During construction, install temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
C. Use crimp joints with or without bead or beaded sleeve couplings for joining round duct sizes 8 inches and smaller.

D. Install duct hangers and supports in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
E. Use double nuts and lock washers on threaded rod supports.
F. Set plenum doors 6 to 12 inches above floor. Arrange door swing so fan static pressure holds door in closed position.

3.3 INTERFACE WITH OTHER PRODUCTS

A. Install openings in ductwork where required to accommodate thermometers and controllers. Install pitot tube openings for testing of systems. Install pitot tube complete with metal can with spring device or screw to prevent air leakage. Where openings are provided in insulated ductwork, install insulation material inside metal ring.

3.4 CLEANING

A. Final Cleaning: Refer to Division 01.
B. Clean duct system and force air at high velocity through duct to remove accumulated dust. To obtain sufficient air flow, clean half of system completely before proceeding to other half. Protect equipment with potential to be harmed by excessive dirt with temporary filters; or bypass during cleaning.

3.5 SCHEDULES

A. Ductwork Material Schedule

AIR SYSTEM	MATERIAL
General Exhaust	Steel

B. Ductwork Pressure Class Schedule

AIR SYSTEM	MATERIAL
General Exhaust	1 inch wg regardless of velocity

END OF SECTION

SECTION 15830

FANS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Ceiling-mounted exhaust fan.
B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 15000 – General Mechanical Requirements.
   3. Division 16 – Electrical.

1.2 REFERENCES

A. American Bearing Manufacturers Association:
   1. ABMA 9 - Load Ratings and Fatigue Life for Ball Bearings.
   2. ABMA 11 - Load Ratings and Fatigue Life for Roller Bearings.
B. Air Movement and Control Association International, Inc.:
   1. AMCA 99 - Standards Handbook.
   2. AMCA 204 - Balance Quality and Vibration Levels for Fans.
   3. AMCA 210 - Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.
   4. AMCA 300 - Reverberant Room Method for Sound Testing of Fans.
   5. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data.
C. American Refrigeration Institute:
   1. ARI 1060 - Air-to-Air Energy Recovery Ventilation Equipment Certification Equipment Program.
D. National Electrical Manufacturers Association:
   1. NEMA MG 1 - Motors and Generators.
   2. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
E. Underwriters Laboratories Inc.:
   1. UL 705 - Power Ventilators.

1.3 SUBMITTALS

A. Section 15000: Submittals.
B. Product Data: Submit data on each type of fan and include accessories, fan curves with specified operating point plotted, power, RPM, sound power levels for both fan inlet and outlet at rated capacity, electrical characteristics and connection requirements.
C. Manufacturer's Installation Instructions: Submit fan manufacturer’s instructions.
D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.

1.5 QUALITY ASSURANCE

A. Performance Ratings: Conform to AMCA 210 and bear AMCA Certified Rating Seal.
B. Sound Ratings: AMCA 301, tested to AMCA 300, and bear AMCA Certified Sound Rating Seal.
C. UL Compliance: UL listed and labeled, designed, manufactured, and tested in accordance with UL 705.
D. Balance Quality: Conform to AMCA 204.
E. Perform Work in accordance with State and local standards.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three (3) years' experience.
B. Installer: Company specializing in performing Work of this section with minimum three (3) years' experience.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect motors, shafts, and bearings from weather and construction dust.

1.8 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.9 WARRANTY

A. Section 15000: Product warranties.

PART 2 - PRODUCTS

2.1 CEILING-MOUNTED EXHAUST FANS

A. Manufacturer:
   1. Greenheck.
   2. Loren Cook Company.
   3. Twin City.
B. Wheel:
   1. Forward curved centrifugal wheel.
   2. Constructed of galvanized steel or calcium carbonate filled polypropylene.
   3. Statically and dynamically balanced in accordance with AMCA Standard 204-05.
C. Motors:
   1. Motor enclosures shall be open drip proof (ODP), opening in the frame body and/or end brackets.
   2. Motors are permanently lubricated sleeve bearing type to match with the fan load and furnished at the specific voltage and phase.
   3. Motor shall be mounted on vibration isolators and be accessible for maintenance.
   4. Thermal overload protection.
D. Housing:
   1. Constructed of heavy gauge galvanized steel.
   2. Interior shall be lined with 0.5 inches of acoustical insulation.

3. Profile as low as 10-1/2 inches.

E. Spring-Loaded Aluminum Backdraft Damper:
1. Prevents air from entering back into the building when fan is off.
2. Eliminates rattling or unwanted backdrafts.

F. Outlet:
1. Type of Outlet: Round.
2. Field rotatable from horizontal to vertical discharge.
3. Duct collar shall include an aluminum backdraft damper.

G. Grille:
1. Constructed of high impact polystyrene; plastic shall be factory standard.

H. External Electrical Access:
1. Eliminates removing the motor pack, which saves time on installation.

I. Mounting Brackets:
1. Fully adjustable for multiple installation conditions.

J. Options/Accessories:
1. Speed Controls:
a. Controls the fan's output.
b. Fan can be adjusted to 60% of full speed.
2. Wall Discharge:
a. Type: Round Connection, hooded wall cap. Example: Greenheck model WC or equivalent.
3. Roof Discharge:
a. Flat Roof Caps Example: Greenheck Model RCC-7 or equivalent.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify roof curbs are installed and dimensions are as instructed by manufacturer.

3.2 INSTALLATION

A. Install as per manufacturer recommendations.

3.3 DEMONSTRATION

A. Demonstrate fan operation and maintenance procedures.

3.4 PROTECTION OF FINISHED WORK

A. Do not operate fans for until ductwork is clean, filters in place, bearings lubricated, and fan has been test run under observation.

END OF SECTION

SECTION 16000

ELECTRICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. The requirements of the General Conditions, Special Conditions and General Requirements of these specifications are applicable and part of every section in Division 16 - Electrical. The Contractor shall furnish all labor, material, service, equipment, appliances and shall perform all operations in connection with the installation and testing of Electrical Work in accordance with contract drawings and specifications. Any material found to be defective will be rejected by the Engineer and the Contractor shall remove such defective material from the site of the work.
2. The Contractor shall be responsible for all such material furnished by him and he shall replace at his own expense all such materials found to be defective in manufacture or damaged after delivery.
3. It is anticipated that the interconnections between the various items of electrical equipment and the control system will require coordination and in some cases interface devices such as, but not limited to, couplings, flanges, reducers, converters, conduit, relays, contacts, wiring etc., will be required whether or not these items are shown on the drawings. It is the General Contractor's responsibility to provide the necessary coordination and interface devices at no additional cost to the Owner.

B. Related Sections:
1. Division 01 Specification Sections apply to Work of this Section.

1.2 REQUIREMENTS OF REGULATORY AGENCIES AND STANDARDS

A. Regulatory Agencies: Installation, materials, equipment and workmanship shall conform to the applicable provisions of the following:
1. National Electrical Code (NEC).
2. National Electrical Safety Code (NESC).
3. Terms and conditions of the electrical utility and other authorities having lawful jurisdiction pertaining to the work required.

B. All modifications required by these applicable codes, rules, regulations and authorities shall be made by the Contractor without additional charge to the Owner.
1. Underwriters Laboratories (UL): All materials, appliances, equipment or devices shall conform to the applicable standards of Underwriter's Laboratories, Inc. The label of, or listing by, UL is required.
2. Standards: Where referenced in these specifications or on the drawings, the publications and standards of the following organization shall apply:
a. American Society of Testing and Materials (ASTM).
b. Institute of Electrical and Electronic Engineers (IEEE).
c. Insulated Power Cable Engineers Association (IPCEA).
d. National Electrical Manufacturers Association (NEMA).
e. National Fire Protection Association (NFPA).

f. American National Standards Institute (ANSI).
g. Illuminating Engineering Society of North America (IESNA).

1.3 PLANS AND SPECIFICATIONS

A. Should this Contractor observe any conflict or variation in the plans and specifications, he shall notify the Engineer in writing not later than ten (10) days prior to date of bid opening. Failure to clarify such variations will result in the Electrical Contractor bearing all costs arising from electrical work done contrary to either the specifications or drawings.
B. Electrical contractor shall coordinate all conduit runs, control wiring and electrical connections to equipment items furnished by Mechanical Contractor, General Contractor, Instrumentation Contractor, the Owner, and other contractors under other sections of these specifications.

1.4 SUBMITTALS

A. Materials List: Within 15 days after award of contract, the Contractor shall submit to the Engineer, a list of all equipment to be furnished. Where substitutions are proposed, complete data must be furnished showing performance, quality and dimensions. Written approval of Engineer must be obtained before purchasing any substitute equipment.
B. Shop Drawings: Submit for approval shop drawings after the material list has been approved and prior to ordering. Show complete outlines, dimensions, electrical services, control diagrams, electrical characteristics of a special nature or critical to the installation and pertinent data required for installation. All descriptive and technical data and shop drawings shall bear signed certification to the effect that they have been carefully examined and found to be correct with respect to dimension, space available, non-interference with other trades and that the equipment complies with all the requirements of these specifications. Where catalog data are submitted, the proposed items shall be clearly "flagged" or otherwise identified, so that no confusion exists. In addition to specific references or requests, submit shop drawings for the following applicable items: motor starters, switches, control devices, control systems and sensing equipment.
C. Substitutions: Proposed substitutions of electrical equipment, control devices, and other equipment shall be submitted with other submittal data. This request shall be accompanied by complete descriptions of the substitutes offered, including catalog cuts. The entire burden of proof of equality shall be placed on the Contractor and the decision of the Engineer shall be final.
D. Test Data: Provide four (4) copies of all data obtained during tests required in Specifications. Data shall be organized in an orderly fashion, typed and indicate the result of each test.

PART 2 - PRODUCTS

2.1 REQUIREMENTS

A. The electrical requirements for equipment specified or indicated on the drawings are based on information available at the time of design. If equipment furnished for installation has electrical requirements other than indicated on the electrical drawings, the Contractor shall make any required changes to wire and conduit size, controls, over current protection and installation as required accommodating the equipment supplied, without additional charge to the Owner. The complete responsibility and costs for such adjustments shall be assigned to the respective section of this specification under which the equipment is furnished.

2.2 MATERIALS

A. All similar materials and equipment shall be the product of the same manufacturer unless specified otherwise. Where no specific material, apparatus or appliance is mentioned, any first-class product, with the approval of the Engineer may be used. Materials and equipment shall be the standard products of manufacturers regularly engaged in the production of such material and shall be the manufacturer's current and standard design. Equipment affected by altitude shall perform satisfactorily for the function intended at the altitude of the project site.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Fabrication, erection and installation of the complete electrical system shall be done in accordance with accepted good practice by qualified personnel experienced in such work and shall proceed in an orderly manner so as not to impede the progress of the project. The Electrical Contractor shall check all areas and surfaces where electrical equipment material is to be installed, removed or relocated and report any unsatisfactory conditions before starting work. Commencement of work signifies this Contractor's acceptance of existing conditions. In the acceptance or rejection of the finished installation, no allowance will be made for lack of skill on the part of workmen.

3.2 TEMPORARY POWER AND LIGHTING

A. Furnish and install temporary electrical facilities, if required, for construction and safety operations. No part of the permanent electrical systems or the existing electrical system may be used for temporary service unless approved by the Engineer. Provide separate electrical metering for temporary power.

3.3 PERFORMANCE TESTS

A. Thoroughly test all control circuits, fixtures, services and all circuits for proper operating condition and freedom from grounds and short circuits before acceptance is requested. All equipment, appliances and devices shall be operated under load conditions. After the interior wiring system installation is complete and at such time as the Engineer may direct, conduct operating tests for approval. When requested, test all the wire, cable, devices and equipment after installation, to assure that all material continues to possess all the original characteristics as required by governing codes and standards listed in these specifications.

B. Perform such tests as required by other sections of these specifications or as requested to prove acceptability. Furnish all instruments and labor for testing.

3.4 RECORD DRAWINGS

A. During progress of the work, maintain a clean full set of project plans to be used to record accurate red-lined changes to the installation of the system. Upon completion of the installation, submit the full set of red-lined drawings with all record data to the Engineer.

3.5 OPERATING INSTRUCTIONS AND MANUALS

A. Without additional charge to the Owner, furnish complete instruction to the Owner in the care, adjustment and operation of all parts of the electrical equipment and systems. Upon completion of the work, prepare and deliver to the Owner two (2) sets of complete operating and maintenance manuals for the systems and major equipment installed. Include catalog data, shop drawings, wiring diagrams, performance curves and rating data, spare parts lists and manufacturer's operating maintenance data. Provide one (1) electronic version to Owner.

B. The above requirements are in addition to specific instructions and manuals specified for individual systems or equipment.

3.6 DRAWINGS

A. General: The electrical drawings show the general arrangement of all conduit, equipment, etc. and shall be followed as closely as actual building construction and the work of other trades will permit. The structural drawings shall be considered as a part of the work insofar as these drawings furnish the Contractor with information relating to the design and construction of the building. Because of the small scale of the electrical drawings, it is not possible to indicate all offsets, fittings and accessories which may be required. The Contractor shall investigate the structural and finish conditions affecting the work and arrange his work accordingly, providing such fittings, elbows, pull boxes, and accessories as may be required to meet such conditions.

B. Field Measurements: The Contractor shall verify the dimensions governing the electrical work at the facility. No extra compensation shall be claimed or allowed on account of differences between actual dimensions and those indicated on the drawings.

C. Coordination Drawings: In locations where several trades must be sequenced and positioned with precision to fit into the available space, prepare coordination drawings (shop drawings) showing the actual physical dimensions (at accurate scale) required for the installation if deemed necessary by Engineer. Prepare and submit these coordination drawings, if required, prior to purchase-fabrication-installation of any of these elements involved in the coordination.

3.7 LOCATION OF EQUIPMENT AND OUTLETS

A. The approximate locations of cabinets, conduits, controllers, power outlets, etc., are indicated on the drawings; however, they are not intended to give complete and detailed information. Determine the exact location after thoroughly examining the general building plans and by actual measurements during construction, subject to the approval of the Engineer.

3.8 EXISTING ELECTRICAL

A. The existing electrical system information has been obtained from the most up-to-date source and documents; but their accuracy is not guaranteed. The Contractor shall familiarize himself with the existing conditions prior to preparing his bid.

B. Only the existing electrical affected by this Contract is shown on the drawings. Existing electrical not shown in the drawings is to remain in place and in operation. All existing electrical damaged during construction shall be repaired or replaced.

C. The Contractor shall be responsible for damage to existing walls, ceilings, and underground due to the electrical construction. Repairing of damage to the existing building shall be done by the proper trades involved.

END OF SECTION

SECTION 16111

CONDUIT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Metal conduit.
   2. Liquidtight flexible metal conduit.
   3. PVC Coated Rigid Metallic Conduit
   4. Nonmetal conduit.
   5. Fittings and conduit bodies.

B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 16130 - Boxes.
   3. Section 16190 - Supporting Devices.

1.2 DESCRIPTION

A. The conduit, fittings, conduit bodies and accessories shall be inspected upon delivery and during the progress of the work. Any material found to be defective will be rejected by the Engineer and the Contractor shall remove such defective material from the site of the work.

B. Contractor shall be responsible for all materials furnished by him and he shall replace at his own expense all such materials found to be defective in manufacture or damaged after delivery.

1.3 REFERENCES

A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.

B. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated.

C. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable assemblies.

D. ANSI/NFPA 70 - National Electrical Code.

E. NECA "Standard of Installation."

F. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.

G. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.4 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 01300. Accurately record actual routing of all conduits.

1.5 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect, and handle Products to site under provisions of General Conditions. Accept conduit on site and inspect for damage. Protect conduit from corrosion and entrance of debris by storing above grade and providing appropriate covering. Protect PVC conduit from sunlight.

1.7 PROJECT CONDITIONS

A. Verify that field measurements are as shown on Drawings. Verify routing and termination locations of conduit, prior to rough-in. Conduit routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

PART 2 - PRODUCTS

2.1 CONDUIT REQUIREMENTS

A. Conduit Minimum Size: 3/4 inch unless otherwise specified.
B. Rigid Metallic Conduit (RMC): Hot-Dipped Galvanized Rigid Steel, ANSI C80.1. Fittings and Conduit Bodies: ANSI/NEMA FB 1; material to match conduit.
C. Liquidtight Flexible Metal Conduit: Interlocked steel construction with PVC jacket. Flexible conduit shall be used only for connection to devices and structures subject to vibration. Maximum length of flexible conduit shall be 3 feet.
D. Electrical Metallic Tubing (EMT): ANSI C80.3; galvanized tubing. Fittings and Conduit Bodies: ANSI/NEMA FB1; steel or malleable iron, compression type.
E. PVC Coated RMC: 40 mil gray PVC exterior coating over galvanized rigid conduit, clear urethane coating over hot galvanized threads, UL listed with PVC as the primary corrosion protection for the steal conduit with an underlying zinc coating as a supplemental corrosion protection coating. Fittings and Conduit Bodies shall be by the same manufacturer as the conduit. UL Listed Standard 514B, material and coatings to match conduit
F. Rigid Nonmetallic Conduit: NEMA TC 2; Schedule 80 PVC. PVC Fittings and Conduit Bodies: NEMA TC

2.2 UNDERGROUND INSTALLATIONS

A. At 18 inches below grade and lower utilize Rigid Nonmetallic Conduit. If underground conduit run is not encased in concrete, place 4 inches of sand below and above conduit, and install a red traceable ribbon 6 inches above the top of the conduit for the entire length of the underground run.
B. Any conduit located less than 18 inches below grade shall PVC coated Rigid Metallic Conduit, or Rigid Nonmetallic Conduit encased in concrete.
C. When transferring from below grade to above grade, use PVC coated Rigid Metallic Conduit Ells.

2.3 ABOVEGROUND INSTALLATIONS

A. Wet and Damp Locations: Use Rigid Metallic Conduit.
B. Dry Locations: Use Electrical Metallic Tubing, zinc coated, where conduit will be concealed. Use Rigid Metallic Conduit where conduit will be exposed.

2.4 OUTDOOR VAULTS

A. All conduits and fittings located in outdoor vaults, including conduits encased in the walls and floors of the vaults, shall be PVC Coated RMC.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install conduit in accordance with NECA - Standard of Installation. Install nonmetallic conduit and PVC Coated RMC in accordance with manufacturer's instructions. Arrange supports to prevent misalignment during wiring installation. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and splint hangers. Group related conduits; support using conduit rack. Construct rack using steel channel; provide space on each for 25% additional conduits. Fasten conduit supports to building structure and surfaces under provisions of Section 16190. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports.

B. Arrange conduit to maintain headroom and present neat appearance. Route exposed conduit parallel and perpendicular to walls. Maintain adequate clearance between conduit and piping. Maintain 12-inch clearance between conduit and surfaces with temperatures exceeding 104°F. All sharp edges shall be removed from ends after cutting. “Pipe” cutters shall not be used for cutting conduit. Bring conduit to shoulder of fittings; fasten securely.

C. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.

D. Use conduit hubs to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes. Install no more than equivalent of three 90-degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Conduit bends shall be made so as not to alter the cross-sectional area of the conduit.

E. On PVC-coated RMC, use touch-up compound on all field cut threads and internal reams. Touch-up compound shall be as recommended by the PVC Coated RMC manufacturer.

F. Clamping, cutting, threading, bending, and assembly of PVC-coated RMC shall be done in strict accordance with the manufacturers recommended installation guide. If the manufacturer does not provide a detailed installation guide, Contractor shall follow the Perma-Cote Installation Guide, 2005 Perma-Cote Order Item 10 PC-2002.

G. Use suitable caps to protect installed conduit against entrance of dirt and moisture. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system. Provide suitable fittings to accommodate expansion and deflection where conduit crosses, control and expansion joints. Provide suitable pull string in each empty conduit except sleeves and nipples.

H. All conduits identified on a conduit schedule shall be tagged at each end, and where wall or floor penetrations are made, with metal tags engraved or stamped to identify the conduit according to the identification on the “schedule.”

END OF SECTION

SECTION 16123

WIRE AND CABLE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Power wire and cable.
   2. Control cable.
B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 16111 - Conduit.
   3. Section 16130 - Boxes.

1.2 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code.
B. ICEA - Insulated Cable Engineers Association.

1.3 SUBMITTALS

A. Submit under provisions of Section 01300.
B. Product Data: Provide for each cable assembly type.
C. Test Reports: Indicate procedures and values obtained.

1.4 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.
B. Furnish products listed and classified by Underwriters Laboratories, Inc. (UL) as suitable for purpose specified and shown.
C. The following standards shall form a part of this specification:
   1. UL Standard 1072 for Medium Voltage Power Cable.
   2. ICEA S-93-639 (NEMA WC74) 5-46 kV Shielded Power Cable for Use in the Transmission and Distribution of Electric Energy.

1.5 PROJECT CONDITIONS

A. Verify that field measurements are as shown on Drawings.
B. Wire and cable routing shown on Drawings is approximate unless dimensioned. Route wires and cables as required meeting Project Conditions.
C. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required.

1.6 COORDINATION

A. Coordinate work with other trades.
B. Determine required separation between cable and other work.
C. Determine cable routing to avoid interference with other work.

1.7 FIELD QUALITY CONTROL

A. Perform field inspection and testing under provisions of General Conditions.
B. Inspect wire for physical damage and proper connection.
C. Measure tightness of bolted connections.
D. Utilize accurate torque wrench to tighten bolts and nuts on MCC.
E. Verify continuity of each branch circuit conductor.
F. Verify that all non-grounded conductors have an open circuit to ground.
G. For medium voltage cables, after installation and before the cable is put in service, a DC High Pot test shall be performed using recommended values by ICEA. Leakage current at the end of the time period shall be recorded. All phases should be relatively close and constant at the end of the test.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Power Wire and Cable: Cable to be as manufactured by Southwire, Okinite, PWC, Inc., Capital Wire & Cable Corp, or equal.
B. Cable shall meet or exceed the applicable ICEA test requirements for the type of insulation used and the application.

2.2 POWER WIRE AND CABLE

A. 600V And Below:
   1. Description: Tray Cable Rated, multi-conductor, insulated wire.
   2. Conductor: Copper.
   3. Insulation Voltage Rating: 600 volts.
   4. Insulation: ANSI/NFPA 70; Type THHN/THWN-2, 90 degrees C insulation for service entrance, feeders and branch circuits.

2.3 CONTROL CABLE

A. Analog I/O wiring shall be 16AWG twisted pair shielded, Belden 8719 or equal.
B. Discrete I/O wiring shall be 16AWG, 600V, stranded copper, THWN. Use multi-conductor cable when possible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that interior of building has been protected from weather.
B. Verify that mechanical work likely to damage wire has been completed.

3.2 INSTALLATION

A. Install products in accordance with manufacturer instructions.
B. Use copper conductor not smaller than 12 AWG for power and lighting circuits.
C. Use copper conductor not smaller than 16 AWG for control circuits.
D. Use 10 AWG copper conductors for 20 ampere, 120 volt branch circuits longer than 75 feet.
E. Use 10 AWG copper conductors for 20 ampere, 277 volt branch circuits longer than 200 feet.
F. Pull all conductors into raceway at same time.
G. Use suitable wire pulling lubricant for building wire 8 AWG and larger or runs longer than 50 feet.
H. Use suitable cable fittings and connectors.
I. Neatly train and lace wiring inside boxes, equipment, and panelboards.
J. Clean conductor surfaces before installing lugs and connectors.
K. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
L. Use split bolt connectors for copper conductor splices and taps, 8 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.
M. Use solderless pressure connectors with insulating covers or spring wire connectors for copper conductor splices and taps, 10 AWG and smaller.

3.3 INTERFACE WITH OTHER PRODUCTS

A. Identify each conductor with its destination terminal block.

END OF SECTION

SECTION 16130

BOXES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Wall and ceiling outlet boxes.
   2. Pull and junction boxes.

B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 16140 - Wiring Devices: Wall plates in finished areas.

1.2 REFERENCES

A. NECA: Standard of Installation.
B. NEMA FB 1: Fittings and Supports for Conduit and Cable Assemblies.
C. NEMA OS 1: Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
D. NEMA 250: Enclosures for Electrical Equipment (1000 Volts Maximum).
E. NFPA 70: National Electrical Code.

1.3 SUBMITTALS FOR CLOSEOUT

A. Section 01700 – Contract Closeout.
B. Record actual locations and mounting heights of outlet, pull, and junction boxes on project record documents.

1.4 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.
B. Provide Products listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 - PRODUCTS

2.1 OUTLET BOXES

A. Farralloy Outlet Boxes: NEMA OS 1, galvanized.
   1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; include 1/2 inch male fixture studs where required.
   2. Concrete Ceiling Boxes: Concrete type.

B. Nonmetallic Outlet Boxes: NEMA OS 2.
C. Cast Boxes: NEMA FB 1, Type FD, and aluminum cast ferroalloy. Provide gasketed cover by box manufacturer.
D. Boxes and covers in outdoor vault locations shall be Cast Boxes with 40 mil gray PVC exterior coating, and 2 mil urethane interior coating.
E. Wall Plates for Finished Areas: As specified in Section 16140.

2.2 PULL AND JUNCTION BOXES

A. Surface Mounted Cast Metal Box: NEMA 250, Type 4 flat-flanged, surface mounted junction box, or as specified on drawings.
   1. Material: Galvanized cast iron, Cast aluminum.
   2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.
B. Boxes and covers in Wet Well Locations shall be Cast Boxes with 40 mil gray PVC exterior coating, and 2 mil urethane interior coating.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install boxes in accordance with NECA "Standard of Installation."
B. Install in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
C. Set wall mounted boxes at elevations to accommodate mounting heights indicated.
D. Electrical boxes are shown on Drawings in approximate locations dimensioned. Adjust box location up to 10 feet if required to accommodate intended purpose.
E. Orient boxes to accommodate wiring devices as specified in Section 16140.
F. Maintain headroom and present neat mechanical appearance.
G. Install boxes to preserve fire resistance rating of partitions and other elements.
H. Locate outlet boxes to allow luminaires positioned as shown on plans.
I. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.
J. Use adjustable steel channel fasteners for hung ceiling outlet box.
K. Support boxes independently of conduit.
L. Use gang box where more than one device is mounted together. Do not use sectional box.
M. Use cast aluminum outlet box in exterior locations and wet locations.
N. Large Pull Boxes: Use NEMA 4 enclosure.

3.2 INTERFACE WITH OTHER PRODUCTS

A. Coordinate installation of outlet box for equipment to be connected.

3.3 ADJUSTING

A. Section 01700 – Contract Closeout.
B. Install knockout closures in unused box openings.

3.4 CLEANING

A. Section 01700 – Contract Closeout.
B. Clean interior of boxes to remove dust, debris, and other material.
C. Clean exposed surfaces and restore finish.

END OF SECTION

SECTION 16140

WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Wall switches.
   2. Receptacles.
   3. Device plates.
B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 16130 - Boxes.

1.2 REFERENCES

A. NECA - Standard of Installation.
B. NEMA WD1 - General Requirements for Wiring Devices.
C. NEMA WD 6 - Wiring Device - Dimensional Requirements.
D. NFPA 70 - National Electric Code.

1.3 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

1.4 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.
B. Provide Products listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 - PRODUCTS

2.1 WALL SWITCHES

A. Manufacturers:
   1. General Electric: Model 5951-2G.
   2. Hubbell: Model 1221-I.
   3. P&S: Model 20-AC-1-1.
   4. Or approved equal.
B. Description: NEMA WD 1, Specification Grade, AC only general-use snap switch.
C. Body and Handle: Ivory plastic with toggle handle.
D. Ratings:
   1. Voltage 120/277 volts, AC.
   2. Current: 20 amperes.

2.2 RECEPTACLES

A. Manufacturers:
   1. General Electric: Model 5362-2.
   2. Hubbel: Model 5362-1.
   3. P&S: Model 5362-1.
   4. Or approved equal.
B. Description: NEMA WD 1, Specification Grade general-use receptacle.
C. Device Body: Ivory plastic.
D. Configuration: NEMA WD 6, type as specified and indicated.
E. Convenience Receptacle: Type 5-20.
F. GFCI Receptacle: 20 amp rated convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements.
G. Outdoor receptacles shall have an enclosure that is weatherproof whether or not the attachment plug cap is inserted.

2.3 WALL PLATES

A. General: Provide plates for each switch and receptacle device. Provide stainless steel wall plates.
B. Exposed: Plates for exposed screw jointed fittings shall match the fittings with edges of plates flush with edges of fittings. Plates for cast type boxes shall be of the cast, vapor tight type.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of existing conditions prior to beginning work.
B. Verify that outlet boxes are installed at proper height.
C. Verify that wall openings if required are neatly cut and will be completely covered by wall plates.
D. Verify that branch circuit wiring installation is completed, tested and ready for connection to wiring devices.

3.2 PREPARATION

A. Clean debris from outlet boxes.

3.3 INSTALLATION

A. Install in accordance with NECA “Standard of Installation.”
B. Install devices plumb and level.
C. Install switches with OFF position down.
D. Install receptacles with grounding pole on bottom.
E. Connect wiring device grounding terminal to branch circuit equipment grounding conductor.

F. Connect wiring devices by wrapping conductor around screw terminal.
G. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.

3.4 INTERFACE WITH OTHER PRODUCTS

A. Coordinate locations of outlet boxes provided under Section 16130 to obtain mounting heights specified and indicated on drawings.
B. Install wall switch 44 inches above finished floor.
C. Install convenience receptacle 18 inches above finished floor.

3.5 FIELD QUALITY CONTROL

A. Inspect each wiring device for defects.
B. Operate each wall switch with circuit energized and verify proper operation.
C. Verify that each receptacle device is energized.
D. Test each receptacle device for proper polarity.
E. Test each GFCI receptacle device for proper operation.

3.6 ADJUSTING

A. Section 01700 – Contract Closeout.
B. Adjust devices and wall plates to be flush and level.

3.7 CLEANING

A. Section 01700 – Contract Closeout.
B. Clean exposed surfaces to remove splatters and restore finish.

END OF SECTION

SECTION 16170

GROUNDING AND BONDING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Grounding electrodes and conductors.
   2. Equipment grounding conductors.
   3. Bonding.

B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 03300 - Cast-In-Place Concrete: Structures.

1.2 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code.

1.3 GROUNDING ELECTRODE SYSTEM

A. Metal underground water pipe if available.
B. Metal frame of the building if available.
C. Concrete-encased electrode.
D. Rod electrode.

1.4 PERFORMANCE REQUIREMENTS

A. Grounding System Resistance: 1 ohm.

1.5 SUBMITTALS

A. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation and installation of exothermic connectors.

1.6 PROJECT RECORD DOCUMENTS

A. Submit under provisions of General Conditions.
B. Accurately record actual locations of grounding electrodes.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this Section with minimum three years' documented experience.

1.8 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.
B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.9 FIELD QUALITY CONTROL

A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.
B. Use suitable test instrument to measure resistance to ground of system. Perform testing in accordance with test instrument manufacturer's recommendations using the fall-of-potential method.

PART 2 - PRODUCTS

2.1 ROD ELECTRODE

A. Material: Copper or Copper-clad steel.
B. Diameter: 3/4 inch.
C. Length: 10 feet.

2.2 EXOTHERMIC CONNECTIONS AND RELATED MATERIAL

A. Exothermic connectors, rod electrodes and other grounding related equipment shall be supplied by a manufacturer with 10 years experience in manufacturing

2.3 WIRE

A. Material: Stranded copper.
B. Foundation Electrodes: 1/2 inch x 20 feet long minimum.
C. Grounding Electrode Conductor: Size to meet NFPA 70 requirements or as indicated on drawings or in specifications if larger.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that final backfill and compaction has been completed before driving rod electrodes.

3.2 INSTALLATION

A. Install Products in accordance with manufacturer's instructions. Exothermically weld all connections.
B. Install rod electrodes at locations indicated. Install additional rod electrodes as required to achieve specified resistance to ground.

C. Provide grounding electrode conductor and connect to reinforcing steel at two locations in foundation footing. Bond steel together.
D. Provide foundation electrodes for all blowers, pumps and other skid mounted equipment with #4 CU ground wire from electrode to base. Exothermic weld at all connections.
E. Provide bonding to meet Regulatory Requirements.

END OF SECTION

SECTION 16190

SUPPORTING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Conduit and equipment supports.
   2. Anchors and fasteners.
B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.

1.2 REFERENCES

A. NECA - National Electrical Contractors Association.
B. ANSI/NFPA 70 - National Electrical Code.

1.3 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.
B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

PART 2 - PRODUCTS

2.1 PRODUCT REQUIREMENTS

A. Materials and Finishes: Support devices located in outdoor vault locations shall have 20 mil gray PVC exterior coating. Support devices in all other areas shall be hot-dipped galvanized for adequate corrosion resistance.
B. Provide materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit. Consider weight of wire in conduit when selecting products.
C. Anchors and Fasteners:
   1. Concrete Structural Elements: Use expansion anchors, powder actuated anchors and preset inserts.
   2. Steel Structural Elements: Use beam clamps, spring steel clips and steel ramset fasteners.
   3. Concrete Surfaces: Use self-drilling anchors and expansion anchors.
   4. Sheet Metal: Use sheet metal screws.
   5. Wood Elements: Use wood screws.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install products in accordance with manufacturer's instructions.
B. Provide anchors, fasteners, and supports in accordance with NECA "Standard of Installation."
C. Do not fasten supports to pipes, ducts, mechanical equipment, and conduit.
D. Obtain permission from Architect/Engineer before drilling or cutting structural members.
E. Fabricate supports from structural steel as indicated on drawings. Rigidly weld members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use lock washers under all nuts.
F. Install surface-mounted cabinets and panelboards with minimum of four anchors.
G. In wet and damp locations use steel channel supports to stand cabinets and panelboards one inch off wall.
H. Install conduit supports a maximum spacing specified in the NEC.

END OF SECTION

SECTION 16195

ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Nameplates and labels.
   2. Wire and cable markers.
B. Related Section:
   1. Division 01 Specification Sections apply to Work of this Section.

1.2 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code.

PART 2 - PRODUCTS

2.1 NAMEPLATES AND LABELS

A. Nameplates and Labels: Engraved 3-layer laminated plastic, white letters on black background.
B. Locations:
   1. Each electrical distribution and control equipment enclosure.
   2. Communication cabinets and computer cabinets.
   3. Field disconnects, start stop stations, control panels.
C. Letter Size:
   1. Use 1/4-inch letters for identifying individual equipment and loads.
   2. Use 1/4-inch letters for identifying grouped equipment and loads.
   3. Use 3/8-inch letters for identifying Main Disconnect equipment.
   4. Use 1/4-inch letters for identifying receptacle and light switches.

2.2 WIRE/CONDUIT/BOX MARKERS

A. Description: Brady B-321 Heat-Shrink Polyolefin markers. Typed label to identify each termination end point of the conductor. DC conductors shall identify polarity.
B. Locations: Each conductor at wireway, pull boxes, outlet and junction boxes, and each load connection. All conduit penetrations identifying the location of each end.
C. Legend:
   1. Power and Lighting Circuits: Branch circuit or feeder number indicated on drawings.
D. Boxes:
   1. Label each junction box in accessible locations to indicate the type of system (security; power circuit - 1, 3, 5; etc.)
   2. Boxes serving fire alarm system shall have box covers painted red.
   3. Provide label in each light switch and receptacle black box.

PART 3 - EXECUTION

3.1 PREPARATION

A. Degrease and clean surfaces to receive nameplates and labels.

3.2 APPLICATION

A. Install nameplate and label parallel to equipment lines.
B. Secure nameplate to equipment front using screws or rivets.
C. Identify underground conduits using underground warning tape. Install one tape per trench at 12 inches below finished grade. Identify all conduit at exposed locations into all boxes, cabinets, etc. (see specification Section 16000)
D. Identify all conductors at every termination indicating endpoints of termination and tag identification as required.
E. Color Coding for Phase Identification:

120/208 volts	Phase	277/480 volts
Black	A	Brown
Red	B	Orange
Blue	C	Yellow
White	Neutral	Gray
Green	Ground	Green

F. Conductor phase and voltage identification shall be made by color-coded insulation for all conductors smaller than No. 6 AWG. For conductors No. 6 AWG and larger, identification shall be made by color-coded insulation, or conductors with black insulation may be furnished and identified by colored electrical tape. Conductor identification shall be provided within each enclosure where a tap, splice, or termination is made.

END OF SECTION

SECTION 16441

ENCLOSED SWITCHES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Fusible switches.
   2. Non-fusible switches.
B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.

1.2 REFERENCES

A. NEMA KS 1 - Enclosed Switches.
B. NFPA 70 - National Electrical Code.

1.3 SUBMITTALS

A. Submit under provisions of Section 01300 - Submittals.
B. Product Data: Provide switch ratings and enclosure dimensions.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with NECA Standard of Installation.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this Section with minimum three years' documented experience.

1.6 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.
B. Furnish products listed and classified by UL as suitable for purpose specified and shown.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. As specified on Drawings, in Specifications, or equal approved by Engineer.

2.2 DISCONNECT SWITCHES

A. Fusible Switch Assemblies: NEMA KS 1, Type HD load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Must accept Class R Type Fuses. Handle lockable in ON and OFF position. Number of poles, amperage, and voltage ratings to be as shown on contract drawings.

B. Enclosures: NEMA KS 1.
   1. Interior Dry Locations: Type 1.
   2. Exterior Locations: Type 3R or 4.
   3. NEMA ratings of enclosures as specified on drawings take precedence over location specification.

C. Non-fusible Switch Assemblies: NEMA KS 1, Type HD load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in ON and OFF position. Number of poles, amperage, and voltage ratings to be as shown on contract drawings.

D. Enclosures: NEMA KS 1.
   1. Interior Dry Locations: Type 1.
   2. Exterior Locations: Type 3R or 4.
   3. NEMA ratings of enclosures as specified on Drawings take precedence over location specification.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install isolation switches where indicated.

B. Provide warning labels as indicated on Drawings.

END OF SECTION

SECTION 16461

DRY TYPE TRANSFORMERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Dry type two-winding transformers.
B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 16111 - Conduit: Flexible conduit connections.
   3. Section 16170 - Grounding and Bonding.
   4. Section 16190 - Supporting Devices.

1.2 REFERENCES

A. NEMA ST 1 - Specialty Transformers.
B. NEMA ST 20 - Dry Type Transformers for General Applications.
C. NFPA 70 - National Electrical Code.

1.3 SUBMITTALS

A. Submit under provisions of Section 01300. Product Data: Provide outline and support point dimensions of enclosures and accessories, unit weight, voltage, KVA, and impedance ratings and characteristics, tap configurations, insulation system type, and rated temperature rise. Test Reports: Indicate loss data, efficiency at 25, 50, 75, and 100 percent rated load, and sound level.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with NECA Standard of Installation. Maintain one copy of each document on site.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this Section with minimum ten years' experience.

1.6 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70. Furnish products listed and classified by UL as suitable for purpose specified and shown.

1.7 DELIVERY, STORAGE AND HANDLING

A. All equipment on site shall be stored, protected, and handled in such a way as to insure that when it is placed in operation it is in its original condition. Deliver transformers individually wrapped for protection and mounted on shipping skids. Accept transformers on site. Inspect for damage. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic. Handle in accordance with manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to transformer internal components, enclosure, and finish.

PART 2 - PRODUCTS

2.1 TWO-WINDING TRANSFORMERS

A. Manufacturers: As specified or equal approved by Engineer. Description: NEMA ST 20, factory-assembled, air cooled dry type transformers. Insulation system and average winding temperature rise for rated KVA as follows:
   1. 1-15 KVA: Class 185 with 80 degrees C rise.
   2. 16-500 KVA: Class 220 with 80 degrees C rise.

B. Case temperature: Do not exceed 35 degrees C rise above ambient at warmest point. Winding Taps: Transformers Less than 15 KVA: Two 2-1/2 percent above and below rated voltage, full capacity taps on primary winding. Transformers 15 KVA and Larger: NEMA ST 20.

C. Sound levels shall conform to NEMA ST 20. Basic impulse level shall be 15 KVA. Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap. Dry type transformer shall be mounted as an integral part to the MCC. Coil Conductors: Continuous windings with terminations brazed or welded or brackets. Nameplate: Include transformer connection data and overload capacity based on rated allowable temperature rise.

2.2 SOURCE QUALITY CONTROL

A. Provide production testing of each unit in accordance with NEMA ST20.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify condition under provisions of General Provisions.

3.2 INSTALLATION

A. Install Products in accordance with manufacturer's instructions. Set transformer plumb and level. Provide grounding and bonding in accordance with Section 16170.

3.3 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of General Conditions. Check for damage and tight connections prior to energizing transformer. Measure primary and secondary voltages and make appropriate tap adjustments.

3.4 PAYMENT

A. Payment will be made for all work covered in this section at the contract unit price per unit or will be included in the lump sum price per job for items, as shown on the proposal. Either such payment shall be complete compensation for the complete performance of work in accordance with the drawings and the provisions of these specifications.

END OF SECTION

SECTION 16470

PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Distribution panelboards.
   2. Power meter.
B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 16190 - Supporting Devices.

1.2 REFERENCES

A. NECA (National Electrical Contractors Association) “Standard of Installation.”
B. NEMA AB 1 - Molded Case Circuit Breakers.
C. NEMA PB 1 - Panelboards.
D. NEMA PB 1.1 - Instructions for Safe Installation, Operation and Maintenance of Panelboards.
E. Rated 600 Volts or Less.
F. NFPA 70 - National Electrical Code.

1.3 SUBMITTALS

A. Submit under provisions of Section 01300 - Submittals.
B. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker and fusible switch arrangement and sizes.

1.4 MANUFACTURER’S INSTALLATION INSTRUCTIONS

A. Indicate application conditions and limitations of use stipulated by Product testing agency.
B. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.

1.5 PROJECT RECORD DOCUMENTS

A. Submit under provisions of General Conditions. Record actual locations of Products; indicate actual branch circuit arrangement.

1.6 OPERATION AND MAINTENANCE DATA:

A. Submit under provisions of General Conditions.
B. Maintenance Data: Include spare parts data listing; and recommended maintenance procedures and intervals.

1.7 QUALITY ASSURANCE

A. Perform Work in accordance with NECA Standard of installation.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing of products specified in this section with minimum five years' experience.

1.9 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70. Furnish products listed and classified by UL as suitable for purpose specified and indicated.

1.10 GENERAL CONDITIONS

A. Provide two of each panelboard key if required.

1.11 FIELD QUALITY CONTROL

A. Field inspection and test for grounds on each circuit after installation is completed. Measure steady state load currents at each panelboard feeder; rearrange circuits in the panelboard to balance the phase loads to within 20 percent of each other. Maintain proper phasing for multi-wire branch circuits. Visual and Mechanical Inspection: Inspect for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections for circuit breakers, fusible switches, and fuses.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Independently mounted panelboards shall be manufactured by the following:
   1. Siemens.
   2. Square D.
   3. Or equal.

2.2 DISTRIBUTION PANELBOARDS

A. Panelboards 120/240 VAC, 1 phase, 3 wire, 60 Hertz.
   1. Service Conditions.
      a. Temperature: 105°F.
      b. Altitude: 4,000 feet.
   2. Bus: Copper.
      a. Provide copper ground bus in each panelboard.
      b. Minimum integrated short circuit rating: 18 amperes RMS symmetrical at 240 VAC.
      c. Molded Case Circuit Breakers: NEMA AB1, bolt-on type. Provide circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Provide circuit breaker accessory trip units and auxiliary switches as indicated.
      d. A name plate shall be provided and located near the top of the front trim on the exterior surface listing panel type. Ratings as required by UL.

e. Enclosure: NEMA 4.
f. Enclosure shall be provided with provisions for locking the cover of the panel closed with a padlock.

2.3 POWER SUPPLY

A. Transformer: Dry Type, 480 V Primary, 120/240 VAC Secondary, 37.5KVA, 1-phase, 3-wire, 60 Hertz
B. Service Conditions:
1. Temperature: 105°F
2. Altitude: 4000 feet
C. Bus: Copper
D. Provide copper ground bus in each panelboard. Minimum integrated short circuit rating: 18k amperes RMS symmetrical at 240 VAC. Molded Case Circuit Breakers: NEMA AB 1, plug-on type. Provide circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Provide circuit breaker accessory trip units and auxiliary switches as indicated.
E. Enclosure: NEMA 3R rated.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install panelboards in accordance with NEMA PB 1.1. Install panelboards plumb. Provide supports in accordance with drawings and Section 16190. Height: 6 feet maximum to top of panelboard. Provide filler plates for unused spaces in panelboards. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads. Spare slots shall be labeled as such in erasable pencil on directory. Provide black on white engraved plastic nameplates.

END OF SECTION

SECTION 16670

SURGE PROTECTIVE DEVICE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Surge Protective Device SPD, former Transient Voltage Surge Suppression devices (Abbreviated as TVSS) SPD will be used in this Specification and on all Drawings.

B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 16123 - Wire and Cable.
   3. Section 16170 - Grounding and Bonding.

1.2 REFERENCES

A. The specified system shall be designed, manufactured, tested and installed in compliance with:
   1. Canadian Standards Association (CSA).
   2. American National Standards Institute.
   3. National Electrical Manufacturer Association (NEMA).

B. Institute of Electrical and Electronic Engineers:
   1. ANSI/IEEE C62.11.
   2. C62.41.
   3. C62.45.

C. Federal Information Processing Standards Publication 94:
   1. FIP PUB 94.

D. National Fire Protection Association:
   1. NFPA 20.
   2. NFPA 70.
   3. NFPA 75.
   4. NFPA 780.

E. Underwriters Laboratories - UL 1449 3rd. Ed., UL 1283: MIL-STD-220A.

1.3 SYSTEM DESCRIPTION

A. Includes electrical and mechanical requirements for a high-energy transient voltage surge suppression system. Specified system shall provide effective high energy surge current diversion, sine wave tracking for electrical line noise filtering and be suitable for application in ANSI/IEEE C62.41 Category A, B, and C environments, as tested by ANSI/IEEE C62.11, C62.45, and MIL-STD-220A.

B. System shall be connected in parallel with the protected system; no series connected elements shall be used which limit load current or kVA capability.

1.4 SUBMITTALS FOR REVIEW

A. Submit under provisions of Section 01300.
B. Provide dimensions and materials of each component. Include isolation switch data.
C. Documentation of specified system's UL 1449 Listing and clamping voltage ratings of all protection modes shall be included as required product data submittal information.
D. Documentation of the specified system's UL 1283 Complimentary Listing shall be included as required product data submittal information.
E. Independent fuse coordination tests from a nationally recognized independent testing laboratory.

1.5 PROJECT CLOSEOUT SUBMITTALS

A. Manufacturer shall furnish an installation manual with installation, start up, trouble-shooting guide and operating instructions for the specified system.
B. Electrical and mechanical drawings shall be provided by the manufacturer, which show unit dimensions, weights, component and connection locations, mounting provisions, connection details and wiring diagram.
C. Record actual location of SPD.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in the manufacture of SPD equipment for with minimum five years' experience.

1.7 REGULATORY REQUIREMENTS

A. Product Listing: UL listed under UL 1449 (Rev 09/2009) Standard for Surge Protective Device (SPD) and the surge ratings shall be permanently affixed to the SPD.
B. Complimentary listed to UL 1283 Standard for EMI/RFI Facility Filters.

1.8 FIELD QUALITY CONTROL

A. Inspect each wiring device for defects.
B. Verify that all connections a properly bonded.

1.9 WARRANTY

A. Manufacturer shall provide a full five-year warranty from date of shipment against any failure when installed in compliance with manufacturer's written instructions, UL listing requirements, and any applicable national or local electrical codes.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Eaton.
B. Erico Critec.
C. MVC.

D. Square D.
E. Or approved equal.
F. All manufacturers shall submit independent test data from a nationally recognized testing laboratory for over current protection, protection modes, and compliance with UL 1449 ratings.

2.2 ENVIRONMENTAL REQUIREMENTS

A. Storage temperature range shall be -67°F to +187°F.
B. Operating temperature range shall be -40°F to +122°F.
C. Operation shall be reliable in an environment with 0% to 95% non-condensing relative humidity.
D. SPD shall not generate any appreciable audible noise.
E. Unit shall not generate any appreciable magnetic fields and shall be suitable for use directly inside computer rooms.

2.3 ELECTRICAL REQUIREMENTS

A. Nominal system operating voltage shall be 277/480 three phase WYE, 4 wire plus ground.
B. Maximum Continuous Operating Voltage (MCOV) shall be greater than 115% of the nominal system operating voltage to ensure the ability of the system to withstand temporary RMS overvoltage (swell) conditions.
C. Operating frequency range of the system shall be at least 47 to 63 Hertz.
D. All protection modes (including Neutral to Ground) of the SPD shall be internally fused at the component level with the fuses IxIxT capability to allow the suppressor's maximum rated transient current to pass through the suppressor without fuse operation. If the rated I x I x T characteristic of the fusing is exceeded, the fusing shall be capable of opening in less than one millisecond and clear both high and low impedance fault conditions. The fusing shall be capable of interrupting up to 100-kA symmetrical fault current with 600 VAC applied. This over current protection circuit shall be monitored and provide indication of suppression failure/operability. Conductor level fuses or circuit breakers internal or external to the SPD shall not be acceptable. Contractor to furnish submittal documentation of proper fuse coordination of actual fault tests from a nationally recognized testing laboratory for product approval.
E. SPD unit shall be supplied with a factory installed disconnect and over-current protection that eliminated the requirement for external fusing.

2.4 PROTECTION MODES

A. Protection Modes:
   1. Line to Neutral Protection.
   2. Neutral to Ground Protection.
   3. Line to Ground Protection.
   4. Line to Line Protection.
B. SPD surge current capacity shall be 240 kA per phase.
C. SPD system shall provide a joule rating that meets or exceeds the requirements of ANSI/IEEE C62.41 Category C delivery capability.
D. Typical response time of all suppression components shall be less than 1 nanosecond.

