

The City of Ennis will receive sealed bids for the Electrical Improvements at Intersection of McKinney and Knox, City Bid No. 23-316-11 at Ennis Public Works located at 500 Lake Bardwell Drive Ennis, Texas 75119 on April 25, 2023 at 2:00 pm CST and then, at said office publicly opened and read aloud. Sealed bids shall be addressed to Ed Green, City of Ennis, Texas, and shall be plainly marked "Electrical Improvements at the Intersection of McKinney and Knox, City Bid No. 23-316-11" on the outside of bids. Bids shall be hand delivered only (not a USPS Mail address). Bids received after 2:00 pm CST shall be returned, unopened.

The work to be bid on is generally as follows:

Construction of electrical improvements