2.5 SURGE SUPPRESSION COMPONENTS

A. The TVSS unit shall display the combined total number of transient voltage surges detected from L-N, L-G, N-G, and L-L since the counter was last reset.
B. Provide dry contacts to monitor ON/OFF and alarm status.
C. Alarm silence, reset, and test functions.
D. Indication of full or partial loss of protection.
E. Individually fused suppression modules.
F. AC Tracking Filter: EMI/RFI filtering up to –50dB from 100 kHz to 100 MHz.
G. Unit to include isolation switch, module status indicator lights, form C summary alarm contact.

PART 3 - EXECUTION

3.1 INSTALLATION

A. The SPD shall be installed as a Type 2 device.
B. The contractor shall follow the SPD manufacturer's recommended installation practices and comply with all applicable codes.
C. Manufacturer shall furnish an installation manual with installation, start up, trouble-shooting guide and operating instructions for the specified system.
D. Electrical and mechanical drawings shall be provided by the manufacturer, which show unit dimensions, weights, component and connection locations, mounting provisions, connection details and wiring diagram.
E. No sharp bend will be allowed in wiring from SPD unit to ground.
F. The SPD shall be installed such that wiring between SPD and Point of Connection is kept to a minimum.

END OF SECTION

SECTION 16990

ELECTRICAL SYSTEM TESTING AND START-UP

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Testing procedures and methods required prior to acceptance of electrical systems by Owner. Electrical system start-up procedures.

B. Related Sections:
   1. Division 01 Specification Sections apply to Work of this Section.
   2. Section 16000 - Electrical General Provisions.
   3. Section 16123 - Wire and Cable.
   4. Section 16170 - Grounding and Bonding.
   5. Section 16470 - Panelboards.

1.2 REFERENCES

A. National Electrical Code - NEC.
B. National Electrical Manufacturer's Association - NEMA.
C. American Society for Testing and Materials - ASTM.
D. Institute of Electrical and Electronic Engineers - IEEE.
E. American National Standards Institute - ANSI.
F. ANSI C2 - National Electrical Safety Code.
G. ANSI Z244-1 - American National Standard for Protection.
H. Manufacturer's instruction manuals applicable to each particular apparatus.
I. ICEA - Insulated Cable Engineers Association.

1.3 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 01300. Calibration of all equipment utilized in electrical system tests must be documented and capable of being verified. Accuracy of test instruments shall be directly traceable to the National Bureau of Standards. Analog field instruments shall be calibrated within 6 months of use. Digital field instruments shall be calibrated within 12 months of use. Leased instruments shall be calibrated within 12 months of use where the accuracy is guaranteed by the lessor. Accurately record field data obtained during tests in a manner acceptable to Owner. Provide three copies of tests summary to Owner in a form acceptable to Owner.

PART 2 - PRODUCTS

2.1 CABLE TESTS

A. Power Cable - 600V and Below:
   1. All power cables shall meet or exceed the applicable ICEA test requirements for the type of insulation used and the application. Verification shall be provided by the manufacturer in the form of published literature or by submittal.
   2. After installation and before rated voltage is applied to any power cable #8 AWG or larger, a DC insulation check shall be made for each cable with a megohmmeter. Applied potential shall be 1000 Volts DC for 1 minute. Terminations shall be properly corona suppressed by guard ring, field reduction sphere, or other suitable method. For any reading less than 100 megohms the cause of the low reading shall be corrected or the cable replaced.

2.2 GROUNDING SYSTEMS

A. Inspect ground system for compliance with plans and specifications. Perform three point fall-of-potential test per IEEE Standard No. 81, Section 9.04 on the main grounding electrode, Resistance to ground shall be no greater than one ohm. Contractor shall be responsible for installing additional electrodes as required to lower resistance to one ohm, if greater, at no additional expense to Owner.

2.3 FIELD DEVICE TESTS

A. Visually inspect all electrical equipment for physical damage and proper installation. Calibrate devices per manufacturer's recommendations. Verify proper operation of all field devices prior to Start-Up.

2.4 ELECTRICAL READINGS AND SETTINGS

A. After motor operation has been verified, voltage readings shall be taken at all panelboards and starters. Based on these readings, make final adjustments of primary taps on all transformers in the building as needed or coordinate with the electric utility for proper building voltage.
B. With all motors fully loaded and running at 100% speed, fully loaded and running at 85% speed, and with the motor drives off, the following readings shall be recorded on each phase of the load side of the service entrance main breaker and submitted to the Engineer.
   1. Voltage (phase to phase, and phase to neutral).
   2. Amperage.
   3. Power Factor.
   4. Frequency.
   5. Total harmonic current distortion.
   6. Total harmonic voltage distortion.

PART 3 - EXECUTION

3.1 GENERAL

A. The purpose of the start-up procedures is to assure that the equipment and systems utilized are ready for operation and use. Start-up will be performed by the Contractor with the Engineer and Owner Representative (if desired) present.

3.2 PROCEDURE

A. Field devices and other equipment utilized will be operated as required for efficient system operation. Contractor shall demonstrate that the field devices work as specified. Upon effectively demonstrating the satisfactory operation of all electrical systems, the contractor will energize all equipment that will not be adversely effected for a period of seven days. Any controls or other equipment found to be defective shall be replaced prior to acceptance by Owner. Contractor shall provide "Certification of Proper Operation" to Engineer upon completion of Start-Up.

END OF SECTION

CONFEDERATE CITIZENS COLLECTION STATION

3510 CONFEDERATE DR.
EL PASO, TX 79936

PARKHILL SMITH & COOPER

4222 85th Street
Lubbock, Texas 79423
806.473.2200

SHEET INDEX

GENERAL

G-001	COVER SHEET AND INDEX
G-002	SYMBOLS, LEGENDS & ABBREVIATIONS
G-003	ACCESSIBILITY STANDARDS
G-004	ACCESSIBILITY STANDARDS
G-005	CODE INFORMATION

CIVIL

C-100	PLAT
C-101	SURVEY
C-102	DEMOLITION PLAN
C-103	SITE PLAN
C-104	GRADING PLAN
C-105	DRAINAGE PLAN
C-106	UTILITY PLAN
C-201	EROSION CONTROL PLAN
C-301	SITE CROSS SECTION
C-501	DETAIL SHEET
C-502	DETAIL SHEET
C-503	DETAIL SHEET
C-504	UTILITY DETAIL SHEET
C-505	UTILITY DETAIL SHEET
C-601	CONTROL POINT TABLE

LANDSCAPE

L-101	LANDSCAPE IRRIGATION PLAN
L-102	LANDSCAPE PLANTING PLAN
L-501	PLANTING & IRRIGATION DETAILS

STRUCTURAL

S-501	DETAILS
S-502	DETAILS

ARCHITECTURAL

A-101	FLOOR PLAN, REFLECTED CEILING PLAN, SCHEDULES & DETAILS

MECHANICAL

MP100	GENERAL MECHANICAL & PLUMBING INFORMATION
MP101	PLUMBING FLOOR PLAN
MP501	PLUMBING SCHEDULE AND DETAILS

ELECTRICAL

E-101	ELECTRICAL SITE PLAN, LEGEND & GENERAL NOTES
E-102	ELECTRICAL ONE-LINE LOAD TABLE & PANEL SCHEDULE
E-103	ELECTRICAL FLOOR PLAN & LIGHTING SCHEDULE
E-501	ELECTRICAL DETAILS
E-502	ELECTRICAL DETAILS

REFERENCES – BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL SMITH & COOPER, INC. — STATE OF TEXAS — NICHOLAS N. YBARRA — 111156 — LICENSED PROFESSIONAL ENGINEER — 02/01/16

SCALE
Hor. AS SHOWN
Ver. AS SHOWN

DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

SHEET TITLE
COVER SHEET

SET NUMBER:
G-001

ABBREVIATIONS

A

ACC	ACCESSIBLE
AB	ANCHOR BOLT
ACI	AMERICAN CONCRETE INSTITUTE
AD	AREA DRAIN
ADA	AMERICANS WITH DISABILITIES ACT
ADDL	ADDITIONAL
ADJ	ADJUSTABLE
ADDM	ADDENDUM
AFF	ABOVE FINISH FLOOR
AHU	AIR HANDLING UNIT
AIA	AMERICAN INSTITUTE OF ARCHITECTS
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ALT	ALTERNATE
ALUM	ALUMINUM
ANOD	ANODIZED
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APA	AMERICAN PLYWOOD ASSOCIATION
APPROX	APPROXIMATE
ARCH	ARCHITECT
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASTM	AMERICAN SOCIETY OF TESTING MATERIALS
AUTO	AUTOMATIC
AVG	AVERAGE
AWG	AMERICAN WIRE GAGE
AWS	AMERICAN WELDING SOCIETY
A/C	AIR CONDITIONING

B

BAL	BALANCE
BC	BACK OF CURB
BIA	BRICK INSTITUTE OF AMERICA
BITUM	BITUMINOUS
BL	BUILDING LINE
BLDG	BUILDING
BM	BENCH MARK
BOCA	BUILDING OFFICIALS AND CODE ADMINISTRATORS INTERNATIONAL, INC
BOS	BOTTOM OF STEEL
BOT	BOTTOM (BOTTOM FACE, LAYER, SIDE)
B PL	BASE PLATE
BRDG	BRIDGING
BRG	BEARING
BTWN	BETWEEN
BUR	BUILT-UP ROOFING

C

C	AMERICAN STANDARD CHANNEL (STRUCTURAL SHAPE)
CU FT	CUBIC FOOT
CF/CI	CONTRACTOR FURNISHED/CONTRACTOR INSTALLED
CF/OI	CONTRACTOR FURNISHED/OWNER INSTALLED
CG	CORNER GUARD
CI	CAST IRON
CIR	CIRCLE
CIRC	CIRCULAR
CJ	CONTROL JOINT
CL	CENTER LINE
CLG	CEILING
CLR	CLEAR
cm	CENTIMETER
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONN	CONNECT
CONSTR	CONSTRUCTION
CONT	CONTINUE
CONTR	CONTRACTOR
CRCMF	CIRCUMFERENCE
CSK	COUNTER SUNK
CSI	CONSTRUCTION SPECIFICATIONS INSTITUTE
CTR	CENTER
CU YD	CUBIC YARD

D

D	DEPTH
DAT	DATUM
DBL	DOUBLE
DDS	DOUBLE DISPLAY STRIP
DEG	DEGREE
DEMO	DEMOLISH
DET	DETAIL
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DIV	DIVIDE
DL	DEAD LOAD
DS	DOWNSPOUT
DWG	DRAWING

E

E	EAST, MODULUS OF ELASTICITY
EA	EACH
EF	EACH FACE, EXTERIOR FINISH
EIFS	EXTERIOR INSULATION FINISH SYSTEM
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRIC, ELECTRICAL
ELEV	ELEVATOR
ENGR	ENGINEER
EQ	EQUAL
EQUIP	EQUIPMENT
EW	EACH WAY
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
EXP	EXPANSION
EXP BT	EXPANSION BOLT
EXT	EXTERIOR

F

FD	FLOOR DRAIN
FDTN	FOUNDATION
FEB	FIRE EXTINGUISHER & BRACKET
FEC	FIRE EXTINGUISHER & CABINET
FF EL	FINISH FLOOR ELEVATION
FIN FLR	FINISH FLOOR
FIN	FINISH(ED)
FOC	FACE OF CONCRETE, FACE OF CURB
FOF	FACE OF FINISH
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FOW	FACE OF WALL
FS	FAR SIDE (FACE, LAYER)
FT	FOOT
FTG	FOOTING
FURG	FURRING

G

GA	GAGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GOVT	GOVERNMENT
GYP BD	GYPSUM BOARD
GYP	GYPSUM

H

HDBD	HARDBOARD
HDW/D	HARDWOOD
HDW	HARDWARE
HEX	HEXAGON(AL)
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HP	HEAT PUMP
HS	HIGH STRENGTH
HT	HEIGHT
HVAC	HEATING VENTILATION AND AIR CONDITIONING

I

I	MOMENT OF INERTIA
IBC	INTERNATIONAL BUILDING CODE
ID	INSIDE DIAMETER
IF	INSIDE FACE
INCL	INCLUDE(D)(ING)(SIVE)
INS	INSULATION
INT	INTERIOR
INV	INVERT(ED)

J

JAN	JANITOR

L

l	LITER
L	ANGLE (STRUCTURAL SHAPE)
LB	POUND
LH	LEFT HAND
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LT	LIGHT
LT WT	LIGHT WEIGHT

M

MAU	MAKE UP AIR UNIT(S)
m	METER(S)
MATL	MATERIAL
MAX	MAXIMUM
MB	MACHINE BOLT
MCJ	MASONRY CONTROL JOINT
MECH	MECHANIC(AL)
MFG	MANUFACTURING
MFR	MANUFACTURER
MIL STD	MILITARY STANDARD
MIN	MINIMUM
MISC	MISCELLANEOUS
mm	MILLIMETER
MO	MASONRY OPENING
MOD	MODIFY
MT	METAL THRESHOLD
MTL	METAL
MLWK	MILLWORK

N

N	NORTH
NA	NOT APPLICABLE
NAT	NATURAL
NBS	NATIONAL BUREAU OF STANDARDS
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NOM	NOMINAL
NRC	NOISE REDUCTION COEFFICIENT
NS	NEAR SIDE (FACE)
NTS	NOT TO SCALE

O

OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OFD	OVER FLOW DRAIN
OF/CI	OWNER FURNISHED/CONTRACTOR INSTALLED
OF/OI	OWNER FURNISHED/OWNER INSTALLED
OH DR	OVERHEAD DOOR
OPNG	OPENING
OPH	OPPOSITE HAND
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
Oz	OUNCE

P

PAR	PARALLEL
PCA	PORTLAND CEMENT ASSOCIATION
PCF	POUNDS PER CUBIC FOOT
PCI	PRESTRESSED CONCRETE INSTITUTE
PERF	PERFORATE(D)
PERP	PERPENDICULAR
PL	PROPERTY LINE
PLAM	PLASTIC LAMINATE
PLF	POUNDS PER LINEAL FOOT
PR	PAIR
PREFAB	PREFABRICATE
PREFIN	PREFINISH
PRELIM	PRELIMINARY
PROJ	PROJECT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PBD	PARTICLE BOARD
PTD	PAPER TOWEL DISPENSER
PTDWR	PAPER TOWEL DISPENSER & WASTE RECEPTACLE
PVC	POLYVINYL CHLORIDE
PLYWD	PLYWOOD
PVG	PAVING

Q

QC	QUALITY CONTROL
QTY	QUANTITY

R

R	RADIUS
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REF	REFERENCE
REFL	REFLECT
REINF	REINFORCE
REQD	REQUIRED
REV	REVISION
RH	RIGHT HAND(ED)
RO	ROUGH OPENING
ROW	RIGHT OF WAY
RTU	ROOF TOP UNIT

S

S	SOUTH
SBCCI	SOUTHERN BUILDING CODE CONGRESS INTERNATIONAL
SCHED	SCHEDULE
SD	SOAP DISPENSER
SDI	STEEL DOOR INSTITUTE
SECT	SECTION
SHT	SHEET
SIM	SIMILAR
SJI	STEEL JOIST INSTITUTE
SPEC	SPECIFICATION
SP	SOLID PLASTIC
SST	STAINLESS STEEL
STD	STANDARD
STL	STEEL
STRUCT	STRUCTURAL
SUSP	SUSPENDED
SYMM	SYMMETRICAL

T

THD	TREAD
TAN	TANGENT
TEMP	TEMPORARY
TFF	TOP OF FINISH FLOOR
THK	THICKNESS
TLT	TOILET
TMH	TOP OF MANHOLE
TOB	TOP OF BEAM
TOC	TOP OF CURB
TOF	TOP OF FOOTING
TOG	TOP OF GRADE
TOJ	TOP OF JOIST
TOL	TOLERANCE
TOM	TOP OF MASONRY
TOS	TOP OF STEEL
TOW	TOP OF WALL
TTD	TOILET TISSUE DISPENSER
TRANS	TRANSPARENT
TRTD	TREATED
TS	TUBE STEEL
TYP	TYPICAL
T&G	TONGUE AND GROOVE

U

UBC	UNIFORM BUILDING CODE
UL	UNDERWRITERS LABORATORIES, INC.
ULT	ULTIMATE
UNO	UNLESS NOTED OTHERWISE
UON	UNLESS OTHERWISE NOTED

V

VAR	VARIES
VERT	VERTICAL

W

W	WEST
WLD	WELDED
WP	WORK POINT
WWF	WELDED WIRE FABRIC
W/	WITH
W/O	WITHOUT
W/W	WALL TO WALL

X

XFMR	TRANSFORMER

SHEET IDENTIFICATION FORMAT

AANNN

- AA — DISCIPLINE DESIGNATOR
- A — SHEET TYPE DESIGNATOR (SEE BELOW)
- NN — SHEET SEQUENCE NUMBER

SHEET TYPE DESIGNATORS

0 GENERAL (COVER SHEETS, INDEX, SYMBOLS LEGEND, NOTES, ETC.)
1 PLANS (HORIZONTAL VIEWS)
2 ELEVATIONS (VERTICAL VIEWS)
3 SECTIONS (SECTIONAL VIEWS)
4 LARGE SCALE VIEWS (ENLARGED PLANS, ELEVATIONS, OR SECTIONS THAT ARE NOT DETAILS)
5 DETAILS
6 SCHEDULES AND DIAGRAMS
7 USER DEFINED (FOR TYPES THAT DO NOT FALL IN OTHER CATEGORIES OR STANDARD DETAILS)
8 USER DEFINED (FOR TYPES THAT DO NOT FALL IN OTHER CATEGORIES)
9 3D REPRESENTATIONS (ISOMETRICS, PERSPECTIVES, PHOTOGRAPHS)

GENERAL DRAWING LEGEND

ROOM NAME 000	ROOM NAME ROOM NUMBER		NEW DOOR
000	DOOR NUMBER		
00	WINDOW MARK		EXISTING DOOR
LV00	LOUVER MARK		
HM00	HOLLOW METAL FRAME MARK	N	NORTH ARROW FOR SITE PLANS
AL00	ALUMINUM FRAME MARK		
AA00 00	FURNISHINGS/EQUIPMENT		
00	KEY NOTE	TRUE NORTH PLAN NORTH	PLAN NORTH ARROW
00	KEY NOTE-DEMOLITION		
A0	PARTITION TYPE		
DB00	DISPLAY BOARD	NORTH	NORTH ARROW
0	REVISION		
00	STRUCTURAL COLUMN LINE	A1/G-001	ELEVATION MARK
	DATUM ELEVATION (EXISTING)	A1/G-001	SECTION MARK
	DATUM ELEVATION (NEW)	A1/G-001	PLAN DETAIL MARK
	BREAK LINE	A1 TITLE 1/8"=1'-0"	DRAWING BLOCK TITLE
CL	CENTER LINE		
	PROPERTY LINE	SHEET NUMBER WHERE REFERENCED / REFERENCE NUMBER	
	MATCH/DIVIDE LINE		

SITE PLAN LEGEND

	EXISTING CONSTRUCTION TO REMAIN	A	ACCESSIBLE PARKING SIGN
	EXISTING CONSTRUCTION TO BE REMOVED		PARKING SIGN
	PROPERTY LINE		LIGHT POLE
X X	FENCE		TREE
	NEW ASPHALT PAVING		SLOPE
	NEW CONCRETE WALK/PAVING		
	NEW CONTROL JOINT		
	NEW EXPANSION JOINT		
99.6	NEW CONTOUR LINES		
99.6	EXISTING CONTOUR LINES TO REMAIN		
320.10 TC 319.60 G 319.60	NEW SPOT ELEVATION		
x 319.60	EXISTING SPOT ELEVATION		
+TC	TOP OF CURB		
+G	GUTTER		
+FL	FLOW LINE		
WP	WORKING POINT		

FLOOR PLAN LEGEND

	CONCRETE WALL
	FACE BRICK
	CMU WALL
MCJ	MASONRY CONTROL JOINT
	EXISTING CONSTRUCTION TO REMAIN
	EXISTING CONSTRUCTION TO BE REMOVED
	NEW METAL STUD WALLS
	NEW PARTIAL HEIGHT WALLS
	GLAZING SYSTEM
	WIRE MESH OR FABRIC PARTITION
	CORNER GUARD
	END WALL GUARD
	WALL GUARD
	HANDRAIL
FEC	FIRE EXTINGUISHER AND CABINET
FEB	FIRE EXTINGUISHER AND BRACKET
	FURNITURE/EQUIPMENT NIC
DS	DOWN SPOUT
FD	FLOOR DRAIN

ROOF PLAN LEGEND

RD	ROOF DRAIN
OD	OVERFLOW DRAIN
	SLOPE
	MECHANICAL EQUIPMENT
	VENT THROUGH ROOF (VTR)
	SKYLIGHT
	ROOF HATCH

RCP LEGEND

	GYP BD CEILING
	SUSPENDED METAL LATH AND PLASTER CEILING
	LAY-IN CEILING PANEL
	LAY-IN CEILING PANEL
	SUPPLY AIR GRILLE
	RETURN AIR OR EXHAUST GRILLE
	EXIT LIGHTS
	LIGHT FIXTURES
	SKYLIGHT
	CEILING TRACK
CJ	CONTROL JOINT
	ACCESS PANEL

DETAIL LEGEND

	COMPACTED SOIL
	UNDISTURBED SOIL
	STONE/MARBLE
	PLASTER OR STUCCO ON METAL LATH
	STEEL
	CONCRETE IN SECTION
	BRICK
	CMU
	FLEXIBLE INSULATION
	ACOUSTICAL TILE
	RIGID INSULATION
	WOOD CONTINUOUS
	WOOD DISCONTINUOUS
	PLASTER, SAND OR CEMENT GROUT
	POUROUS FILL, GRAVEL (CAPILLARY WATER BARRIER PAVEMENT BASE)
	TERRAZZO (IN SECTION)

REFERENCES - BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

REGISTERED ARCHITECT — STATE OF TEXAS — 2001
02/01/2016

SCALE
Hor. AS SHOWN
Ver. AS SHOWN

DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

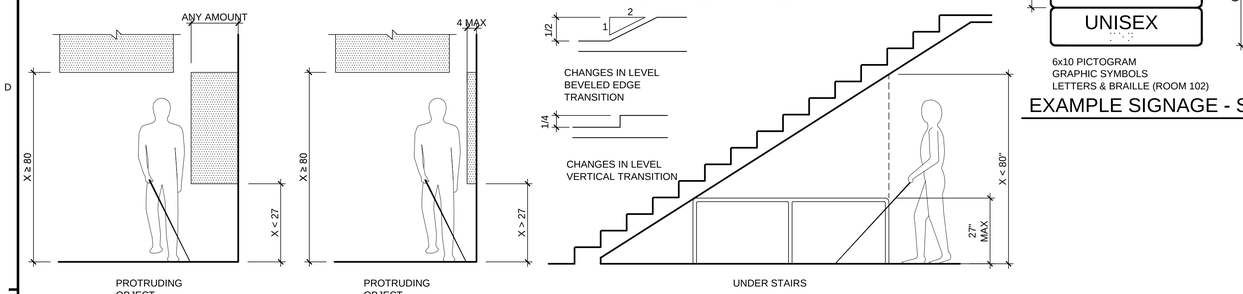
CITY OF EL PASO

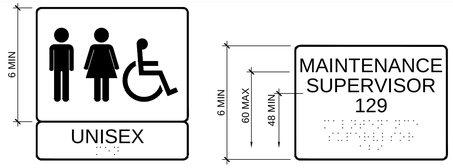
SHEET TITLE
SYMBOLS, LEGENDS & ABBREVIATIONS

G-002

GENERAL NOTES

- ACCESSIBILITY GUIDELINE SHEETS ARE FOR INFORMATIONAL PURPOSES ONLY, AND INTENDED TO SERVE AS A GUIDE FOR CONSTRUCTION PROFESSIONALS AND OWNERS.
- SOME OF THE INFORMATION AND PICTOGRAPHS SHOWN MAY NOT BE APPLICABLE TO THIS PROJECT.



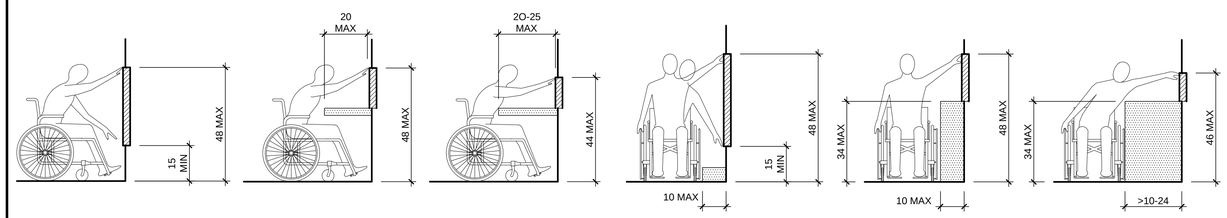


6x10 PICTOGRAM
GRAPHIC SYMBOLS
LETTERS & BRAILLE (ROOM 102)

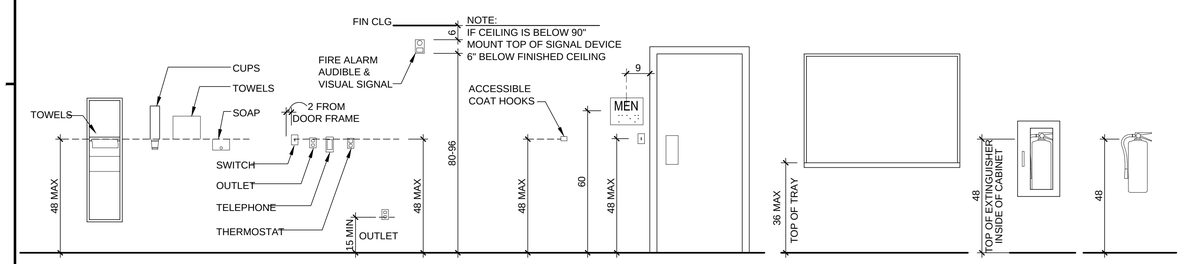
8x6 ROOM NAME
ROOM NUMBER
& BRAILLE (ROOM 103 & ROOM 104)

NOTE: COORDINATE WITH OWNER ROOM NAME AND NUMBER

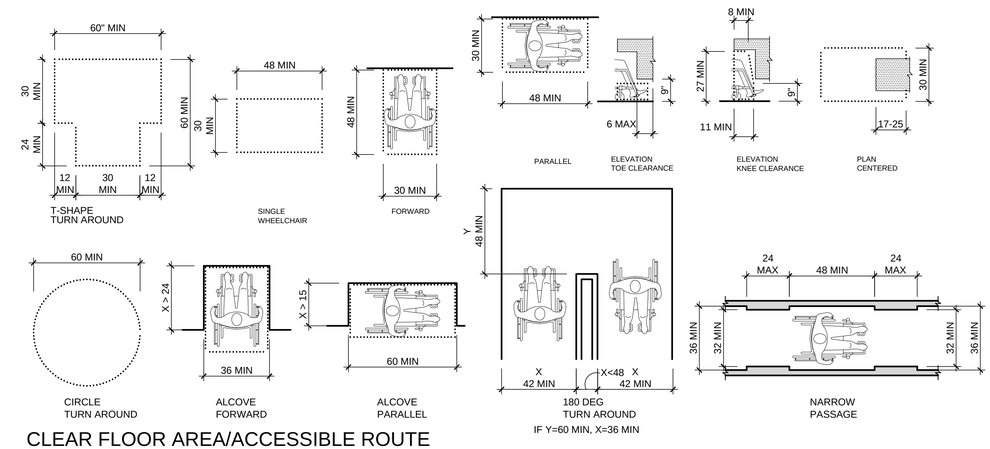
EXAMPLE SIGNAGE - SEE STANDARD ACCESSIBLE MOUNTING HEIGHT



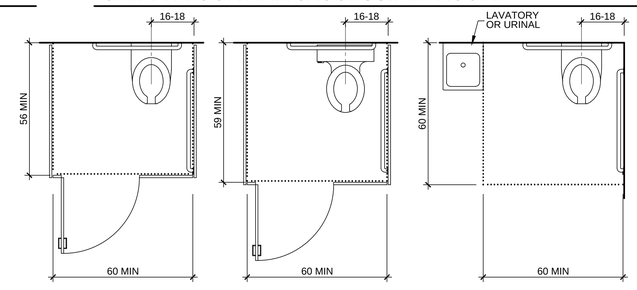
PROTRUDING OBJECT PROTECTION/REACH RANGES



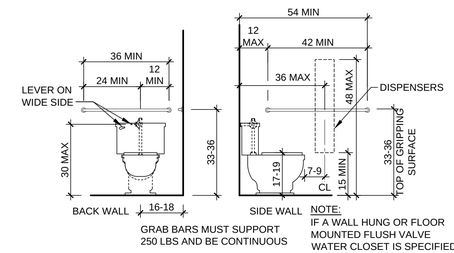
STANDARD ACCESSIBLE MOUNTING HEIGHTS



CLEAR FLOOR AREA/ACCESSIBLE ROUTE



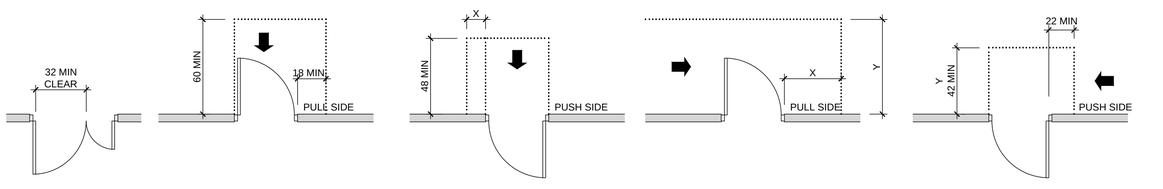
TYPICAL TOILET STALLS



GRAB BARS MUST SUPPORT 250 LBS AND BE CONTINUOUS

NOTE: IF A WALL HUNG OR FLOOR MOUNTED FLUSH VALVE WATER CLOSET IS SPECIFIED, ENSURE ALL DIMENSIONS SHOWN ARE MET.

TYPICAL WATER CLOSETS



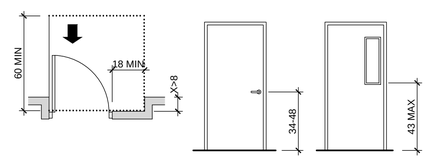
NOTE: X = 12" MIN (305mm) IF DOOR HAS BOTH A CLOSER AND A LATCH

NOTE: X = 36" MIN IF Y = 60"; X = 42" MIN IF Y = 54"

NOTE: Y = 48" MIN (1220mm) IF DOOR HAS BOTH A CLOSER AND A LATCH

FRONT APPROACHES SWINGING DOORS

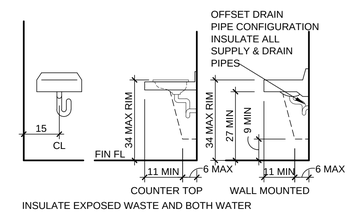
HINGE SIDE APPROACHES SWINGING DOORS



RECESSED DOOR

DOOR HARDWARE

DOOR LITE

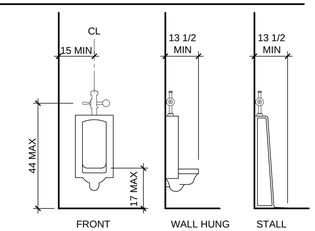


COUNTER TOP

WALL MOUNTED

INSULATE EXPOSED WASTE AND BOTH WATER LINES WITH PREMOLDED INSUL/JACKET

LAVATORY

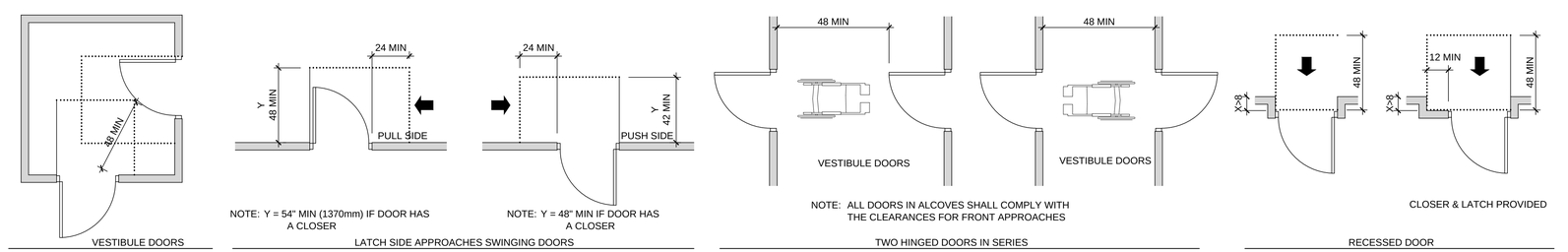


FRONT

WALL HUNG

STALL

URINALS



VESTIBULE DOORS

NOTE: Y = 54" MIN (1370mm) IF DOOR HAS A CLOSER

NOTE: Y = 48" MIN IF DOOR HAS A CLOSER

LATCH SIDE APPROACHES SWINGING DOORS

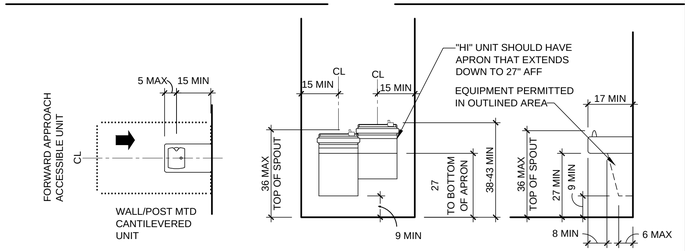
NOTE: ALL DOORS IN ALCOVES SHALL COMPLY WITH THE CLEARANCES FOR FRONT APPROACHES

TWO HINGED DOORS IN SERIES

CLOSER & LATCH PROVIDED

RECESSED DOOR

TYPICAL DOOR CLEARANCES



EWC/DRINKING FOUNTAINS

REFERENCES – BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

REGISTERED ARCHITECT STATE OF TEXAS
02/01/2016

SCALE:
Hor. AS SHOWN
Ver. AS SHOWN

DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

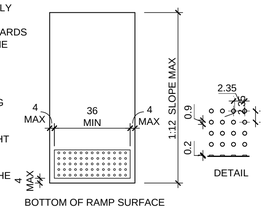
CITY OF EL PASO

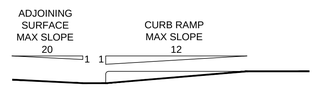
SHEET TITLE
ACCESSIBILITY STANDARDS

G-003

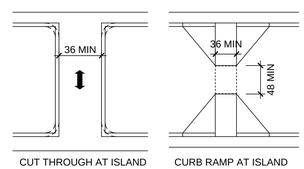
DETECTABLE WARNING DEVICES SHALL COMPLY WITH THE TEXAS ACCESSIBILITY STANDARDS AND BE ALIGNED IN THE DIRECTION OF PEDESTRIAN TRAVEL

THE SURFACE OF THE DETECTABLE WARNING DEVICES SHALL BE A CONTRASTING COLOR THAT PROVIDES A LIGHT REFLECTIVE VALUE SIGNIFICANTLY CONTRASTING WITH THE ADJACENT SURFACES

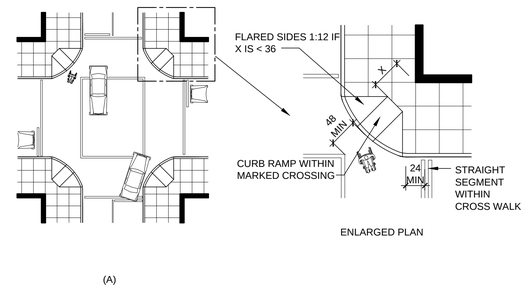


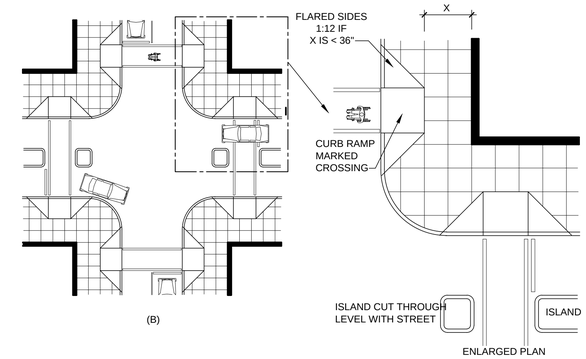


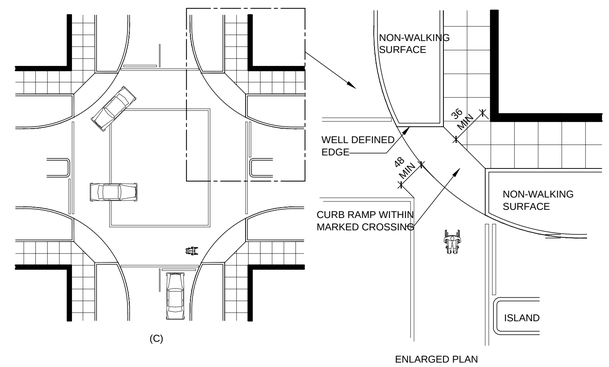
CURB RAMP AND ADJOINING SURFACE SLOPES

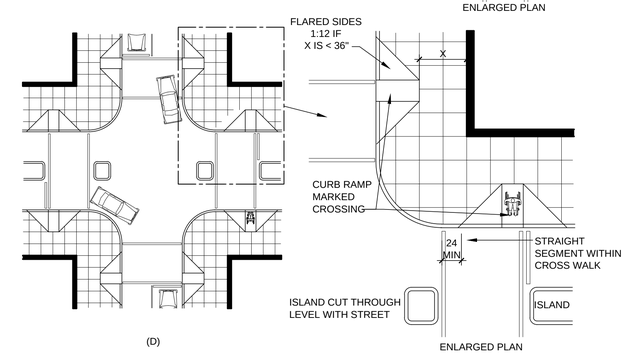


CURB RAMPS



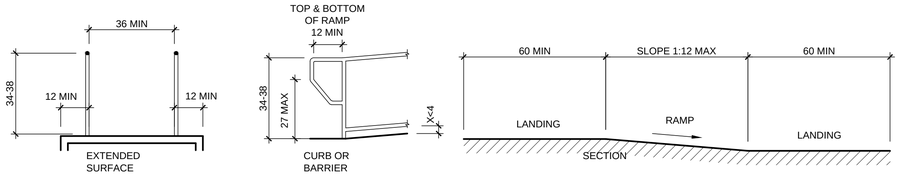


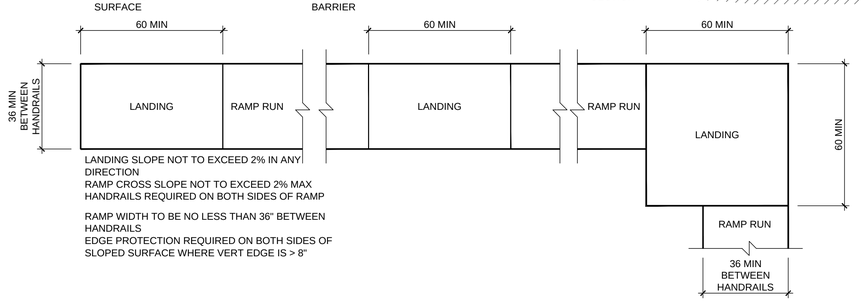




WITHIN CURB RAMP AND FLARES, THERE SHALL BE NO LIGHT OR SIGNAL POLES, SIGNAL BOXES, VALVE BOX COVERS, OR THE LIKE

CURB RAMPS AT MARKED CROSSINGS

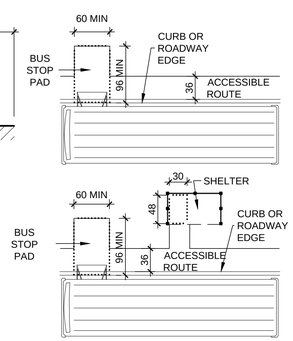




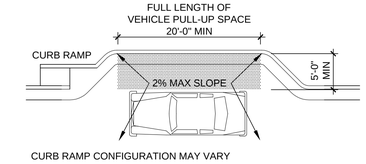
LANDING SLOPE NOT TO EXCEED 2% IN ANY DIRECTION
RAMP CROSS SLOPE NOT TO EXCEED 2% MAX
HANDRAILS REQUIRED ON BOTH SIDES OF RAMP

RAMP WIDTH TO BE NO LESS THAN 36" BETWEEN HANDRAILS
EDGE PROTECTION REQUIRED ON BOTH SIDES OF SLOPED SURFACE WHERE VERT EDGE IS > 8"

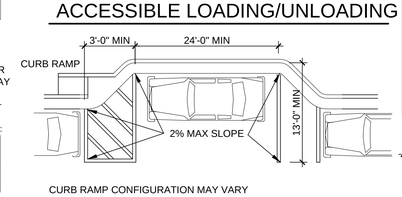
ACCESSIBLE RAMP



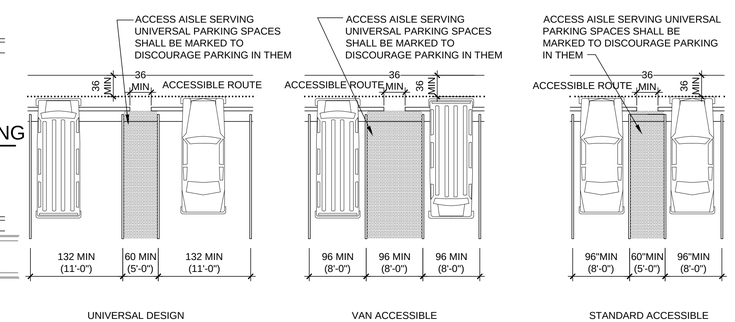
BUS STOPS



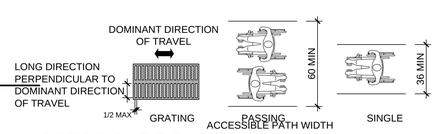
ACCESSIBLE LOADING/UNLOADING



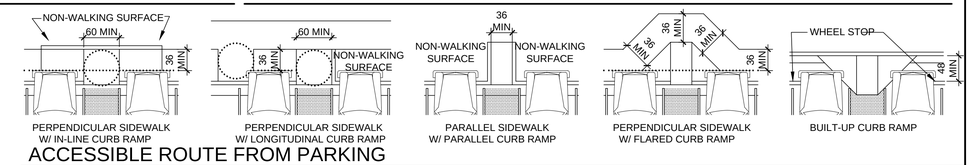
ACCESSIBLE PARALLEL PARKING



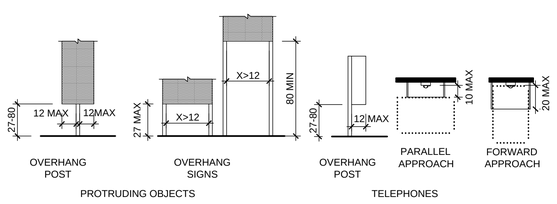
ACCESSIBLE PARKING SPACES



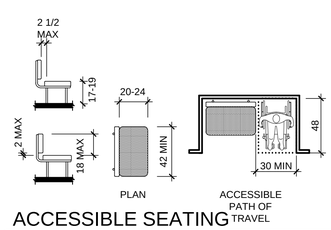
ACCESSIBLE ROUTES



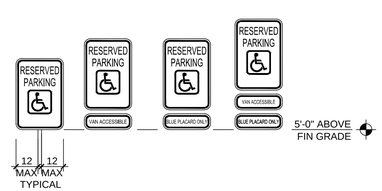
ACCESSIBLE ROUTE FROM PARKING



PROTRUDING OBJECTS/TELEPHONES



ACCESSIBLE SEATING



ACCESSIBLE PARKING SIGNAGE

REFERENCES – BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

REGISTERED ARCHITECT STATE OF TEXAS
02/01/2016

SCALE
Hor. AS SHOWN
Ver. AS SHOWN

DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

SHEET TITLE
ACCESSIBILITY STANDARDS

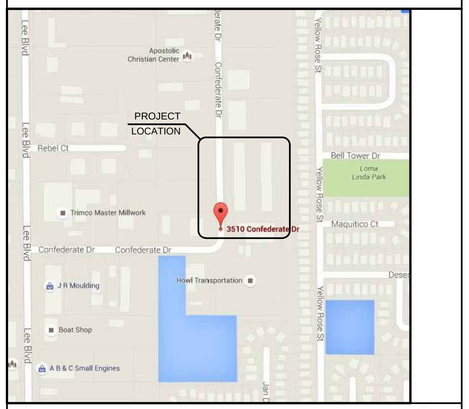
G-004

VICINITY MAP

NOT TO SCALE

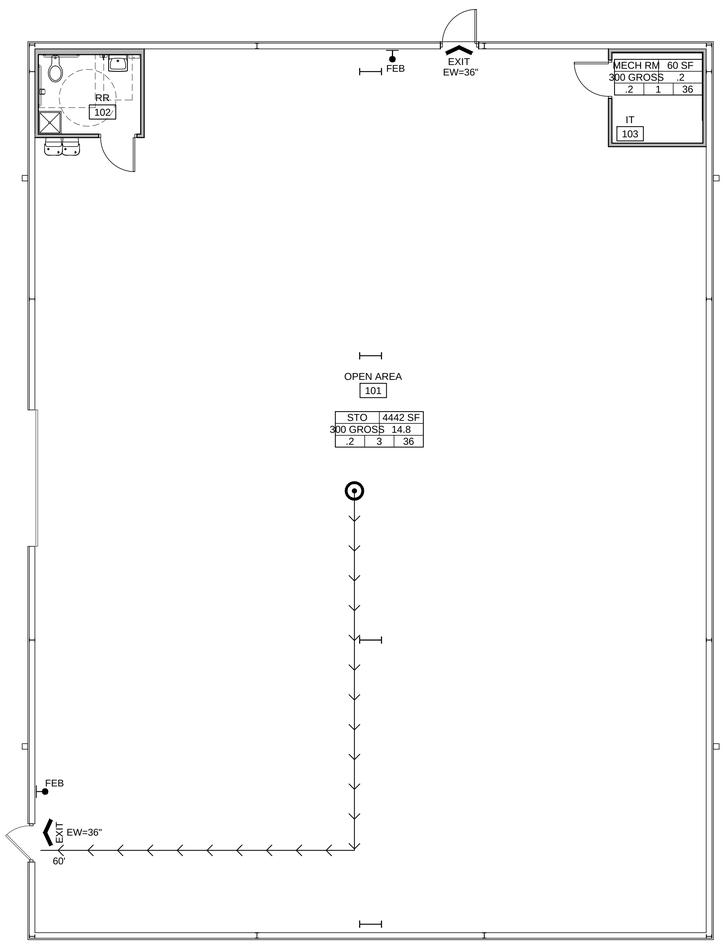
NORTH

LOCATION MAP



NOT TO SCALE

NORTH



A1 FLOOR PLAN

NOT TO SCALE

NORTH

EGRESS

TOTAL OCCUPANT LOAD FOR THE BUILDING	15 PEOPLE
TOTAL OCCUPANT LOAD EGRESS WILL ACCOMODATE	180 PEOPLE
EGRESS WIDTH REQUIRED	
15 X 0.2 (SECTION 1005)	3 INCHES
EGRESS PROVIDED	72 INCHES
MAXIMUM ALLOWABLE TRAVEL DISTANCE (TABLE 1016.1)	200 FEET WITHOUT SPRINKLER SYSTEM
LONGEST TRAVEL DISTANCE	60 FEET
MAXIMUM DEAD END LIMIT (SECTION 1018.4)	20 FEET
MAXIMUM COMMON PATH OF EGRESS TRAVEL (1014.3)	100 FEET
COMMON PATH OF EGRESS TRAVEL	8 FEET
MINIMUM NUMBER OF EXITS FOR OCCUPANT LOAD IEBC, SECTION 705	
LESS THAN 50	1 EXIT REQUIRED
	2 EXITS PROVIDED

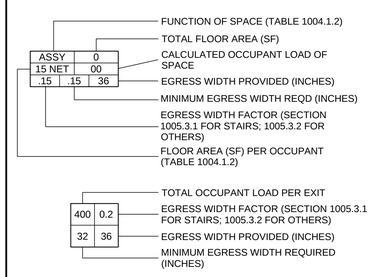
FIRE PROTECTION REQUIREMENTS (TABLE 601)

CONTRUCTION TYPE - TYPE II-B (EXISTING BUILDING)

STRUCTURAL FRAME	0 HOUR(S)
EXTERIOR BEARING WALLS	0 HOUR(S)
INTERIOR BEARING WALLS	0 HOUR(S)
FLOOR CONSTRUCTION	0 HOUR(S)
ROOF CONSTRUCTION	0 HOUR(S)
EXTERIOR WALLS (TABLE 602)	0 HOUR(S) TYPE OF FIRE DOORS 0 HR.
CORRIDORS (TABLE 1018.1)	0 HOUR(S) W/ SPRINKLER SYSTEM

LEGEND

EXIT	EGRESS EXIT
200' / 200'	EGRESS PATH AND TRAVEL DISTANCE
EW=36"	EXIT WIDTH PROVIDED AT SPECIFIC EXIT
GSF	GROSS SQUARE FOOT
NSF	NET SQUARE FOOT
FEC	FIRE EXTINGUISHER CABINET
FEB	FIRE EXTINGUISHER BRACKET
TD	TRAVEL DISTANCE
CPOT	COMMON PATH OF TRAVEL
DBE	DISTANCE BETWEEN EXITS
MDBE	MINIMUM DISTANCE BETWEEN EXITS
OL	OCCUPANT LOAD



OCCUPANCY CLASSIFICATION

OCCUPANCY: MODERATE-HAZARD STORAGE GROUP S-1
(IEBC ALTERATIONS - LEVEL 2)

OCCUPANCY LOAD CALCULATION (TABLE 1004.1.1)

FUNCTION OF SPACE	FLOOR AREA PER OCCUPANT	SQ. ST.	OCCUPANT
MERCANTILE: STORAGE, STOCK, SHIPPING AREA	300 GROSS	4442 SF.	14.8
ACCESSORY STORAGE AREAS, MECHANICAL EQUIPMENT ROOM	300 GROSS	60 SF.	.20
			15 TOTAL

ALLOWABLE BUILDING HEIGHTS AND AREAS

BUILDING	
TYPE OF CONSTRUCTION	II-B (55'-0")
ALLOWABLE BUILDING AREA PER TABLE 503	17,500 SF
ALLOWABLE BUILDING HEIGHT PER TABLE 503	2-STORIES

PLUMBING FIXTURE REQUIRMENTS - IPC

OCCUPANCY:	USE GROUP	OCCUPANT LOAD (ACTUAL)	DESCRIPTION:	WATER CLOSETS M	WATER CLOSETS F	LAV'S M	LAV'S F	DRINK FOUNT. REF. 410.1	SERVICE SINK
MODERATE-HAZARD STORAGE	S-1	15	STORAGE						
			TOTAL REQUIRED	1 PER 100		1 PER 100		1 PER 1000	1
			TOTAL PROVIDED	1		1		2	1

FIXTURE COUNT TABLE 2902.1

OCCUPANT LOAD (TAB 1004.1.1)

FUNCTION OF SPACE	OCCUPANT PER SF
ACCESSORY STORAGE AREAS, MECHANICAL	
EQUIPMENT ROOM	300 GROSS
AGRICULTURAL BUILDING	300 GROSS
AIRCRAFT HANGARS	500 GROSS
AIRPORT TERMINAL	
BAGGAGE CLAIM	20 GROSS
BAGGAGE HANDLING	300 GROSS
CONCOURSE	100 GROSS
WAITING AREAS	15 GROSS
ASSEMBLY	
GAMING FLOORS (KENO, SLOTS, ETC.)	11 GROSS
ASSEMBLY W/ FIXED SEATS	SEE SECTION 1004.7
ASSEMBLY WITHOUT FIXED SEATS	
CONCENTRATED (CHAIRS ONLY-NOT FIXED)	7 NET
STANDING SPACE	5 NET
UNCONCENTRATED (TABLES AND CHAIRS)	15 NET
BOWLING CENTERS, ALLOW 5 PERSONS FOR EACH LANE INCLUDING 15 FEET OF RUNWAY, AND FOR ADDITIONAL AREAS	7 NET
BUSINESS AREAS	100 GROSS
COURT ROOMS-OTHER THAN FIXED SEATING AREAS	40 NET
DAY CARE	35 NET
DORMITORIES	50 GROSS
EDUCATIONAL	
CLASSROOM AREA	20 NET
SHOPS AND OTHER VOCATIONAL ROOM AREAS	50 NET
EXERCISE ROOMS	50 GROSS
H-5 FABRICATION AND MANUFACTURING AREAS	200 GROSS
INDUSTRIAL AREAS	100 GROSS
INSTITUTIONAL AREAS	
INPATIENT TREATMENT AREAS	240 GROSS
OUTPATIENT AREAS	100 GROSS
SLEEPING AREAS	120 GROSS
KITCHENS, COMMERCIAL	200 GROSS
LIBRARY	
READING ROOM	50 NET
STACK AREA	100 GROSS
LOCKER ROOMS	50 GROSS
MERCANTILE	
AREAS ON OTHER FLOORS	60 GROSS
BASEMENT AND GRADE FLOOR LEVELS	30 GROSS
STORAGE, STOCK, SHIPPING AREAS	300 GROSS
PARKING GARAGES	200 GROSS
RESIDENTIAL	200 GROSS
SKATING RINKS, SWIMMING POOLS	
RINK AND POOL	50 GROSS
DECKS	15 GROSS
STAGES AND PLATFORMS	15 NET
WAREHOUSES	500 GROSS

PROJECT CODE INFORMATION

BUILDING	IBC 2009 AND (ALTERATIONS - LEVEL 2)
PLUMBING	IBC 2009
MECHANICAL	IBC 2009
ELECTRICAL	IBC 2009
FIRE	IBC 2009
ENERGY	IBC 2009
ACCESSIBILITY	TEXAS ACCESSIBILITY STANDARDS, 2012
OTHER	AMERICAN WITH DISABILITIES ACT GUIDELINES, 1990

BUILDING AREA	
GROSS SQUARE FOOTAGE	4764 SF
NET SQUARE FOOTAGE	4568 SF
OCCUPANCY	S-1
CONSTRUCTION	TYPE II-B EXISTING
ZONING	REFER TO CIVIL SHEETS FOR ZONING INFORMATION
PARKING INFORMATION	REFER TO CIVIL SHEETS FOR PARKING INFORMATION

REFERENCES – BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

REGISTERED ARCHITECT STATE OF TEXAS 2001

02/01/2016

SCALE
Hor. AS SHOWN
Ver. AS SHOWN

DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME

CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

SHEET TITLE

CODE INFORMATION

G-005

ALTA/ACSM LAND TITLE SURVEY

BEING LOTS 10, 11 AND A PORTION OF LOT 12,
BLOCK 2, GENERAL LEE INDUSTRIAL PARK
CITY OF EL PASO, EL PASO COUNTY, TEXAS
CONTAINING : 2.3300± Acres

NOTES:

1. BEARING BASIS AS PER PLAT OF GENERAL LEE INDUSTRIAL PARK RECORDED IN VOLUME 58, PAGE 47, PLAT RECORDS OF EL PASO COUNTY, TEXAS.

2. ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP COMMUNITY PANEL NO 480214-0037B, DATED OCTOBER 15, 1982, THIS PROPERTY IS IN FLOOD HAZARD ZONE C "AREAS OF MINIMAL FLOODING".

3. SET 1/2" REBAR AT ALL PROPERTY CORNERS UNLESS OTHERWISE NOTED.

4. A METES AND BOUNDS DESCRIPTION OF EVEN DATE ACCOMPANIES THIS SURVEY.

5. BUILDING SET BACKS PER M-1 ZONING

FRONT YARD 15 FEET
SIDE YARD 10 FEET
SIDE YARD (SIDE STREET) 10 FEET
REAR YARD 10 FEET

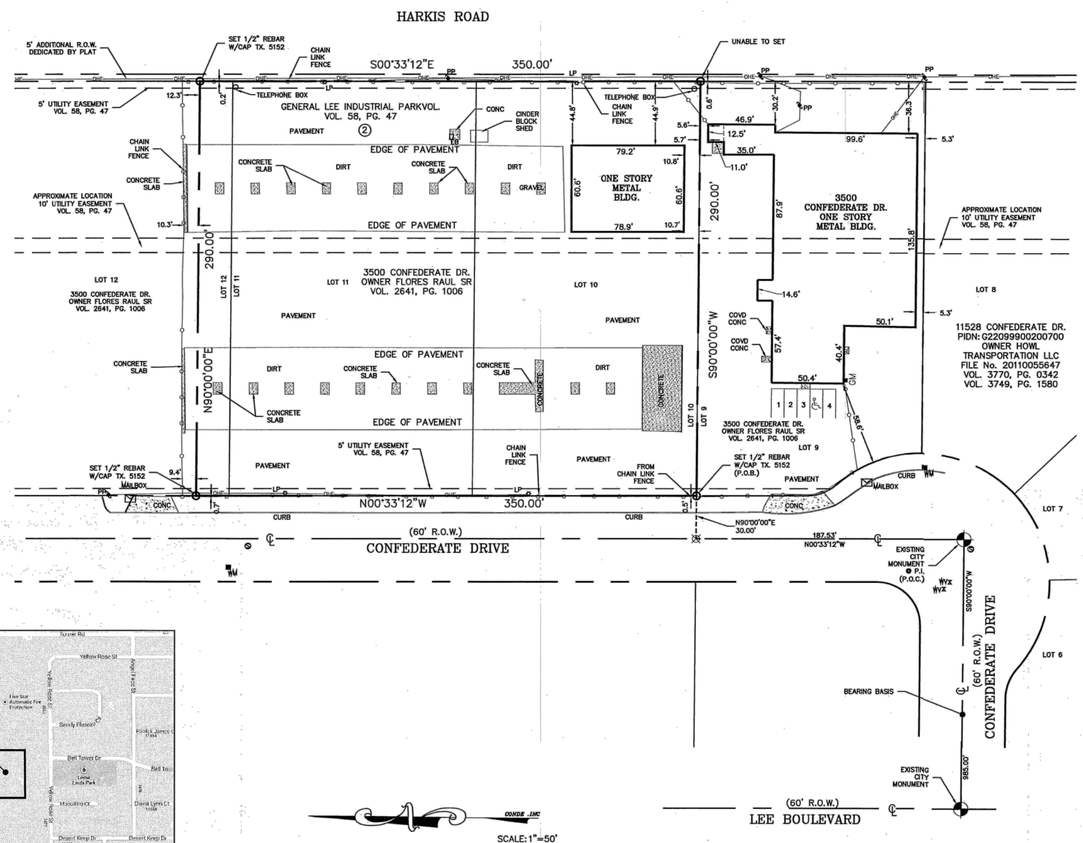
4. REFERENCE COMMITMENT FOR TITLE INSURANCE ISSUED BY NORTH AMERICAN INSURANCE COMPANY GF NO. 1341854, WITH EFFECTIVE DATE OF DECEMBER 1, 2013, SCHEDULE B ITEMS LISTED BELOW.

10a. ALL LEASES, GRANTS, EXCEPTIONS OR RESERVATIONS OF COAL, LIGNITE, OIL, GAS, AND OTHER MINERALS, TOGETHER WITH ALL RIGHTS, PRIVILEGES AND IMMUNITIES RELATING THERETO, APPEARING IN THE PUBLIC RECORDS WHETHER LISTED IN SCHEDULE B OR NOT. THERE MAY BE LEASES, GRANT, EXCEPTIONS OR RESERVATIONS OF MINERAL INTEREST THAT ARE NOT LISTED.

10b. EASEMENT FOR UTILITIES AS SHOWN ON THE PLAT, RECORDED IN BOOK 58, PAGE 47, PLAT RECORDS, EL PASO COUNTY, TEXAS, BEING FIVE FEET WIDE ALONG THE EASTERLY PROPERTY LINE OF ALL LOTS, FIVE FEET WIDE ALONG THE WESTERLY PROPERTY LINE OF LOTS 10 THROUGH 14; AND ALONG A PORTION OF THE WESTERLY PROPERTY LINE OF LOT 9; AND A TEN FOOT UTILITY EASEMENT RUNNING IN THE NORTHERLY-SOUTHERLY DIRECTION ACROSS ALL LOTS RECORDED.

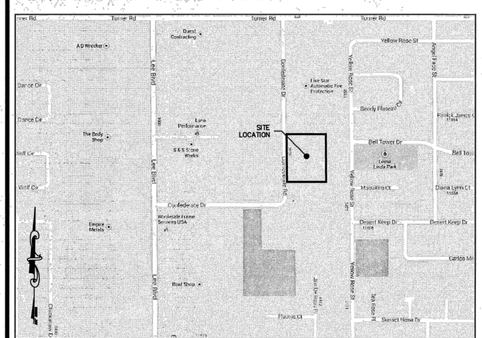
10c. CERTAIN LOTS IN THIS SUBDIVISION ARE SUBJECT TO ON-SITE PONDING AS CITED ON THE PLAT RECORDED IN BOOK 58, PAGE 47, PLAT RECORDS, EL PASO COUNTY, TEXAS.

10d. RIGHTS OF PARTIES IN POSSESSION (OWNER TITLE POLICY ONLY)



SYMBOL LEGEND

- FOUND CITY MONUMENT
- SET 1/2" REBAR W/CAP 5152
- CALCULATED POINT (NOT SET)
- POWER POLE
- TELEPHONE BOX
- GAS METER
- AIR CONDITIONER
- ELECTRIC PULL BOX
- WATER VALVE
- WATER METER
- SANITARY SEWER
- MAIL BOX
- = CHAIN LINK FENCE
- = OVER HEAD ELECTRIC



UPDATED & REVISED 1-8-14 ADDED TITLE COMMITMENTS SCHEDULE B ITEMS.

UPDATE AND REVISED: 9-10-13 JOB No. 713-06

CONDE INC.
ENGINEERING/ PLANNING/ SURVEYING/ CADD
6080 SURETY DRIVE-SUITE 100-EL PASO, TEXAS 79905
PHONE (915) 592-0283 FAX (915) 592-0286

©COPYRIGHT 2014/CONDE INC.
ALL RIGHTS RESERVED

STATE OF TEXAS REGISTERED RONALD ROBERT CONDE 5152 PROFESSIONAL LAND SURVEYOR

This is to certify that this plat and the survey on which it is based were made in accordance with the 2011 Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys," jointly established and adopted by ALTA and , NSPS, and includes Items 1, 2, 3, 4, 6(a), 6(b), 7(a), 8, 9, 10, 11(b) and 20 of Table A thereof. The field work was completed on September 10, 2013

Ron R. Conde
Registered Professional Land Surveyor
Texas License No. 5152

DRAWN BY: F.R. FIELD: D.G. DATE: 11-8-12 JOB # NO. 1112-06 CADD FILE: S:\Survey\projects\E\GENERAL LEE INDUSTRIAL PARK\LDD\dwg\3500 CONFEDERATE.dwg

REFERENCES - BENCH MARKS
BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

SCALE:
Hor. AS SHOWN
Ver. AS SHOWN

DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

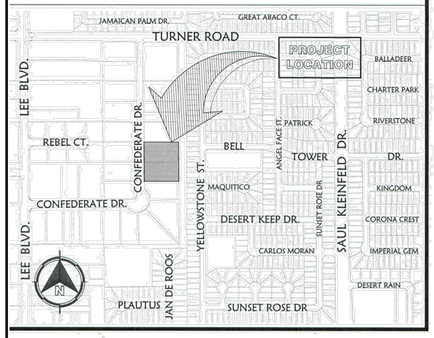
PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

SHEET TITLE
PLAT

C-100

VICINITY MAP SCALE: 1"=600'



UTILITIES & AGENCIES

WATER: EL PASO WATER UTILITIES 1154 HARKIS BLVD. EL PASO, TX. 79925 (915) 594-5785 TELEPHONE: SOUTHWESTERN BELL 11200 PELICANO EL PASO, TX. 79935 (800) 286-8313 REPAIR BUREAU (915) 595-5306 ROBERT CORTEZ	CABLE VISION: PARADISE CABLE CO. 701 D. AIRPORT RD. EL PASO, TX. 79906 (915) 772-1123 RAYMOND MENDOZA ELECTRIC: EL PASO ELECTRIC CO. 501 W. SAN ANTONIO ST. EL PASO, TX. 79902 (915) 543-5271 MIKE RAMOS (DISTRIBUTION) TELEPHONE: VERIZON 9010 VISCOUNT EL PASO, TX. 79926 (915) 593-7606	FIBER OPTICS: U.S. SPRINT 151 N. BOONE ST. EL PASO, TX. 79905 (915) 534-7910 (800) 521-0575 RICK DERAGISCH RAILROAD: UNION PACIFIC: RAILROAD ENGINEERING DEPARTMENT 1400 E. MONTANA ST. EL PASO, TX. 79901 (915) 534-3722 (915) 534-3711 (915) 796-7572 (PAGER) PETE CHRISTENSEN	COUNTY ROADS & BRIDGES: COUNTY ROADS & BRIDGES 500 E. SAN ANTONIO ST. RM. 401 EL PASO, TX. 79901 (915) 546-2014 ROBERT RIVERA, P.E. HIGH PRESSURE GAS: EL PASO NATURAL GAS 12600 McCOMBS EL PASO, TX. 79934 (915) 822-7369 DAVID F. REDMAN	FIBER OPTICS: AT&T P.O. BOX 1450 EL PASO, TX. 79949 (915) 852-3786 NANCY GUERRERO CITY STREETS: STREET DEPARTMENT STREETS, SIGNS & SIGNALS 7960 SAN PAULO DRIVE EPASO, TX. 79907 (915) 621-6750 GERALD TUCEL	GENERAL UTILITIES: TEXAS EXCAVATION SAFETY SERVICE 11864 GREENVILLE AVE. DALLAS, TX. 75243 (800) 344-8377 RESIDENTIAL GAS: TEXAS GAS SERVICE 4700 POLLARD ST. EL PASO, TX. 79930 (915) 562-8411 DRAINS & LATERALS: EL PASO COUNTY WATER IMPROVEMENTS DISTRICT NO. 1 294 CANDELARIA ST. EL PASO, TX. 79907 (915) 859-4186 JESUS REYES

STOP!
CALL BEFORE YOU DIG
TEXAS ONE CALL SYSTEM
1-800-245-4545
(@ least 48 hours prior to digging)

SUPPLEMENTAL NOTES

1. BASIS OF BEARING IS THE MONUMENTED CENTERLINE OF CONFEDERATE DRIVE (60.00' R.O.W.) AS SHOWN ON THE SUBDIVISION PLAT FOR GENERAL LEE INDUSTRIAL PARK. (AS SHOWN HEREON)

2. ELEVATIONS AND CONTOURS SHOWN ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (N.A.V.D. 88) DETERMINED THROUGH G.P.S. OBSERVATION AT A NATIONAL GEODETIC SURVEY (N.G.S.) MONUMENT "SHERMAN RM 4" (P.I.D. CE0402) LOCATED (7.90 MI) EASTERLY ALONG U.S. HIGHWAYS 62 AND 180 FROM THE JUNCTION OF INTERSTATE HIGHWAY 10 IN EL PASO, THENCE (0.25 MI) SOUTHERLY ALONG LEE BOULEVARD (351.0 FT) SOUTH OF THE EXTENDED CENTER OF ESPER DRIVE, (28.9 FT) EAST OF AND LEVEL WITH THE BOULEVARD CENTERLINE, (3.0 FT) NORTH OF A UTILITY POLE, (2.6 FT) SOUTH OF A WITNESS POST. ELEVATION = 4015.39' (N.A.V.D.88).

3. SUBJECT PROPERTY IS LOCATED IN ZONE "C" (AREAS OF MINIMAL FLOODING) AS DETAILED ON CITY OF EL PASO, EL PASO COUNTY, TEXAS FLOOD INSURANCE RATE MAP PANEL NO. 480214 0037B, DATED OCTOBER 15, 1982.

4. SUBJECT PROPERTY IS ZONED "M-1" (LIGHT MANUFACTURING DISTRICT) AS DESIGNATED AT THE CITY OF EL PASO PLANNING DIVISION WEBSITE http://gis.elpasotexas.gov/dsd/index.html. THE MAXIMUM HEIGHT ALLOWED IN THIS ZONE IS 60 FEET.

SETBACKS FOR ZONE "M-1":

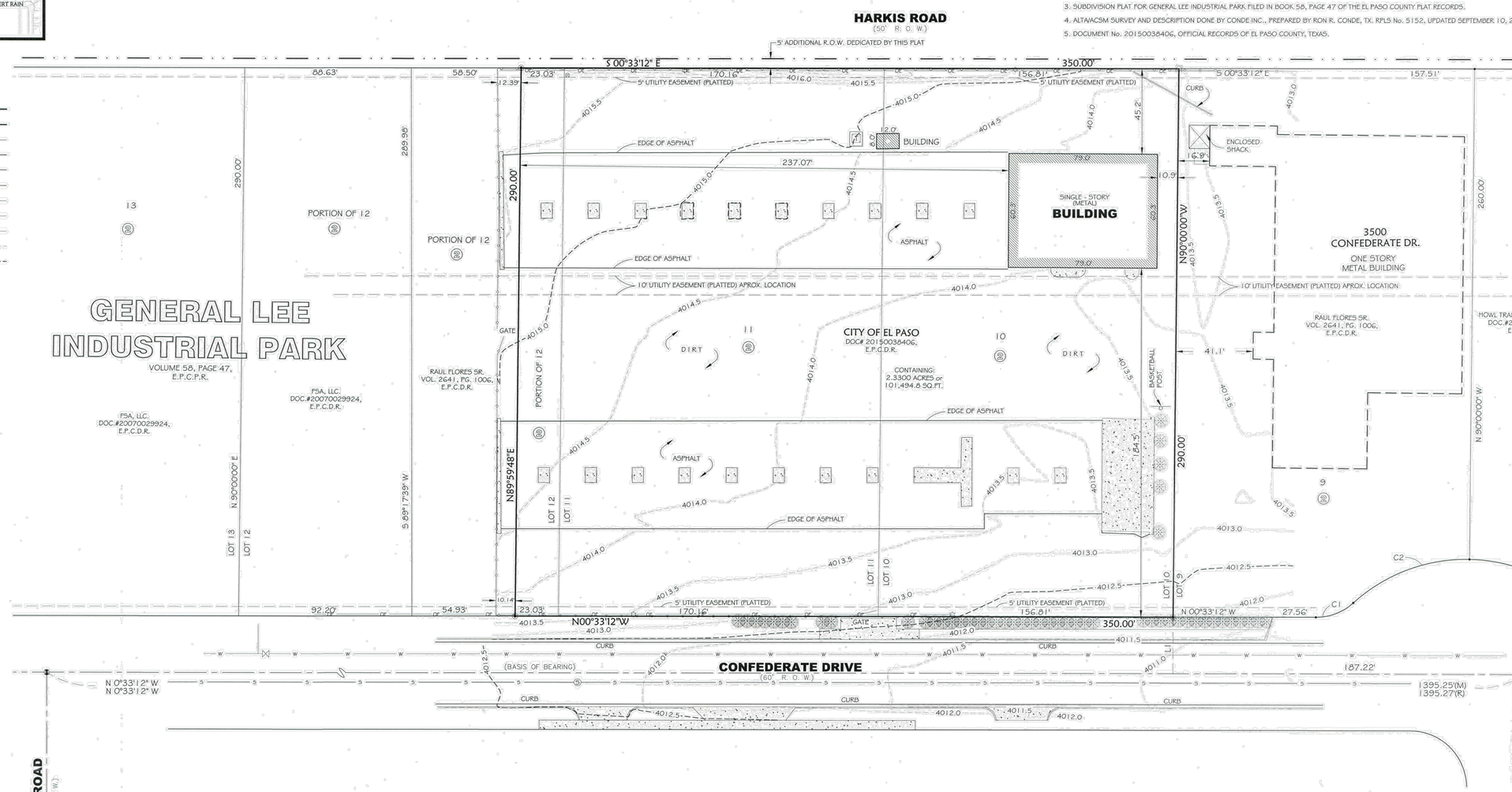
FRONT:	15'
REAR:	10'
SIDE:	10' WHEN ABUTTING A RESIDENTIAL OR APARTMENT DISTRICT
SIDE STREET:	10'

REFERENCE DOCUMENTS

1. NO TITLE COMMITMENT WAS USED FOR THIS SURVEY.
2. UTILITY PLANS PROVIDED BY THE RESPECTIVE UTILITY COMPANIES AS LISTED IN THE UTILITY BOX LEFT.
3. SUBDIVISION PLAT FOR GENERAL LEE INDUSTRIAL PARK FILED IN BOOK 58, PAGE 47 OF THE EL PASO COUNTY PLAT RECORDS.
4. ALTA/ACSM SURVEY AND DESCRIPTION DONE BY CONDE INC., PREPARED BY RON R. CONDE, TX. RPLS No. 5152, UPDATED SEPTEMBER 10, 2015
5. DOCUMENT No. 20150038406, OFFICIAL RECORDS OF EL PASO COUNTY, TEXAS.

LEGEND

PROJECT BOUNDARY	
ADDITIONAL BOUNDARY LINE	
LOT LINE	
RIGHT-OF-WAY LINE	
CENTERLINE OF RIGHT-OF-WAY LINE	
SANITARY SEWER LINE	S
WATER LINE	W
OVERHEAD ELECTRIC LINE	OE
CHAIN LINK FENCE	
0.5' CONTOUR INTERVAL	4014.5
2.5' CONTOUR INTERVAL	4015.0
SANITARY SEWER MANHOLE	S
WATER VALVE	W
TELEPHONE PEDESTAL	
ELECTRIC TRANSFORMER	T
LIGHT POLE	
TREES VARIOUS	
CONCRETE AREA	
EXISTING BUILDING	
FOUND CITY MONUMENT	
FOUND 1/2" REBAR W/ SURVEY CAP NO. "TX 5152"	
FOUND 1" BY 2" GUARD STAKE	
LOT NUMBER	10
BLOCK NUMBER	20
EL PASO COUNTY PLAT RECORDS	E.P.C.P.R.
EL PASO COUNTY DEED RECORDS	E.P.C.D.R.



LINE TABLE		
LINE	LENGTH	BEARING
L1	30.00'	N89°26'48"E

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
C1	21.58'	30.00'	41°24'25"	21.21'	S21°32'01"E
C2	65.92'	90.00'	41°57'47"	64.45'	S22°37'00"E

CERTIFICATION;

I HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN THE STATE OF TEXAS; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

Isaac Camacho 11-06-2015
ISAAC CAMACHO, TX. R.P.L.S. NO. 5337

STATE OF TEXAS REGISTERED ISAAC CAMACHO 5337 PROFESSIONAL LAND SURVEYOR

DRAWN BY: J.R.	BOUNDARY & TOPOGRAPHIC
APPROVED BY: I.C.	LOTS 10, 11 AND A PORTION OF LOT 12, GENERAL LEE INDUSTRIAL PARK, CITY OF EL PASO, EL PASO COUNTY, TE
SCALE: 1"=30'	
DATE: 11-04-2015	
JOB NO. 06315-024	
REVISION:	DATE:

BROCK & BUSTILLOS INC.
CONSULTING CIVIL ENGINEERS
LAND SURVEYORS
TBPE REG. NO. F-737

REFERENCES - BENCH MARKS
BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

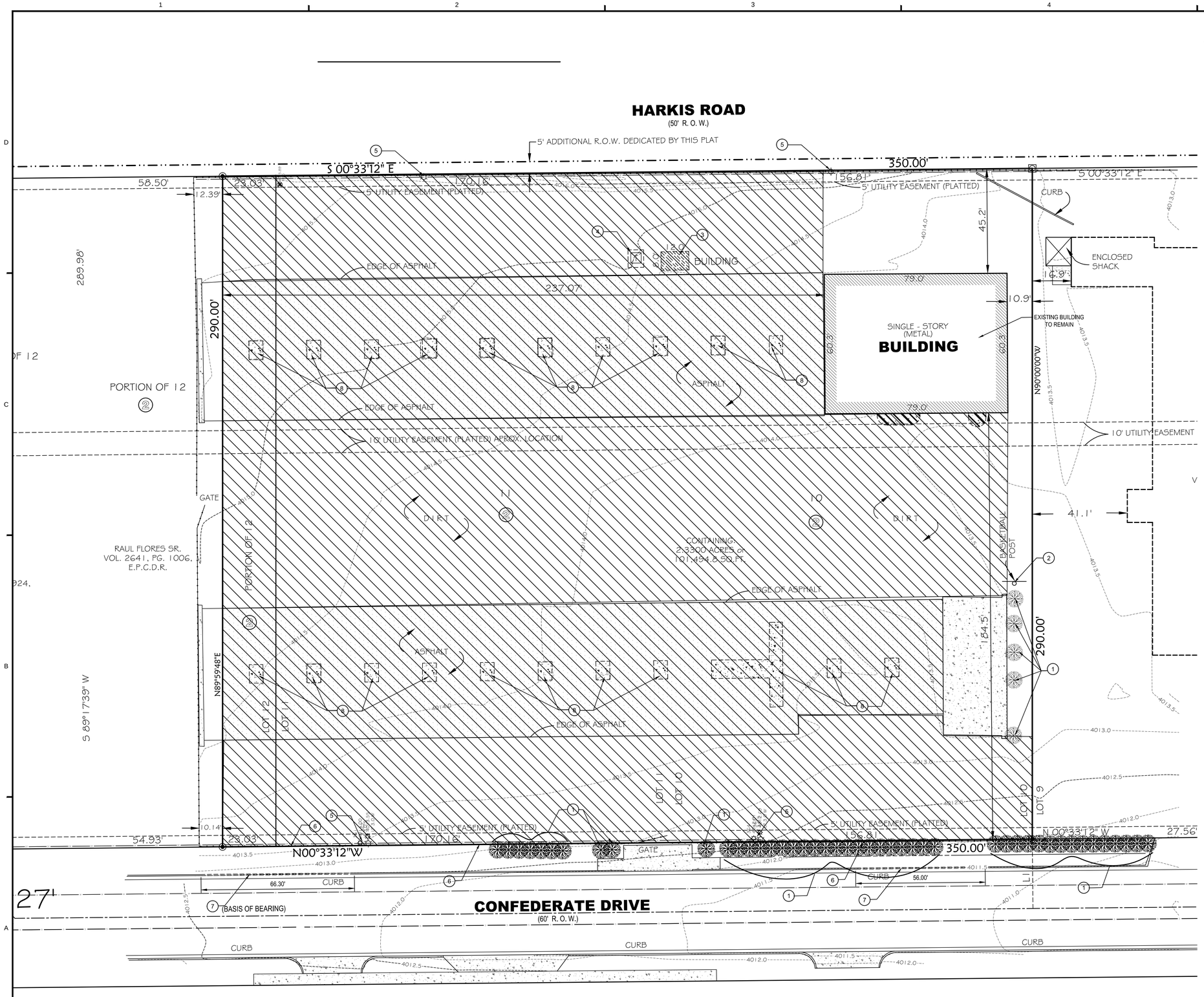
SCALE
Hor. AS SHOWN
Ver. AS SHOWN
DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

SHEET TITLE
SURVEY

C-101



KEYED NOTES

AS INDICATED BY: (#)

1. EXISTING TREES TO BE REMOVED AND PROPERLY DISPOSED OF.
2. BASKETBALL POST TO BE REMOVED AND PROPERLY DISPOSED OF.
3. EXISTING BUILDING TO BE REMOVED. CONTRACTOR TO COORDINATE WITH OWNER. ELECTRICAL EQUIPMENT TO BE RETURNED TO THE OWNER.
4. EXISTING TRANSFORMER TO BE REMOVED BY EL PASO ELECTRIC. ELECTRICAL BOX DISPOSAL TO BE COORDINATE WITH CONTRACTOR.
5. EXISTING LIGHT POLE AND LIGHT TO BE REMOVED BY EL PASO ELECTRIC.
6. THE FENCE ALONG CONFEDERATE WILL BE REMOVED IF THE ALTERNATE FOR WROUGHT IRON FENCE IS CHOSEN.
7. DEMO EXISTING CURB FOR NEW DRIVEWAY ENTRANCE. SEE SHEET C-103.
8. CONCRETE SLAB

LEGEND

- LIGHT POLE
- TREE
- ROAD CENTERLINE
- PROPERTY LINE
- EASEMENT
- CURB AND GUTTER
- EXISTING BUILDING
- CONCRETE

DEMOLITION LEGEND

- CONCRETE TO BE DEMO'D
- ASPHALT PAVING BE DEMO'D

GENERAL NOTES

1. COORDINATE DEMOLITION PHASING WITH CIVIL, LANDSCAPE, STRUCTURAL, ARCHITECTURE, MECHANICAL,PLUMBING AND ELECTRICAL DISCIPLINES
2. CONTRACTOR SHALL PERFORM DEMOLITION TO ALLOW EXISTING BUILDING TO REMAIN IN SERVICE.
3. ALL TREES TO REMAIN AND PROTECTED DURING CONSTRUCTION UNLESS OTHERWISE NOTED.
4. CONTRACTOR SHALL HAUL AND PROPERLY DISPOSE OF ALL MATERIAL REMOVED/DEMOLISHED FROM THE SITE
5. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MISCELLANEOUS REPAIRS DUE TO DEMOLITION ACTIVITIES
6. ALL STREET SIGNS WILL REMAIN UNLESS OTHERWISE NOTED
7. CONTRACTOR SHALL PERFORM THE DEMOLITION WORK IN SUCH A MANNER SO AS TO MINIMIZE DISRUPTION TO THE OPERATIONS OF THE EXISTING BUSINESSES.
8. CONTRACTOR SHALL COORDINATE WITH APPROPRIATE UTILITY OWNER OR THE CITY OF EL PASO PRIOR TO REMOVING, RELOCATING, CONNECTING TO, OR DISCONNECTING ANY UTILITIES
9. REMOVE AND DISPOSE OF ALL EXISTING IRRIGATION EQUIPMENT.
10. ALL POWER POLES TO BE PROTECTED DURING DEMOLITION AND CONSTRUCTION AND TO REMAIN UNLESS OTHERWISE NOTED
11. ALL TREES ADJACENT TO THE PROPERTY AND ALONG CONFEDERATE DRIVE WILL BE REMOVED. SEE KEYED NOTE 1.

REFERENCES - BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL SMITH & COOPER, INC. STATE OF TEXAS NICHOLAS N. YBARRA 111156 LICENSED PROFESSIONAL ENGINEER 02/01/16

SCALE:
Hor. AS SHOWN
Ver. AS SHOWN

DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME

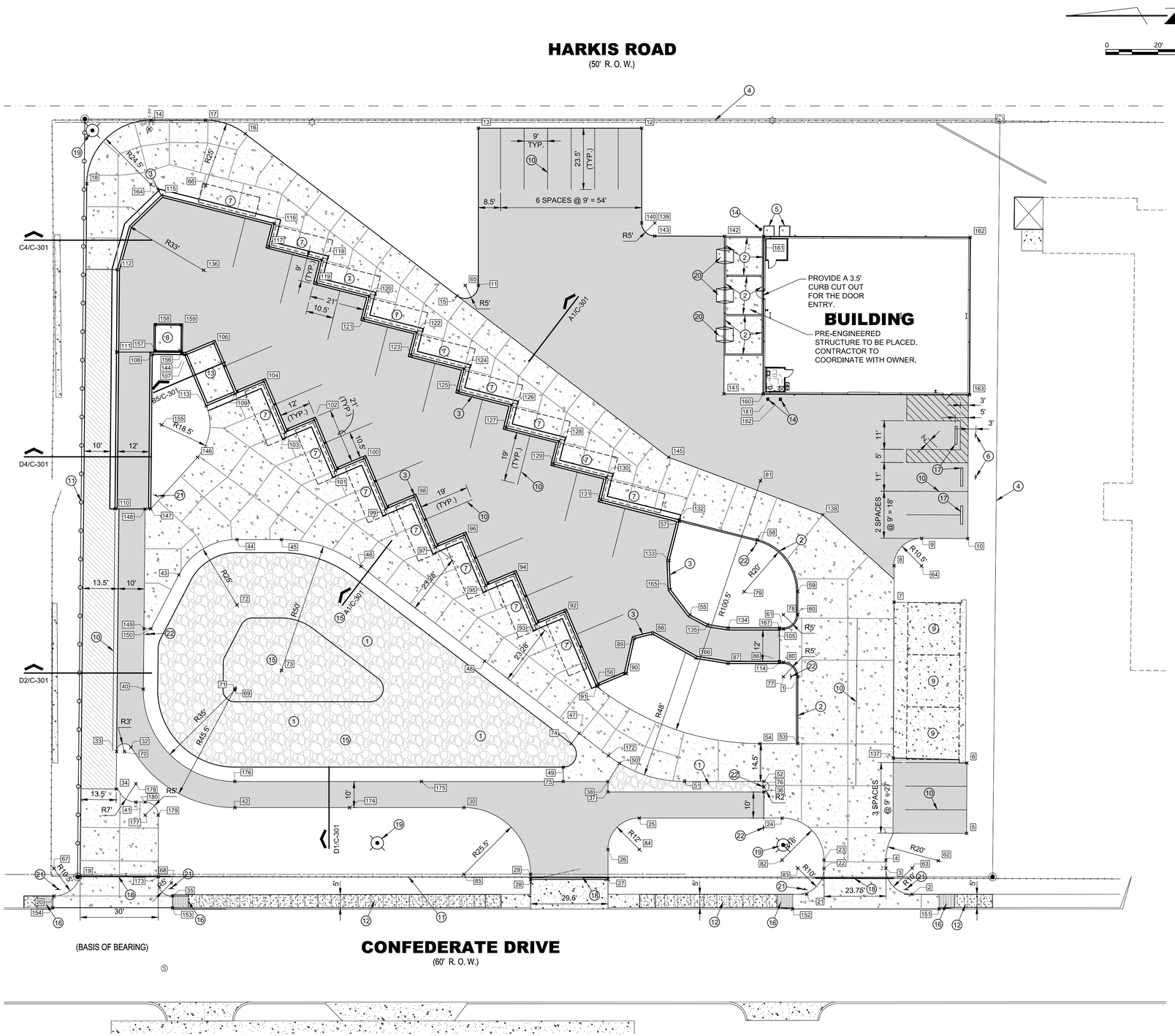
CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

SHEET TITLE

DEMOLITION

C-102



NOTES

1. THE EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION SUPPLIED BY OTHERS AND SURFACE LOCATIONS SHOWN. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY, BOTH HORIZONTALLY AND VERTICALLY, THE LOCATIONS OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION, TO MAKE ALL NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED, AND TO NOTIFY THE ENGINEER PROMPTLY OF ALL CONFLICTS OF THE WORK WITH EXISTING FACILITIES.
2. ALL STRIPING DIMENSIONS ARE MEASURED FROM CENTER OF STRIPE OR TO BACK OF CURB UNLESS OTHERWISE NOTED
3. ALL STRIPING IS TO BE 4" WIDE WHITE STRIPE UNLESS OTHERWISE NOTED.
4. ALL DIMENSIONS ARE MEASURED TO BACK OF CURB UNLESS OTHERWISE NOTED.
5. SCORE CONCRETE SIDEWALK IN CONFORMANCE WITH SPECIFICATIONS AND DETAIL SHEET C-501
6. JOINT SPACING IS TO BE LESS THAN 30 TIMES THE CONCRETE SLAB THICKNESS IN FEET. E.G. 4"=0.33*30=10'
7. CONCRETE PANELS SHOULD BE SQUARE OR NEARLY SQUARE. THE LENGTH SHOULD NOT EXCEED 1.5 TIMES THE WIDTH. L-SHAPED PANELS SHOULD BE AVOIDED
8. THE JOINTING PLAN IS ONLY A RECOMMENDATION AND NOT A FINAL LAYOUT.
9. FULL-DEPTH SAW CUT ALL EXISTING PAVEMENT SECTIONS WHERE PROPOSED PAVEMENT IS TO TIE INTO EXISTING PAVEMENT.
10. MAINTAIN A MINIMUM 3 FOOT WIDTH ON ALL SIDEWALKS AND PATHS FOR HANDICAP ACCESSIBILITY.
11. METAL GUIDES TO BE INSTALLED IN ALL ROLL-OFF AREA BAYS. 12" GUIDES TO BE PLACED ALONG THE SHORT END OF THE ROLL-OFF BAY AND 8" GUIDES ALONG THE LONG END OF THE ROLL OFF BAY. SEE SHEET S-501 AND DETAIL B1/C-503. INSTALLATION TO BE COORDINATED WITH OWNER.
12. ALTERNATE #1 TO BE 6' WROUGHT IRON FENCE ALONG CONFEDERATE DRIVE.
13. 6"x2" WALL CUT OUT ALONG THE WESTERN WALL. CUT OUTS TO BE AT THE DOWNSTREAM CORNER AND MIDDLE OF THE WALL. SEE DETAIL A3/S-502 AND DETAIL B1/C-503.
14. SEE SHEET C-301 FOR CROSS-SECTIONS
15. COORDINATE ANY ADDITIONAL SIGNAGE WITH OWNER.

KEYED NOTES

1. 6-INCH ROCK RIP RAP WITH FABRIC, SEE DETAIL C1\C-501.
2. 6" CONCRETE STAND-UP CURB, SEE DETAIL C2\C-501.
3. 10" CONCRETE RETAINING WALL, SEE DETAIL A3\S-501.
4. PLACE SCREENING ON EXISTING FENCE
5. 6" THICK CONCRETE PAD FOR CONDENSER AND TRANSFORMER. COORDINATE WITH ELECTRICAL, MECHANICAL AND UTILITY.
6. ACCESSIBLE SPACE SIGN, SEE DETAIL C5\C-501
7. ROLL-OFF AREA
8. 10'x10' BUILDING/GATE HOUSE, SEE DETAIL A1/S-501
9. RECYCLE BIN AREA
10. 4" WIDE WHITE STRIPE
11. 6' CHAIN LINK FENCING WITH SCREENING AND 3-STRAND BARB WIRE, SEE DETAIL A1\C-502.
12. 4" CONCRETE SIDEWALK, SEE DETAIL B4\C-501.
13. COMPACTOR
14. BOLLARD, SEE DETAIL C3/C-501
15. PONDING AREA
16. ACCESSIBLE RAMP
17. CONCRETE WHEEL STOP, SEE DETAIL B3\C-501.
18. SLIDE GATE, SEE DETAIL B3\C-502.
19. LIGHT POLE, REFER TO ELECTRICAL PLANS
20. 6" RAMP ON BOTH SIDES OF CURB
21. METAL SIGN "DO NOT ENTER", SEE DETAIL D3/C-502
22. METAL SIGN "STOP", SEE DETAIL D3/C-502

LEGEND

- PROPERTY LINE
- FENCE, SEE DETAIL A1\C-502
- 24" CURB AND GUTTER SEE, DETAIL C1\C-501
- SIGN
- CONTROL POINT AND NUMBER, SEE SHEET C-601
- CONCRETE PAVING, SEE DETAIL D3\C-501
- CONCRETE SIDEWALK, SEE DETAIL B4\C-501.
- LIGHT DUTY ASPHALT, SEE DETAIL D2\C-501
- HEAVY DUTY ASPHALT, SEE DETAIL D1\C-501

SITE DATA – PARKING	
STANDARD SPACES	12
ACCESSIBLE SPACES	2
TOTAL	14

REFERENCES – BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL, SMITH & COOPER, INC. STATE OF TEXAS NICHOLAS N. YBARRA 111156 LICENSED PROFESSIONAL ENGINEER
02/01/16

SCALE
Hor. AS SHOWN
Ver. AS SHOWN

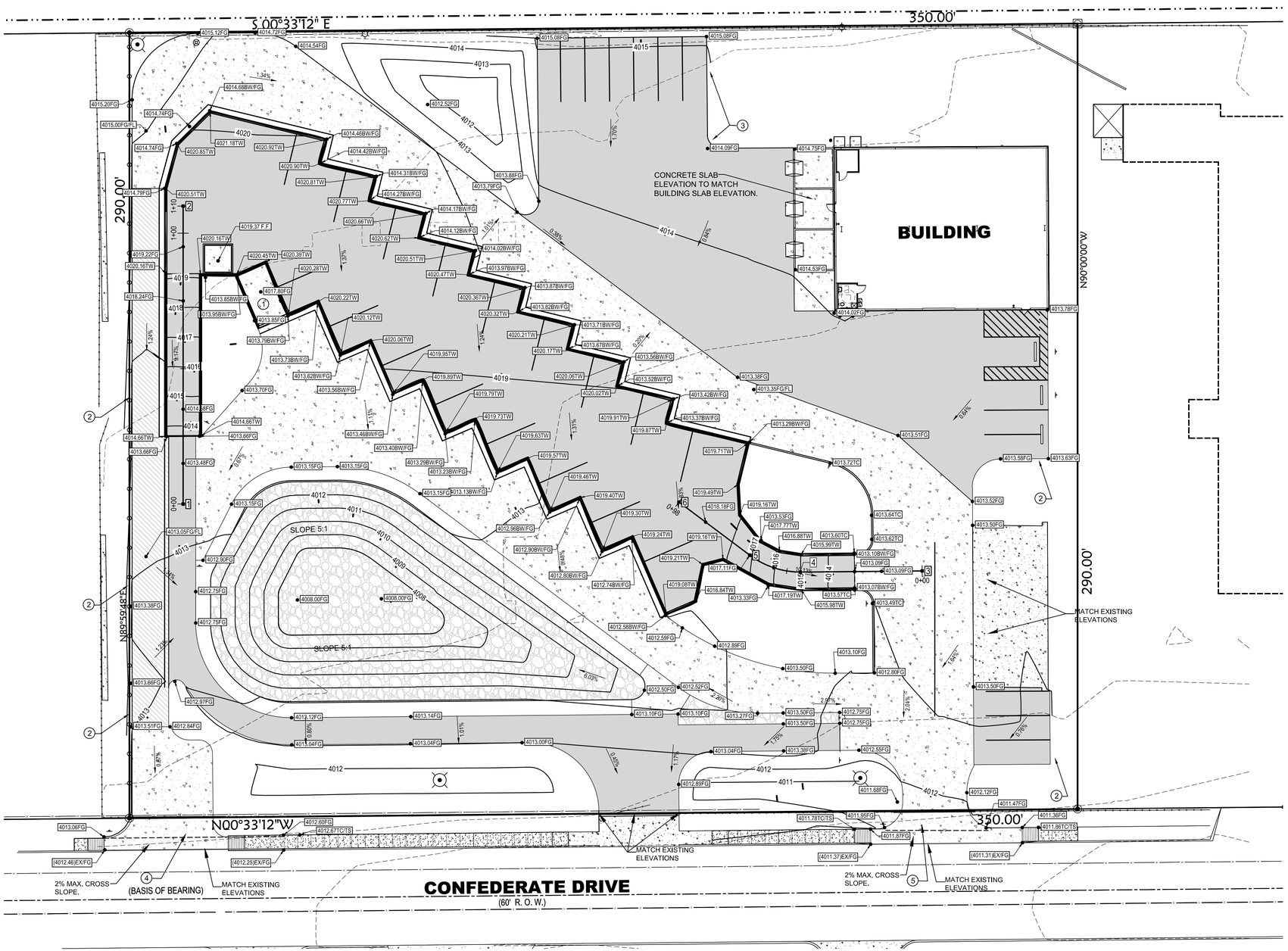
DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

SHEET TITLE
SITE PLAN

C-103



KEYED NOTES

1. COMPACTOR SLAB 45" ABOVE FINISHED GROUND
2. GRADING AT 3:1 TO EXISTING GROUND
3. GRADING AT 10:1 TO EXISTING GROUND
4. NORTH DRIVEWAY ENTRANCE, SEE DETAIL C1/C-503
3. SOUTH DRIVEWAY ENTRANCE, SEE DETAIL B3/C-503

HORZ. 0 20' 40'

VERT. 0 5' 10'

GENERAL HMAC NOTES:

1. THE FLEXIBLE BASE COURSE SHALL MEET THE REQUIREMENTS AS SET FORTH WITHIN SECTION CRUSHED AGGREGATE BASE COURSE OF THE GEOTECHNICAL REPORT.
2. THE TOP SURFACE COURSE SHALL MEET THE REQUIREMENTS FOR GRADE "D" FOR THE TYPICAL SECTION AS SET FORTH WITHIN SECTION PLANT MIX BITUMINOUS PAVEMENTS OF THE TECHNICAL SPECIFICATIONS.
3. SUBGRADE TO BE COMPACTED TO 95% MAXIMUM DRY DENSITY AT ±3% OF OPTIMUM MOISTURE AS PER ASTM D-1557.

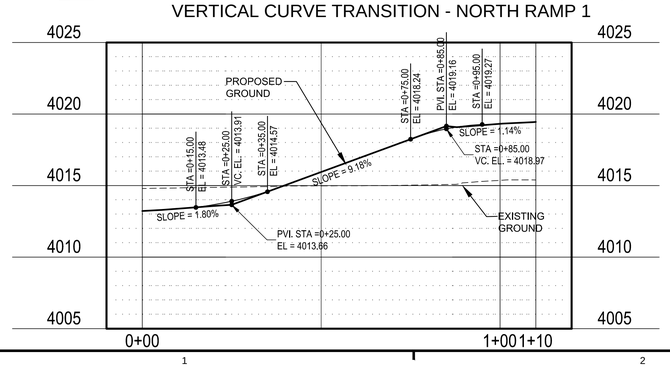
NOTES

1. MAXIMUM 2% SLOPE IN HANDICAP ACCESSIBLE AREAS IN ALL DIRECTIONS
2. RAMPS ACCESSING THE ROLL-OFF DUMPSTERS NOT TO EXCEED 10% SLOPE.
3. MAXIMUM 2% CROSS SLOPE FOR HANDICAP ACCESSIBLE SIDEWALKS
4. A MINIMUM OF 0.25% SLOPE FOR CONCRETE SECTIONS AND 0.50% FOR ASPHALT SECTIONS UNLESS OTHERWISE SPECIFIED ON PLANS.
5. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND GRADES, NEW OR EXISTING PRIOR TO CONSTRUCTION, NOTIFY THE ENGINEER OF ANY DISCREPANCIES WITH EXISTING OR NEW CONDIT IONS. THE CONTRACTOR SHALL EMPLOY A LICENSED PUBLIC SURVEYOR TO SET ALL GRADES, SPOT ELEVATIONS, FLOW LINES, ETC.
6. THE FLEXIBLE BASE COURSE SHALL MEET THE REQUIREMENTS AS SET FORTH WITHIN SECTION CRUSHED AGGREGATE BASE COURSE OF THE GEOTECHNICAL REPORT.
7. THE TOP SURFACE COURSE SHALL MEET THE REQUIREMENTS FOR GRADE "D" FOR THE TYPICAL SECTION AS SET FORTH WITHIN SECTION PLANT MIX BITUMINOUS PAVEMENTS OF THE TECHNICAL SPECIFICATIONS.
8. SUBGRADE TO BE COMPACTED TO 95% MAXIMUM DRY DENSITY AT ±3% OF OPTIMUM MOISTURE AS PER ASTM D-1557.

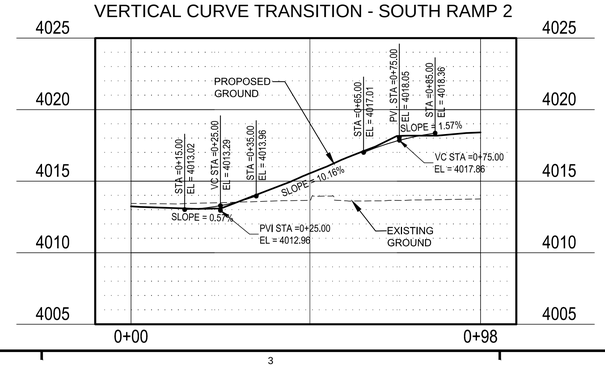
GRADING LEGEND

- 2420 — PROPOSED MAJOR CONTOUR ELEVATION
- {2777} — EXISTING CONTOUR
- GRADE BREAK
- RIDGE
- SWALE
- (2532.49 EX) EXISTING ELEVATION
- 2532.49 FG — NEW SPOT ELEVATION, TOP OF FINISHED GROUND
- 2532.49 TC — NEW SPOT ELEVATION, TOP OF CURB
- 2532.49 HP — NEW SPOT ELEVATION, HIGH POINT
- 2532.49 TS — NEW SPOT ELEVATION, TOP OF SIDEWALK
- 2532.49 TW — NEW SPOT ELEVATION, TOP OF WALL
- 2532.49 BW — NEW SPOT ELEVATION, BOTTOM OF WALL
- 1.50% — DIRECTION OF FLOW AND VALUE

VERTICAL CURVE TRANSITION - NORTH RAMP 1



VERTICAL CURVE TRANSITION - SOUTH RAMP 2



ALIGNMENT POINT TABLE			
POINT #	NORTHING	EASTING	DESCRIPTION
1	10666409.93	446677.97	BEGIN ALIGNMENT
2	10666409.93	446787.97	END ALIGNMENT
3	10666137.11	446653.28	BEGIN ALIGNMENT
4	10666182.14	446652.84	PC
5	10666200.70	446659.03	PT
6	10666226.90	446678.66	END ALIGNMENT

REFERENCES - BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL, SMITH & COOPER, INC. STATE OF TEXAS NICHOLAS N. YBARRA 111156 LICENSED PROFESSIONAL ENGINEER 02/01/16

SCALE
Hor. AS SHOWN
Ver. AS SHOWN

DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

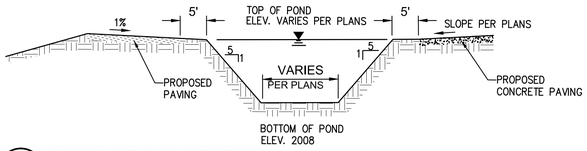
PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

SHEET TITLE

GRADING PLAN

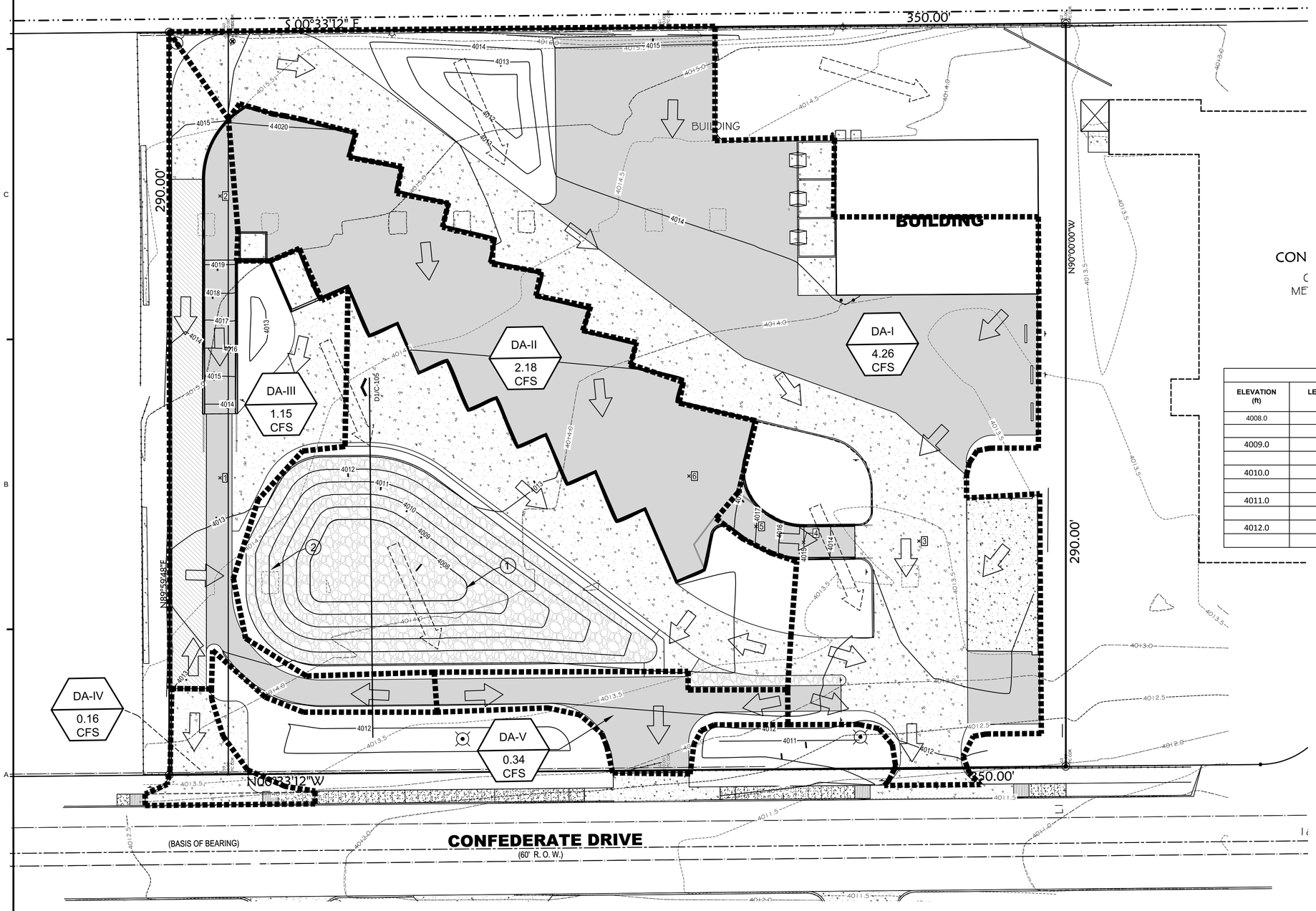
C-104



D1 POND CROSS SECTION
NTS

PROPOSED 100 YR DRAINAGE CALCULATIONS										
DRAINAGE AREA (DA) No.	Total Area (Ac.)	Impervious Area (Ac.)	Pervious Area (Ac.)	(I = b/(Tc+d)e Intensity (In/hr)	Time of Conc. (min.)	Post-Dev Impervious Coefficient	General Open Space	Weighted coefficient	Proposed Flow Q (cfs)	Volume (Acre-ft)
I	0.72	0.58	0.14	5.36	10	0.95	0.50	0.86	3.32	
II	0.92	0.69	0.24	5.36	10	0.95	0.50	0.84	4.14	0.26
III	0.23	0.23	0.00	5.36	10	0.95	0.50	0.95	1.15	0.07
IV	0.03	0.03	0.00	5.36	10	0.95	0.50	0.95	0.16	
V	0.07	0.07	0.00	5.36	10	0.95	0.50	0.95	0.34	
Total	1.97								**9.11**	**0.33**

EXISTING 100 YR DRAINAGE CALCULATIONS									
EXISTING DRAINAGE AREA (DA) No.	Total Area (Ac.)	Impervious Area (Ac.)	Pervious Area (Ac.)	(I = b/(Tc+d)e Intensity (In/hr)	Time of Conc. (min.)	Impervious Coefficient	General Open Space	Weighted coefficient	Proposed Flow Q (cfs)
I	1.97	1.97	0.00	5.36	10	0.95	0.5	0.95	10.01



LEGEND

- EXISTING CONTOURS (.5' INTERVAL)
- NEW CONTOURS (.5' INTERVAL)
- PROPOSED DRAINAGE FLOW
- EXISTING DRAINAGE FLOW
- DRAINAGE AREA

KEYED NOTES

KEYED NOTES SHOWN REFER TO THE CALCULATION TABLE NUMBERS ON THE BOTTOM OF THE PAGE.

DRAINAGE NOTES

1. PONDING AREAS NOT INCLUDED IN DRAINAGE AREA CALCULATIONS.

DRAINAGE SUMMARY

THE INTERNAL DRAINAGE ON SITE WAS ANALYZED USING THE RATIONAL METHOD AND THE CITY OF EL PASO COEFFICIENTS WERE USED ACCORDING TO THE CITY OF EL PASO DRAINAGE MANUAL.. THE SITE DRAINAGE IMPROVED THE RUNOFF TO CONFEDERATE. THE EXISTING RUNOFF WAS 7.89 CFS. THE ADDITION OF PONDING AREAS TO THE SITE REDUCED THE TOTAL RUNOFF TO 4.76 CFS. A REDUCTION OF 3.13 CFS.

BASIN CAPACITY CALCULATIONS						
ELEVATION (ft)	LENGTH (ft)	AREA (sf)	AVG AREA (sf)	VOLUME (cf)	VOLUME (acre-ft)	CUMMULATIVE VOLUME (acre-ft)
4008.0		1483				
	1.0		1,918.0	1,918.0	0.04	**0.04**
4009.0		2,353				
	1.0		2,867.0	2,867.0	0.07	**0.11**
4010.0		3381				
	1.0		3,973.5	3,973.5	0.09	**0.20**
4011.0		4566				
	1.0		5,237.0	5,237.0	0.12	**0.32**
4012.0		5908				
	1.0		5,908.0	5908	0.14	**0.46**

CONCRETE FLUME	
SEE KEYED NOTE 1	
ROUGHNESS COEFFICIENT	0.013
SLOPE (%)	**5.850**
NORMAL DEPTH	0.5
BOTTOM WIDTH	3
DISCHARGE (CFS)	**21.56**
FLOW AREA (FT2)	1.5
WETTED PERMETER (FT)	4
HYDRAULIC RADIUS	0.38
VELOCITY (FT/S)	14.38
FR. NUMBER	3.58

CONCRETE FLUME	
SEE KEYED NOTE 2	
ROUGHNESS COEFFICIENT	0.013
SLOPE (%)	**13.080**
NORMAL DEPTH	0.5
BOTTOM WIDTH	3
DISCHARGE (CFS)	**32.25**
FLOW AREA (FT2)	1.5
WETTED PERMETER (FT)	4
HYDRAULIC RADIUS	0.38
VELOCITY (FT/S)	21.5
FR. NUMBER	5.36

0 20' 40'

REFERENCES – BENCH MARKS
BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL, SMITH & COOPER, INC. STATE OF TEXAS NICHOLAS N. YBARRA 111156 LICENSED PROFESSIONAL ENGINEER 02/01/16

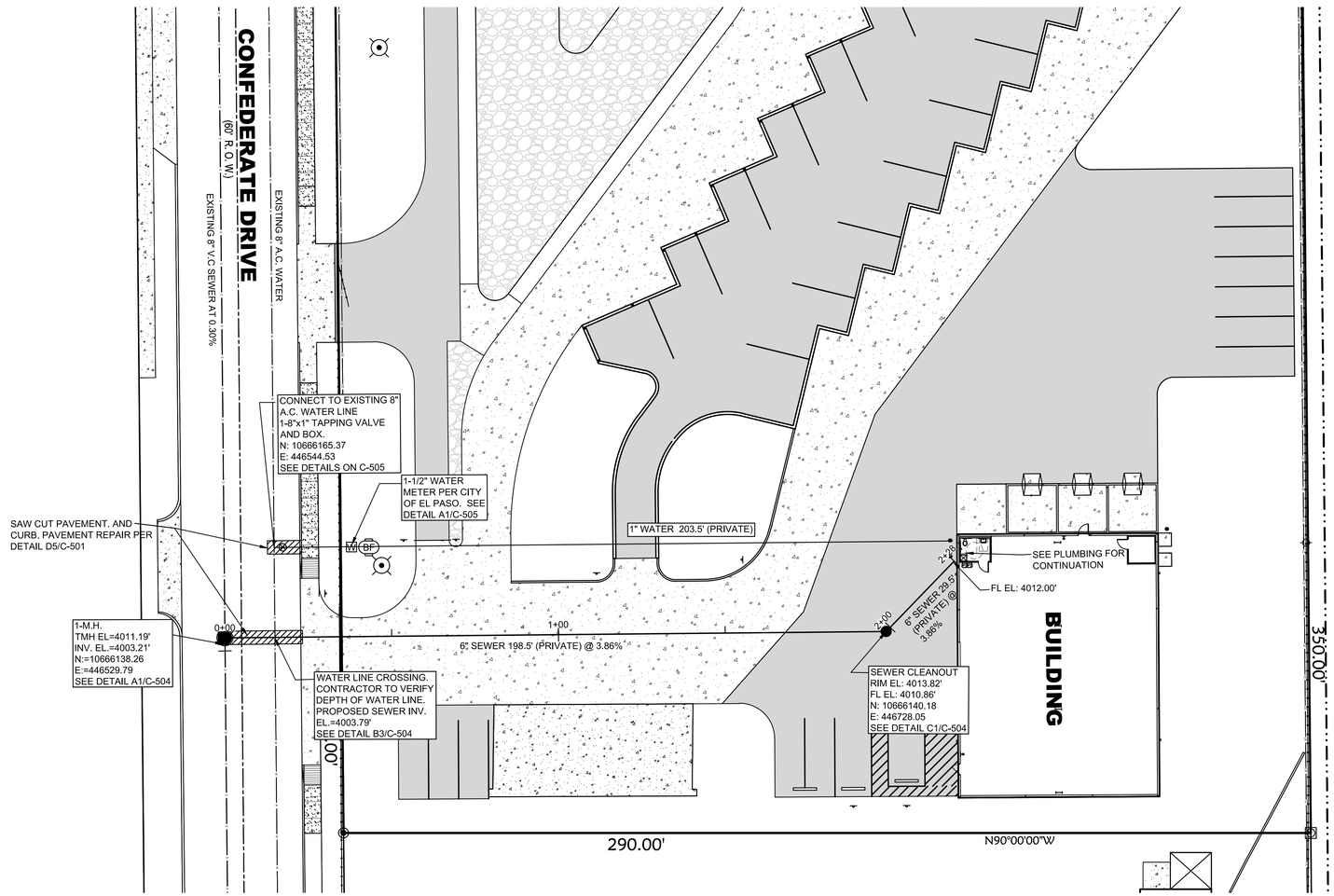
SCALE
Hor. AS SHOWN
Ver. AS SHOWN
DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

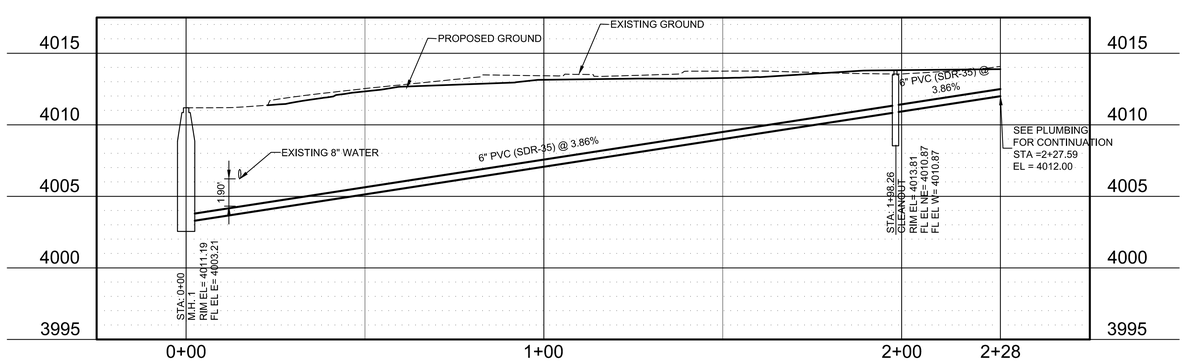
CITY OF EL PASO

SHEET TITLE
DRAINAGE PLAN

C-105



6" SEWER LINE PROFILE



NOTES

1. ALL UTILITIES MAY NOT BE SHOWN ON THE PLANS. LOCATION OF EXISTING UTILITIES DEPICTED ON THE PLANS ARE APPROXIMATE . IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL UTILITY LOCATIONS PRIOR TO CONSTRUCTION. UTILITIES DAMAGED BY THE CONTRACTOR DURING CONSTRUCTION SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT ALL PUBLIC UTILITIES IN THE CONSTRUCTION OF THIS PROJECT. ALL MANHOLES, CLEAN OUTS AND VALVE BOXES MUST BE ADJUSTED TO THE PROPER LINE AND GRADE BY THE CONTRACTOR PRIOR TO AND AFTER THE PLACING OF PERMANENT PAVING.
3. CONTRACTOR SHALL FIELD VERIFY SIZES AND DEPTHS OF ALL SANITARY SEWER LINES AND WATER LINES TO BE CONNECTED TO PRIOR TO CONSTRUCTION OF THE CONNECTING LINES. NOTIFY ENGINEER IMMEDIATELY IF CONFLICT EXISTS BETWEEN WHAT IS OBSERVED AND WHAT IS SHOWN IN THE PLANS.
4. EXISTING MANHOLES, CLEANOUTS, VALVE BOXES, METER BOXES, IN AFFECTED PAVED AREAS AND ARE NOT PLANNED TO BE RE-LOCATED FROM THE AFFECTED AREAS, SHALL BE RAISED/LOWERED TO MEET NEW FINISH GRADES.
5. ALL WATER LINES SHALL BE INSTALLED WITH A MINIMUM 4' COVER FROM FINISH GRADE TO TOP OF PIPE.
6. MAINTAIN MINIMUM SEPARATION DISTANCES BETWEEN ALL SANITARY SEWER AND POTABLE WATER LINES OUTSIDE OF BUILDINGS AS SPECIFIED.
7. ALL UTILITIES SHALL BE OPEN TRENCH UNLESS OTHERWISE NOTED.
8. ALL VALVE BOXES AND CLEANOUTS LOCATED IN PAVED AREAS TO BE HEAVY DUTY.
9. CONCRETE THRUST BLOCKING NOT SHOWN FOR CLARITY. FOR CONCRETE THRUST BLOCKING REQUIREMENTS SEE CITY OF EL PASO.
10. REFER TO M.E.P. DRAWINGS FOR INTERNAL ROUTING OF UTILITIES AND ENTRY AND EXIT LOCATIONS.
11. PAVEMENT REPAIRS SHOULD BE TO EXISTING OR BETTER WHEN CUTTING CONFEDERATE DRIVE FOR UTILITY CONNECTIONS. ANY CONCRETE FLATWORK OR CURBING CUT TO FACILITATE REPAIRS MUST BE REMOVED AND REPLACED TO THE NEAREST JOINT.

UTILITIES & AGENCIES

WATER
EL PASO WATER UTILITIES
1154 HAWKINS BLVD.
EL PASO, TX. 79925
(915) 594-5725

TELEPHONE
AT&T
1120D RELICANO
EL PASO, TX. 79935
(915) 594-5725
REPAIR BUREAU
(915) 595-6306
ROBERT CORTEZ

CABLE VISION
PARADCON CABLE CO.
7010 AIRPORT RD.
EL PASO, TX. 79906
(915) 772-4000
RAYMOND MENDOZA

ELECTRIC
EL PASO ELECTRIC CO.
501 W. SAN ANTONIO ST.
EL PASO, TX. 79902
(915) 543-5711
MIKE RANCE
(DISTRIBUTION)

TELEPHONE
VERIZON
9010 VIBCOUNT
EL PASO, TX. 79926
(915) 593-7936

FIBER OPTICS
U.S. SPRINT
101 N. BOONE ST.
EL PASO, TX. 79905
(915) 521-2000
(800) 521-0070
RICK DERAGISCH

RAIL ROAD
UNION PACIFIC RAILROAD
(CITY LANDSCAPING DEPARTMENT)
(2)1 LANZERY ST.
EL PASO, TX. 79901
(915) 534-3722
(915) 534-2711
(915) 790-7572
(PAGER)
PETE CHRISTENSEN

COUNTY ROADS & BRIDGES
COUNTY ROADS & BRIDGES
500 E. SAN ANTONIO ST.,
Rm. 401
EL PASO, TX. 79901
(915) 546-2174
ROBERT RIVERA, P.E.

HIGH PRESSURE GAS
EL PASO NATURAL GAS CO.
12600 McCOMBS
EL PASO, TX. 79934
(915) 532-7361
DAVID F. REDMAN

FIBER OPTICS
A.T.&T.
P.O. BOX 1650
EL PASO, TX. 79949
(915) 772-5000
NANCY GUERRERO

CITY STREETS
STREET DEPARTMENT
STREETS, SIGNS & SIGNALS
7969 SAN PAOLO
P.O. BOX
EL PASO, TX. 79907
(915) 621-6750
GERALD TUCEL

GENERAL UTILITIES
TEXAS EXCAVATION SAFETY SERVICE
11864 GREENVILLE AVE.
DALLAS, TX. 75243
(800) 344-8377

RESIDENTIAL GAS
TEXAS GAS SERVICE
4700 POLLARD ST.
EL PASO, TX. 79930
(915) 562-6411

DRAINAGE & LATERALS
EL PASO COUNTY WATER IMPROVEMENTS DISTRICT NO. 1
204 CANDELARIA ST.
EL PASO, TX. 79907
(915) 858-4122
JESUS REYES

STOP!
CALL BEFORE YOU DIG
TEXAS ONE CALL SYSTEM
1-800-245-4545
(@ least 48 hours prior to digging)

0 20' 40'
HORZ.
0 5' 10'
VERT.

REFERENCES - BENCH MARKS
BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL SMITH & COOPER, INC. STATE OF TEXAS NICHOLAS N. YBARRA 111156 LICENSED PROFESSIONAL ENGINEER
02/01/16

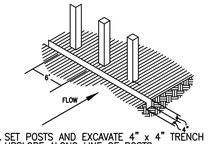
SCALE:
Hor. AS SHOWN
Ver. AS SHOWN
DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

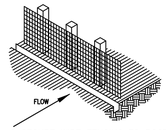
CITY OF EL PASO

SHEET TITLE
UTILITY PLAN

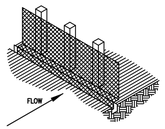
C-106



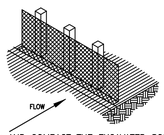
1. SET POSTS AND EXCAVATE 4" x 4" TRENCH UPSLOPE ALONG LINE OF POSTS.



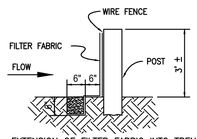
2. SECURE WIRE FENCING TO POSTS.



3. ATTACH FILTER MATERIAL TO WIRE FENCE AND EXTEND IT INTO THE TRENCH.



4. BACKFILL AND COMPACT THE EXCAVATED SOD.



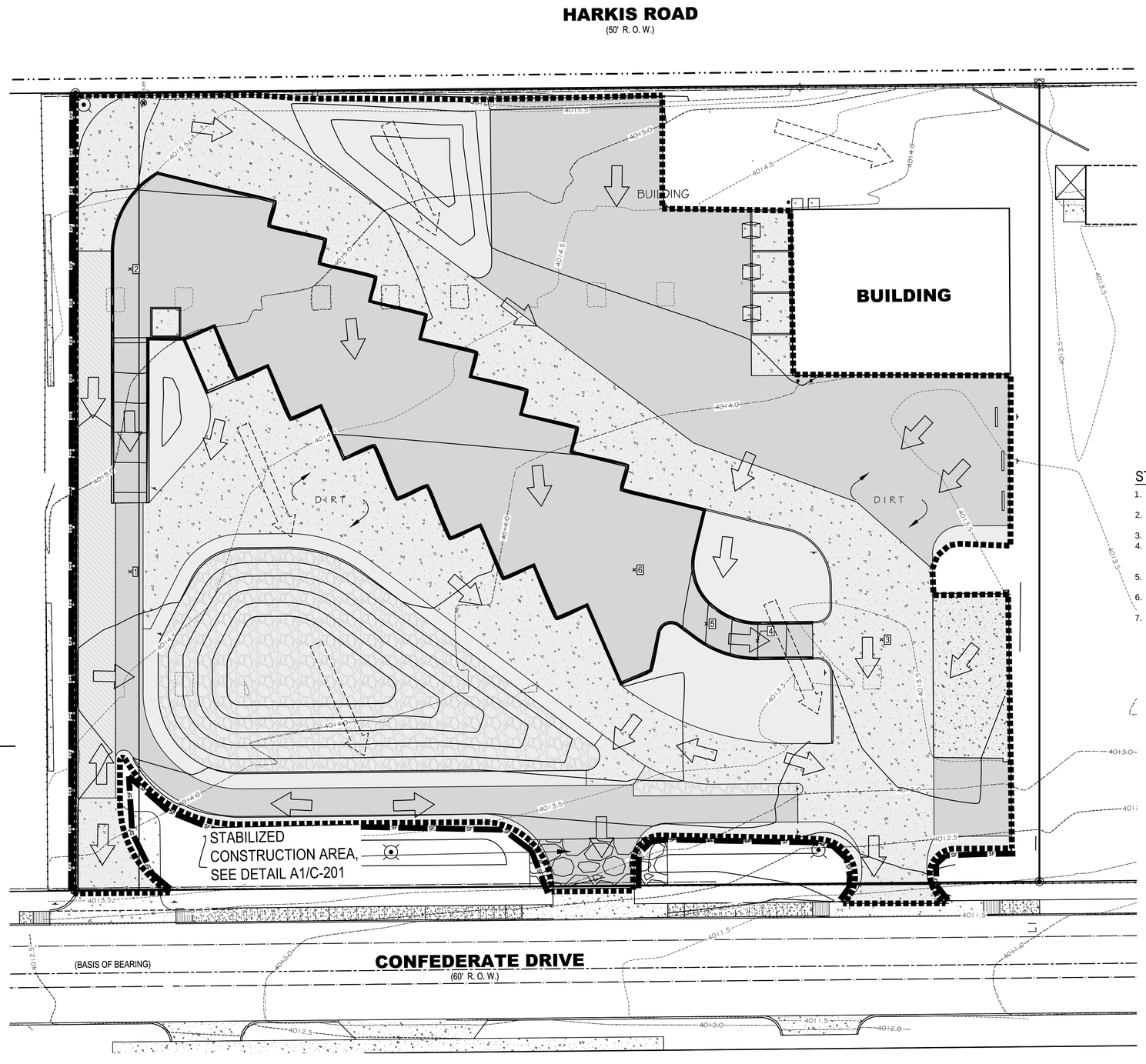
EXTENSION OF FILTER FABRIC INTO TRENCH.

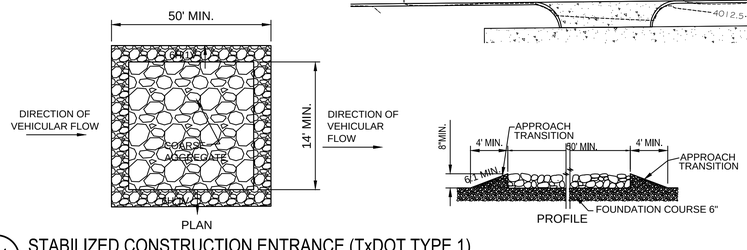
B2 FILTER FABRIC BARRIER (SILT FENCE)

NO SCALE

NOTES:

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT THE TOP AND MIDSECTION.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED 6" AT THE POSTS AND FOLDED.
4. FENCE POSTS SHALL BE CAPABLE OF SUPPORTING FENCE AND MAY BE METAL OR WOOD.





A1 STABILIZED CONSTRUCTION ENTRANCE (TxDOT TYPE 1)

NO SCALE

GENERAL NOTES

1. THE LENGTH OF THE CONSTRUCTION ENTRANCE SHALL BE AS INDICATED ON THE PLANS, BUT NOT LESS THAN 50'.
2. THE COARSE AGGREGATE SHOULD BE OPEN GRADED WITH A SIZE OF 4" TO 8".
3. THE APPROACH TRANSITIONS SHOULD BE NO STEEPER THAN 6:1 AND CONSTRUCTED AS DIRECTED BY THE ENGINEER.
4. THE CONSTRUCTION ENTRANCE FOUNDATION COURSE SHALL BE FLEXIBLE BASE, BITUMINOUS CONCRETE, PORTLAND CEMENT CONCRETE OR OTHER MATERIAL AS APPROVED BY THE ENGINEER.
5. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.
6. CONTRACTOR TO COORDINATE WITH ENGINEER PRIOR TO CONSTRUCTION.
7. CONTRACTOR TO COORDINATE W/OWNER THE LOCATION OF THE STAGING AREA AND CONCRETE WASHOUT AREA. PROVIDE TEMPORARY FENCING

EROSION CONTROL NOTES

1. SILT FENCING OR TEMPORARY BERMS SHALL BE INSTALLED PRIOR TO START OF CONSTRUCTION.
2. TEMPORARY SWALES AND DESILTING BASINS WILL BE PLACED WHERE NECESSARY IN ORDER TO CONVEY STORMWATER RUN-OFF.
3. A STABILIZED CONSTRUCTION ENTRANCE WILL BE PROVIDED TO HELP REDUCE VEHICLE TRACKING OF SEDIMENTS. THE PAVED STREET ADJACENT TO THE SITE ENTRANCE WILL BE SWEPT DAILY TO REMOVE ANY EXCESS MUD. DIRT OR ROCK TRACKED FROM THE SITE.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSURING THAT ALL EROSION CONTROL METHODS ARE INSPECTED ON A WEEKLY BASIS OR AFTER EVERY ERODIBLE RAINFALL (1/2" OR MORE). ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL SHALL BE MADE AT THAT TIME.
5. THIS DRAWING IS PART OF A TPDES CONSTRUCTION POLLUTION PREVENTION PLAN. PLEASE REFER TO TEXT PORTION OF THIS PLAN FOR ADDITIONAL AND REQUIREMENTS.

STABILIZED CONSTRUCTION NOTES

1. THE LENGTH OF THE TYPE 1 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, BUT NOT LESS THAN 50'.
2. THE COARSE AGGREGATE SHOULD BE OPEN GRADED WITH A SIZE OF 4" TO 8".
3. THE APPROACH SHOULD BE NO STEEPER THAN 6:1
4. THE CONSTRUCTION EXIT FOUNDATION COURSE SHALL BE FLEXIBLE BASE, BITUMINOUS CONCRETE OR PORTLAND CEMENT CONCRETE.
5. THE CONSTRUCTION EXIT SHALL BE GRADED TO ALLOW DRAINAGE TO A SEDIMENT TRAPPING DEVICE.
6. USE 8" STONE OR EQUIVALENT AT A MINIMUM DEPTH OF 12" FOR STABILIZED CONSTRUCTION ENTRANCE.
7. FILTER FABRIC SHOULD BE PLACED UNDERNEATH STONE OF CONSTRUCTION ENTRANCE TO REDUCE THE AMOUNT OF RUTTING AND TO PREVENT STONE FROM BEING EMBEDDED INTO THE SOIL.

EROSION CONTROL LEGEND

- AREA AFFECTED BY PROJECT (APPROX. 1.82 ACRES)
- 2% — PROPOSED DRAINAGE PATH WITH PERCENT SLOPE
- STABILIZED CONSTRUCTION ENTRANCE, SEE DETAIL SHEET C-201
- EXISTING CONTOURS (1' INTERVAL)
- EXISTING CONTOURS (1' INTERVAL)
- LIMITS OF DISTURBANCE
- FLOW DIRECTION (PROPOSED)
- FLOW DIRECTION (EXISTING)
- SF — SILT FENCE, SEE DETAIL SHEET C-203

0 20' 40'

REFERENCES – BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO St. EPASO, TEXAS 79901

PARKHILL SMITH & COOPER, INC. — STATE OF TEXAS — NICHOLAS N. YBARRA — 111156 — LICENSED PROFESSIONAL ENGINEER — 02/01/16

SCALE:
Hor. AS SHOWN
Ver. AS SHOWN

DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

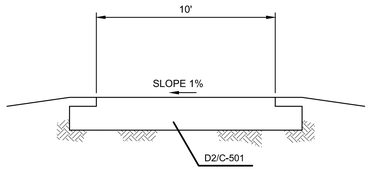
PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

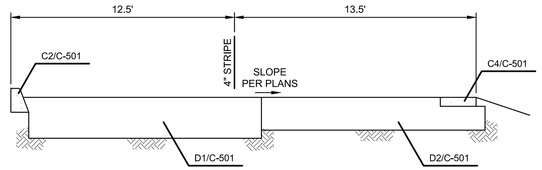
SHEET TITLE

EROSION CONTROL PLAN

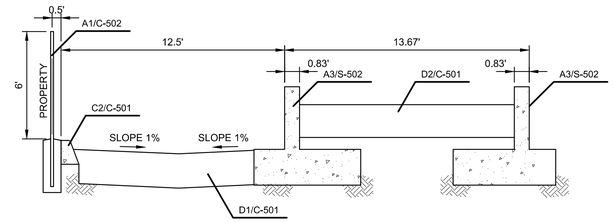
C-201



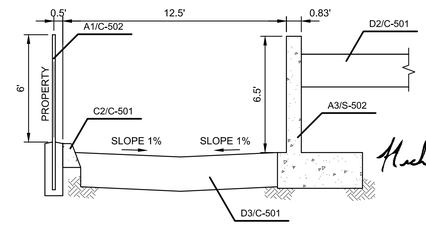
D1 SECTION
SCALE: 1" = 4'



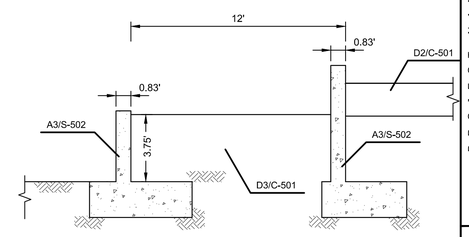
D2 SECTION
SCALE: 1" = 4'



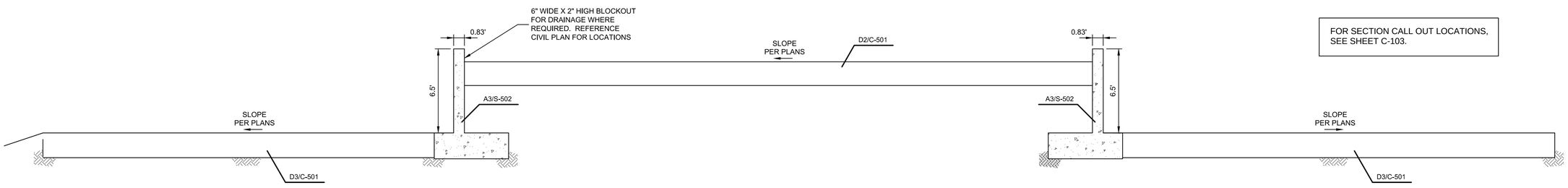
D4 SECTION
SCALE: 1" = 4'



C4 SECTION
SCALE: 1" = 4'



B5 SECTION
SCALE: 1" = 4'



A1 SECTION
SCALE: 1" = 4'

FOR SECTION CALL OUT LOCATIONS,
SEE SHEET C-103.

REFERENCES - BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL SMITH & COOPER, INC.
STATE OF TEXAS
NICHOLAS N. YBARRA
111156
LICENSED
PROFESSIONAL ENGINEER
02/01/16

SCALE:
Hor. AS SHOWN
Ver. AS SHOWN

DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

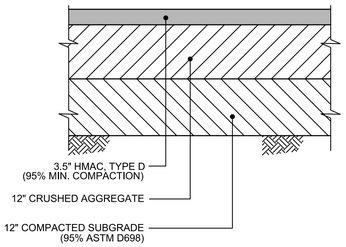
PROJECT NAME
CONFEDERATE CITIZENS
COLLECTION STATION

CITY OF EL PASO

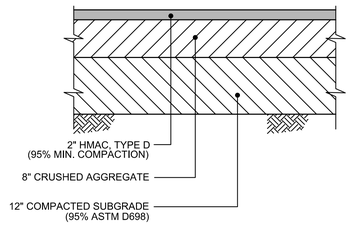
SHEET TITLE

SITE CROSS SECTIONS

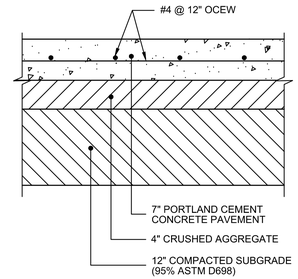
C-301



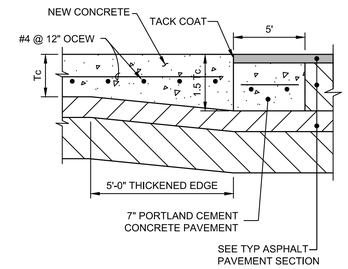
D1 HEAVY DUTY ASPHALT PAVEMENT SECTION
NO SCALE



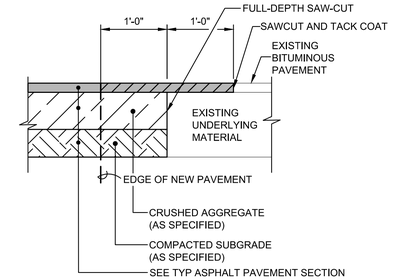
D2 LIGHT DUTY ASPHALT PAVEMENT SECTION
NO SCALE



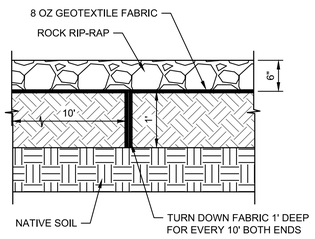
D3 TYPICAL CONCRETE PAVEMENT
NO SCALE



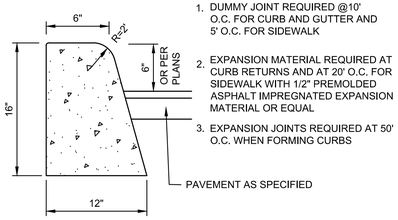
D4 CONCRETE/ASPHALT JUNCTURE
NO SCALE



D5 JUNCTURE OF NEW AND EXISTING FLEXIBLE PAVEMENT
NO SCALE

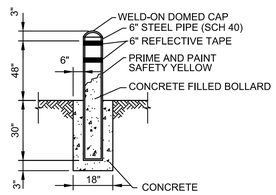


C1 POND ROCK RIP-RAP CROSS SECTION
NO SCALE

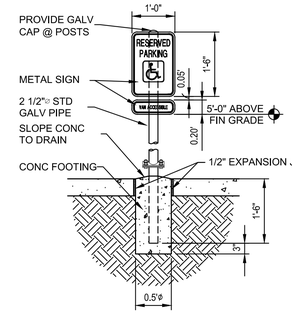


1. DUMMY JOINT REQUIRED @10' O.C. FOR CURB AND GUTTER AND 5' O.C. FOR SIDEWALK
2. EXPANSION MATERIAL REQUIRED AT CURB RETURNS AND AT 20' O.C. FOR SIDEWALK WITH 1/2" PREMOLDED ASPHALT IMPREGNATED EXPANSION MATERIAL OR EQUAL
3. EXPANSION JOINTS REQUIRED AT 50' O.C. WHEN FORMING CURBS

C2 6" CONCRETE CURB
NO SCALE

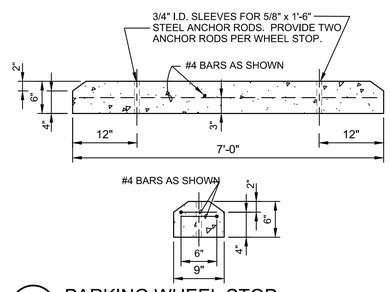


C3 BOLLARD DETAIL
NO SCALE

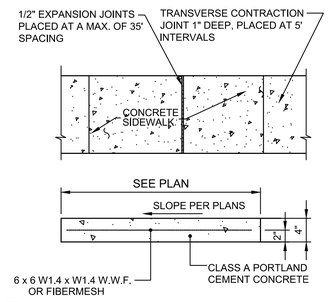


* FOR ALL NON-ADA PARKING AND TRAFFIC SIGNAGE REFER TO SHEET A-002

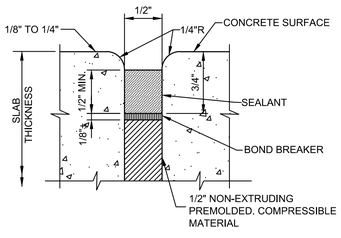
C5 STANDARD SIGNAGE ELEVATION
NO SCALE



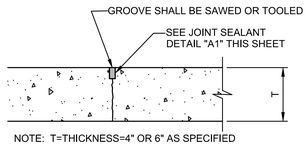
B3 PARKING WHEEL STOP
NO SCALE



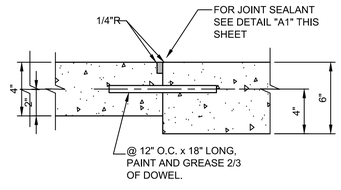
B4 SIDEWALK DETAIL
NO SCALE



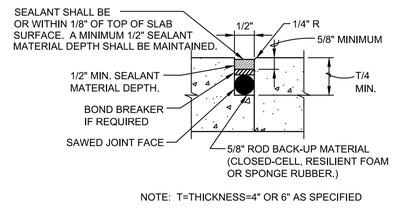
A1 1/2" EXPANSION JOINT SECTION
NO SCALE



A2 CONTRACTION JOINT
NO SCALE

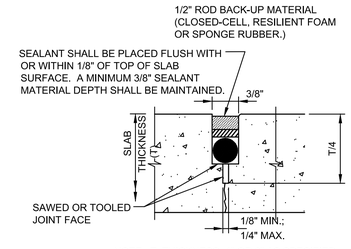


A3 DOWELED EXPANSION JOINT
NO SCALE



NOTE: T=THICKNESS=4" OR 6" AS SPECIFIED

A4 CONSTRUCTION JOINT
NO SCALE



NOTE: T=THICKNESS=4" OR 6" AS SPECIFIED

A5 SAWED/TOOLED CONTRACTION JOINT
NO SCALE

REFERENCES – BENCH MARKS
BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL SMITH & COOPER, INC. STATE OF TEXAS NICHOLAS N. YBARRA 111156 LICENSED PROFESSIONAL ENGINEER
02/01/16

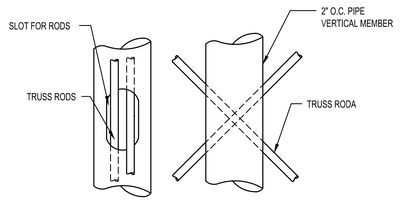
SCALE
Hor. AS SHOWN
Ver. AS SHOWN
DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS
COLLECTION STATION

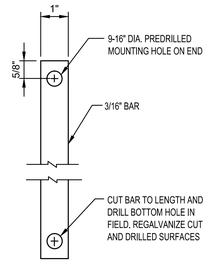
CITY OF EL PASO

SHEET TITLE
DETAIL SHEET

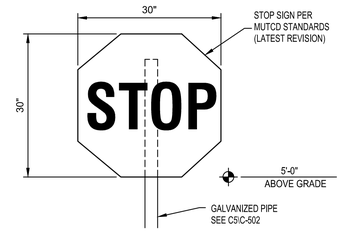
C-501



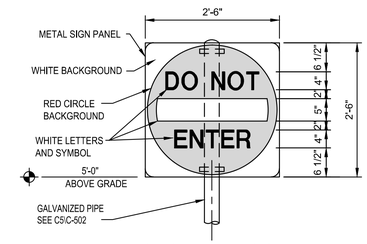
D1 DETAIL A
NO SCALE



D2 ROLLER SPACER BAR DETAIL
NO SCALE



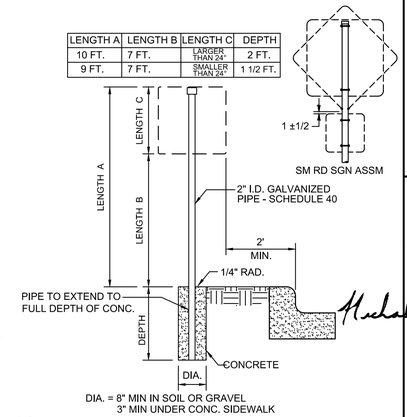
"STOP" SIGN



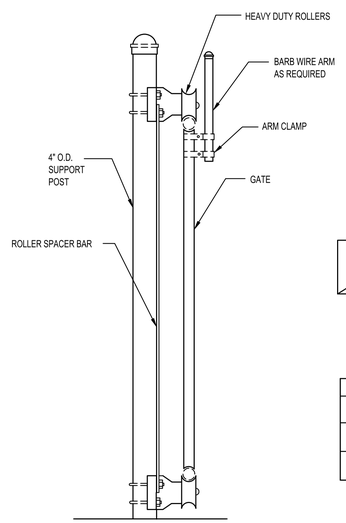
"DO NOT ENTER" SIGN

D3 METAL SIGNS
NO SCALE

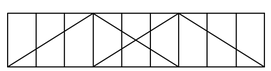
LENGTH A	LENGTH B	LENGTH C	DEPTH
10 FT.	7 FT.	LARGER THAN 24"	2 FT.
9 FT.	7 FT.	SMALLER THAN 24"	1 1/2 FT.



C5 SIGN POST INSTALLATIONS
NO SCALE



B1 SUPPORT POST DETAIL
NO SCALE

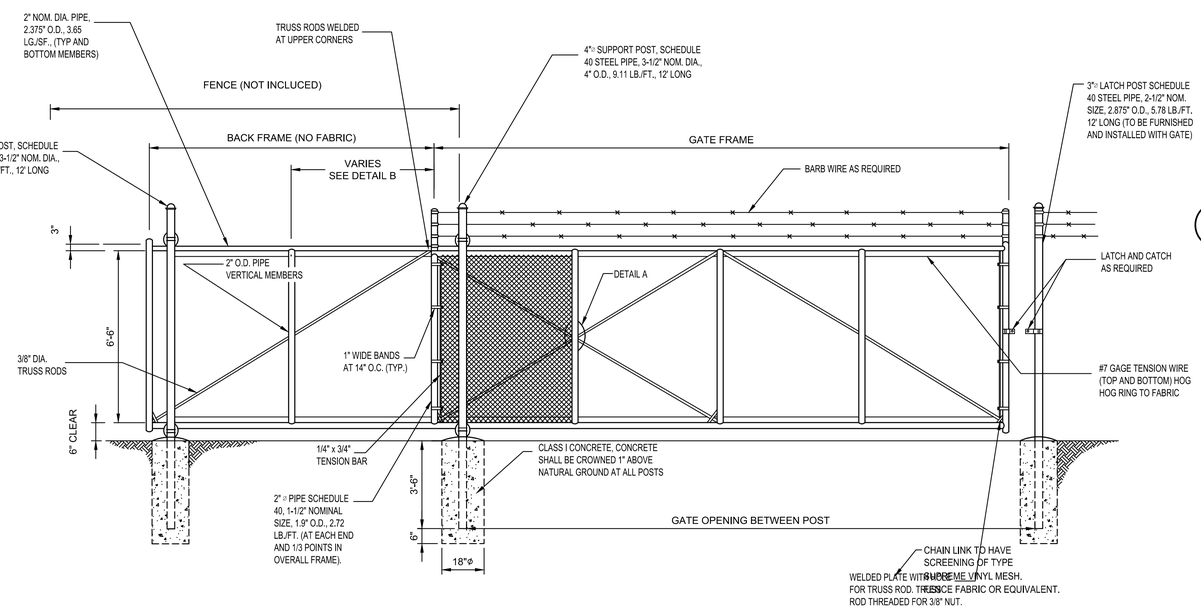


TYPICAL FRAME

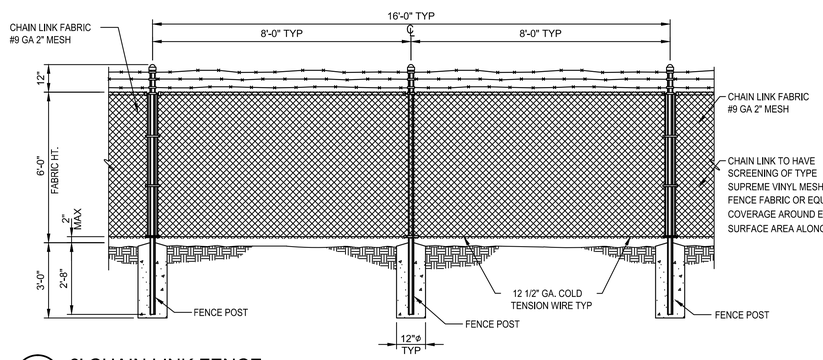
DETAIL B

** GATE OPENING	GATE FRAME	BACK FRAME
24'-0"	24'-3"	12'-0"
30'-0"	30'-3"	12'-0"
32'-0"	32'-3"	12'-0"

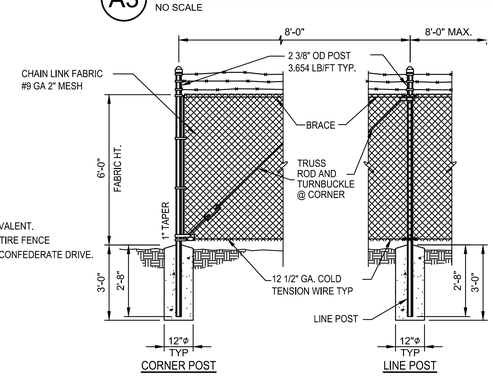
** CONTRACTOR TO COORDINATE WITH OWNER



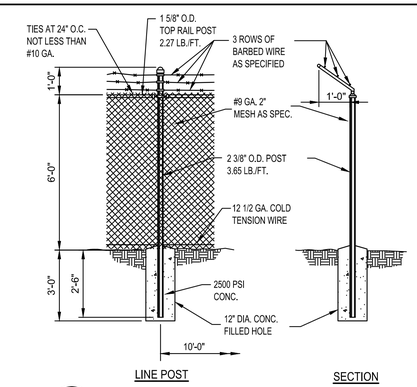
A3 CANTILEVER SLIDE GATE DETAIL
NO SCALE



A1 6' CHAIN LINK FENCE
NO SCALE



A3 TYPICAL FENCE DETAILS
NO SCALE



A4 CHAIN LINK FENCE DETAILS
NO SCALE

GENERAL NOTES:

1. THE CONTRACTOR MAY SUBSTITUTE ANY EQUIVALENT CANTILEVER SLIDE GATE APPROVED BY THE ENGINEER.
   EXTRUDED, ROLLED OR FORMED COMPONENTS THAT PROVIDE EQUAL STRENGTH AND STABILITY MAY BE USED IN LIEU OF THE PIPE COMPONENTS SHOWN; AND, INTERNAL ROLLERS MAY BE USED IN LIEU OF THE EXTERNAL ROLLER UNITS SHOWN.
   GATE COMPONENTS SHALL MEET OR EXCEED THE MATERIAL REQUIREMENTS SPECIFIED ON INDEX NO. 452.
2. STEEL GATE FRAME SHALL BE FABRICATED PRIOR TO GALVANIZING, EXCEPT THAT TRUSS RODS AND TRUSS ROD PLATES MAY BE FABRICATED FOLLOWING FRAME GALVANIZING PROVIDED SURFACES DAMAGED DURING WELDING ARE GALVANIZED IN ACCORDANCE WITH SECTION 24 OR AASHTO M36.
3. ALL FABRIC SHALL BE KNUCKLED TOP AND BOTTOM SELVAGES.
4. COST OF ALL GATE COMPONENTS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR SLIDING FENCE GATE (CANTILEVER), EACH.

REFERENCES – BENCH MARKS
BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL SMITH & COOPER, INC. STATE OF TEXAS NICHOLAS N. YBARRA 111156 LICENSED PROFESSIONAL ENGINEER 02/01/16

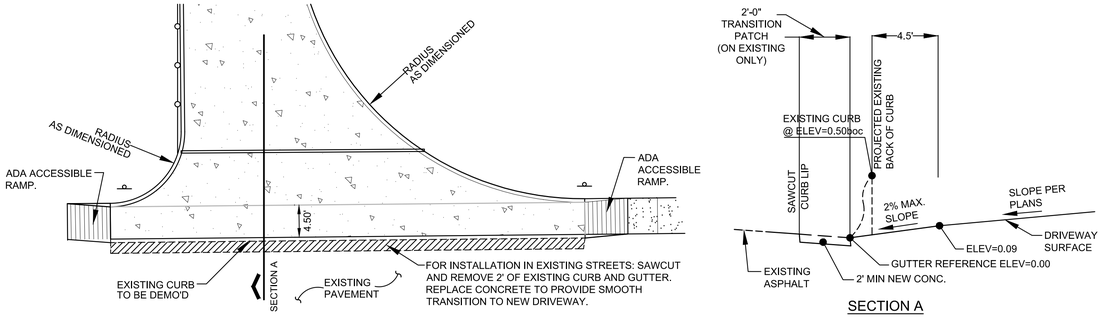
SCALE
Hor. AS SHOWN
Ver. AS SHOWN
DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

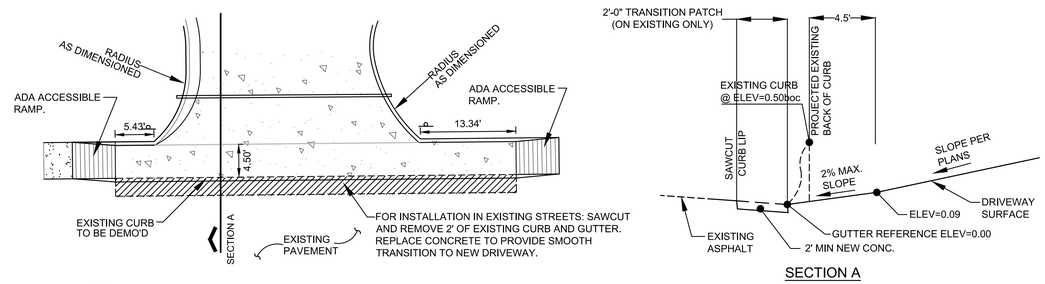
SHEET TITLE
DETAIL SHEET

C-502



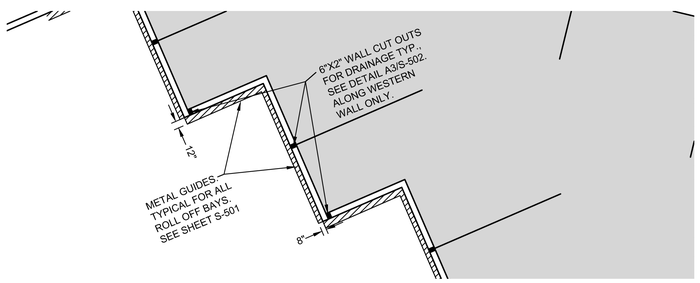
C1 NORTH DRIVEWAY ENTRANCE

NTS



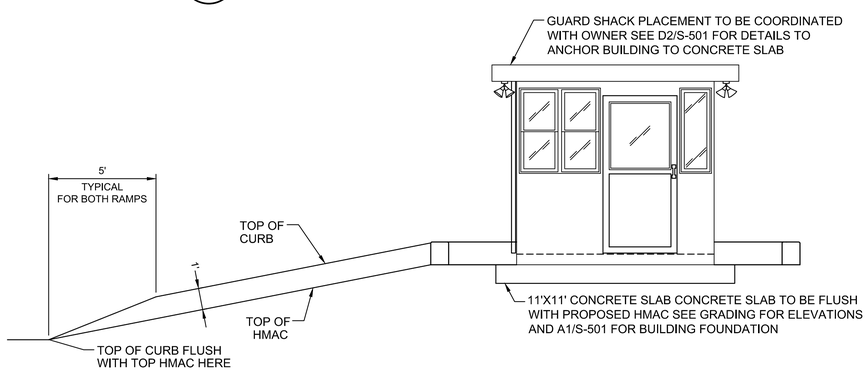
B3 SOUTH DRIVEWAY ENTRANCE

NTS



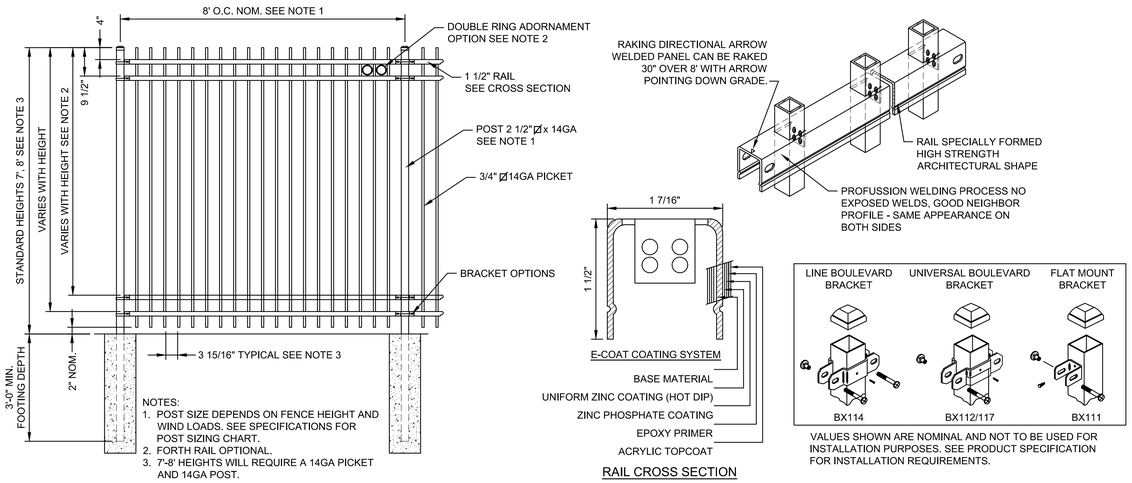
B1 METAL GUIDES AND DRAINAGE CUT OUTS

NTS



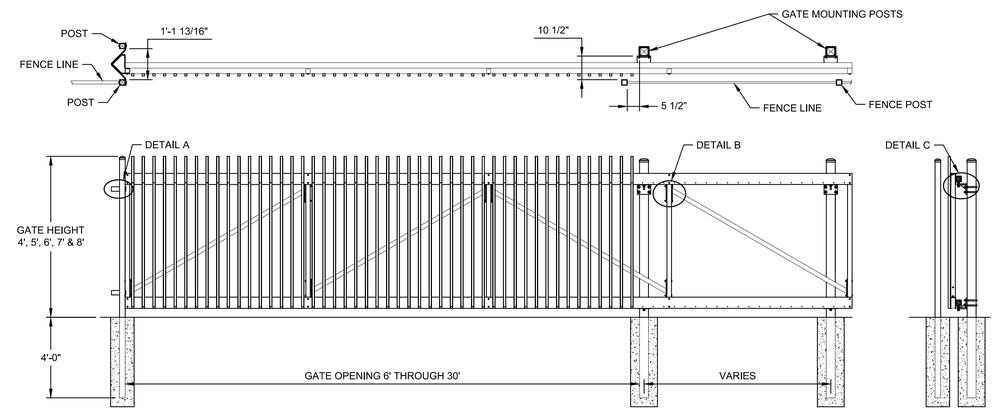
A1 ELEVATION - RAMP WALL @ GUARD SHACK

NTS

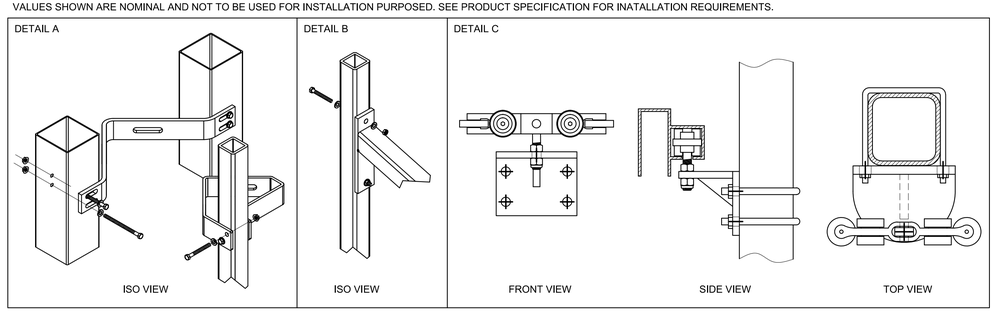


C2 WELDED STEEL PANEL GATE SECTION AND DETAILS

NTS



VALUES SHOWN ARE NOMINAL AND NOT TO BE USED FOR INSTALLATION PURPOSED. SEE PRODUCT SPECIFICATION FOR INATALLATION REQUIREMENTS.



A2 CANTILEVER GATE SECTION AND DETAILS

NTS

REFERENCES - BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL SMITH & COOPER, INC. STATE OF TEXAS NICHOLAS N. YBARRA 111156 LICENSED PROFESSIONAL ENGINEER
02/01/16

SCALE:
Hor. AS SHOWN
Ver. AS SHOWN

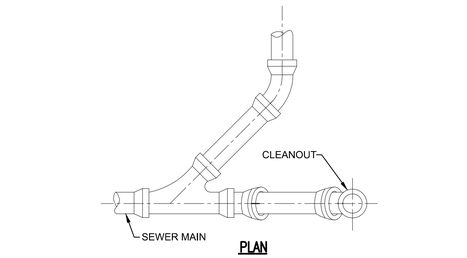
DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

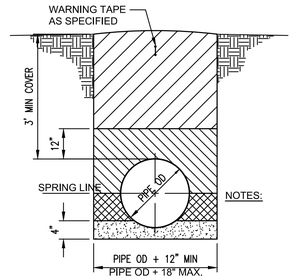
CITY OF EL PASO

SHEET TITLE
DETAIL SHEET

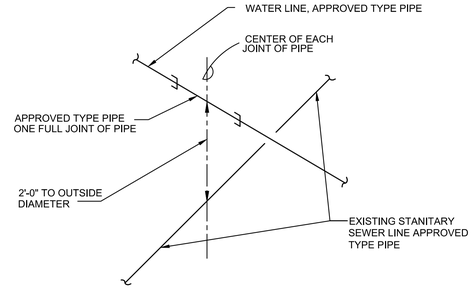
C-503



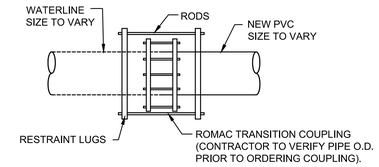
C1 CLEAN OUT DETAIL
NO SCALE



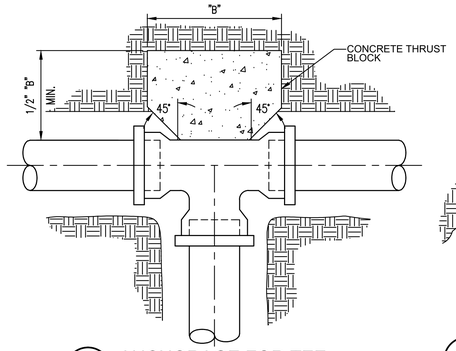
D2 WATER LINE TRENCH DETAIL
NO SCALE



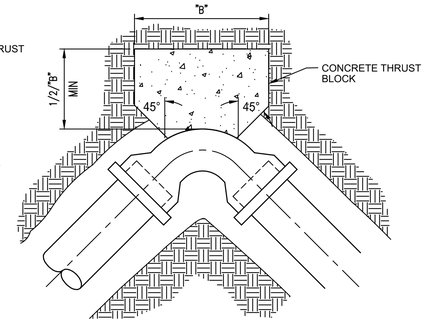
D3 WATER AND SEWER CROSSING
NO SCALE



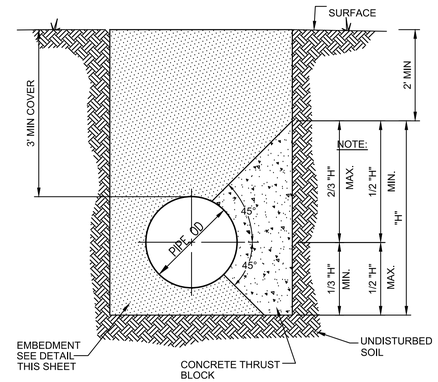
D5 WATER LINE TIE-IN DETAIL
NO SCALE



C2 ANCHORAGE FOR TEE
NO SCALE



C3 ANCHORAGE FOR 90° BEND
NO SCALE



C4 THRUST BLOCK SECTION DETAIL
NO SCALE

FINISH GROUND	THRUST BLOCK BEARING AREA (SF)				
FITTING SIZE (IN)	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	TEES & DEAD ENDS
4	2.1	3.9	2.1	2.1	2.7
6	4.3	8.0	4.3	4.3	5.6
8	7.4	13.7	7.4	7.4	9.7

TO GET "B" TAKE THE SQUARE ROOT OF THE NUMBER LISTED ABOVE
(EXAMPLE B=$\sqrt{25}$SF = 5FT)

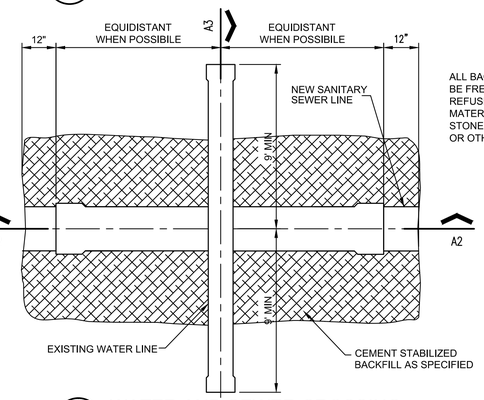
L E G E N D

BEDDING SHALL BE NATIVE TRENCH MATERIAL LOOSELY PLACED AS SPECIFIED.

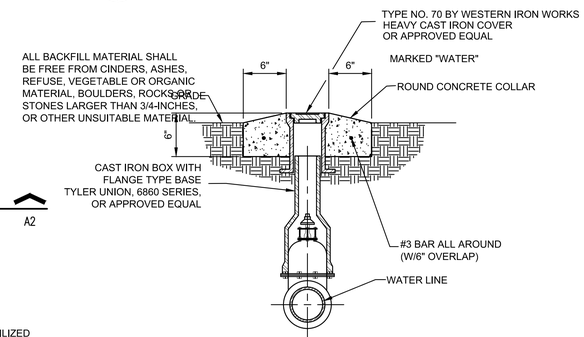
HAUNCHING SHALL BE NATIVE TRENCH MATERIAL PLACED BY HAND IN 3-INCH LAYERS, THOROUGHLY COMPACTED AS SPECIFIED.

INITIAL BACKFILL SHALL BE NATIVE TRENCH MATERIAL PLACED BY HAND OR APPROVED MECHANICAL METHODS IN 6-INCH LAYERS, COMPACTED TO 95% OF THE MAXIMUM DENSITY AS SPECIFIED.

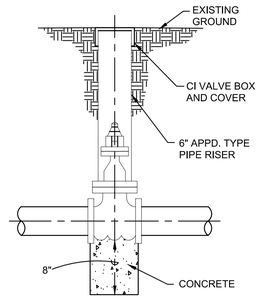
FINAL BACKFILL SHALL BE NATIVE TRENCH MATERIAL PLACED BY JETTING OR TAMPING AS SPECIFIED. MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY AS SPECIFIED



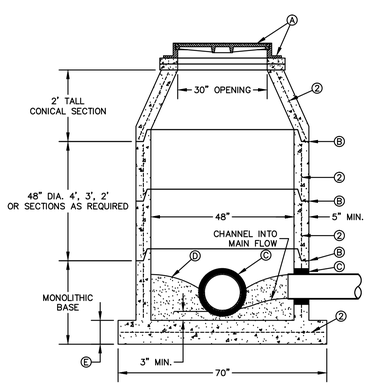
B3 WATER AND SEWER CROSSING
NO SCALE



B4 VALVE W/BOX COVER
NO SCALE



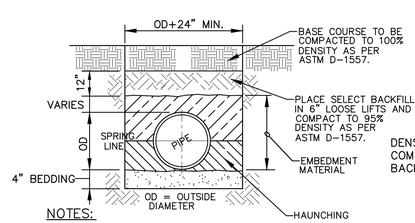
B5 ANCHORAGE FOR GATE VALVE
NO SCALE



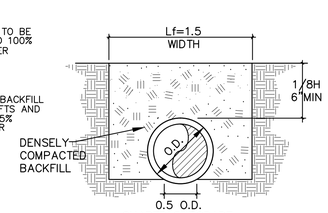
GENERAL NOTES:
1. MANHOLE TYPE "A" SHALL BE USED FOR LINES 21" AND SMALLER.
2. PRE-CAST MANHOLE SECTIONS SHALL BE OF REINFORCED CONCRETE CONFORMING TO ASTM C-478 AND SHALL MEET HS-20 LOADING. PROVIDE REINFORCEMENT WITHIN 3" @ OPENINGS OR KNOCKOUTS, OPENINGS (UP TO 8") MADE IN FIELD SHALL BE CORE DRILLED.
3. CEMENT SHALL BE TYPE I-II, PER ASTM C-150, AND MUST CONTAIN A MINIMUM OF 4% FLY ASH OF THE TOTAL MANHOLE WEIGHT.
4. THE BASE & RISER SHALL BE INTEGRALLY CAST. CONCRETE SHALL BE MIN. 28 DAY COMPRESSIVE STRENGTH 4000psi.
5. MANUFACTURER TO PROVIDE LIFTERS OF ADEQUATE SIZE AS NEEDED.
6. THE SUBGRADE UNDER THE BASE SHALL BE COMPACTED TO 95% DENSITY IN ACCORDANCE WITH ASTM D-1557.
7. MANHOLES BELOW GROUNDWATER TO BE EXTERNALLY AND INTERNALLY COATED WITH BITUMINOUS COATING.

CONSTRUCTION KEY NOTES:
A. MANHOLE RING AND COVER (SEE DETAILS 377 & 378), SET FRAME AND COVER FLUSH WITH ROADWAY SURFACE OR FINISHED GRADE (SEE DETAIL 185).
B. ALL JOINTS TO BE TONGUE, GROOVE AND SEALED WITH RAM-NEK OR APPROVED EQUAL.
C. PIPE OPENINGS/KNOCKOUTS AS REQUIRED TO FIT PIPE SIZE AND SHALL HAVE FLEXIBLE PIPE TO MANHOLE CONNECTORS (COMPRESSION TYPE ASTM-923), "KOR-N-SEAL" OR APPROVED EQUAL.
D. GROUT AS REQUIRED.
E. CONCRETE BASE SHALL BE 8" FOR MH's UP TO 12' DEEP AND 12" FOR DEPTHS GREATER THAN 12'.

A1 MANHOLE TYPE "A"
NTS

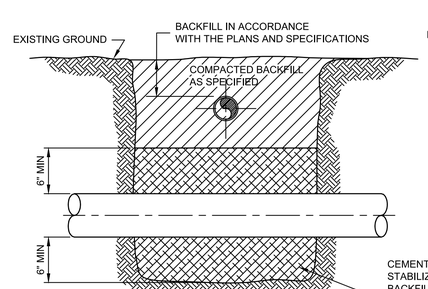


NOTES:
1. PIPE INSTALLATION AND COMPACTION SHALL BE PERFORMED IN ACCORDANCE WITH PIPE MANUFACTURER AND GEOTECHNICAL REQUIREMENTS.

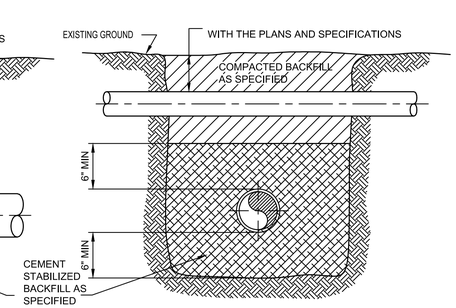


BEDDING DETAIL
SCALE: NONE

A2 TYPICAL TRENCH AND BACKFILL FOR STORM SEWER INSTALLATION
NTS



A3 SECTION
NO SCALE



A4 SECTION
NO SCALE

REFERENCES – BENCH MARKS
BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL SMITH & COOPER, INC. STATE OF TEXAS NICHOLAS N. YBARRA 111156 LICENSED PROFESSIONAL ENGINEER
02/01/16

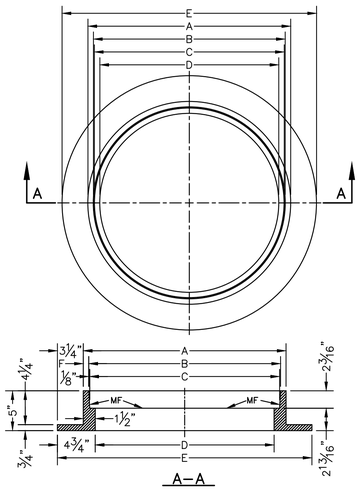
SCALE
Hor. AS SHOWN
Ver. AS SHOWN
DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

SHEET TITLE
UTILITY DETAIL SHEET

C-504

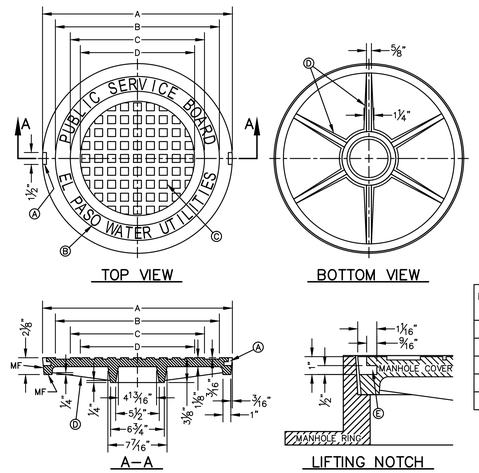


GENERAL NOTES:
1. MATCHING SURFACES MARKED "MF" TO BE FINISHED OF ANY IRREGULARITIES THAT WOULD PREVENT A SNUG FIT.
2. CASTING TO BE SMOOTH & VOID OF AIR HOLES.
3. CASTING MUST MEET REQUIREMENTS OF AASHTO M306-07.
4. AS-CAST DIMENSIONS MAY VARY 1/16"±/ PER FOOT (AASHTO M306-07).
5. WEIGHT MAY VARY 5%± (AASHTO M306-07).

MANHOLE RING	MANHOLE - ALL TYPES	*MANHOLE TYPE A, A1, A2 & C
A	33"	25½"
B	31¾"	24⅛"
C	31½"	23⅞"
D	30"	22½"
E	39½"	32"
F	⅝"	1 1/16"
WEIGHT	205 lbs.	170 lbs.

*OBSOLETE -DO NOT USE (FOR REFERENCE ONLY)

C1 SEWER MANHOLE RING
NO SCALE



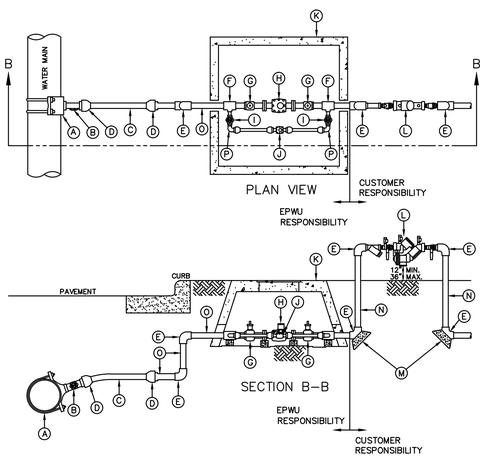
GENERAL NOTES:
1. MATCHING SURFACES MARKED "MF" TO BE FINISHED OF ANY IRREGULARITIES THAT WOULD PREVENT A SNUG FIT.
2. CASTING TO BE SMOOTH & VOID OF AIR HOLES.
3. CASTING MUST MEET REQUIREMENTS OF AASHTO M306-07.
4. AS-CAST DIMENSIONS MAY VARY 1/16"±/ PER FOOT (AASHTO M306-07).
5. WEIGHT MAY VARY 5%± (AASHTO M306-07).

CONSTRUCTION KEY NOTES:
A. LIFTING NOTCH.
B. 3/16" RAISED LETTERING.
C. 1" SQUARES (3/16" TALL) WITH ⅜" SPACE BETWEEN.
D. REINFORCING RIBS.
E. SLOT.

MANHOLE COVER	MANHOLE - ALL TYPES	*MANHOLE TYPE A, A1, A2 & C
A	31⅞"	23⅞"
B	28⅛"	20⅞"
C	24⅜"	16⅞"
D	21⅞"	14⅜"
WEIGHT	200 lbs.	165 lbs.

*OBSOLETE -DO NOT USE (FOR REFERENCE ONLY)

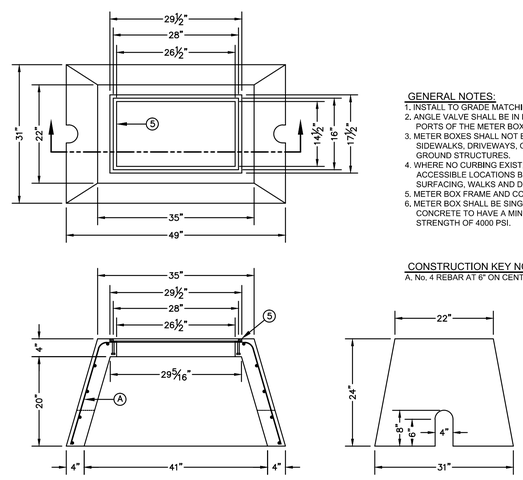
C3 SEWER MANHOLE COVER
NO SCALE



GENERAL NOTES:
1. DETAIL SHOWN FOR 1½" SERVICE; INSTALLATION SIMILAR FOR 2" SERVICE EXCEPT FOR SIZES OF PIPE, FITTINGS, METER AND METER BOX. WHEN SPECIFIED A 1" BY-PASS METER SHALL BE INSTALLED WITH A 1½" SERVICE, A 2" SERVICE SHALL INCLUDE A 1" BY-PASS METER.
2. WHERE NO CURB EXISTS, METER IS TO BE SET NEAR PROPERTY LINE OR AT DESIGNATED LOCATION.
3. THE EPWU WILL FURNISH AND INSTALL ALL NECESSARY PIPE, FITTINGS, METER BOXES, AND METERS REQUIRED. IT SHALL BE THE RESPONSIBILITY OF THE PRIVATE OWNER TO HAVE A CERTIFIED PLUMBER INSTALL A BACKFLOW PREVENTER AND EXTEND SERVICE LINE ON DISCHARGE SIDE OF METER.

CONSTRUCTION KEY NOTES:
A. SERVICE SADDLE
B. 1½" TAP WITH CORPORATION STOP
C. 1½" COPPER PIPE, FOR 1½" & 2" SERVICE INSTALLATIONS, ALL PIPING SHALL BE COPPER AND ALL FITTINGS SHALL BE BRONZE UNLESS OTHERWISE SPECIFIED.
D. 1½" FLARED CONNECTION
E. 1½" FEMALE THREADED 90° ELBOW
F. 1½"x1" FEMALE THREADED TEE
G. 1½" FLANGED BY FEMALE THREADED GATE VALVE
H. 1½" TURBINE METER
I. 1" FEMALE THREADED CURB VALVE
J. 1" BY-PASS METER
K. METER BOX TYPE "C" (SEE DETAIL 293) FOR 1½" OR TYPE "D" (SEE DETAIL 294) FOR 2".
L. 1½" BACKFLOW PREVENTER WHEN REQUIRED BY EPWU
M. THRUST BLOCKING AS REQUIRED
N. 1½" BRASS PIPE-LENGTH AS REQUIRED
O. 1½" THREADED NIPPLE
P. 1" FLARED BY MALE THREADED 90° ELBOW

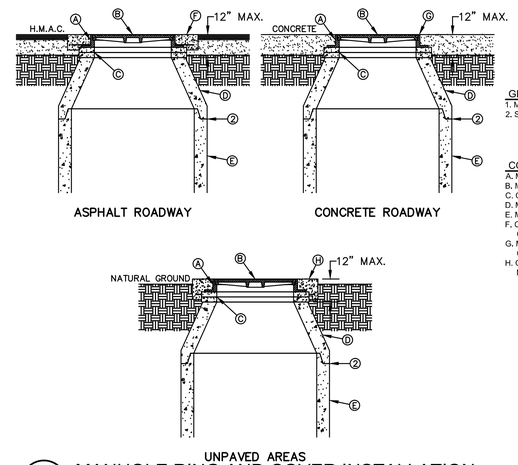
A1 1-1/2" WATER METER
NO SCALE



GENERAL NOTES:
1. INSTALL TO GRADE MATCHING TOP OF CURB.
2. ANGLE VALVE SHALL BE IN LINE WITH THE INLET/OUTLET PORTS OF THE METER BOX.
3. METER BOXES SHALL NOT BE INSTALLED UNDER SIDEWALKS, DRIVEWAYS, OR PROPOSED ABOVE GROUND STRUCTURES.
4. WHERE NO CURBING EXIST, INSTALL BOXES IN ACCESSIBLE LOCATIONS BEYOND LIMITS OF STREET SURFACING, WALKS AND DRIVEWAYS.
5. METER BOX FRAME AND COVER PER EPWU DETAIL 302.
6. METER BOX SHALL BE SINGLE UNIT CONSTRUCTION; CONCRETE TO HAVE A MINIMUM 28 DAYS COMPRESSIVE STRENGTH OF 4000 PSI.

CONSTRUCTION KEY NOTES:
A. No. 4 REBAR AT 6" ON CENTER, EACH WAY

A3 METER BOX TYPE "C" FOR 1/-1/2" SERVICE INSTALLATION
NO SCALE



GENERAL NOTES:
1. MANHOLE TYPE SHALL BE AS SHOWN ON THE PLANS.
2. SEAL JOINTS PER SPECIFICATIONS.

CONSTRUCTION KEY NOTES:
A. MANHOLE RING (SEE DETAIL 377).
B. MANHOLE COVER (SEE DETAIL 378).
C. CONCRETE ADJUSTMENT RINGS AS REQUIRED.
D. MANHOLE CONE SECTION.
E. MANHOLE BARREL SECTION.
F. CONCRETE COLLAR (SEE DETAIL 184-1) FLUSH WITH TOP OF H.M.A.C.
G. MANHOLE RING FLUSH WITH TOP OF CONCRETE. CONCRETE COLLAR NOT NEEDED.
H. CONCRETE APRON (SEE DETAIL 184-2) FLUSH WITH MANHOLE RING AND 2" ABOVE NATURAL GROUND.

A4 MANHOLE RING AND COVER INSTALLATION
NO SCALE

REFERENCES – BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL SMITH & COOPER, INC. TEXAS
STATE OF TEXAS
NICHOLAS N. YBARRA
111156
LICENSED PROFESSIONAL ENGINEER
02/01/16

SCALE:
Hor. AS SHOWN
Ver. AS SHOWN

DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

SHEET TITLE
UTILITY DETAIL SHEET

C-505

POINT TABLE

POINT #	DESCRIPTION	NORTHING	EASTING
1	BOC	10666155.00	446641.2668
2	EDGE OF PAVEMENT	10666110.51	446558.4112
3	EDGE OF PAVEMENT	10666120.61	446568.3125
4	EDGE OF PAVEMENT	10666120.64	446571.3852
5	EDGE OF PAVEMENT	10666089.88	446581.9069
6	EDGE OF PAVEMENT	10666090.03	446608.9065
7	EDGE OF PAVEMENT	10666118.49	446670.1268
8	EDGE OF PAVEMENT	10666118.58	446684.0191
9	EDGE OF PAVEMENT	10666108.19	446694.6220
10	EDGE OF PAVEMENT	10666090.53	446694.7240
11	PAVEMENT EDGE	10666278.65	446789.7632
12	PAVEMENT EDGE	10666216.73	446850.5406
13	PAVEMENT EDGE	10666279.23	446849.9371
14	PAVEMENT EDGE	10666404.51	446851.7273
15	PAVEMENT EDGE	10666286.65	446785.7137
16	PAVEMENT EDGE	10666368.34	446846.9363
17	PAVEMENT EDGE	10666383.58	446851.9294
18	EDGE OF PAVEMENT	10666428.77	446827.2271
19	EDGE OF PAVEMENT	10666428.75	446561.8856
20	EDGE OF PAVEMENT	10666438.65	446554.5871
21	BOC	10666150.76	446558.0157
22	EDGE OF PAVEMENT	10666144.28	446567.9548
23	EDGE OF PAVEMENT	10666144.32	446571.2432
24	EDGE OF PAVEMENT	10666160.47	446587.0852
25	EDGE OF PAVEMENT	10666215.09	446586.5577
26	EDGE OF PAVEMENT	10666226.98	446574.4424
27	EDGE OF PAVEMENT	10666226.87	446562.9682
28	EDGE OF PAVEMENT	10666256.46	446562.6774
29	EDGE OF PAVEMENT	10666256.48	446564.6612
30	EDGE OF PAVEMENT	10666282.23	446589.9095
32	EDGE OF PAVEMENT	10666409.78	446611.7670
33	EDGE OF PAVEMENT	10666415.26	446610.0788
34	EDGE OF PAVEMENT	10666415.26	446595.7292
35	EDGE OF PAVEMENT	10666393.30	446555.0326
36	EDGE OF PAVEMENT	10666167.57	446597.0172
37	EDGE OF PAVEMENT	10666227.19	446596.4413
38	EDGE OF PAVEMENT	10666227.23	446600.4412
40	EDGE OF PAVEMENT	10666405.26	446634.0595
41	EDGE OF PAVEMENT	10666407.69	446590.8289
42	EDGE OF PAVEMENT	10666369.81	446589.0636
43	EDGE OF PAVEMENT	10666392.08	446677.9079
44	EDGE OF PAVEMENT	10666370.02	446691.6147
45	EDGE OF PAVEMENT	10666352.98	446691.7792
46	BOC	10666322.51	446681.7929
47	EDGE OF PAVEMENT	10666238.43	446618.7778
48	EDGE OF PAVEMENT	10666274.82	446646.0522
49	EDGE OF PAVEMENT	10666244.38	446605.7758
50	EDGE OF PAVEMENT	10666222.86	446607.4570

POINT TABLE

POINT #	DESCRIPTION	NORTHING	EASTING
51	BOC	10666197.88	446600.7246
52	EDGE OF PAVEMENT	10666167.61	446601.0169
53	EDGE OF PAVEMENT	10666154.75	446615.6319
54	EDGE OF PAVEMENT	10666169.23	446615.5020
55	RET WALL	10666197.56	446665.2154
56	BOC	10666231.43	446637.0475
57	BOC	10666201.00	446700.2965
58	EDGE OF PAVEMENT	10666170.99	446693.5229
59	EDGE OF PAVEMENT	10666155.32	446673.8033
60	EDGE OF PAVEMENT	10666155.24	446664.9316
61	EDGE OF PAVEMENT	10666160.68	446659.3778
62	RADIUS CEN	10666100.64	446571.3548
63	RADIUS CEN	10666110.61	446568.4107
64	RADIUS CEN	10666108.13	446684.1222
65	RADIUS CEN	10666283.65	446789.7149
66	RADIUS CEN	10666383.33	446826.9306
67	RADIUS CEN	10666438.75	446565.0866
68	RADIUS CEN	10666393.85	446560.0275
69	RADIUS CEN	10666370.26	446634.0614
70	RADIUS CEN	10666412.26	446610.0789
71	RADIUS CEN	10666370.25	446634.5615
72	RADIUS CEN	10666369.78	446666.6158
73	RADIUS CEN	10666352.50	446641.7815
74	EDGE OF PAVEMENT	10666241.43	446614.7767
75	EDGE OF PAVEMENT	10666244.32	446600.2760
76	RADIUS CEN	10666167.59	446599.0170
77	RADIUS CEN	10666160.50	446641.2127
78	RADIUS CEN	10666160.74	446664.8776
79	RADIUS CEN	10666175.82	446673.6019
80	RADIUS CEN	10666222.68	446636.9140
81	RADIUS CEN	10666170.03	446715.9989
82	RADIUS CEN	10666160.32	446571.0860
83	RADIUS CEN	10666154.28	446567.9816
84	RADIUS CEN	10666214.98	446574.5583
85	RADIUS CEN	10666281.98	446564.4107
86	RET WALL	10666160.56	446646.7125
87	RET WALL	10666181.75	446646.0078
88	RET WALL	10666210.99	446658.2044
89	RET WALL	10666217.57	446655.7386
90	RET WALL	10666220.55	446641.7565
91	RET WALL	10666231.96	446636.8187
92	RET WALL	10666244.27	446665.2676
93	RET WALL	10666255.28	446660.5005
94	RET WALL	10666263.63	446679.7723
95	RET WALL	10666274.64	446675.0052
96	RET WALL	10666282.98	446694.2770
97	RET WALL	10666293.99	446689.5099
98	RET WALL	10666302.28	446708.6422
99	RET WALL	10666313.21	446703.9096
100	RET WALL	10666321.55	446723.1814

POINT TABLE

POINT #	DESCRIPTION	NORTHING	EASTING
101	RET WALL	10666332.56	446718.4143
102	RET WALL	10666340.91	446737.6861
103	RET WALL	10666351.92	446732.9190
104	RET WALL	10666360.26	446752.1908
105	EDGE OF PAVEMENT	10666162.18	446659.3634
106	RET WALL	10666379.62	446766.6955
107	RET WALL	10666390.02	446762.1908
108	RET WALL	10666403.10	446762.1900
109	RET WALL	10666371.27	446747.4237
110	RET WALL	10666416.76	446702.9011
111	RET WALL	10666416.77	446762.9047
112	RET WALL	10666416.77	446794.5026
113	RET WALL	10666382.29	446742.6566
114	RET WALL	10666162.06	446646.6980
115	RET WALL	10666400.11	446823.1715
116	RET WALL	10666356.88	446812.6729
117	RET WALL	10666359.00	446803.9271
118	RET WALL	10666338.60	446798.9715
119	RET WALL	10666340.72	446790.2257
120	RET WALL	10666320.31	446785.2701
121	RET WALL	10666322.44	446776.5242
122	RET WALL	10666302.03	446771.5686
123	RET WALL	10666304.16	446762.8228
124	RET WALL	10666283.75	446757.8672
125	RET WALL	10666285.87	446749.1214
126	RET WALL	10666265.47	446744.1658
127	RET WALL	10666267.59	446735.4200
128	RET WALL	10666247.18	446730.4643
129	RET WALL	10666249.31	446721.7185
130	RET WALL	10666228.90	446716.7629
131	RET WALL	10666231.00	446708.0978
132	EDGE OF PAVEMENT	10666200.88	446700.7823
133	RET WALL	10666204.69	446685.0765
134	RET WALL	10666181.88	446659.6732
135	RADIUS CEN	10666182.11	446683.8390
136	RADIUS CEN	10666383.76	446794.5860
137	EDGE OF PAVEMENT	10666118.19	446610.4518
138	PAVEMENT EDGE	10666146.06	446703.2644
139	RADIUS CEN	10666211.38	446814.3212
140	PAVEMENT EDGE	10666216.38	446814.2729
141	PAVEMENT EDGE	10666184.33	446749.1803
142	PAVEMENT EDGE	10666184.69	446809.4792
143	PAVEMENT EDGE	10666211.35	446809.3213
144	RET WALL	10666390.74	446762.1907
145	PAVEMENT EDGE	10666205.28	446724.7402
146	PAVEMENT EDGE	10666385.40	446722.9698
147	PAVEMENT EDGE	10666403.10	446703.0330
148	PAVEMENT EDGE	10666405.26	446703.0121
149	PAVEMENT EDGE	10666405.26	446657.2013
150	PAVEMENT EDGE	10666402.56	446657.2014

POINT TABLE

POINT #	DESCRIPTION	NORTHING	EASTING
151	PAVEMENT EDGE	10666100.13	446552.9129
152	PAVEMENT EDGE	10666156.13	446552.3627
153	EDGE OF PAVEMENT	10666393.26	446550.5328
154	EDGE OF PAVEMENT	10666439.11	446550.0824
155	RADIUS CEN	10666399.24	446735.2498
156	BLDG CORNER	10666392.06	446763.5234
157	BLDG CORNER	10666402.06	446763.5234
158	BLDG CORNER	10666402.06	446773.5228
159	BLDG CORNER	10666392.06	446773.5228
160	BLDG CORNER EXIST	10666169.33	446749.2691
161	BLDG CORNER EXIST	10666169.69	446809.5681
162	BLDG CORNER EXIST	10666090.69	446810.0360
163	BLDG CORNER EXIST	10666090.34	446749.7370
164	RADIUS CEN	10666404.27	446827.2285
165	RADIUS CEN	10666186.07	446680.5534
166	RADIUS CEN	10666198.34	446648.7223
167	RADIUS CEN	10666213.49	446654.8699
172	EDGE OF PAVEMENT	10666227.13	446610.3114
173	EDGE OF PAVEMENT	10666398.88	446562.2817
174	EDGE OF PAVEMENT	10666326.02	446589.4866
175	EDGE OF PAVEMENT	10666298.57	446599.7521
176	EDGE OF PAVEMENT	10666369.92	446599.0631
177	RADIUS CEN	10666404.11	446585.8638
178	RADIUS CEN	10666407.76	446597.8285
179	EDGE OF PAVEMENT	10666399.11	446585.9129
180	EDGE OF PAVEMENT	10666404.16	446590.8636
181	BOLLARD	10666167.47	446747.2801
182	BOLLARD	10666162.70	446747.3084

FOR CONTROL POINT AND NUMBER LOCATIONS, SEE SHEET C-103.

REFERENCES – BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL SMITH & COOPER, INC. STATE OF TEXAS NICHOLAS N. YBARRA 111156 LICENSED PROFESSIONAL ENGINEER
02/01/16

SCALE
Hor. AS SHOWN
Ver. AS SHOWN

DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

SHEET TITLE

CONTROL POINT TABLES

C-601

KEY NOTES

AS INDICATED BY: (XX)

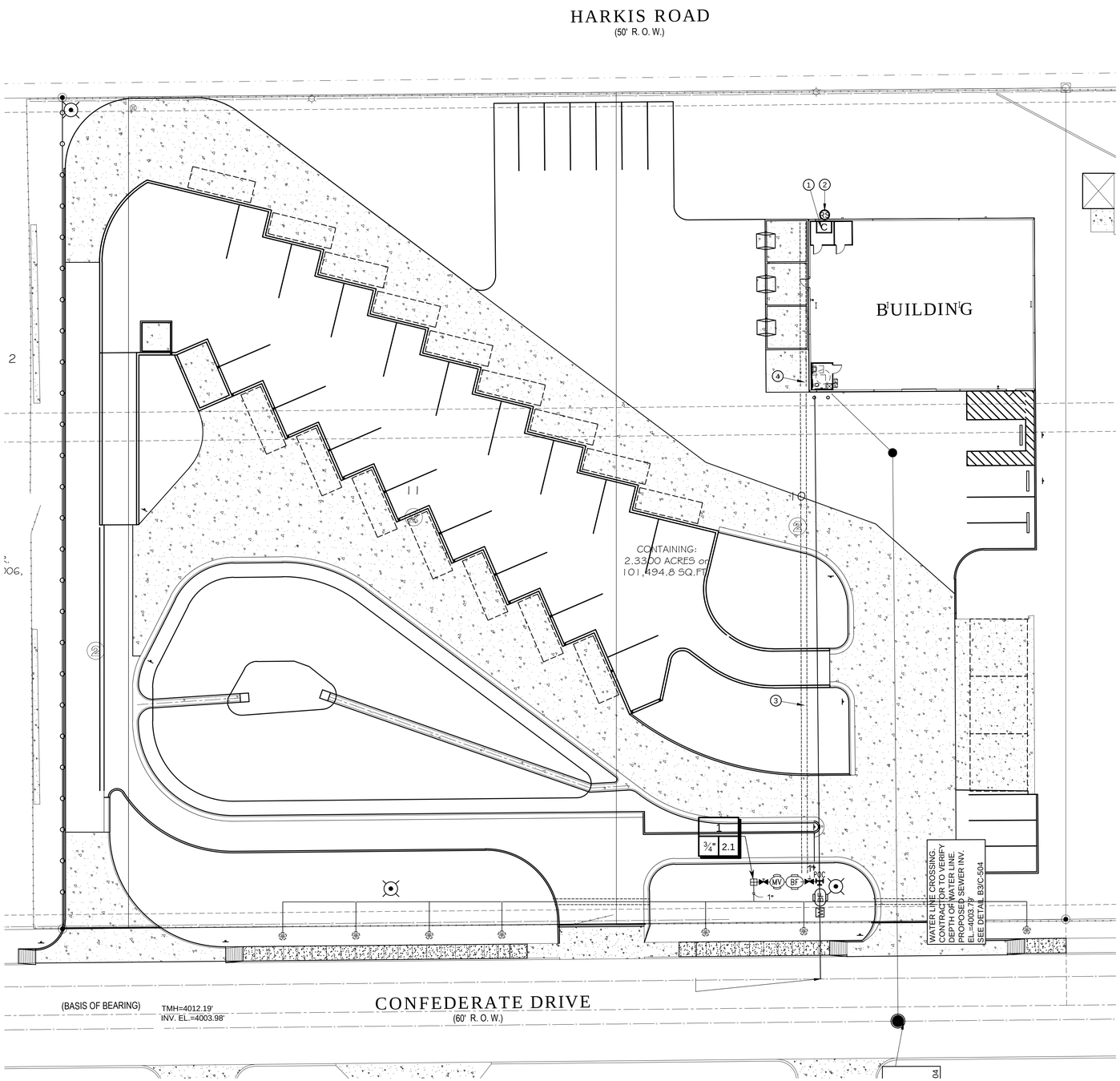
1. IRRIGATION CONTROLLER & RECEIVER TO BE WALL MOUNTED AS PER MNFR'S SPECIFICATIONS. CONTRACTOR TO COORDINATE WITH ELECTRICAL.
2. WIRELESS IRRIGATION RAIN SENSOR TO BE MOUNTED ON SIDE OF BUILDING 10' ABOVE FINISH GRADE AS PER MNFR'S SPECIFICATIONS.
3. PIPE SLEEVE FOR 18 GA. 13 STRAND MULTI-STRAND WIRE FOR CONTROLLER. CONTRACTOR TO COORDINATE WITH ELECTRICAL.
4. ELECTRICAL CONDUIT FOR 18 GA. 13 STRAND MULTI STRAND WIRE FOR CONTROLLER. CONTRACTOR TO COORDINATE WITH ELECTRICAL.

GENERAL NOTES:

A. REMOVE AND DISPOSE OF ANY EXISTING IRRIGATION EQUIPMENT.

IRRIGATION GENERAL NOTES

A. THE CONTRACTOR SHALL LOCATE AND VERIFY THE EXISTENCE OF ALL UTILITIES PRIOR TO INITIATING WORK.
B. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE OR INTERRUPTION IN SERVICE CAUSED BY HIS EXCAVATIONS AND/OR WORK.
C. IRRIGATION PLAN IS DIAGRAMMATIC IN NATURE. CONTRACTOR SHALL BE RESPONSIBLE FOR ACCOMPLISHING FULL COVERAGE IN ALL AREAS WITH SPECIFIED EQUIPMENT. ANY DISCREPANCIES IN THE PLAN SHOULD BE BROUGHT TO THE LANDSCAPE ARCHITECT'S ATTENTION BEFORE BID.
D. WHERE TREES, LIGHT STANDARDS, ETC. ARE AN OBSTRUCTION OF PIPING AND DRIP EMITTERS THE IRRIGATION SHALL BE ADJUSTED AND/OR RELOCATED AS NECESSARY TO OBTAIN FULL COVERAGE WITH MINIMAL OVERSPRAY INTO NON-LANDSCAPE AREAS OR ONTO HARD CONSTRUCTION.
E. ALL FITTINGS AND NECESSARY EQUIPMENT REQUIRED TO MAKE THIS IRRIGATION SYSTEM OPERATE PROPERLY AND TO COMPLY WITH LOCAL AND STATE CODES ARE INCIDENTAL TO THESE PLANS AND ARE THE CONTRACTOR'S RESPONSIBILITY. CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY TO CONSTRUCT PROPOSED IRRIGATION SYSTEM IN ACCORDANCE WITH PLANS, WRITTEN SPECIFICATIONS, AND DETAILS.
F. THIS IRRIGATION SYSTEM WAS DESIGNED FOR A MINIMUM STATIC PRESSURE AT THE POINT OF CONNECTION AS INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY ACTUAL PSI AND DELIVER RESULTS TO THE LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION. IN THE EVENT THE ACTUAL PSI IS LESS THAN WHAT IS SPECIFIED ON THE PLANS THE CONTRACTOR SHALL RECEIVE DIRECTION FROM THE LANDSCAPE ARCHITECT REGARDING DESIGN MODIFICATIONS IF NECESSARY.
G. CONTRACTOR WILL BE HELD LIABLE FOR GAINING ACCESS UNDER ALL PAVEMENTS. IF SLEEVES ARE INDICATED ON THE PLANS THEY SHOULD BE VERIFIED FOR ACCESSIBILITY AND PASSIBILITY BEFORE BID IS MADE, IF NOT, THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF SLEEVE PIPING WITH ALL TRADES TO INSURE THAT SLEEVES ARE INSTALLED PROPERLY PRIOR TO INSTALLATION OF CURB AND GUTTER, ASPHALT PAVING, SIDEWALKS, CONCRETE PADS, ETC.
H. THE CONTRACTOR SHALL LOCATE AND VERIFY WATER SUPPLY TO WHICH THE IRRIGATION SYSTEM WILL CONNECT. ALL EQUIPMENT AND INSTALLATION METHODS SHALL COMPLY WITH ALL LOCAL, REGIONAL, STATE, AND FEDERAL GUIDELINES.
I. THIS IRRIGATION SYSTEM HAS BEEN DESIGNED FOR THE USE OF WATER THAT IS POTABLE.
J. CONTRACTOR IS RESPONSIBLE FOR ALL CONNECTIONS AND METERS REQUIRED FOR THE FULL IMPLEMENTATION OF THE SYSTEM.
K. THE CONTRACTOR SHALL COORDINATE WATER "TAP-IN" LOCATIONS AND CONTROLLER CONNECTIONS WITH THE OWNER'S AGENT PRIOR TO INSTALLATION.
L. ALL VALVES SHALL BE LOCATED IN PLANTING AREAS WHERE SHOWN AND ALL PIPING SHALL BE INSTALLED PRIOR TO LANDSCAPE PLANTING WORK.
M. NO TEES, ELLS, OR OTHER TURNS IN PIPING SHALL BE LOCATED UNDER PAVING.
N. CONTRACTOR SHALL SIZE VALVE BOXES TO HOUSE ENTIRE IRRIGATION ASSEMBLIES AS SHOWN. VALVE BOX EXTENSIONS AS MANUFACTURED BY THE VALVE BOX SUPPLIER SHALL BE INSTALLED TO MAINTAIN THE VALVE BOX COVER FLUSH WITH THE FINISHED GRADE AND THE VALVE BOX BASE A MINIMUM OF 2 INCHES BELOW THE BOTTOM OF ANY IRRIGATION ASSEMBLY.
O. PIPE SIZES SHOWN AT POINTS OF CONNECTION AND WHERE CHANGES IN PIPE SIZE OCCUR. ALL PIPES SHALL BE THE SIZE OF THE LAST PRECEDING SIZE CALLED OUT UPSTREAM OF EACH SECTION OF PIPE UNLESS OTHERWISE NOTED. LATERAL LINES WITH FLOW OF 10 GPM OR LESS SHALL BE SIZE 1".
P. EACH CONTROLLER WILL HAVE AN INDEPENDENT COMMON WIRE. THE WIRING SHALL BE UL 493, TYPE UF-B SINGLECONDUCTOR, WITH SOLID-COPPER CONDUCTORS AND INSULATED CABLE; SUITABLE FOR DIRECT BURIAL.
Q. SPLICING OF REMOTE CONTROL VALVE WIRES IS NOT ALLOWED BETWEEN CONTROLLER & VALVE BOX FOR REMOTE CONTROL VALVE. WIRES MUST BE CONTINUOUS FROM CONTROLLER TO REMOTE CONTROL VALVE WITHOUT SPLICING.
R. CONTRACTOR TO FLUSH ALL LINES PRIOR TO INSTALLING HEADS AND EMITTERS.
S. ALL TRENCH BACKFILL SHALL BE CLEAN MATERIAL FROM EXCAVATION BACKFILL. TRENCH IS TO BE EVEN WITH EXISTING GRADES AFTER COMPACTION.
T. TRENCH BACKFILL MATERIAL SHALL BE WATER SETTLED AND COMPACTED.
U. ALL REMOTE CONTROL VALVE WIRES NEED TO BE LABELED AT VALVE W/ WEATHER (WATER) PROOF LABELS AND AT CONTROLLER WITH CORRESPONDING LABEL.



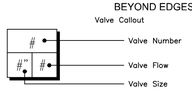
A1 LANDSCAPE IRRIGATION PLAN
1"=20'-0"

IRRIGATION LEGEND

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
	RAIN BIRD XCZ-075-PRF LOW FLOW DRIP CONTROL KIT, 3/4" LOW FLOW VALVE, 3/4" PRESSURE REGULATING RBY FILTER, AND 30PSI PRESSURE REGULATOR, 0.2GPM-5GPM.	1
	TREE DRIP RING 20 L.F. OF TUBING PER TREE, XFS-09-12 (12)	7

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
	MANUAL VALVE AS SPECIFIED SAME SIZE AS PIPE SIZE	2
MV	RAIN BIRD PESB 1" 1", 1-1/2", 2" PLASTIC INDUSTRIAL VALVES. LOW FLOW OPERATING CAPABILITY, GLOBE CONFIGURATION. WITH SCRUBBER TECHNOLOGY FOR RELIABLE PERFORMANCE IN DIRTY WATER IRRIGATION APPLICATIONS.	1
BF	FEBCO 825YA 1" REDUCED PRESSURE BACKFLOW PREVENTER	1
C	RAIN BIRD ESP4ME 4 STATION, HYBRID MODULAR OUTDOOR CONTROLLER. FOR RESIDENTIAL OR LIGHT COMMERCIAL APPLICATIONS.	1
	RAIN BIRD WR2-RFC WIRELESS RAIN AND FREEZE SENSOR COMBO, INCLUDES 1 RECEIVER AND 1 RAIN/FREEZE SENSOR TRANSMITTER.	1
POC	POINT OF CONNECTION 1" 1" WATER METER, SEE CIVIL	1
	IRRIGATION LATERAL LINE: PVC SCHEDULE 40 PVC SCHEDULE 40 IRRIGATION PIPE. ONLY LATERAL TRANSITION PIPE SIZES 1 1/4" AND ABOVE ARE INDICATED ON THE PLAN, WITH ALL OTHERS BEING 1" IN SIZE.	344.2 L.F.
	IRRIGATION MAINLINE: PVC SCHEDULE 40	23.0 L.F.
	PIPE SLEEVE: PVC CLASS 200 SDR 21 TYPICAL PIPE SLEEVE FOR IRRIGATION PIPE. PIPE SLEEVE SIZE SHALL ALLOW FOR IRRIGATION PIPING AND THEIR RELATED COUPLINGS TO EASILY SLIDE THROUGH SLEEVING MATERIAL. EXTEND SLEEVES 18 INCHES BEYOND EDGES OF PAVING OR CONSTRUCTION.	284.8 L.F.

Valve Callout



NORTH

DESIGN PRESSURE
MINIMUM 54 PSI

REFERENCES – BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO, EL PASO, TEXAS 79901

2/1/2016
STATE OF TEXAS
TYF. SISCO
17730
REGISTERED PROFESSIONAL ENGINEER

SCALE
Hor. AS SHOWN
Ver. AS SHOWN

DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

SHEET TITLE
LANDSCAPE IRRIGATION PLAN

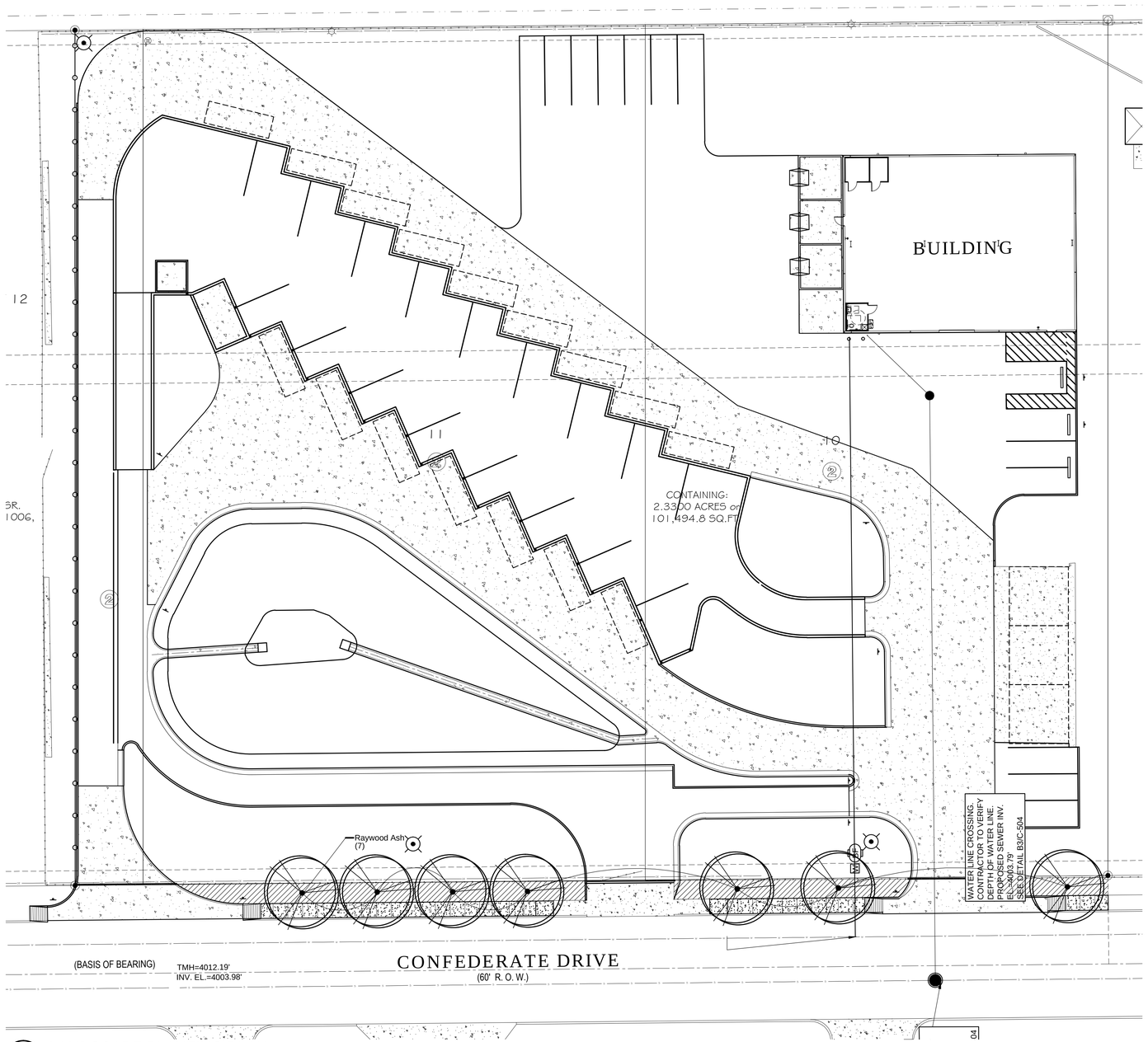
L-101

\\Data1\Projects\2015\5124.15\BIM_CAD\00_SHEETS_L101-5124.dwg, L-101, 1/26/2016 1:08:17 PM,
PCKhoa, DWG To PDF.pc3, ARCH expand D (24.00 x 36.00 inches), 1:1

KEY NOTES

AS INDICATED BY: (00)

1. XXX



A1 LANDSCAPE PLANTING PLAN

1"=20'-0"

PLANTING GENERAL NOTES

A. THE LANDSCAPE CONTRACTOR SHALL REFER TO THE CONTRACT AND SPECIFICATIONS FOR REQUIREMENTS NOT LISTED HEREIN.
B. THE CONTRACTOR SHALL LOCATE AND VERIFY THE EXISTENCE OF ALL UTILITIES PRIOR TO STARTING WORK.
C. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTING PLAN SHOWN ON ALL DRAWINGS. PLANT COUNTS AND SQUARE FOOTAGES ARE PROVIDED AS A COURTESY ONLY.
D. ALL PLANT MATERIAL SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE CURRENT AMERICAN STANDARD FOR NURSERY STOCK, PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN OR EQUIVALENT.
E. IN THE CASE OF A DISCREPANCY BETWEEN THE CONTAINER SIZE CALLED OUT IN PLANT LIST AND THE CALIPER AND HEIGHT OF PLANT MATERIAL, THE SPECIFIED TREE MUST MEET THE CALIPER AND HEIGHT REQUIREMENTS SPECIFIED, EVEN IF THE LARGER CONTAINER SIZE IS REQUIRED TO MEET THESE SPECIFICATIONS AT NO ADDITIONAL COST TO THE OWNER.
F. ALL PLANTS TO BE GROWN AS SPECIFIED. NO CONTAINER GROWN STOCK WILL BE ACCEPTED IF IT IS ROOT BOUND.
G. WITH CONTAINER GROWN STOCK, THE CONTAINER SHALL BE REMOVED AND THE PLANT BALL SHALL BE CUT THROUGH THE SURFACE IN TWO VERTICAL LOCATIONS.
H. LANDSCAPE CONTRACTOR SHALL LOCATE THE SOURCE OF AND SELECT ALL PLANTS FOR APPROVAL BY THE PROJECT LANDSCAPE ARCHITECT.
I. ALL PLANT MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY AT THE NURSERIES OR SUPPLIERS BY THE PROJECT LANDSCAPE ARCHITECT.
J. IF ANY SOURCE OF PLANTS IS LOCATED FURTHER THAN 30 MILES FROM THE PROJECT SITE THE CONTRACTOR WILL BE REQUIRED TO PAY TIME AND TRAVEL EXPENSES INCURED BY THE PROJECT LANDSCAPE ARCHITECT.
K. ALL PLANTS TAGGED AS APPROVED AT NURSERY OR SUPPLIER SHALL BEAR THE SAME TAG WHEN DELIVERED ON SITE.
L. THE RIGHT TO REJECT PLANT MATERIALS DELIVERED TO THE SITE THAT DO NOT BEAR APPROVAL TAGS IS RESERVED BY THE PROJECT LANDSCAPE ARCHITECT.
M. IN AREAS WHERE PAVING SUBGRADES AND BUILDING PADS EXTEND INTO PLANT BED AREAS, 6 INCH HOLES SHALL BE DRILLED EVERY 3 FEET AND FILLED WITH 1 INCH DIAMETER GRAVEL TO PROVIDE PERCOLATION AND DRAINAGE FOR THE PLANTING BED. HOLES SHALL BE DRILLED THROUGH IMPROVED SUBGRADES INTO EXISTING SITE SOILS BUT NO DEEPER THAN FOUR FEET.
N. ALL PLANTING BEDS TO RECEIVE 2 INCHES OF BACK TO EARTH COMPOST PER SQUARE FOOT AND 1 POUND OF A 4(N):1(P):2(K) RATIO FERTILIZER PER 100 SQUARE FEET. BOTH MATERIALS SHALL BE INCORPORATED INTO THE SOIL TO A DEPTH OF 12 INCHES.
O. ALL FINAL PLANTING BED GRADES IN AREAS WHERE ORGANIC AND/OR INORGANIC MULCH IS BEING APPLIED SHOULD BE 3 INCHES BELOW ADJACENT HARD SURFACES.
P. NO PLANT SHALL BE PUT INTO THE GROUND BEFORE ROUGH GRADING IS COMPLETE AND APPROVED BY THE PROJECT LANDSCAPE ARCHITECT.
Q. ALL PLANTS SHALL BEAR THE SAME RELATIONSHIP TO FINISHED GRADE AS THE PLANT'S ORIGINAL GRADE BEFORE DIGGING OR AS ESTABLISHED IN CONTAINER.
R. ALL PLANTS SHALL BE INSTALLED AS PER DETAILS.
S. ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24 HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL THEN BE WATERED WEEKLY OR MORE OFTEN AS NEEDED DURING THE FIRST GROWING SEASON.
T. ALL PLANTING BEDS TO RECEIVE ORGANIC AND/OR INORGANIC MULCH MATERIALS AS NOTED ON PLANS.
U. THE DAY PRIOR TO PLANTING, THE LOCATION OF ALL TREES AND SHRUBS SHALL BE STAKED FOR APPROVAL BY THE LANDSCAPE ARCHITECT.
V. THE CONTRACTOR SHALL PRUNE ALL BRANCHES 6 FEET ABOVE FINISH GRADE ON ALL DECIDUOUS TREES 12 FEET OR TALLER.

PLANTING LEGEND

TREES	QTY	BOTANICAL NAME	COMMON NAME	CONT	CAL	SIZE
	7	FRAXINUS OXYCARPA 'RAYWOOD' TM SINGLE TRUNK	RAYWOOD ASH	B & B	2"CAL	10'-12' HT

REMOVE TOP SOIL AS REQUIRED TO MEET 4" BELOW THE EXISTING ADJACENT HARDSCAPE IN TREE PLANTING AREA TO ACCOMODATE MULCH TO BE PLACED BY OWNER AT A FUTURE DATE.

NORTH

REFERENCES – BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO, EL PASO, TEXAS 79901

REGISTERED LANDSCAPE ARCHITECT
STATE OF TEXAS
2/12/2016

SCALE
Hor: AS SHOWN
Ver: AS SHOWN

DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME

CONFEDERATE CITIZENS COLLECTION STATION

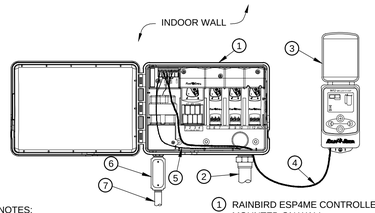
CITY OF EL PASO

SHEET TITLE

LANDSCAPE PLANTING PLAN

L-102

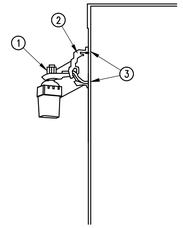
I:\Data\Projects\2015\5124.15\BIM_CAD\00_SHEETS\L-102-5124.dwg, L-102, 1/26/2016 1:12:36 PM, PDFdist, DWG To PDF.pc3, ARCH expand D (24.00 x 36.00 Inches), 1:1



NOTES:
1. FOR BEST PERFORMANCE, THE CONTROLLER INTERFACE SHOULD BE INSTALLED AT LEAST FIVE FEET ABOVE THE GROUND.
2. IT IS RECOMMENDED THAT THE CONTROLLER INTERFACE BE INSTALLED AWAY FROM SOURCES OF ELECTRICAL INTERFERENCE (SUCH AS TRANSFORMERS, GENERATORS, PUMPS, FANS, ELECTRICAL METER BOXES) AND METAL OBJECTS TO MAXIMIZE COMMUNICATION RANGE.

1. RAINBIRD ESP4ME CONTROLLER MOUNTED ON WALL
2. 1" PVC SCH 40 CONDUIT & FITTINGS FOR VALVE WIRES
3. RAINBIRD WR2-RFC WIRELESS SENSOR CONTROLLER INTERFACE
4. CABLE HARNESS FOR CONTROLLER INTERFACE (30" MAX.)
5. GROUND WIRE TO GROUNDING GRID
6. JUNCTION BOX
7. 1" PVC SCH 40 CONDUIT TO POWER SUPPLY

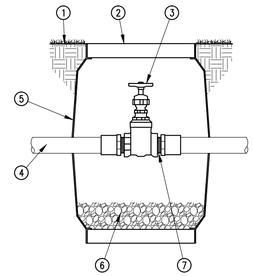
D1 CONTROLLER & RAIN SENSOR RECEIVER
N.T.S.



1. RAINBIRD WR2-RFC WIRELESS RAIN/FREEZE SENSOR
2. ATTACHMENT PROVIDED WITH RAIN/FREEZE SENSOR
3. MOUNT TO BUILDING AS DIRECTED BY ARCHITECT

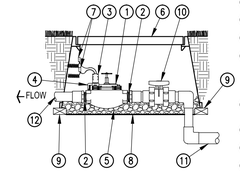
NOTE: MOUNT SENSOR VERTICALLY. AVOID PLACEMENT UNDER EAVE OR TREE CANOPY. LOCATE WITHIN 50 FT OF SENSOR RECEIVER AND CONTROLLER.

D2 RAIN/FREEZE SENSOR
N.T.S.



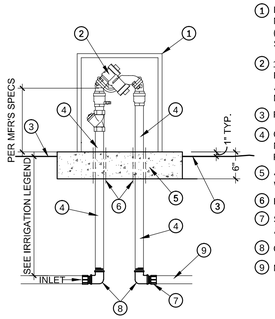
1. FINISH GRADE
2. (2) COMMERCIAL GRADE RECTANGULAR VALVE BOXES WITH COVER
3. GATE VALVE
4. MAINLINE PIPE
5. VALVE BOX EXTENSIONS AS NEEDED TO EXTEND TO MAINLINE DEPTH
6. 4" DEPTH WASHED GRAVEL
7. THREADED MALE ADAPTER W/ TEFLON TAPE

D3 ISOLATION GATE VALVE
1 1/2"=1'-0"



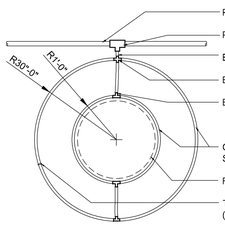
1. REMOTE CONTROL VALVE
2. INSTALL THREADED MALE ADAPTER WITH TEFLON TAPE, TYP
3. SOLENOID
4. MANUAL BLEED LEVER
5. 3/4 INCH GRAVEL SUPPORT
6. 12" RECTANGULAR VALVE BOX WITH EXTENSIONS AS NECESSARY TO EXTEND BELOW VALVE ASSEMBLY A MIN. OF 3", TYP
7. EXPANSION COIL AND 3M DBY WATERPROOF CONNECTOR
8. LANDSCAPE FABRIC
9. BRICK SUPPORT
10. SCH. 80 TRUE UNION BALL VALVE
11. PVC MAINLINE PIPE
12. PVC LATERAL PIPE

D4 MASTER VALVE
1"=1'-0"



1. LB.75 HOT-BOX NON-HEATED ENCLOSURE (INSTALL PER MFR'S SPECIFICATIONS)
2. 1" FEBCO 825 YA REDUCED PRESSURE BACKFLOW ASSEMBLY (INSTALL PER MFR'S SPECIFICATIONS)
3. FINISH GRADE
4. GALVANIZED NIPPLE (LENGTH AS REQUIRED)
5. 4000 PSI CONCRETE PAD W/ TOOLED EDGES
6. PVC PIPE SLEEVE
7. SCH. 40 PVC MALE ADAPTER
8. GALVANIZED ELBOW
9. MAINLINE

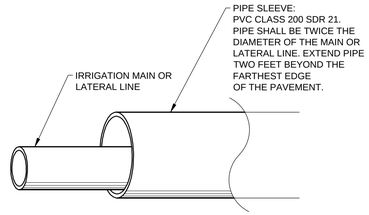
C1 BACKFLOW PREVENTION
3/4"=1'-0"



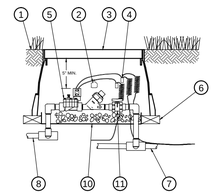
PVC DRIP MANIFOLD PIPE
PVC SCH 40 TEE OR EL
BLANK POLYETHYLENE TUBING
BARB CROSS INSERT FITTING
BARB TEE, TYP
ON-SURFACE DRIPLINE PLACE AS SHOWN (LENGTH AS REQUIRED)
ROOT BALL
TIE DOWN STAKE (QUANTITY AS REQUIRED BY MNFR)

NOTES:
1. EMITTER SPACING TO BE BASED ON SOIL TYPE, AND TREE CANOPY, REF INSTALLATION SPECIFICATIONS BY MNFR
2. PLACE TIE DOWN STAKES EVERY THREE FEET
3. AT FITTINGS WHERE THERE IS A CHANGE OF DIRECTION SUCH AS TEES OR ELBOWS, USE TIE-DOWN STAKES ON EACH LEG OF THE CHANGE OF DIRECTION
4. DRIPLINE SHALL BE COVERED BY 3" DEPTH OF WOOD MULCH IN GRASS AREAS

C2 TREE DRIP RING
1/2"=1'-0"

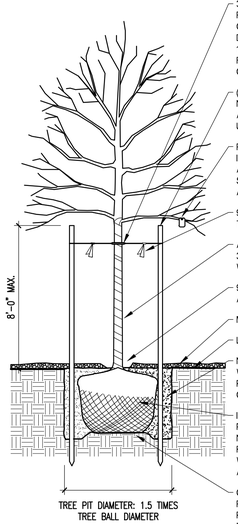


C3 PIPE SLEEVE
N.T.S.



1. FINISH GRADE
2. ID TAG
3. VALVE BOX WITH COVER
4. WATERPROOF CONNECTION
5. VALVE WITH FILTER
6. BRICK (1 OF 4)
7. PVC MAINLINE
8. LATERAL PIPE
9. PVC MAINLINE PIPE
10. 3-INCH MINIMUM DEPTH OF 3/4-INCH WASHED GRAVEL WITH FILTER FABRIC BENEATH
11. SCH 80 TRUE UNION BALL VALVE

C4 DRIP CONTROL VALVE
1/2"=1'-0"



3/4" DIAMETER REINFORCED RUBBER HOSE LOOPED COMPLETELY AROUND TRUNK DIAMETER WITH (2) STRANDS OF 12 GAUGE GALVANIZED WIRE RUNNING THROUGH THE CENTER CONNECTING TO WOOD STAKES

(2) 3" DIAMETER WOOD STAKES NOTCHED FOR WIRE. ANCHORED AT LEAST 12" INTO UNDISTURBED GRADE

PLANT ID TAG TO REMAIN UNTIL INSPECTED BY LANDSCAPE ARCHITECT. REMOVE AFTER SUBSTANTIAL COMPLETION ACCEPTANCE

9" YELLOW WARNING TAPE TIED TO SUPPORT WIRE

APPROVED TREE WRAP WITH 30% OVERLAP AND ENDS TIED WITH TAPE

9" RADIUS CLEAR OF MULCH AROUND TRUNK

MULCH AS SPECIFIED

LANDSCAPE FABRIC

NATIVE SOIL FILL. TAMP AND WATER SETTLE TO REMOVE ALL POCKETS OF AIR WITHOUT COMPACTING SOIL

IF ROOT BALL IS WRAPPED IN PLASTIC, WIRE, OR NON-BIODEGRADABLE MATERIAL, REMOVE ENTIRE WRAP. IF WRAPPED IN BURLAP, REMOVE AT LEAST TOP 1/3

COMPACT SUBGRADE TO FORM PEDESTAL TO PREVENT SETTLING. PEDESTAL SHALL BE 12" DEEP OF TAMPED EARTH. FINISHED TOP OF ROOT BALL SHALL BE 1" ABOVE ADJACENT FINISHED GRADE

A1 DECIDUOUS TREE PLANTING
1/4"=1'-0"

REFERENCES – BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

STATE OF TEXAS
REGISTERED LANDSCAPE ARCHITECT
2/12/2016

SCALE
Hor: AS SHOWN
Ver: AS SHOWN

DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

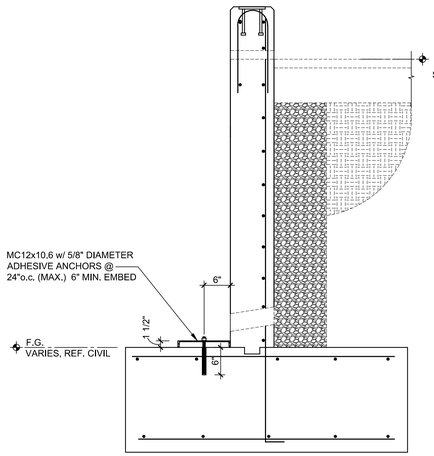
PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

SHEET TITLE
PLANTING & IRRIGATION DETAILS

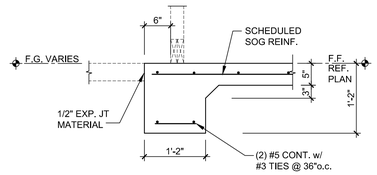
L-501

\\Data1\Projects\2015\5124.15\BIM_CAD\00_SHEETS\L-501-5124.dwg, L-501, 1/26/2016 1:14:09 PM, PCKhoa, DWG To PDF.pc3, ARCH expand D (24.00 x 36.00 inches), 1:1

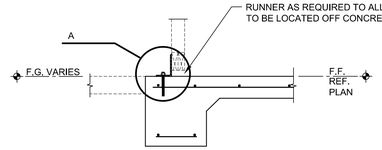


REFERENCE DETAIL A3/S-501 FOR NOTES NOT CALLED OUT

C1 RETAINING WALL
3/4" = 1'-0"

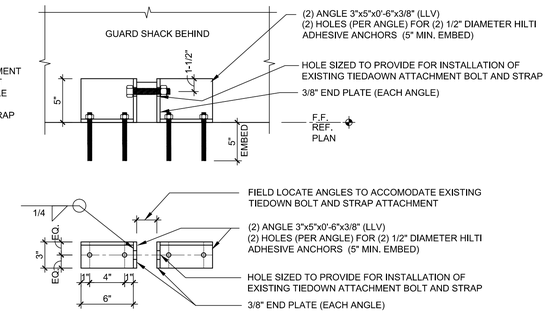


D2 TIEDOWN DETAIL
3/4" = 1'-0"

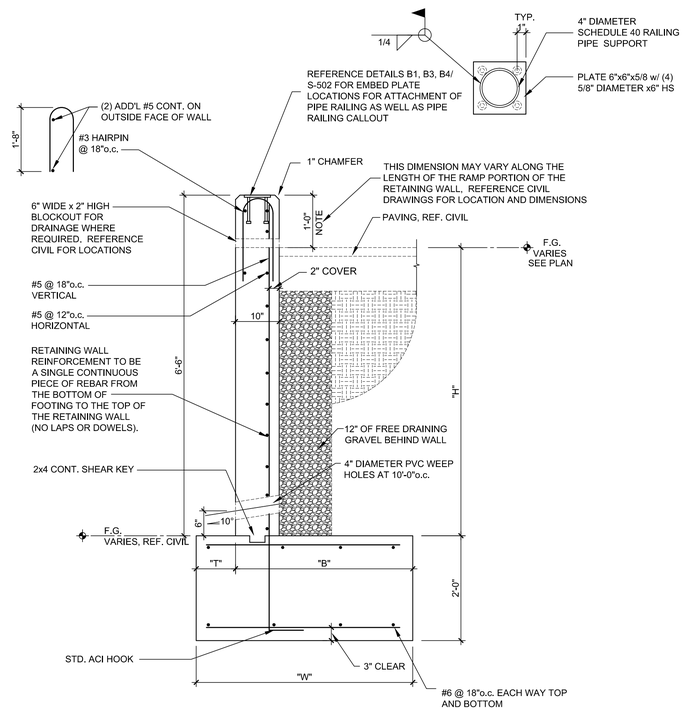


DETAIL OCCURS AT EACH EXISTING TIEDOWN STRAP
REFERENCE DETAIL A FOR NOTES NOT SHOWN

D3 TIEDOWN DETAIL
3/4" = 1'-0"



DETAIL A



REFERENCE CIVIL FOR RAIL GUIDE DETAIL TO BE PLACED
ON THE TOE OF THE RETAINING WALL FOOTING

REFERENCE DETAIL C1/S-502 FOR TYPICAL WALL
CONSTRUCTION JOINT DETAIL

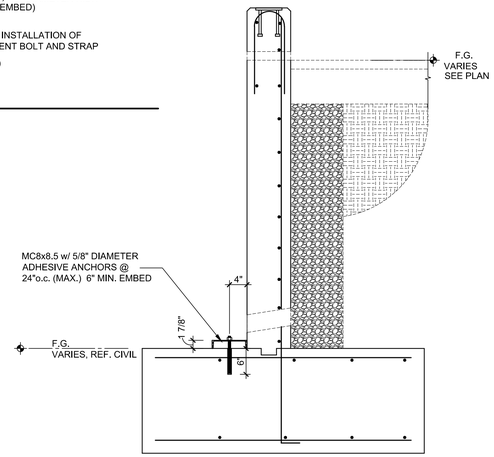
RETAINING WALL TABLE

H	T	B	W	BEARING PRESSURE (psf) TOE	HEEL	SAFETY FACTOR SLIDING	OVER-TURNING
2'-0" OR LESS	9"	1'-7"	2'-4"	1383	0	2.27	1.84
3'-0" ≥ H > 2'-0"	9"	2'-1"	2'-10"	1673	0	1.75	1.80
4'-0" ≥ H > 3'-0"	9"	3'-3"	4'-0"	1455	0	1.62	2.57
5'-0" ≥ H > 4'-0"	9"	4'-6"	5'-3"	1453	172	1.57	3.37
6'-0" > H > 5'-0"	2'-0"	2'-6"	4'-6"	1737	0	--*	1.82

* - CONCRETE PAVING RESISTING SLIDING

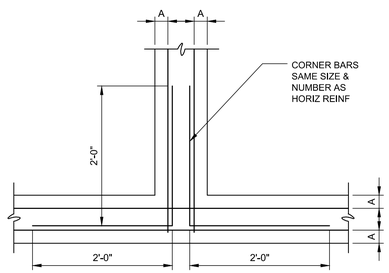
EQUIVALENT FLUID PRESSURE = 40 psf
DESIGN SOIL WEIGHT = 110 pcf
DESIGN CONCRETE WEIGHT = 145 pcf
SURCHARGE = 50 psf
F'c = 3000 psi Fy = 60,000 psi
PASSIVE SOIL PRESSURE = 350 pcf
FTNG/SOIL FRICTION RATIO = .3

A3 RETAINING WALL
3/4" = 1'-0"



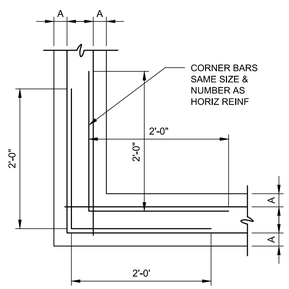
REFERENCE DETAIL A3/S-501 FOR NOTES NOT CALLED OUT

C5 RETAINING WALL
3/4" = 1'-0"



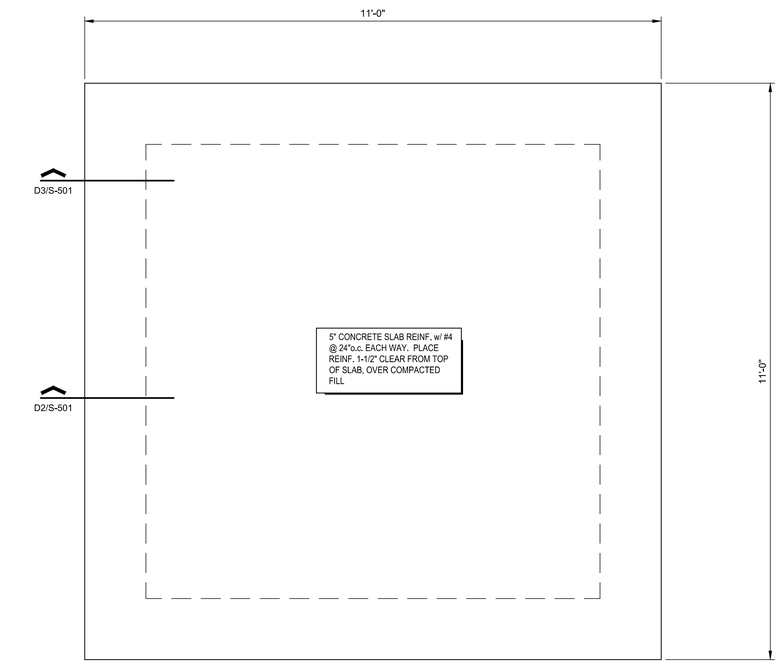
A = 1 1/2" FOR CONCRETE CAST ON FORMS
A = 3" FOR CONCRETE CAST ON EARTH

B5 TYPICAL INTERSECTION BAR
NO SCALE



A = 1 1/2" FOR CONCRETE CAST ON FORMS
A = 3" FOR CONCRETE CAST ON EARTH

A5 TYPICAL CORNER BAR
NO SCALE



REFERENCE CIVIL DRAWINGS FOR F.F. SLAB ELEVATION AND LOCATION

A1 BUILDING FOUNDATION
3/4" = 1'-0"

REFERENCES – BENCH MARKS
BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL, SMITH & COOPER, INC. F-1195
STATE OF TEXAS
JOHN DAVID PASS
58070
01/28/16

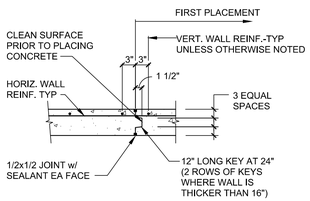
SCALE
Hor. AS SHOWN
Ver. AS SHOWN
DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS
COLLECTION STATION

CITY OF EL PASO

SHEET TITLE
DETAIL SHEET

S-501

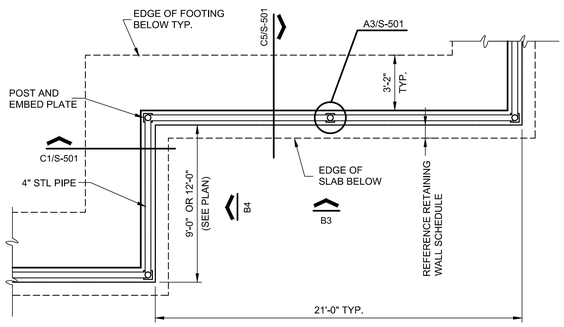


NOTES

1. PROVIDE CONSTRUCTION JOINT AT 40'-0" MAX.
2. LOCATION AND DETAIL OF JOINTS SHALL BE APPROVED BY ARCHITECT PRIOR TO CONSTRUCTING FORMS OR PLACING CONCRETE.

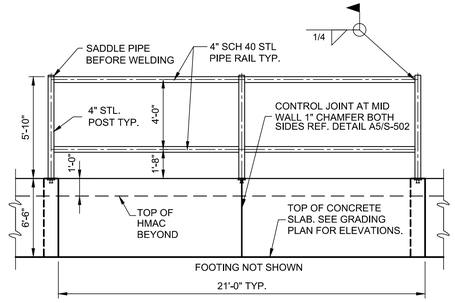
C1 WALL VERTICAL CONSTRUCTION JOINTS

NO SCALE



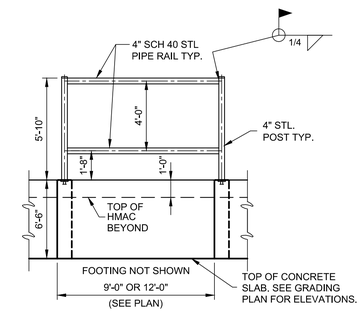
B1 PLAN

1/4"=1'-0"



B3 ELEVATION

1/4"=1'-0"



B4 ELEVATION

1/4"=1'-0"

GENERAL NOTES

SITE PLANNING AND FILL NOTES

A. PROPER CONSTRUCTION DRAINAGE SHALL BE PROVIDED AND MAINTAINED AT ALL TIMES DURING FOUNDATION CONSTRUCTION. PONDING OF WATER AT THE SITE SHOULD BE AVOIDED DURING ALL PHASES OF CONSTRUCTION.

B. THE SUBSURFACE INFORMATION AND FOUNDATION AND RETAINING WALL DESIGN ARE BASED ON A REPORT PREPARED BY amec foster wheeler, AMEC PROJECT NO. 1537192043 DATED NOVEMBER 18, 2015. THE GEOTECHNICAL REPORT IS AN INTEGRAL PART OF THIS PROJECT. THE GENERAL CONTRACTOR SHALL PERFORM THE EXCAVATION AND FOOTING CONSTRUCTION ACCORDING TO THE RECOMMENDATIONS PROVIDED IN THE REPORT

CONCRETE

A. F'c = 3,000 PSI ASTM C33, C150
B. AIR ENTRAINMENT - 6% +/- 1-1/2% (RETAINING WALLS ONLY)
C. MAXIMUM FLYASH CONTENT NOT TO EXCEED 20% BY WEIGHT

CONCRETE REBAR

A. Fy = 60,000 psi ASTM A615
B. LAP CONTINUOUS WALL REINFORCEMENT A MINIMUM OF 48 BAR DIAMETERS

MISCELLANEOUS STEEL

A. CHANNELS, ANGLES, EMBED PLATES - ASTM A-36
B. STANDARD STEEL PIPE SECTIONS - Fy = 35,000 psi, ASTM A501 OR A53, TYPE E or S, GRADE A

HEADED STUDS

A. NELSON STUD, KSM OR EQUAL

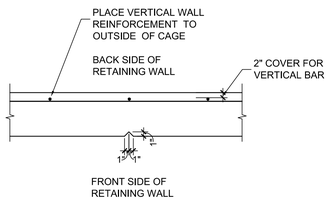
WELDING

A. WELDING SHALL CONFORM TO THE STANDARDS OF THE AMERICAN WELDING SOCIETY. ELECTRODES FOR ALL FIELD AND SHOP WELDING SHALL CONFORM TO AWS STANDARDS (CLASS E70 ELECTRODES) AND ASTM A223)

POST-INSTALLED ANCHORS

EXCEPT WHERE INDICATED ON THE DRAWINGS, POST-INSTALLED ANCHORS SHALL CONSIST OF THE FOLLOWING ANCHOR TYPES AS PROVIDED BY HILTI, INC. OR APPROVED EQUAL. CONTACT HILTI AT (800) 879-8000 FOR PRODUCT RELATED QUESTIONS.

A. ANCHORAGE TO CONCRETE
   1. ADHESIVE ANCHORS FOR CRACKED AND UNCRACKED CONCRETE USE:
      a. HILTI HIT-HY 200 SAFE SET SYSTEM WITH HILTI HIT-Z ROD PER ICC ESR-3187
      b. HILTI HIT-HY 200 SAFE SET SYSTEM WITH HILTI HOLLOW DRILL BIT SYSTEM WITH HAS-E THREADED ROD PER ICC ESR-3187.
      c. HILTI HIT-RE 500-SD EPOXY ADHESIVE ANCHORING SYSTEM WITH HAS-E THREADED ROD PER ICC ESR-2322 FOR SLOW CURE APPLICATIONS
B. REBAR DOWELING INTO CONCRETE
   1. ADHESIVE ANCHORS FOR CRACKED AND UNCRACKED CONCRETE USE:
      a. HILTI HIT-HY 200 SAFE SET SYSTEM WITH HILTI HOLLOW DRILL BIT SYSTEM WITH CONTINUOUSLY DEFORMED REBAR PER ICC ESR-3187.
      b. HILTI HIT-RE 500-SD EPOXY ADHESIVE ANCHORING SYSTEM WITH CONTINUOUSLY DEFORMED REBAR PER ICC ESR-2322.
C. ANCHOR CAPACITY USED IN DESIGN SHALL BE BASED ON THE TECHNICAL DATA PUBLISHED BY HILTI OR SUCH OTHER METHOD AS APPROVED BY THE STRUCTURAL ENGINEER OF RECORD. SUBSTITUTION REQUESTS FOR ALTERNATE PRODUCTS MUST BE APPROVED IN WRITING BY THE STRUCTURAL ENGINEER OF RECORD PRIOR TO USE. CONTRACTOR SHALL PROVIDE CALCULATIONS DEMONSTRATING THAT THE SUBSTITUTED PRODUCT IS CAPABLE OF ACHIEVING THE PERFORMANCE VALUES OF THE SPECIFIED PRODUCT. SUBSTITUTIONS WILL BE EVALUATED BY THEIR HAVING AN ICC ESR SHOWING COMPLIANCE WITH THE RELEVANT BUILDING CODE FOR SEISMIC USES, LOAD RESISTANCE, INSTALLATION CATEGORY, AND AVAILABILITY OF COMPREHENSIVE INSTALLATION INSTRUCTIONS. ADHESIVE ANCHOR EVALUATION WILL ALSO CONSIDER CREEP, IN-SERVICE TEMPERATURE AND INSTALLATION TEMPERATURE.
D. INSTALL ANCHORS PER THE MANUFACTURER INSTRUCTIONS, AS INCLUDED IN THE ANCHOR PACKAGING.
E. OVERHEAD ADHESIVE ANCHORS MUST BE INSTALLED USING THE HILTI PROFIS SYSTEM.
F. THE CONTRACTOR SHALL ARRANGE AN ANCHOR MANUFACTURER'S REPRESENTATIVE TO PROVIDE ONSITE INSTALLATION TRAINING FOR ALL OF THEIR ANCHORING PRODUCTS SPECIFIED. THE STRUCTURAL ENGINEER OF RECORD MUST RECEIVE DOCUMENTED CONFIRMATION THAT ALL OF THEIR CONTRACTOR'S PERSONNEL WHO INSTALL ANCHORS ARE TRAINED PRIOR TO THE COMMENCEMENT OF INSTALLING ANCHORS.
G. ANCHOR CAPACITY IS DEPENDANT UPON SPACING BETWEEN ADJACENT ANCHORS AND PROXIMITY OF ANCHORS TO EDGE OF CONCRETE. INSTALL ANCHORS IN ACCORDANCE WITH SPACING AND EDGE CLEARANCES INDICATED ON THE DRAWINGS.
H. EXISTING REINFORCING BARS IN THE CONCRETE STRUCTURE MAY CONFLICT WITH SPECIFIC ANCHOR LOCATIONS. UNLESS NOTED ON THE DRAWINGS THAT THE BARS CAN BE CUT, THE CONTRACTOR SHALL REVIEW THE EXISTING STRUCTURAL DRAWINGS AND SHALL UNDERTAKE TO LOCATE THE POSITION OF THE REINFORCING BARS AT THE LOCATIONS OF THE CONCRETE ANCHORS BY HILTI FERROSCAN, GPR, X-RAY CHIPPING OR OTHER APPROVED MEANS.



A5 RETAINING WALL VERT. CONTROL JOINT

NO SCALE REFERENCE DETAIL B3/S-502 FOR LOCATIONS

REFERENCES – BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL, SMITH & COOPER
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL SMITH & COOPER, INC. F-595 STATE OF TEXAS JOHN DAVID PASS 58070 LICENSED PROFESSIONAL ENGINEER 01/28/16

SCALE
Hor. AS SHOWN
Ver. AS SHOWN

DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

SHEET TITLE
DETAIL SHEET

S-502

FINISH SCHEDULE 101

ROOM MARK	ROOM DESCRIPTION	FLOOR[1]	BASE[2]	WALLS[3] N	WALLS[3] E	WALLS[3] S	WALLS[3] W	CEILING[4] TYPE	CEILING[4] HT(ft-in)	REMARKS[5]	COLORS[6] DOOR	COLORS[6] FRAME
101	OPEN AREA	F3	X	W3	W3	W3	W3	C2	EXISTING	1,2	C1	C1
102	RR	F2	B1	W2	W2	W2	W2	C3	9'-6"	2	C1	C1
103	IT	F1	B1	W1	W1	W1	W1	C2	9'	2	C1	C1

FOOTNOTES X=EXISTING

1 FLOOR
- F1 = SEALED CONCRETE
- F2 = VINYL TILE
- F3 = EXISTING, NO WORK

2 BASE
- B1 = RESILIENT

3 WALLS
- W1 = PAINT
- W2 = EPOXY PAINT
- W3 = NO WORK, EXCEPT AT NEW WALLS OF RR 102 AND ELEC 103

4 CEILING (FT-IN)
- C1 = 2x4 SUSPENDED ACOUSTICAL
- C2 = EXISTING EXPOSED STRUCTURE, NO WORK
- C3 = DRYWALL, TEXTURE & PAINT

5 REMARKS
- 1 = PAINT EXISTING DOOR & FRAME, XO1
- 2 = PAINT COLOR FOR WALLS, DOORS AND FRAMES TO BE SELECTED BY ARCHITECT FROM STANDARD PAINT COLORS

DOOR SCHEDULE 00A

DOOR FLR	DOOR MARK	PR	DOOR SIZE[1]	DOOR TYPE[2]	DOOR CONST[3]	FRAME CONST[4]	FRAME SIZE[5]	DETAILS[6] HEAD	DETAILS[6] JAMB	DETAILS[6] SILL	REMARKS[7]
1	X01		EXISTING 3'-0'X7'-0"	-	-	-	-	-	-	-	M3, H3
1	X02		EXISITNG OVERHEAD	-	-	-	-	-	-	-	EXISTING DOOR, NO WORK
1	101		3-0x7-0	B	HMPF	HM	5 7/8	D5/A-101	D4/A-101	B2/A-101	M1, M2, M5, H3
1	102		3-0x7-0	A	SCPF	HM	5 7/8	C5/A-101	C4/A-101	C3/A-101	M1,M5, H2
1	103		3-0x7-0	A	SCPF	HM	5 7/8	C5/A-101	C4/A-101	-	M1,M5, H1

FOOTNOTES X=EXISTING

1 OPENING SIZE (INDICATED IN FT-IN, WxH)
DOOR SIZE INDICATED IS NOMINAL. REDUCTION SHALL BE MADE FOR THRESHOLD & EDGE CLEARANCES. ALL DOORS ARE 1 3/4" THICK, UNLESS INDICATED OTHERWISE.

2 DOOR TYPE
REFER TO DOOR TYPE SCHEDULE (THIS SHEET)

3 CONSTRUCTION/VENEER
SCPF = SOLID CORE WOOD, PAINTED FINISH

HMPF = HOLLOW METAL, PAINT FINISH

4 FRAME TYPE
HM = HOLLOW METAL, PAINT FINISH

5 FRAME SIZE (INDICATED IN INCHES)
SIZE INDICATED IS OVERALL FRAME DEPTH.
REFER TO STANDARD DOOR DETAILS (THIS SHEET) FOR TYPICAL HOLLOW METAL FRAME PROFILE & ADDITIONAL INFORMATION.

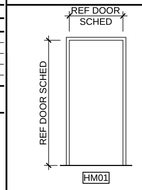
6 DETAILS
EXAMPLE:
DETAIL # A1/A-501 SHEET #
* = SIMILAR

7 REMARKS
MISCELLANEOUS (GENERAL NOTES)
- M1 = VERIFY ROUGH OPENING
- M2 = DOOR TRIM TO MATCH EXISTING
- M3 = REMOVE EXISTING HARDWARE AND ADD NEW. CLEAN AND PAINT DOOR AND FRAME
- M4 = 1'-0" X 1'-0" DOOR METAL LOUVER, PAINTED
- M5 = SEE STANDARD DOOR DETAILS (THIS SHEET) FOR DOOR AND HEAD DETAILS

GLAZING
- G1 = CLEAR ANNEALED FULLY TEMPERED FLOAT GLASS 6 MM MINIMUM THICKNESS

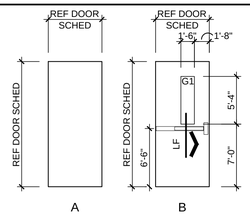
HARDWARE (WHEN NO SPECS)
- H1 = 1 1/2 PR HINGES, LEVER, LOCKSET, CLOSER, WALL STOP, ARMORPLATE, SILENCERS (UTILITY ROOM)
- H2 = 1 1/2 PR HINGES, LEVER, PRIVACY SET, CLOSER, GASKET, WALL STOP, SILENCER, ARMORPLATE (RESTROOM)
- H3 = 1 1/2 PR HINGES, PANIC DEVICE, PULL PLATE, CLOSER, LOCKSET, WEATHER STRIPPING, ARMORPLATE, THRESHOLD, DOOR SWEEP, RAIN DRIP (EXIT DOOR)

HOLLOW METAL FRAME SCHEDULE

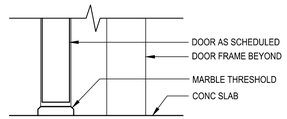


HM00 NOTE: FRAME FACES ARE 2" UNO

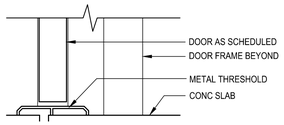
DOOR TYPE SCHEDULE



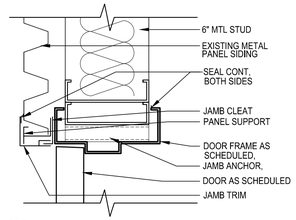
NOTE: DOOR LITE OPENINGS ARE TO LITE FRAME INTERIOR OPENING (DAYLIGHT OPENING).
RIGHT EDGE OF SWING DOOR IS STRIKE EDGE.



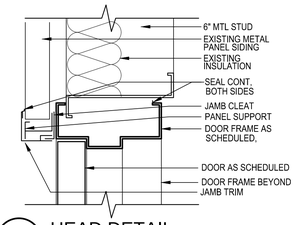
C3 SILL DETAIL
3"=1'-0"



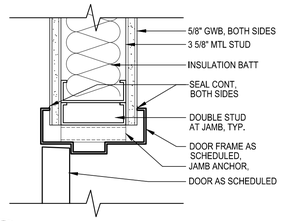
B2 SILL DETAIL
3"=1'-0"



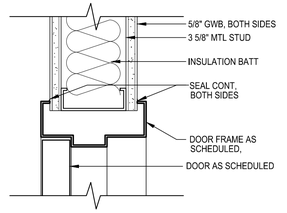
D4 JAMB DETAIL
3"=1'-0"



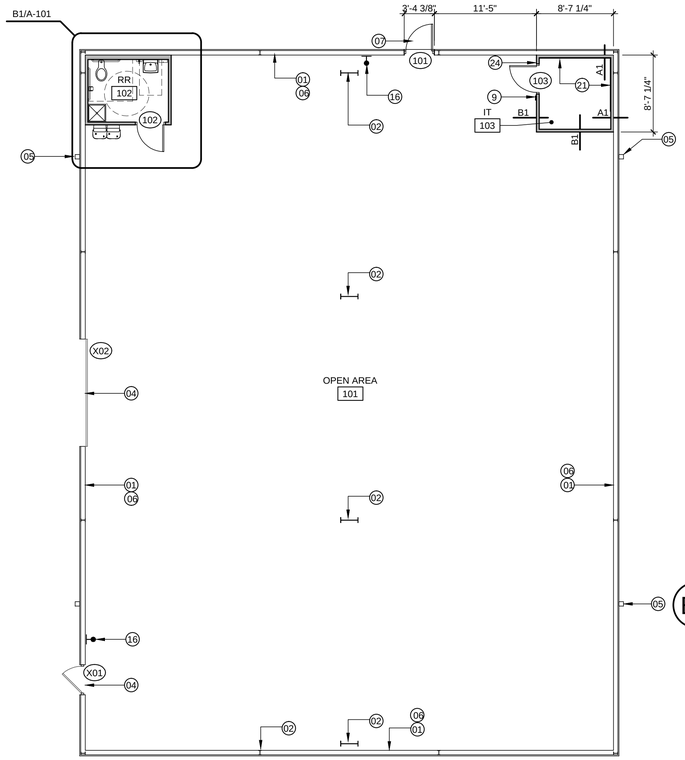
D5 HEAD DETAIL
3"=1'-0"



C4 JAMB DETAIL
3"=1'-0"

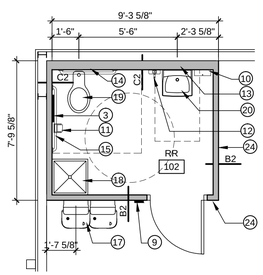


C5 HEAD DETAIL
3"=1'-0"

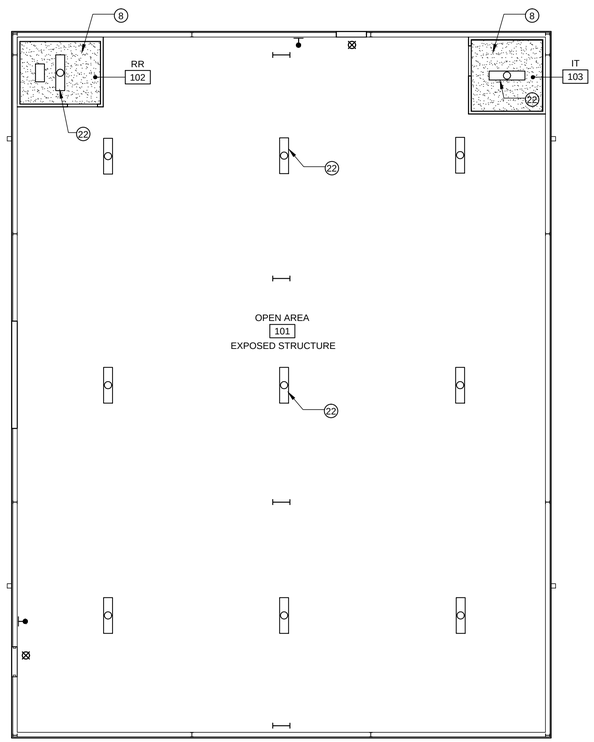


A1 FLOOR PLAN
1/8"=1'-0"

NORTH



B1 ENLARGED FLOOR PLAN
1/4"=1'-0"



A3 REFLECTED CEILING PLAN
1/8"=1'-0"

NORTH

GENERAL NOTES

A. ALL DIMENSIONS ARE TO FACE OF STUD, CMU, OR CENTERLINE OF STRUCTURE
B. ALL NEW WALLS TO BE 3-5/8" METAL STUD UNLESS NOTED OTHERWISE CONTRACTOR SHALL VERIFY ALL DIMENSIONS
C. GENERAL CONTRACTOR SHALL VERIFY AND CLARIFY ALL DIMENSIONAL DISCREPANCIES FROM THIS OR ANY PLAN, SECTION, OR ELEVATION W/ THE ARCHITECT PRIOR TO CONSTRUCTION
D. REFER TO SHEET G-003 FOR TYPICAL MOUNTING LOCATIONS OF TOILET ROOM ACCESSORIES
E. PROVIDE BLOCKING WHERE FIXTURES OR ACCESSORIES ARE TO BE MOUNTED ON THE WALLS
F. UNLESS NOTED OTHERWISE ALL DOOR FRAMES SHALL BE LOCATED A MINIMUM OF 4" FROM PERPENDICULAR ADJACENT WALL ON HINGE SIDE
G. SAWCUT SLAB FOR PLUMBING PIPING INSTALLATION, WHEN FINISHED PATCH CONCRETE SLAB, FLUSH WITH EXISTING FINISHED FLOOR.

KEY NOTES

AS INDICATED BY: 00

1. EXISTING METAL BUILDING WALLS TO REMAIN
2. EXISTING COLUMNS TO REMAIN, NEW PAINT COAT
3. ACCESS PANEL, COORDINATE EXACT LOCATION ON THE FIELD. COORDINATE WITH LOCATION OF GRAB BAR AND TOILET PAPER DISPENSER
4. EXISTING DOOR TO REMAIN
5. EXISTING DOWNSPOUTS TO REMAIN
6. EXISTING PLYWOOD TO REMAIN
7. CUT OPENING IN EXISTING METAL PANEL FOR NEW DOOR AND FRAME. ADJUST AND FRAME METAL STRUCTURE AS NEEDED AT NEW DOOR OPENING. ADJUST INSULATION EDGE OF EXISTING FRAME.
8. GYPSUM BOARD CEILING
9. ROOM IDENTIFICATION SIGN
10. PAPER TOWEL DISPENSER
11. TLT TISSUE DISPENSER
12. SOAP DISPENSER
13. MIRROR
14. GRAB BAR - 36"
15. GRAB BAR - 42"
16. FIRE EXTINGUISHER - BRACKET MOUNTED
17. HI-LO DRINKING FOUNTAIN, REF PLUMBING
18. MOP SINK, REF PLUMBING
19. WATER CLOSET, REF PLUMBING
20. LAVATORY, REF PLUMBING
21. TWO (2) 4'-0" X 8'-0" PLYWOOD SHEETS, MOUNTED VERTICALLY AT EACH WALL, REF ELECTRICAL
22. LIGHT FIXTURES (TYPICAL), REF ELECTRICAL
23. ELECTRICAL HEATER, REF MECHANICAL
24. RESILIENT BASE AT NEW WALL

PARTITION LEGEND

THE FOLLOWING PARTITION GRAPHIC SYMBOL AND TWO PART NOTATION SYSTEM IS USED IN THE CONSTRUCTION DOCUMENTS FOR THIS PROJECT. NOTE: THE PARTITION CONSTRUCTION WILL MAINTAIN ITS DESIGNATION TO THE POINT OF AN INTERSECTING WALL. IF NO CHANGE IN DESIGNATION IS SHOWN BEYOND THE INTERSECTION, THE PREVIOUS PARTITION CONSTRUCTION DESIGNATOR APPLIES. REFER TO CODE PLAN G-005 FOR RATED WALLS.

(A) PARTITION CONSTRUCTION

A. METAL STUDS-GYPSUM BOARD ONE SIDE
B. METAL STUDS-GYPSUM BOARD EACH SIDE
C. 6" METAL STUDS-MOISTURE RESISTANT BOARD ONE SIDE

(B) PARTITION CONDITIONS

1. COMPLETE ASSEMBLY EXTENDS TO 10'-6" AFF, BRACE ABOVE TO METAL BUILDING AS NEEDED.
2. COMPLETE ASSEMBLY EXTENDS TO 10'-0" AFF. WALL CAVITY IS FULLY INSULATED WITH SOUND ATTENUATION BATTS, BRACE ABOVE TO METAL BUILDING AS NEEDED.

REFERENCES – BENCH MARKS
BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

REGISTERED ARCHITECT STATE OF TEXAS
02/01/2016

SCALE
Hor. AS SHOWN
Ver. AS SHOWN
DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

SHEET TITLE
FLOOR PLAN
RCP PLAN
SCHEDULES
DETAILS

A-101

PLUMBING FIXTURE MOUNTING HEIGHTS	EDUCATIONAL FACILITIES						COMMERICAL FACILITIES	
	PRE-KINDERGARTEN		*KINDERGARTEN THRU ELEMENTARY SCHOOL*				*MIDDLE THROUGH HIGH SCHOOL*	
* ALL DIMENSIONS ARE IN INCHES	AGES: 3 & 4		AGES: 5 THROUGH 8		AGES: 9 THROUGH 12		AGES: 13 THROUGH ADULTS	
AND FROM FINISHED FLOOR	ADA/TAS	STANDARD	ADA/TAS	STANDARD	ADA/TAS	STANDARD	ADA/TAS	STANDARD
WATER CLOSETS								
TOP OF SEAT	11 - 12 MAX	11 - 12 MAX	12 - 15 MAX	12 - 15 MAX	15 - 17 MAX	15 - 17 MAX	17 - 19 MAX	16 - 18 MAX
FLUSH CONTROLS (HANDLE HEIGHT)	36 MAX	36 MAX	40 MAX	40 MAX	44 MAX	44 MAX	26 - 44 MAX	46 MAX
URINALS								
RIM OF BASIN	14 MAX	14 MAX	14 MAX	14 MAX	14 MAX	24 MAX	17 MAX	24 MAX
MINIMUM DEPTH (SEE NOTE E)	13 1/2 MIN	13 1/2 MIN	13 1/2 MIN	13 1/2 MIN	13 1/2 MIN	13 1/2 MIN	13 1/2 MIN	13 1/2 MIN
FLUSH CONTROLS (HANDLE HEIGHT)	36 MAX	36 MAX	40 MAX	40 MAX	44 MAX	44 MAX	46 MAX	46 MAX
LAVATORIES AND SINKS								
RIM (NOTE J)	31 MAX	31 MAX	31 MAX	31 MAX	31 MAX	31 MAX	34 MAX	34 MAX
KNEE CLEARANCE	24 MAX	24 MAX	24 MAX	24 MAX	24 MAX	24 MAX	27 MIN	27 MIN
FRONT EDGE TO WALL/FAUCET HANDLE	20 MAX	20 MAX	20 MAX	20 MAX	20 MAX	20 MAX	20 - 25 MAX	20 - 25 MAX
DRINKING FOUNTAINS/ ELECTRIC WATER COOLERS								
SPOUT OUTLETS								
HEIGHT (LOW)	30 MAX	- - -	30 MAX	- - -	30 MAX	- - -	36 MAX	- - -
HEIGHT (HI)	38 - 43 MAX	- - -	38 - 43 MAX	- - -	38 - 43 MAX	- - -	38 - 43 MAX	- - -
DISTANCE FROM FRONT EDGE	3 1/2 MAX	- - -	3 1/2 MAX	- - -	3 1/2 MAX	- - -	5 MAX	- - -
DISTANCE FROM VERTICAL SUPPORT	15 MIN	- - -	15 MIN	- - -	15 MIN	- - -	15 MIN	- - -
SHOWERS								
FIXED HEAD (NON-MEDICAL APPLICATION)	48 MAX	48 MAX	48 MAX	48 MAX	48 MAX	72 - 78 MAX	48 MAX	72 - 78 MAX
ADJUSTABLE HEAD (NOTE I)	48 MAX	48 MAX	48 MAX	48 MAX	48 MAX	48 MAX	48 MAX	48 MAX
HOSE LENGTH	59 MIN	- - -	59 MIN	- - -	59 MIN	- - -	59 MIN	- - -

NOTES:

A. CONTRACTOR TO REFER TO ARCHITECTURAL PLANS AND SPECIFICATIONS FOR LOCATIONS OF PLUMBING FIXTURES, GRAB BARS, DISPENSERS, ETC. WITH RESPECT TO WALLS, STALLS, ETC.
B. ACCESSIBILITY GUIDELINES SHOWN ARE FOR INFORMATIONAL PURPOSES ONLY, AND INTENDED TO SERVE AS A GUIDE FOR CONSTRUCTION PROFESSIONALS AND OWNERS.
C. SOME OF THE INFORMATION SHOWN HERE MAY NOT BE APPLICABLE TO THIS PROJECT.
D. STANDARD HEIGHT INFORMATION IS OBTAINED FROM ASPE (AMERICAN SOCIETY OF PLUMBING ENGINEERS), HEIGHTS NOTED HERE ARE SUPERSEDED BY INFORMATION ON DRAWINGS.
E. DEPTH TO BE MEASURED FROM THE OUTER FACE OF THE URINAL RIM TO THE BACK OF THE FIXTURE.
F. KNEE CLEARANCE FOR LAVATORIES AND SINKS SHALL COMPLY WITH TAS 306.3.
G. REFER TO DETAIL FOR COUNTER MOUNTED SINKS WITH BUBBLERS FOR DIMENSIONS, ON ARCHITECTURAL DRAWINGS.
H. DRINKING FOUNTAINS AND ELECTRIC WATER COOLER DISTANCES FROM FRONT EDGE INCLUDES BUMPERS. KNEE CLEARANCES MUST BE MAINTAINED THROUGH THE MIN./MAX. RANGE HEIGHTS FOR THE SPOUT. REFER TO ARCHITECTURAL SPECIFICATIONS FOR KNEE CLEARANCES.
I. THE BOTTOM OF THE 30" LONG SLIDE BAR FOR HAND-HELD SHOWER WAND CAN BE MOUNTED NO HIGHER THAN 48" ABOVE SHOWER FINISHED FLOOR.
J. THE PLUMBING CONTRACTOR SHALL COORDINATE WITH THE COUNTER TOP/BASE CABINET MANUFACTURER TO VERIFY THAT THE RIM OF THE LAVATORY/SINK IS INSTALLED AT NO MORE THAN THE MAXIMUM HEIGHT IN INCHES ALLOWED IN EACH CATEGORY. REFER TO ARCHITECTURAL ROOM DESIGNATIONS AND OCCUPANCY USAGE FOR EACH ROOM FOR MORE DETAILS.
K. KNEE CLEARANCE MAY BE LOWERED FROM 27 INCHES TO 24 INCHES, IF THE RIM HEIGHT IS SET AT 31 INCHES. REFER TO ARCHITECTURAL ROOM DESIGNATIONS AND OCCUPANCY USAGE FOR EACH ROOM FOR MORE DETAILS.

PIPING SYMBOLS

- G — NATURAL GAS
- CHS — CHILLED WATER SUPPLY
- CHR — CHILLED WATER RETURN
- HWS — HEATING WATER SUPPLY
- HWR — HEATING WATER RETURN
- CS — CONDENSING WATER SUPPLY
- CR — CONDENSING WATER RETURN
- COND — CONDENSATE DRAIN
- AUX — AUXILIARY CONDENSATE DRAIN
- FLUID FLOW DIRECTION
- PIPE TURNED UP
- PIPE TURNED DOWN
- CONNECT TO EXISTING
- DOMESTIC HOT WATER RECIRCULATING
- DOMESTIC COLD WATER
- DOMESTIC HOT WATER
- SEWER
- VENT
- G — GAS
- F — FIRE LINE
- EXISTING HOT WATER RECIRCULATING
- EXISTING COLD WATER
- EXISTING HOT WATER
- EXISTING SEWER
- EXISTING VENT
- G — EXISTING GAS
- F — EXISTING FIRE LINE
- ECO — EXTERIOR CLEANOUT
- DCO — DOUBLE CLEANOUT
- FCO — FLOOR CLEANOUT
- WCO — WALL CLEANOUT

DUCTWORK SYMBOLS

- MANUAL BALANCING DAMPER
- CEILING MOUNTED SUPPLY GRILLE
- CEILING MOUNTED RETURN/EXHAUST GRILLE
- WALL MOUNTED SUPPLY GRILLE
- WALL MOUNTED RETURN/EXHAUST GRILLE
- FSD — FIRE/SMOKE DAMPER
- FD — FIRE DAMPER
- SD — SMOKE DAMPER
- LINED RETURN DUCT
- SUPPLY DUCT TURNED UP
- SUPPLY DUCT TURNED DOWN
- RETURN DUCT TURNED UP
- RETURN DUCT TURNED DOWN
- EXHAUST DUCT TURNED UP
- EXHAUST DUCT TURNED DOWN
- ROUND DUCT TURNED UP
- ROUND DUCT TURNED DOWN
- T — THERMOSTAT
- H — HUMIDISTAT
- S — SENSOR
- FLEXIBLE CONNECTION
- 90 DEG. ELBOW W/ TURNING VANES
- 90 DEG. ELBOW W/O TURNING VANES
- RADIAL 90 DEG. ELBOW

GENERAL NOTES

1. GENERAL NOTES ON THIS SHEET ARE APPLICABLE TO EACH MECHANICAL AND PLUMBING DRAWING OF THIS SET OF CONSTRUCTION DOCUMENTS. NOTES SPECIFIC TO INDIVIDUAL MECHANICAL/PLUMBING DRAWINGS WILL BE SHOWN ON THE RESPECTIVE MECHANICAL/PLUMBING DRAWING.
2. THE CONTRACTOR SHALL PROVIDE A COMPLETE HVAC SYSTEM TO INCLUDE ALL LABOR, MATERIALS, TOOLS AND EQUIPMENT FOR A COMPLETE AND FUNCTIONAL SYSTEM INCLUDING ALL NECESSARY APPURTENANCES CUSTOMARILY INCLUDED IF NOT SPECIFICALLY CALLED OUT.
3. ENTIRE INSTALLATION, INCLUDING MATERIALS, EQUIPMENT AND WORKMANSHIP SHALL CONFORM WITH ALL APPLICABLE LAWS, CODES AND REGULATIONS.
4. THIS PROJECT SHALL CONFORM TO APPLICABLE ASHRAE, NFPA AND SMACNA STANDARDS AND OTHER REGULATORY BODIES HAVING JURISDICTION OVER THE CLASS OF WORK.
5. MATERIAL AND EQUIPMENT SHALL HAVE STAMPS OR SEALS OF ARI, ASME, UL OR ASTM.
6. THE CONTRACTOR SHALL MAKE TESTS FOR ACCEPTANCE AND APPROVAL AS REQUIRED BY CODE AND THE REQUIREMENTS OF APPLICABLE REGULATORY AGENCIES. REQUIRED TESTS SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER OF RECORD AND/OR OWNER UNLESS OTHERWISE WAIVED IN WRITING.
7. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, LICENSES, DOCUMENTS AND SERVICES RELATED TO INSTALLATION OF THE WORK.
8. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE OTHER TRADES IN ORDER TO RESOLVE ANY CONFLICT THAT MIGHT ARISE DUE TO THE LOCATION OF EQUIPMENT OR THE USE OF SPACE.
9. EQUIPMENT OF DIFFERENT ELECTRICAL CHARACTERISTICS MAY BE FURNISHED PROVIDED SUCH PROPOSED EQUIPMENT IS APPROVED IN WRITING AND CONNECTING ELECTRICAL SERVICE, CIRCUIT BREAKERS AND CONDUIT ARE APPROPRIATELY MODIFIED AT NO COST TO THE OWNER.
10. RUN ALL HORIZONTAL PIPING AND DUCTWORK ABOVE CEILING UNLESS OTHERWISE NOTED.
11. MAKE DUCT PENETRATIONS OF ALL WALLS WITH SHEET METAL DUCTS. FLEXIBLE DUCT PENETRATIONS OF WALLS ARE NOT ACCEPTABLE.
12. ALL ELBOWS IN DUCTWORK SHALL BE RADIUS ELBOWS UNLESS OTHERWISE NOTED. MINIMUM CENTERLINE RADIUS OF CURVATURE SHALL BE 1.5 TIMES THE DUCT WIDTH OR DIAMETER. WHERE SQUARE ELBOWS ARE SHOWN, INSTALL TURNING VANES.
13. DO NOT INSTALL EQUIPMENT, PIPING OR DUCTWORK OVER ANY ELECTRICAL EQUIPMENT OR ELECTRICAL SERVICE SPACE.
14. LAYOUT OF PIPING AND DUCTWORK IS DIAGRAMMATIC. RUN ALL EXPOSED PIPING AND DUCTWORK AS HIGH AS POSSIBLE UNLESS OTHERWISE NOTED. ALLOW FOR RISES, DROPS AND OFFSETS AS REQUIRED.
15. EXTEND CONDENSATE DRAIN LINES TO NEAREST ROOF DRAIN OR AS INDICATED. ALL CONDENSATE DRAIN PIPING SHALL BE TRAPPED AND PITCHED DOWN IN DIRECTION OF FLOW A MINIMUM OF 1 INCH IN 10 FEET.
16. INSTALL MECHANICAL EQUIPMENT TO FACILITATE SERVICING, MAINTENANCE AND REPAIR OR REPLACEMENT OF ELECTRICAL COMPONENTS. AS MUCH AS PRACTICAL, CONNECT EQUIPMENT FOR EASE OF DISCONNECTING, WITH A MINIMUM OF INTERFERENCE WITH OTHER INSTALLATIONS. PIPING SHALL NOT INTERFERE WITH FILTER PULL.
17. MECHANICAL CONTRACTOR SHALL PROVIDE AUTOMATIC CONTROL DEVICES SUCH AS STARTERS, VARIABLE FREQUENCY DRIVES (VFD), TEMPERATURE SENSORS, RELAYS, PRESSURE SWITCHES THAT ARE ASSOCIATED WITH MECHANICAL EQUIPMENT AND ASSOCIATED CONTROL WIRING FROM CONTROL POWER LOCATION TO THE CONTROL DEVICE. ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUIT AND WIRING FROM POWER SOURCE TO DISCONNECT SWITCH, FROM DISCONNECT SWITCH TO STARTER OR VFD, AND FROM STARTER OR VFD TO THE EQUIPMENT.
18. FLASHING DETAILS FOR PIPES PENETRATING THE ROOF SHALL BE COORDINATED WITH ARCHITECTURAL DETAILS.
19. LOCATE TEMPERATURE SENSORS AND CO2 SENSORS 48" ABOVE FINISHED FLOOR OR AS NOTED ON PLANS.
20. COORDINATE CURBS AND SIZE OF CURBS IN ACCORDANCE WITH ACTUAL EQUIPMENT PURCHASED.
21. CONTRACTOR IS TO PROVIDE AN ADJUSTABLE ROOF CURB TO MATCH ROOF SLOPE FOR CURB MOUNTED EQUIPMENT. THE USE OF SHIMS TO LEVEL EQUIPMENT IS NOT ACCEPTABLE UNLESS THE CURB DIMENSIONS ARE SMALLER THAN 36"x36".
22. NOT ALL SYMBOLS OR ABBREVIATIONS ARE USED.

REFERENCES – BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL SMITH & COOPER, INC. F-560 STATE OF TEXAS BRADLEY BLOUNT 115111 LICENSED PROFESSIONAL ENGINEER 2/01/16

SCALE:
Hor. AS SHOWN
Ver. AS SHOWN

DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME

CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

SHEET TITLE

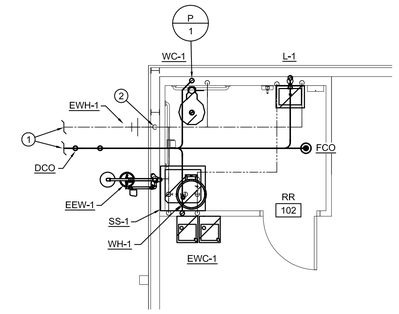
GENERAL MECHANICAL & PLUMBING INFORMATION

MP100

KEY NOTES

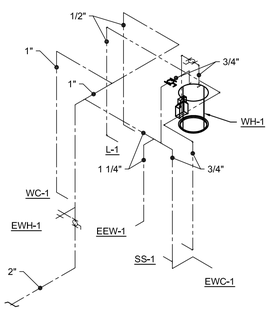
AS INDICATED BY: (XX)

1. REFER TO SITE PLAN FOR CONTINUATION.
2. TURN 2" DOMESTIC COLD WATER LINE UP IN WALL. PROVIDE BALL VALVE AND EWH-1 12" A.F.F. IN VERTICAL FOR SYSTEM DRAIN DOWN WHEN BUILDING IS NOT IN USE. VERIFY EXACT HEIGHT WITH PIPING INSTALLATION TO ALLOW FOR COMPLETE SYSTEM DRAIN DOWN.
3. PROVIDE WALL CAP, GREENHECK MODEL WC.

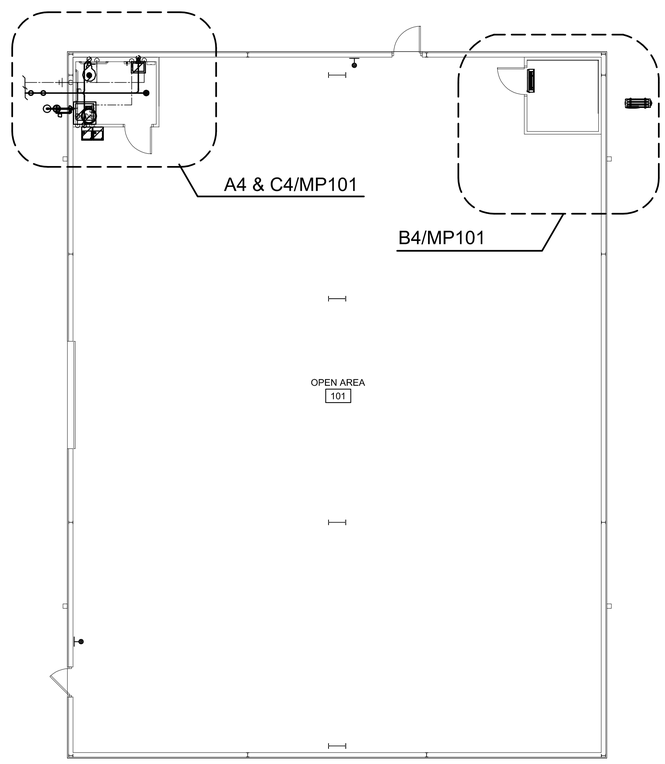


C4 ENLARGED PLUMBING FLOOR PLAN
1/4"=1'-0"

NORTH

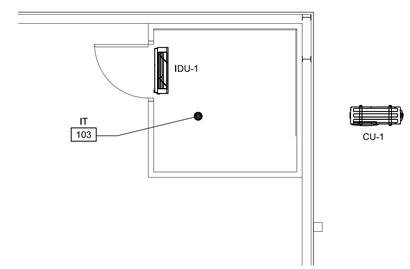


PLUMBING RISER - DOMESTIC WATER
NTS



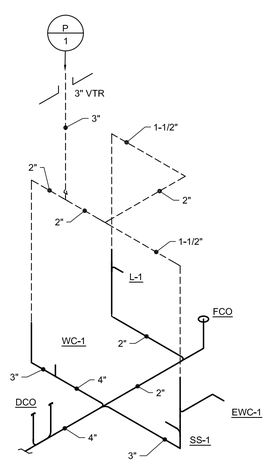
A3 PLUMBING FLOOR PLAN
1/8"=1'-0"

NORTH

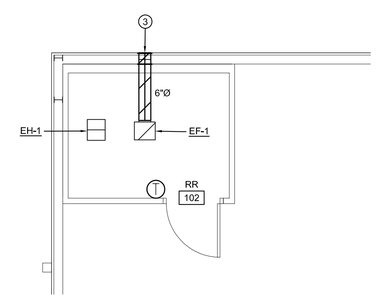


B4 ENLARGED MECHANICAL FLOOR PLAN
1/4"=1'-0"

NORTH



P/1 PLUMBING RISER - WASTE AND VENT
NTS



A4 ENLARGED MECHANICAL FLOOR PLAN
1/4"=1'-0"

NORTH

REFERENCES – BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL, SMITH & COOPER, INC. F-560
BRADLEY BLOUNT
115111
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
10/20/16

SCALE:
Hor. AS SHOWN
Ver. AS SHOWN

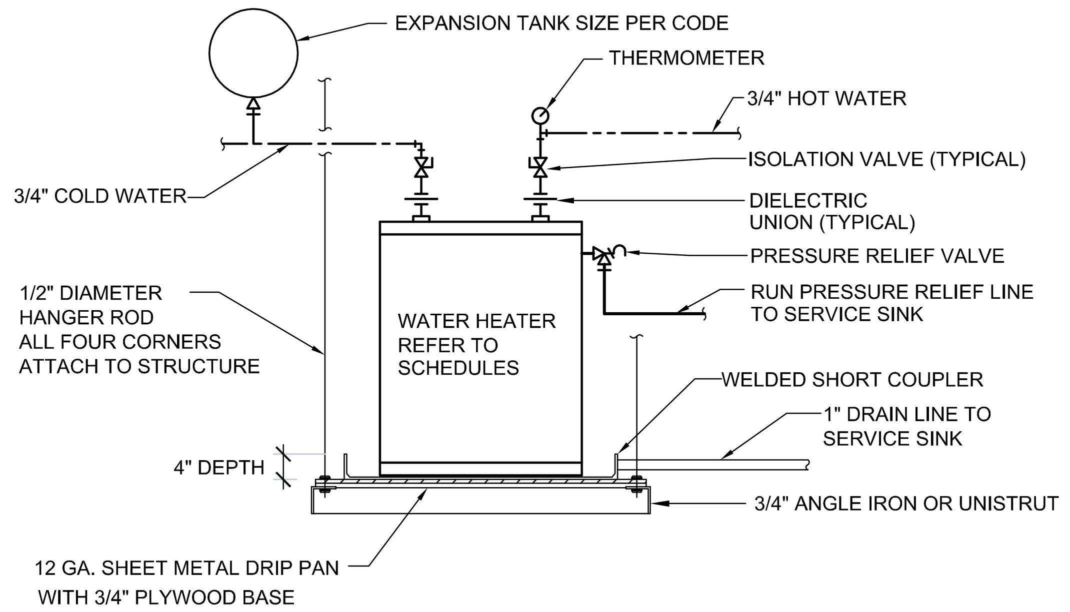
DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

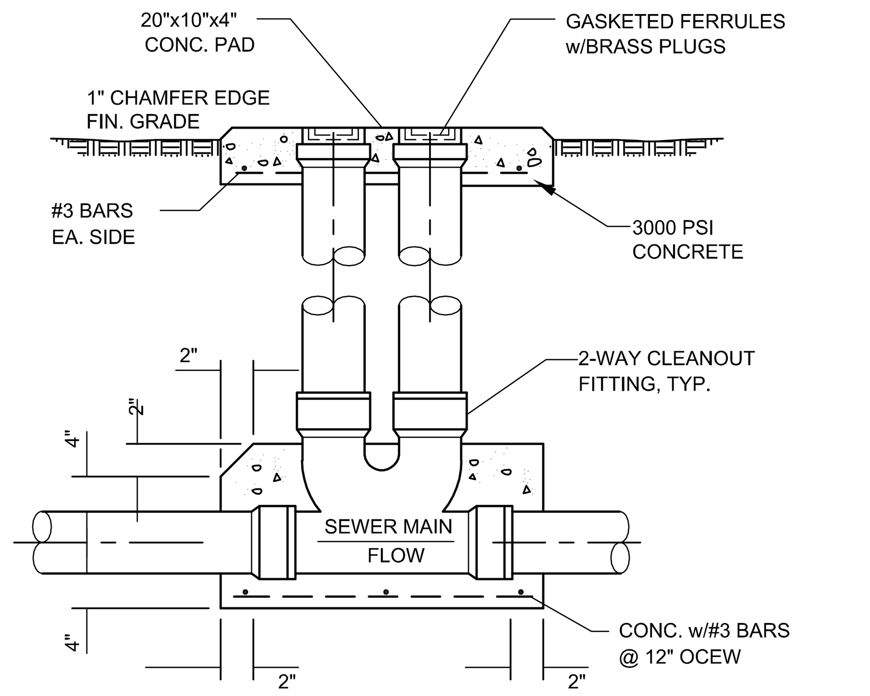
CITY OF EL PASO

SHEET TITLE
PLUMBING FLOOR PLAN

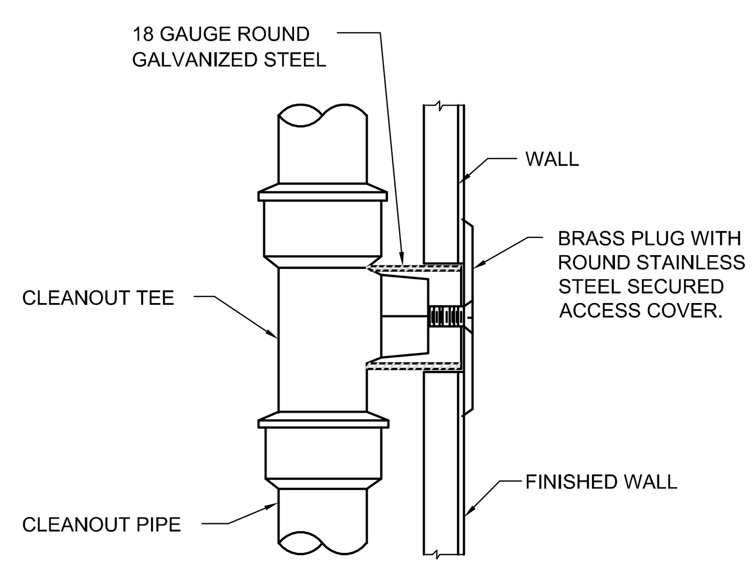
MP101



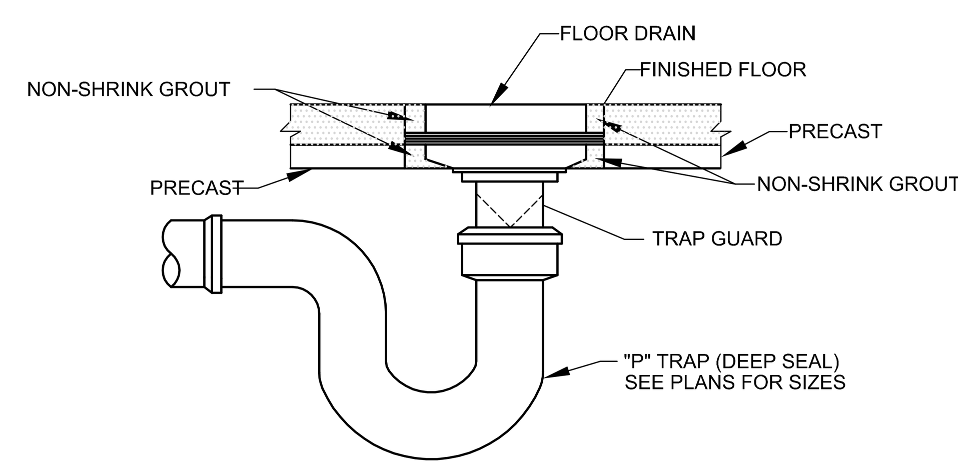
D1 WATER HEATER INSTALLATION DETAIL
SCALE: NONE



D2 2-WAY CLEANOUT DETAIL
SCALE: NONE
NOTE: CLEAN-OUTS TO BE CAST IRON. PVC OR CAST IRON MAY BE UTILIZED FOR OTHER SEWER PIPE & FITTINGS



C1 WALL CLEANOUT DETAIL
SCALE: NONE



C2 FLOOR DRAIN DETAIL
SCALE: NONE

PLUMBING FIXTURE SCHEDULE

SYMBOL	MINIMUM CONNECTIONS CW	HW	VENT	WASTE	TYPE	FIXTURE MANUFACTURER	OPTIONS
WC-1 (HC)	1"	--	2"	4"	FLOOR MOUNTED FLUSH VALVE WATER CLOSET, ELONGATED CHINA BOWL, EXPOSED FLUSH VALVE WITH VANDAL RESISTANT STOP CAP, 1.6 GALLONS PER FLUSH, EXTRA HEAVY DUTY OPEN FRONT WHITE SEAT, EXPOSED FLUSH VALVE WITH 1" TOP SPUD, FLUSH HANDLE ON WIDE SIDE OF TOILET WHERE SHOWN FOR HANDICAPPED ACCESSIBILITY, 16-1/2" TO TOP OF RIM. REFER TO MP100 FOR TAS MOUNTING HEIGHT REQUIREMENTS.	AMERICAN STANDARD 3461.001 MADERA FLOWISE	VALVE - ZURN Z6000AV SEAT - ELJER 124-0355
L-1	1/2"	1/2"	1-1/2"	1-1/2"	WALL MOUNTED ADA COMPLIANT LAVATORY, VITREOUS CHINA, NOMINAL 20"x18", BACK AND SIDE SPLASHES, FOR CONCEALED ARM CARRIER, SINGLE CENTERED FAUCET HOLE, ADA COMPLIANT SINGLE LEVER FAUCET, LESS ESCUTCHEON PLATE, LESS DRAIN, CAST BRASS CONSTRUCTION, DRAIN OUTLET WITH GRID STRAINER. MOUNT TOP OF RIM AS REQUIRED PER ADA/TAS.	AMERICAN STANDARD 0356.421 "LUCERNE"	FAUCET - CHICAGO FAUCET #2200 (SINGLE LEVER) CARRIER - ZURN Z-1231 DRAIN - CHICAGO FAUCET 337
EWC-1	3/4"	--	1-1/2"	2"	WALL MOUNTED ADA TWO LEVEL COMPLIANT WATER COOLER, RECTANGULAR NO LEAD, INLINE FILTER, SINGLE COMPRESSOR AND LIGHT GRAY GRANITE FINISH. CAPACITY OF 8 GPH WITH 50 DEG F COOLING AT 90 DEG AIR TEMPERATURE. WALL MOUNTED CARRIER. POWER - 3.7 AMPS @ 120/60/1 VOLTAGE. MOUNT SPOUT AT 34" AFF FOR HANDICAPPED ACCESSIBILITY AND 38" AFF FOR STANDARD HEIGHT. COORDINATE ALL HEIGHTS WITH ARCHITECTURAL.	HALSEY TAYLOR - HTHB-HVRGRN8BL	CARRIER - ZURN Z-1225-BL PROVIDE CANE APRON
SS-1	3/4"	3/4"	2"	3"	FLOOR MOUNTED, MOLDED HIGH DENSITY COMPOSITE BASIN SINK - 24" x 24" x 12", WITH WALL MOUNTED FAUCET WITH VACUUM BREAKER, TOP BRACE, INTEGRAL STOPS, HOSE THREADED SPOUT. PROVIDE 3" DRAIN OUTLET WITH DOME STRAINER, MOP HANGER, HOSE AND WALL BRACKET COMBINATION.	ZURN 1996-24	FAUCET - SF MOP HANGER - MH HOSE AND WALL HOOK - HH BUMPER GUARD -BV
EEWS	1 1/4"	--	---	3"	FROST-PROOF COMBINATION EMERGENCY DRENCH SHOWER AND EYEWASH/FACEWASH, WALL MOUNTED, GALVANIZED STEEL PROTECTED SAFETY YELLOW COATING, EYEWASH WITH CHROME-PLATED BRASS SPRAYHEAD ASSEMBLY AND PROTECTIVE COVERS. PLASTIC SHOWERHEAD. 1-1/4" NPT WATER SUPPLY.	BRADLEY S19-310TW	
EWH-1	3/4"	--	--	--	EXTERIOR ENCASED WALL HYDRANT ANTI-SIPHON VACUUM BREAKER, CHROME BOX, BRASS VAVLE BODY, HARDENED STAINLESS STEEL STEM, 3/4" INLET, 3/4" OUTLET, AND OPERATING KEY. FREEZE PROOF.	WOODFORD B68	
DCO	--	--	---	AS SHOWN ON DWG	EXTERIOR CLEANOUT - CAST IRON CLEANOUT WITH ROUND ADJUSTABLE SCORIATED SECURED CAST IRON TOP, GASKET SEAL CAST IRON PLUG WITH RECESSED SOCKET. INSTALL IN MINIMUM OF 12" x 12" x 4" REINFORCED CONCRETE PAD WITH BEVELED EDGES.	ZURN Z-1400-HD	
SA	3/4"	3/4"	--	--	SHOCK ABSORBER - STAINLESS STEEL NESTED BELLOWS TYPE. CASING AND BELLOWS SHALL BE TYPE 304 STAINLESS STEEL. PROVIDE ISOLATION BALL VALVE WITH ACCESS DOOR (IF REQUIRED) AT INLET. CONTRACTOR SHALL SIZE, AND LOCATE ACCORDING TO PDI STANDARDS AND MANUFACTURERS RECOMMENDATIONS.	WATTS SERIES 15M2 PISTON TYPE	
FD-1	--	--	2"	3"	FLOOR DRAIN - 6" DIA. ADJUSTABLE POLISHED NICKEL BRONZE STRAINER, CAST IRON BODY, AND ADJUSTABLE FLASHING COLLAR, 1/2" TRAP PRIMER ASSEMBLY AND SEDIMENT BUCKET. P-TRAP SHALL BE DEEP SEAL TYPE.	ZURN Z-415	TRAP PRIMER ASSEMBLY - ZURN 1022-3 or TRAP GUARD - PROSET
FCO	--	--	---	AS SHOWN ON DWG	FLOOR CLEANOUT - CAST IRON BODY WITH SQUARE ADJUSTABLE SCORIATED NICKEL BRONZE TOP, GASKET SEAL BRASS THREADED PLUG WITH RECESSED SOCKET.	ZURN Z-1400 SERIES	
WCO	--	--	---	AS SHOWN ON DWG	WALL CLEANOUT - NO-HUB CAST IRON CLEANOUT TEE WITH ROUND STAINLESS STEEL COVER AND CENTER SCREW, GASKETED SEAL IRON THREADED PLUG WITH RECESSED SOCKET	ZURN Z-1446 SERIES	

NOTES:
1. MANUFACTURERS WITH MODEL NUMBERS ARE BASE ITEMS. OTHER MANUFACTURERS MUST BE EQUIVALENT MANUFACTURERS.
2. FOR MOUNTING HEIGHTS OF INDIVIDUAL WALL-MOUNTED FIXTURES, REFER TO ARCHITECTURAL ELEVATION DRAWINGS.
3. EACH UNDERSLAB OR CONCEALED P-TRAP SHALL BE A DEEP-SEAL TYPE.
4. PROVIDE EACH WALL MOUNTED PLUMBING FIXTURE, SUCH AS SINKS, LAVATORIES, ELECTRIC WATER COOLERS, DRINKING FOUNTAINS, ETC., WITH A FLOOR MOUNTED FIXTURE SUPPORT CARRIER WITH RECTANGULAR LEGS.
5. UNLESS SCHEDULED OTHERWISE, PROVIDE EACH LAVATORY, SINK, WATER COOLER, ETC. WITH A P-TRAP ASSEMBLY CONSISTING OF A CHROME-PLATED (C.P.) CAST BRASS TRAP WITH CLEANOUT PLUG, C.P. TUBING OUTLET (MIN. 17 GA.), AND C.P. CAST BRASS ESCUTCHEON WITH SETSCREW.
6. PROVIDE EACH FIXTURE WHICH REQUIRES COLD AND/OR HOT WATER (EXCEPT FLUSH VALVES) WITH A SUPPLY/STOP ASSEMBLY CONSISTING OF A C.P. BRASS STOP VALVE (MIN. 1/2") WITH LOOSE KEY HANDLE AND LOCK SHIELD, STAINLESS STEEL FLEXIBLE RISER, C.P. BRASS NIPPLE, AND C.P. CAST BRASS ESCUTCHEON WITH SETSCREW.
7. FOR EACH PUBLIC LAVATORY OR SINK WITH EXPOSED DRAIN AND BOTH COLD AND HOT SUPPLY COMPONENTS, PROVIDE A MANUFACTURED INSULATION KIT MADE FROM MOLDED CLOSED CELL VINYL THAT IS ANTI-MICROBIAL AND SEAMLESS. EACH KIT SHALL COVER THE TAILPIECE, P-TRAP, WALL BEND, BOTH WATER SUPPLY STOPS, AND BOTH WATER RISERS. KITS SHALL BE EQUAL OR EQUIVALENT TO "PROWRAP" BY McGUIRE OR LAV-GUARD BY TRUEBRO.
8. WHERE ARCHITECTURAL PLANS SHOW WATER CLOSETS AND URINALS, PROVIDE AND INSTALL FLUSHING VALVE SUCH THAT FLUSH HANDLE IS ON WIDE SIDE OF WATER CLOSET, THAT IS, THE SIDE AWAY FROM THE ADJACENT WALL.
9. PROVIDE EACH COLD AND HOT WATER SYSTEM A MINIMUM OF ONE WATER HAMMER ARRESTOR FOR EACH FIXTURE OR GROUP OF FIXTURES.
10. PROVIDE ISOLATION VALVES IN CW, HW AND HWR PIPING AS NEED OR AS SHOWN FOR ALL GROUPS OF FIXTURES.
11. PROVIDE BALANCING VALVES IN HOT WATER RECIRCULATION LINES TO ALLOW FOR ADEQUATE CIRCULATION OF THE HOT WATER.
12. INSTALL PLUMBING FIXTURES IN ACCORDANCE WITH LATEST ADA STANDARDS.

ELECTRIC WATER HEATER SCHEDULE

SYMBOL	SERVES	STORAGE GALLONS	HTG. ELEMENTS QTY/KW	VOLTAGE/PHASE	RECOVERY GAL/HOUR	WATER TEMP INLET	WATER TEMP RISE	MANUFACTURER & MODEL
EWH-1	BUILDING	10	1.5	120/1	10	50	60	A.O.SMITH DEL 10

NOTES:
1. WATER HEATER SHALL HAVE A PORCELANIZED GLASSLINED TANK AND BE ADDITIONALLY PROTECT AGAINST PREMATURE FAILURE BY A FACTORY INSTALLED ANODE ROD. WATER HATER SHALL HAVE A PROPERLY SIZED, FACTORY PROVIDED TEMPERATURE AND PRESSURE RELIEF VALVE.
2. TANK SHALL HAVE A THREE-YEAR WARRANTY.
3. WATER HEATER SHALL BE PROVIDED WITH NON-SIMULTANEOUS ELEMENTS.

ELECTRIC CEILING HEATER SCHEDULE

SYMBOL	EH-1
CFM	100
TEMPERATURE RISE	47
INPUT, KW	1.5
NUMBER OF STAGES	1
ELECTRICAL:	
VOLTAGE/PHASE	120/1
AMPS	13
NET WEIGHT, LBS.	6
MODEL	E3035DWBW

NOTES:
1. UNITS ARE SCHEDULED TO BE MANUFACTURED BY MARKEL.
2. ELECTRICAL UNIT HEATER AS SCHEDULED SHALL HAVE BUILT-IN CONTROL TRANSFORMER, OVERHEAT PROTECTION, 24V THERMOSTAT, MOUNTES ON WALL.

EXHAUST FAN SCHEDULE

SYMBOL	EF-1
TYPE	CEILING MNT
CFM	100
DRIVE	DIRECT
E.S.P. (IN. W.G.)	0.25
SOUND LEVEL IN SONES	1.5
FAN MOTOR POWER - HP	
NOMINAL FAN R.P.M.	940
VOLTAGE / PHASE	120
METHOD OF CONTROL	LIGHT SWITCH
WEIGHT, LBS (W/O CURB)	12
GREENHECK MODEL NO.	SP-110-VG

NOTES:
1. FANS ARE SCHEDULED TO BE MANUFACTURED BY GREENHECK. PENNBARRY AND COOK ARE CONSIDERED EQUIVALENT MANUFACTURERS.
2. AIRFLOW CONDITIONS RATED AT 3,800 FEET ALTITUDE.
3 FAN SELECTIONS SHALL BE SUBMITTED TO ALLOW FOR A MINIMUM +/- 10% IN SCHEDULED EXTERNAL STATIC AND CFM WITHIN THE PARAMETERS OF THE SCHEDULED MOTOR HP.

DUCTLESS SPLIT SYSTEM A/C SCHEDULE

INDOOR UNIT	
SYMBOL	IDU-1
TYPE	DUCTLESS SPLIT
COOLING :	
COOLING AIRFLOW CFM	400
MINIMUM NET TOTAL CAPACITY, MBH	12.0
ELECTRICAL	
VOLTAGE / PHASE	230/1/60
MITSUBISHI MODEL NUMBER:	PKA-A12HA4
OUTDOOR UNIT	
SYMBOL	CU-1
NOMINAL TONS	1.0
ENTERING CONDENSER AIR TEMPERATURE (F)	95
MINIMUM COOLING SEER	15.2
REFRIGERANT TYPE	R-410a
ELECTRICAL	
VOLTAGE / PHASE	230/1/60
MITSUBISHI MODEL NUMBER:	PUY-A12NHA4

NOTES :
1. SCHEDULED UNITS ARE MANUFACTURED BY MITSUBISHI.
2. AIRFLOW CONDITIONS ARE RATED AT 3,400 FEET.
3. INDOOR UNIT SHALL BE EQUIPPED WITH REPLACEABLE FILTER, FREEZE PROTECTION, AUTOMATIC AIR SWEEP, AUTO RESTART, DIAGNOSTICS, HIGH/MID/LOW & AUTO FAN SPEEDS, AND WHITE FINISH.
4. OUTDOOR UNIT SHALL BE EQUIPPED WITH HAIL GUARD FOR THE CONDENSER COIL, CONDENSATE PUMP, DEFROST CONTROL, HIGH PRESSURE SWITCH, ANTI-SHORT CYCLE TIMER, SERVICE VALVES, ANCILLARY REFRIGERANT EQUIPMENT AND INDOOR BLOWER RELAY KIT. CONTRACTOR SHALL PROVIDE FOR ALL PIPING.
5. ROUTE CONDENSATE DRAIN TO EXTERIOR WALL, ROUTE DOWN TO 8" AFF AND PENETRATE EXTERIOR WALL. EXTEND PIPE 3" OUTSIDE WALL AND TERMINATE DOWN.

REFERENCES -- BENCH MARKS
BENCHMARK:
REVISIONS | DATE | BY

PSC PARKHILL SMITH & COOPER
501 W. SAN ANTONIO EL PASO, TEXAS 79901
PARKHILL SMITH & COOPER, INC. F-560
STATE OF TEXAS BRADLEY BLOUNT 115111 LICENSED PROFESSIONAL ENGINEER 02/01/16

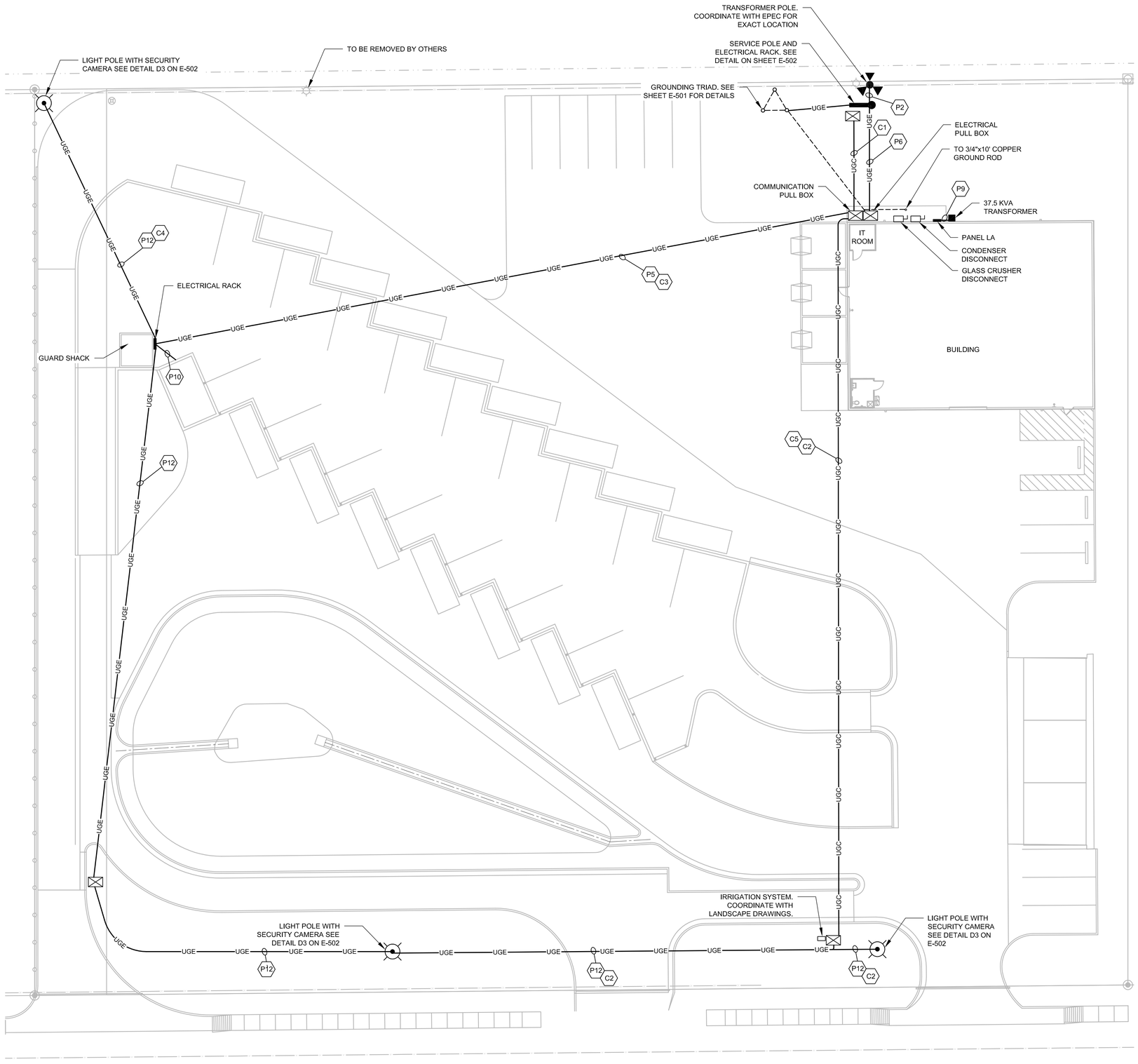
SCALE Hor. AS SHOWN Ver. AS SHOWN
DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

SHEET TITLE
PLUMBING SCHEDULE AND DETAILS

MP501



C2 SITE PLAN
SCALE: 1"=16'

ELECTRICAL SYMBOLS LEGEND

SYMBOL	DESCRIPTION
WP	WEATHERPROOF
AFF	ABOVE FINISH FLOOR
$	SINGLE POLE WALL SWITCH. FLUSH MOUNTED AT 44" AFF UNLESS OTHERWISE INDICATED.
	QUADRUPLEX CONVENIENCE OUTLET. GFCI INDICATES GROUND FAULT CURRENT INTERRUPTER TYPE
	DUPLEX CONVENIENCE OUTLET. GFCI INDICATES GROUND FAULT CURRENT INTERRUPTER TYPE. IG IF INDICATED.
	FLUSH INGROUND PULL BOX
	SAFETY SWITCH, TO HAVE POLES AND RATING REQUIRED. TO BE NEMA 3R IF INSTALLED OUTDOORS.
—OHE—	OVERHEAD ELECTRICAL CIRCUIT
—UGE—	ELECTRICAL UNDERGROUND CIRCUIT, 24" MINIMUM BELOW GRADE
—UGC—	COMMUNICATION UNDERGROUND
	BREAKER OF RATING INDICATED
	EQUIPMENT GROUND
	GROUND ROD, 3/4" X 10' COPPER CLAD
	GROUND WELL TEST STATION
	AREA LIGHT FIXTURE DETAILS IN LIGHTING SCHEDULE
##	CONDUIT NUMBER

GENERAL NOTES

A. PRIOR TO BEGINNING CONSTRUCTION, ALL UTILITIES AND UNDERGROUND STRUCTURES SHALL BE LOCATED. ANY ITEMS OR AREAS THAT WILL CONFLICT WITH THE INSTALLATION OF CONDUIT OR EQUIPMENT SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.

B. CONTRACTOR IS RESPONSIBLE FOR RESTORING ANY AREAS AFFECTED DURING CONSTRUCTION TO THEIR ORIGINAL CONDITION.

C. ANY DEVIATION OR SUBSTITUTIONS IN EQUIPMENT, MATERIALS OR ENGINEERING PRACTICES MUST HAVE THE CLIENT REPRESENTATIVE'S APPROVAL. FABRICATION AND INSTALLATION SHALL BE IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS AND ALL APPLICABLE CODES.

D. BECAUSE OF THE SMALL SCALE OF THE ELECTRICAL DRAWINGS, IT IS NOT POSSIBLE TO INDICATE OFFSETS,FITTINGS, JUNCTION BOXES AND ACCESSORIES WHICH MAY BE REQUIRED.

E. ALL CONDUIT AND CABLE ROUTING IS SHOWN DIAGRAMMATIC. FINAL ROUTING SHALL BE DETERMINED IN THE FIELD TO AVOID ANY DAMAGE OR INTERFERENCE WITH OTHER SYSTEMS. MEET ALL CODE REQUIREMENTS AND MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURES.

F. TYPICAL RECOMMENDED METHODS AND INSTALLATION PRACTICES ARE COVERED IN THE NOTES AND DETAILS. THE DETAILS REPRESENT GENERAL CONSTRUCTION METHODS ONLY AND DO NOT NECESSARILY IMPLY EXACT INSTALLATION PROCEDURES. THE DETAILS MAY BE MODIFIED TO MEET ACTUAL FIELD CONDITIONS PER CLIENT REPRESENTATIVE'S APPROVAL.

G. CONTRACTOR WILL BE RESPONSIBLE FOR COMPLETE LABOR, DEMOLITION, RELOCATION, INSTALLATION AND CABLE TERMINATIONS OF ALL ELECTRICAL EQUIPMENT, INCLUDING THAT SUPPLIED BY OWNER, INVOLVED IN THIS PROJECT.

H. ALL ELECTRICAL WORK SHALL BE IN COMPLIANCE WITH THE LATEST REVISION OF NEC AND ALL APPLICABLE STATE AND CITY CODES.

I. CONTRACTOR SHALL PROVIDE FOR THE ADJUSTMENT/RELOCATION OF BOXES IN A RANGE OF 10'-0" (IN ANY DIRECTION) WITHOUT ADDITIONAL CHARGE TO THE OWNER. PROVIDE CONDUIT, WIRE, CABLE, ETC. AS NECESSARY FOR COMPLETE FUNCTIONING OF THE SYSTEM.

J. CONTRACTOR SHALL PROVIDE PULL BOXES AT INTERVALS AS INDICATED IN THE NATIONAL ELECTRICAL CODE OR AS INDICATED BY CONDUCTOR MANUFACTURER. REFER TO ELECTRICAL DETAILS FOR ADDITIONAL INFORMATION.

K. ALL LIGHTING, POWER, COMMUNICATION, INSTRUMENTATION, GROUNDING AND DETAIL DRAWINGS SHALL BE COORDINATED PRIOR TO AND DURING CONSTRUCTION. ALL INSTALLATION SHALL BE DONE IN A SAFE AND WORKMAN LIKE MANNER. WHERE MANUFACTURERS INSTRUCTIONS ARE FURNISHED WITH EQUIPMENT, INSTALLATION SHALL CONFORM TO THEIR REQUIREMENTS.

L. CONTRACTOR SHALL NOT BORE HOLES OR MAKE OPENINGS OF ANY TYPE IN STRUCTURAL BEAMS, COLUMNS OR BRACES UNLESS INDICATED AND SPECIFICALLY DETAILED ON THE STRUCTURAL DRAWINGS.

M. REFER TO DEMOLITION DRAWINGS FOR REMOVAL OF EXISTING ELECTRICAL EQUIPMENT.

N. A MINIMUM OF 12" CLEARANCE SHALL BE MAINTAINED WHEN CROSSING OTHER UNDERGROUND UTILITIES OR STRUCTURES.

O. CONTRACTOR SHALL COORDINATE DISPOSAL OF ALL EQUIPMENT AND MATERIAL WITH OWNER. MATERIAL RETURNED TO OWNER SHALL REMAIN ON SITE AND BE STORED IN AN ORDERLY FASHION.

P. CONTRACTOR SHALL BE RESPONSIBLE FOR BONDING SHACK TO GROUNDING SYSTEM.

Q. ALL FLOOR MOUNTED EQUIPMENT SHALL BE INSTALLED ON 4" HOUSEKEEPING PADS.

R. TRANSFORMERS SHALL BE SECURELY ANCHORED TO HOUSEKEEPING PAS UTILIZE RIGID CONDUIT AND FITTINGS FOR CONNECTION TO TRANSFORMER. FLEXIBLE CONDUIT WILL NOT BE ALLOWED.

REFERENCES – BENCH MARKS
BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL SMITH & COOPER, INC. F-560 TEXAS
02/01/16
SHAWN R. TOWELL
106911
LICENSED PROFESSIONAL ENGINEER

SCALE
Hor. AS SHOWN
Ver. AS SHOWN
DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

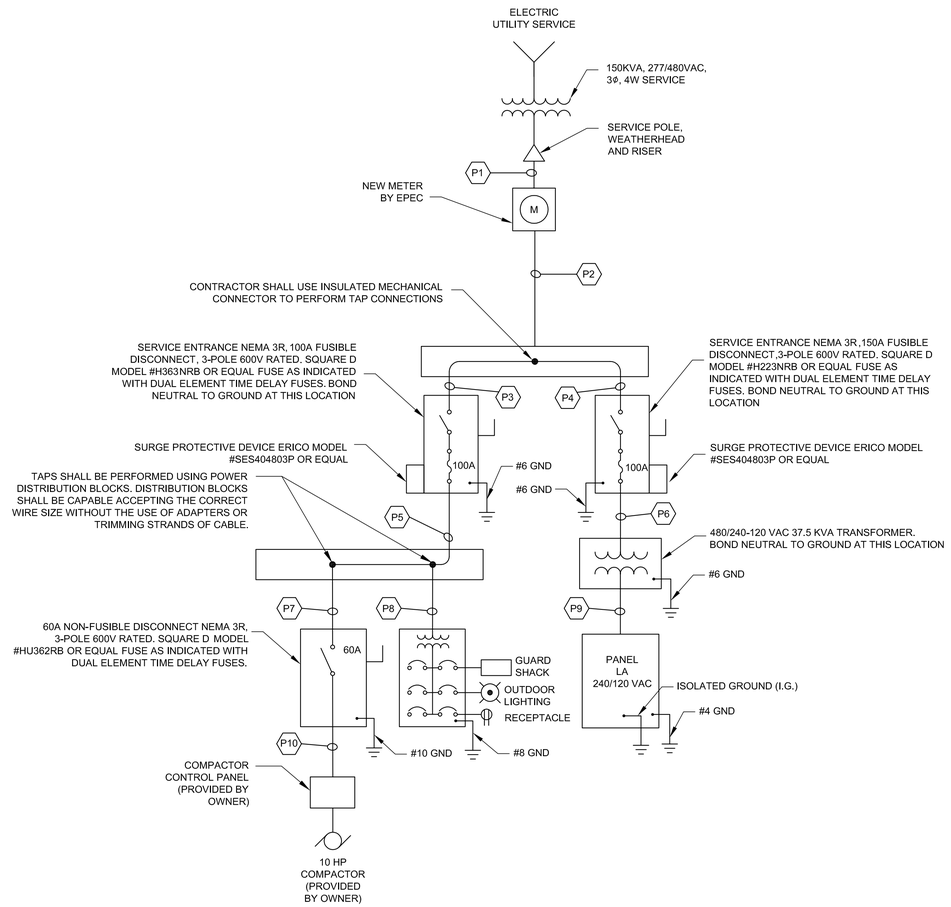
PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

SHEET TITLE
ELECTRICAL SITE PLAN LEGEND & GENERAL NOTES

E-101

Xrefs: X-TB-5124, XLDP-5124, XAFP-5124, X-VRY-5124, XCSP-5124
10:46:49
2/1/2016
Drawing File: X:\2015\5124.15\BIM_CAD\00_SHEETS\E-101-5124.dwg (JCardenas)



D2 ONELINE
SCALE: NONE

CONDUIT SCHEDULE						
No.	SIZE	QTY	FROM	TO	CONDUCTORS	COMMENTS
P1	2"	1	WEATHERHEAD	METERCAN	4 - #3/0 AWG & #4 GND	
P2	2"	1	METERCAN	WIREWAY	3 - #3/0 AWG & #4 GND	
P3	1 1/2"	1	WIREWAY	COMPACTOR/GUARD SHACK FUSIBLE DICONNECT	3 - #2 AWG & #6 GND	
P4	1"	1	WIREWAY	BUILDING FUSIBLE DISCONNECT	2 - #2 AWG & #6 GND	
P5	1 1/2"	1	COMPACTOR/GUARD SHACK FUSIBLE DICONNECT	COMPACTOR/GUARD SHACK WIREWAY	3 - #2 AWG & #8 GND	
P6	1"	1	BUILDING FUSIBLE DISCONNECT	37.5 KVA TRANSFORMER	2 - #2 AWG & #6 GND	
P7	3/4"	1	COMPACTOR/GUARD SHACK WIREWAY	COMPACTOR DISCONNECT	3 - #6 AWG & #10 GND	
P8	3/4"	1	COMPACTOR/GUARD SHACK WIREWAY	25KVA MINI POWER ZONE	2 - #4 AWG & #8 GND	
P9	2"	1	37.5 KVA TRANSFORMER	PANEL LA	3 - #3/0 AWG & #4 GND	
P10	3/4"	1	COMPACTOR DISCONNECT	COMPACTOR	3 - #10 AWG & #10 GND	
P11	3/4"	1	25 KVA MINI POWER ZONE	GUARD SHACK	2 - #4 AWG & #8 GND	
P12	3/4"	1	25 KVA MINI POWER ZONE	AREA LIGHTING	2 - #10 AWG & #10 GND	
P13	3/4"	1	25 KVA MINI POWER ZONE	RECEPTACLE CKT	2- #12 AWG & #12 GND	
P14	3/4"	1	PANEL LA	ELECTRICAL/IT ROOM LIGHTING CKT	2 - #12 AWG & #12 GND	
P15	3/4"	1	PANEL LA	RESTROOM LIGHTING CKT	2 - #12 AWG & #12 GND	
P16	3/4"	1	PANEL LA	EXHAUST FAN	2 - #12 AWG & #12 GND	
P17	3/4"	1	PANEL LA	GENERAL AREA LIGHTING CKT	2- #12 AWG & #12 GND	
P18	3/4"	1	PANEL LA	RECEPTACLE CKT #1 (GENERAL AREA)	2 - #12 AWG & #12 GND	
P19	3/4"	1	PANEL LA	OUTDOOR LIGHTING (WALLPACK)	2- #12 AWG & #12 GND	
P20	3/4"	1	PANEL LA	RECEPTACLE CKT #2 (IT ROOM)	2 - #12 AWG & #12 GND	
P21	3/4"	1	PANEL LA	COMPUTER/SERVER	2 - #12 AWG & #12 GND	
P22	3/4"	1	PANEL LA	ELECTRICAL/I.T ROOM RECEPTACLE CKT (I.G)	2 - #12 AWG & #12 GND	
P23	3/4"	1	PANEL LA	SPACE HEATER	2 - #12 AWG & #12 GND	
P24	3/4"	1	PANEL LA	EMERGENCY LIGHTING CKT	2 - #12 AWG & #12 GND	
P25	3/4"	1	PANEL LA	A/C CONDENSING UNIT	2 - #12 AWG & #12 GND	
P26	3/4"	1	PANEL LA	A/C BLOWER UNIT	2 - #12 AWG & #12 GND	
P27	1"	1	PANEL LA	IT ROOM	SPARE	CAP AND MARK END OF CONDUIT. INSTALL PULLSTRING.
P28	1"	1	PANEL LA	IT ROOM	SPARE	CAP AND MARK END OF CONDUIT. INSTALL PULLSTRING.
C1	3"	1	SERVICE POLE	BUILDING		CAP AND MARK END OF CONDUIT. INSTALL PULLSTRING.
C2	2"	1	BUILDING	LIGHT POLE		CAP AND MARK END OF CONDUIT. INSTALL PULLSTRING.
C3	1"	1	BUILDING	GUARD SHACK		CAP AND MARK END OF CONDUIT. INSTALL PULLSTRING.
C4	1"	1	GUARD SHACK	LIGHT POLE		CAP AND MARK END OF CONDUIT. INSTALL PULLSTRING.
C5	1"	1	BUILDING	IRRIGATION		CAP AND MARK END OF CONDUIT. INSTALL PULLSTRING.

LOAD TABLE

CUSTOMER: CITY OF EL PASO — DATE: 1/28/2015
PROJECT: CONFEDERATE CCS — REVISION NO.: A
JOB NO: 01-5124-15

480 VOLT — MODIFIED FACILITY LOAD CALCULATIONS — 159 AMPS (CONNECTED)

EQUIP. TAG #	DESCRIPTION	LOAD RATING HP, KW, KVA		@ FULL LOAD EST. EFF	EST. PF	CONNECTED (NEC 430.6(A)) KVA	FLA	KW	ESTIMATED KVA	AMPS	KW	COMMENTS
	COMPACTOR	10	HP	0.95	0.88	67.19	23.24	59.13	67.19	18.59	59.13	
	25 KVA MINI POWER ZONE (AT GUARD SHACK)	25	KVA	0.95	0.88	25.00	52.08	22.00	25.00	52.08	22.00	
	37.5 KVA TRANSFORMER (480/ 120-240)	37.5	KVA	0.95	0.88	37.50	78.13	33.00	37.50	78.13	33.00	
	25% OF LARGEST MOTOR	2.5	HP	0.88	0.82	2.58	5.38	2.12				
					TOTALS	132.3 KVA	158.8 AMPS	116.2 KW	129.7 KVA	148.8 AMPS	114.1 KW	

FAULT CURRENT ANALYSIS
XFMR KVA = 150 KVA
%Z= 3.00%
MOTOR CONTRIBUTION = 14
AVAILABLE UTILITY= INFINITE BUS
Isc = 6.1 KA

PANEL LA

PANELBOARD COMPUTATION — MIN SCI RATING 18K AMPS
PANEL LA — VOLTAGE: 120 /240 — PHASE 1 WIRES 3 MCB: 250A

CIRC. NO.	LOAD SERVED	TRIP AMPS	NO. POLES	WIRE SIZE	LOAD IN AMPS A	B	WIRE SIZE	NO. POLES	TRIP AMPS	LOAD SERVED	CIRC. NO.
1	ELECTRICAL/IT ROOM LIGHTING CKT	20	1	12	6		12	1	20	RESTROOM LIGHTING CKT	2
					6						
3	EXHAUST FAN	20	1	12		10	12	1	20	GENERAL AREA LIGHTING CKT #1	4
						2					
5	RECEPTACLE CKT #1 (GENERAL AREA)	20	1	12	5		12	1	20	OUTDOOR LIGHTING WALLPACK	6
					16						
7	RECEPTACLE CKT #2 (IT ROOM)	20	1	12		16	12	1	20	RECEPTACLE CKT #3 (GENERAL AREA)	8
						16					
9	ELECTRICAL/IT ROOM RECEPTACLE CKT (I.G)	20	1	12	13		12	1	20	SPACE HEATER (RESTROOM)	10
					16						
11	GENERAL AREA LIGHTING CKT #2	20	1	12		13	12	2	15	MINI SPLIT COMPRESSOR	12
						10					
13	MINI SPLIT	15	2	12	13						14
					5						
15								1	20	SPARE	16
						5					
17	SPARE	20	1					1	20	SPARE	18
19	SPARE	20	1					1	20	SPARE	20
21	SPARE	20	1					1	20	SPARE	22
23	EMERGENCY LIGHTING CKT	15	1	12				1	20	SPARE	24
						10					
TOTAL CONNECTED LOAD 19.68 KVA			TOTAL		80	82		DEMAND LINE AMPS		82.0	
ESTIMATED DEMAND LOAD 19.68 KVA											

MINI POWER ZONE

PANELBOARD COMPUTATION — MIN SCI RATING 18K AMPS
MPZ — VOLTAGE: 120 /240 — PHASE 1 WIRES 3 MCB: 250A

CIRC. NO.	LOAD SERVED	TRIP AMPS	NO. POLES	WIRE SIZE	LOAD IN AMPS A	B	WIRE SIZE	NO. POLES	TRIP AMPS	LOAD SERVED	CIRC. NO.
1	GUARD SHACK	60	2	4	16		10	2	20	AREA LIGHTING	2
					60						
3						16					4
						60					
5	RECEPTACLE CKT	20	1	12				1	20	SPARE	6
					16						
7	SPARE	20	1					1	20	SPARE	8
9	SPACE									SPACE	10
11	SPACE									SPACE	12
13	SPACE									SPACE	14
15	SPACE									SPACE	16
TOTAL CONNECTED LOAD 22.08 KVA			TOTAL		92	76		DEMAND LINE AMPS		92.0	
ESTIMATED DEMAND LOAD 22.08 KVA											

REFERENCES – BENCH MARKS
BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL, SMITH & COOPER, INC. F-560 TEXAS — 02/01/16 — 106911 — STANLEY R. TOWELL — LICENSED PROFESSIONAL ENGINEER

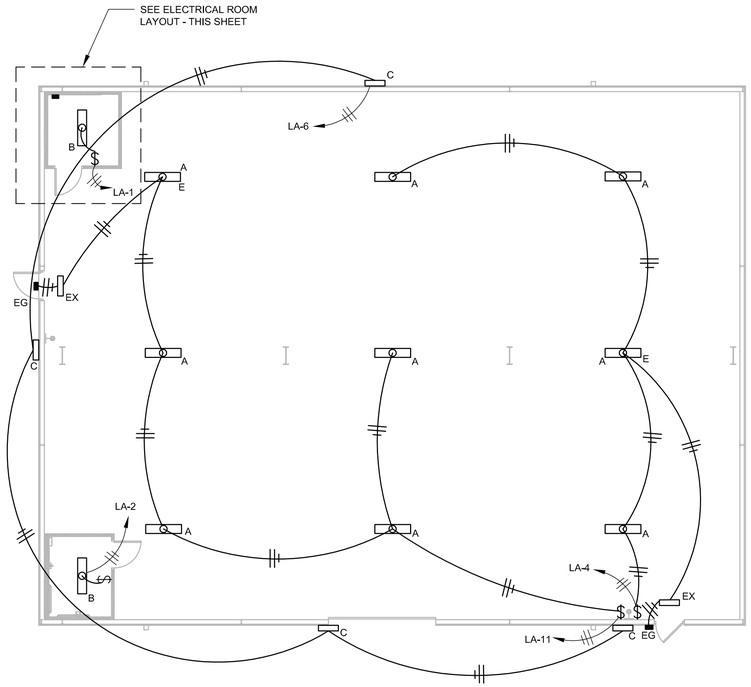
SCALE
Hor. AS SHOWN
Ver. AS SHOWN
DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

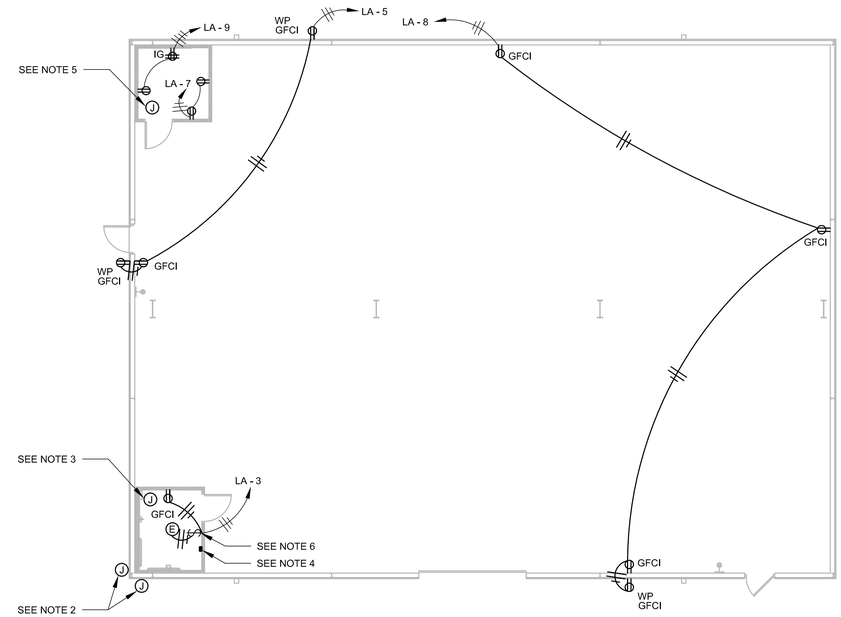
CITY OF EL PASO

SHEET TITLE
ELECTRICAL ONE LINE LOAD TABLE & PANEL SCHEDULE

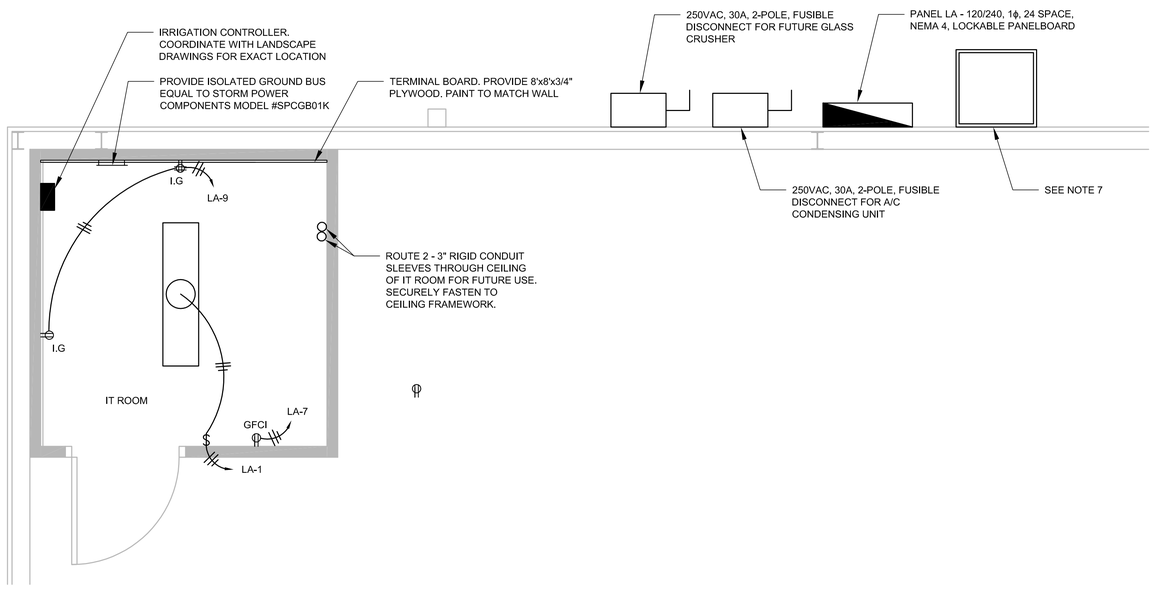
E-102



D2 LIGHTING PLAN
SCALE: 1/8" = 1'-0"



D2 POWER/COMMUNICATION PLAN
SCALE: 1/8" = 1'-0"



D2 IT ROOM LAYOUT
SCALE: 1/2" = 1'-0"

LIGHTING FIXTURE SCHEDULE

TYPE	MOUNTING	VOLTAGE	MODEL NUMBER	LAMPS	REMARKS
A	SUSPENDED	120	LITHONIA IBZ-454L-ACL-EL14SD-WGX	FL	MOUNT AT 18 FEET "E" DENOTES EMERGENCY BATTERY TO BE SUPPLIED AND INSTALLED WITH FIXTURE
B	PENDANT/ SURFACE	120	LITHONIA VSL-2-54T5HO	FL	
C	WALL	120	LITHONIA OLW23	LED	
D	POLE	240	LITHONIA DSX0-LED-20C-700-50K-T4M-MVOLT	LED	COLOR TO BE DARK BRONZE
EG	WALL	120	LITHONIA AFN-DB-EXT-FWD	LED	MOUNT AT 9 FEET COLOR TO BE DARK BRONZE
EX	SURFACE	120	LITHONIA LHQM-LED-R-SD	LED	

NOTES:

1. RECEPTACLES IN WAREHOUSE SHOULD BE MOUNTED 16" TO BOTTOM OF BOX AFF.
2. PROVIDE JUNCTION BOX FOR FUTURE CAMERA INSTALLATION BY OWNER. INSTALL AT 16 FEET AFF.
3. PROVIDE JUNCTION BOX FOR SPACE HEATER.
4. SPACE HEATER THERMOSTAT. COORDINATE WITH MECHANICAL DRAWINGS FOR WIRING REQUIREMENTS
5. PROVIDE JUNCTION BOX WITH DISCONNECT SWITCH FOR MINI SPLIT SYSTEM. COORDINATE EXACT LOCATION WITH MECHANICAL DRAWINGS.
6. PROVIDE WALL SWITCH TO CONTROL BATHROOM EXHAUST FAN.
7. 37.5 KVA DRY TYPE TRANSFORMER, 480 - 120/240 VAC, 1ϕ, NEMA 4, HAMMOND POWER SOLUTIONS MODEL #SG2N0037LEKCFF OR APPROVED EQUAL. INSTALL ON 4" CONCRETE PAD. PAD SHALL BE SIZED TO 2" CLEAR AROUND TRANSFORMER FOR PURPOSED OF ANCHORING TRANSFORMER TO PAD.

CITY OF EL PASO OUTDOOR LIGHTING ORDINANCE COMPLIANCE #15996 REV. FEB. 2005.

PROJECT DATA

	CONFEDERATE CITIZENS COLLECTION STATION	
PROJECT NAME:		
PROJECT ZONING:	M1	
ORDINANCE LIGHTING ZONE:	E-4	
PROPERTY PROJECT AREA	2.33	ACRES
LUMENS PER ACRE ALLOWED:	1,000,000	LUMENS
TOTAL LUMENS PERMITTED	2,330,000	LUMENS

TOTAL LUMEN CALCULATION

TYPE	ZONE	DESCRIPTION	LUM/FIXTURE	SOURCE	WATTS/FIXTURE	CANOPY FACTOR (10%)	QUANTITY	TOTAL LUMENS
F	E-4	ARE LIGHTING	9,060	LED	138	N/A	3	27,180
C	E-4	WALLPACK	2,253	LED	36	N/A	3	6,759
						TOTAL PROJECT LUMENS		33,939

	E-4
LUMENS PERMITTED	2,330,000
LUMENS USED	33,939
LUMENS REMAINING	2,296,061

THE PROJECT COMPLIES WITH THE OUTDOOR LIGHTING ORDINANCE LIGHTING ZONE E-. LUMEN CALCULATION INCLUDES ALL LUMINAIRES. CURFEW PER CODE.

REFERENCES – BENCH MARKS
BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
201 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL, SMITH & COOPER, INC. F-560
STATE OF TEXAS
SHAWN R. TOWELL
106911
LICENSED PROFESSIONAL ENGINEER
02/01/16

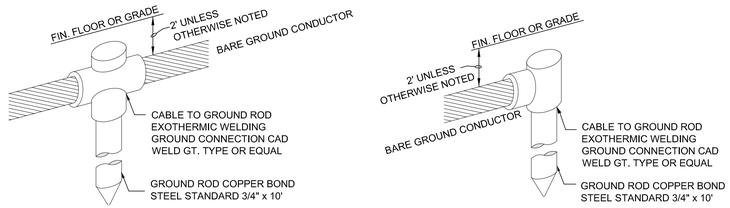
SCALE
Hor. AS SHOWN
Ver. AS SHOWN
DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME
CONFEDERATE CITIZENS
COLLECTION STATION

CITY OF EL PASO

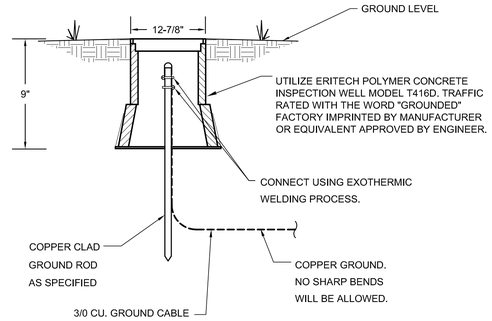
SHEET TITLE
ELECTRICAL FLOOR PLAN & LIGHTING SCHEDULE

E-103



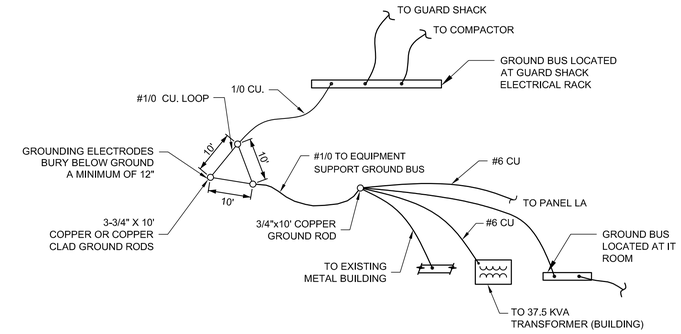
D1 GROUNDING DETAIL

SCALE: NONE



D3 GROUND ROD INSPECTION WELL

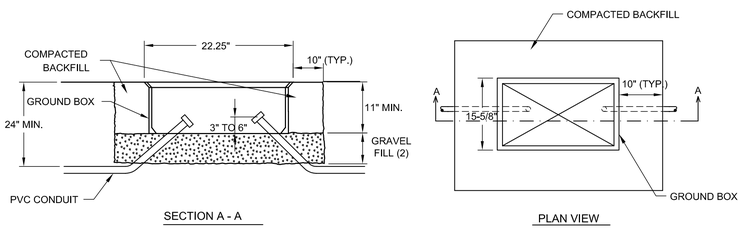
SCALE: NONE



NOTE: ALL CONNECTIONS TO UTILIZE EXOTHERMIC WELDING PROCESS

D5 GROUNDING TRIAD DETAIL

SCALE: NONE



SECTION A - A

PLAN VIEW

NOTES:

1. FINAL POSITION OF END OF CONDUIT SHALL NOT EXCEED ONE-HALF THE DISTANCE TO THE SIDE OF BOX OPPOSITE THE CONDUIT ENTRY.
2. PLACE GRAVEL "UNDER" THE BOX, NOT "IN" THE BOX. GRAVEL SHOULD NOT ENCROACH ON THE INTERIOR VOLUME OF THE BOX.
3. INSTALL BUSHING ON THE UPPER END OF ALL ELLS.
4. PULLBOX SHALL BE A TIER 22, GASKETED, HEAVY DUTY UNDERGROUND ENCLOSURE, PRE-CAST POLYMER BOX QUAZITE MODELWITH HEAVY DUTY COVER OR EQUAL.
5. MAINTAIN SUFFICIENT SPACE BETWEEN ALL CONDUITS SO AS TO ALLOW FOR PROPER INSTALLATION OF BUSHINGS.
6. ALL CONDUITS SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER.
7. ALL CONDUITS INSTALLED IN THE GROUND BOX SHALL BE SEALED AFTER COMPLETION OF CONDUCTOR INSTALLATION AND ANY REQUIRED PULL TESTS. SILICONE SHALL NOT BE USED AS SEALANT.
8. USE WATERPROOF WIRE CONNECTORS WHEN NEEDED.
9. ELECTRICAL PULLBOX SHALL HAVE EMBOSSED LABEL READING "ELECTRICAL" AND/OR "COMMUNICATION".
10. UNDERSIDE OF BOX TO BE WRAPPED WITH WEED CLOTH THEN TAPED WITH HEAVY DUTY 3" WIDE PLASTIC TAPE.
11. ALL PENETRATIONS SHALL BE SEALED TO PREVENT SOIL FROM ERODING INTO BOX.
12. GROUND BOX SHALL BE A JENSEN PRECAST MODEL #HT1324-B WITH MODEL #HT1324-LO LID OR APPROVED EQUAL.

B1 INGROUND PULLBOX DETAIL

SCALE: NONE

REFERENCES – BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL, SMITH & COOPER, INC. F-560 STATE OF TEXAS 02/01/16 SHAWN R. TOWELL 106911 LICENSED PROFESSIONAL ENGINEER

SCALE
Hor. AS SHOWN
Ver. AS SHOWN

DATE
DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

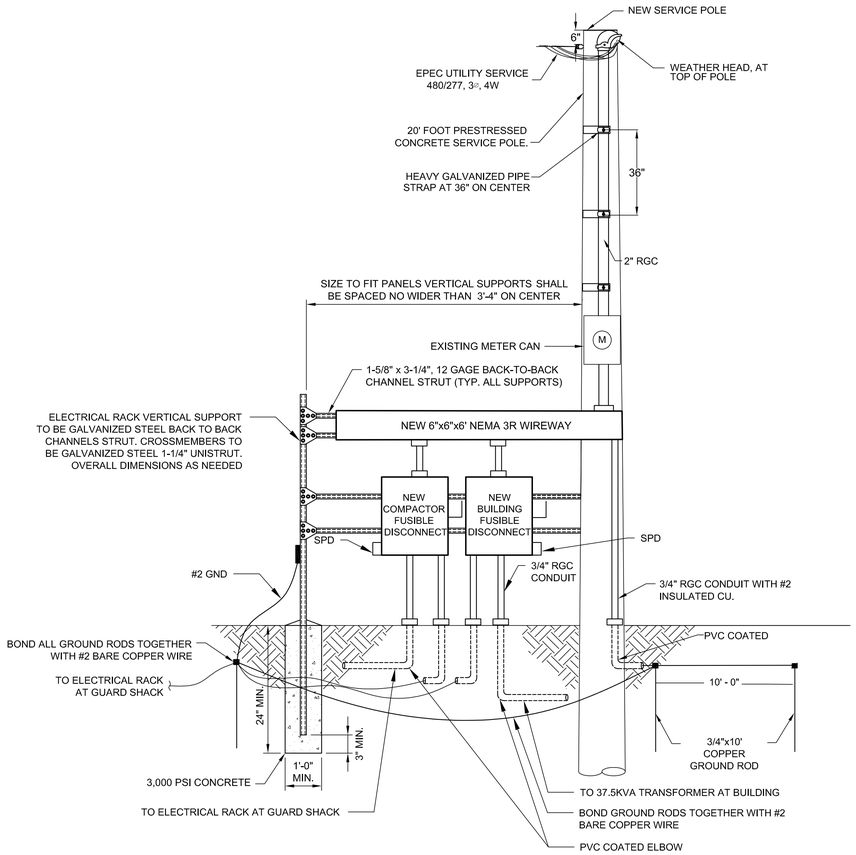
PROJECT NAME
CONFEDERATE CITIZENS COLLECTION STATION

CITY OF EL PASO

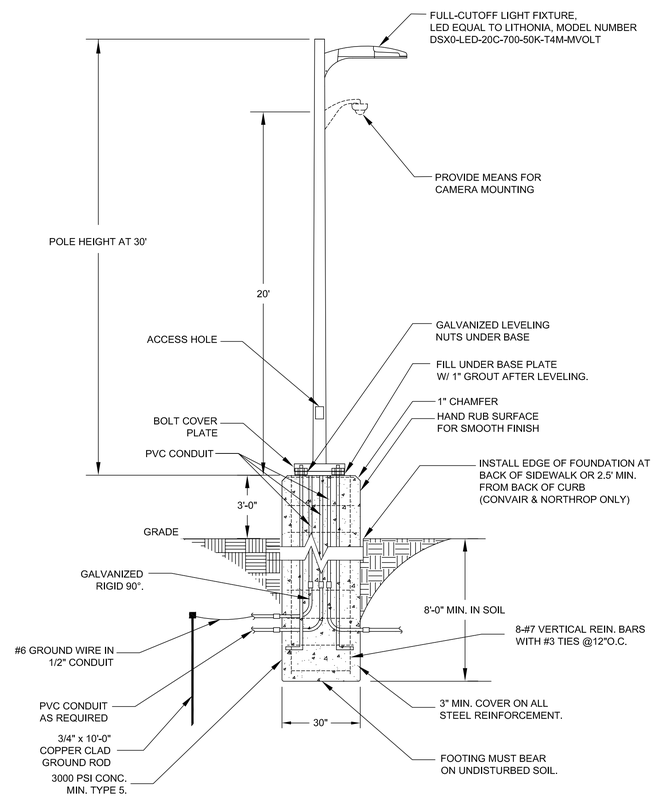
SHEET TITLE

ELECTRICAL DETAILS

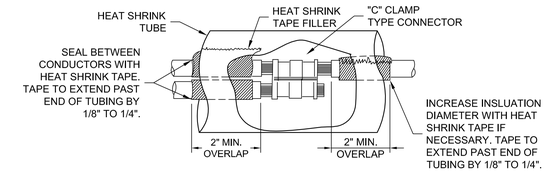
E-501



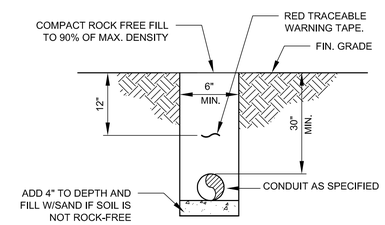
D2 ELECTRICAL RACK
SCALE: NONE



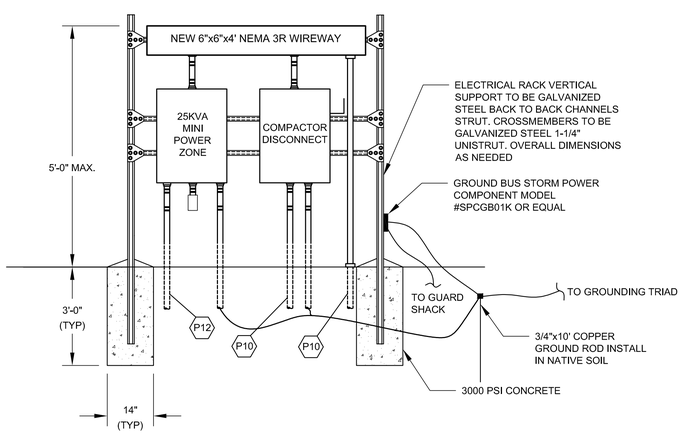
D3 LIGHT POLE FOUNDATION DETAIL
SCALE: NONE



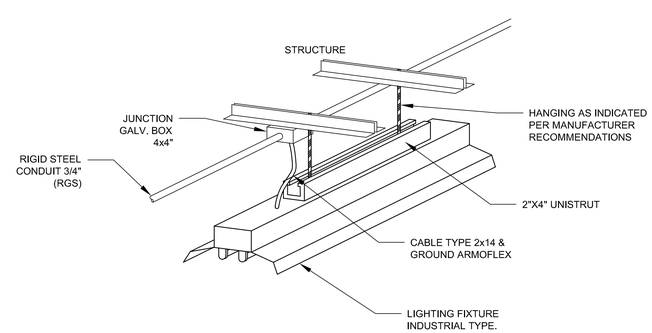
D5 C - CLAMP SPLICE DETAIL
SCALE: NONE



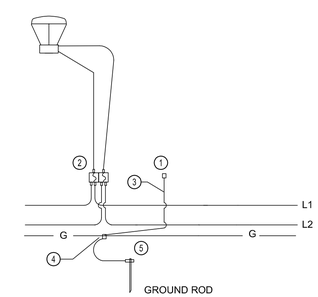
C5 ELECTRICAL TRENCH DETAIL
SCALE: NONE



A1 GUARD SHACK ELECTRICAL RACK DETAIL
SCALE: NONE



A3 INDUSTRIAL LIGHT FIXTURE DETAIL
SCALE: NONE



A4 ILLUMINATION ASSEMBLY WIRING SCHEMATIC
SCALE: NONE

LUMINAIRES SERVED AT 240V

NOTES:

AS INDICATED BY: (00)

1. POLE BONDING CONNECTOR BLACKBURN TTC3 OR WEAVER TGC3 OR EQUAL.
2. FUSED CONNECTOR - SHALL BE WATERTIGHT AND SHALL BE DESIGNED AS BREAKAWAY (BUCHANNAN 65U, BUSSMANN HEBW, LITTERFUSE LEB OR EQUAL). ALL FUSES SHALL BE TIME - DELAY TYPES. 10AMP (LITTELFUSE FLQ. BUSSMAN FNQ OR EQUAL).
3. #6 AWG, BARE, BONDING JUMPER.
4. SPLIT BOLT OR OTHER CONNECTOR.
5. GROUND ROD CLAMP - BLACKBURN GG58H, BURNDY GKP635, OR EQUAL.

REFERENCES – BENCH MARKS

BENCHMARK:

DATE	REVISIONS	BY

PARKHILL SMITH & COOPER
PSC
501 W. SAN ANTONIO EL PASO, TEXAS 79901

PARKHILL, SMITH & COOPER, INC. F-560
STATE OF TEXAS
SYMON R. TOWELL
106911
LICENSED PROFESSIONAL ENGINEER
02/01/16

SCALE
Hor. AS SHOWN
Ver. AS SHOWN

DATE

DESIGN BY
DRAWN BY
CHKD. BY
APPD. BY

PROJECT NAME

CONFEDERATE CITIZENS
COLLECTION STATION

CITY OF EL PASO

SHEET TITLE

ELECTRICAL DETAILS

E-502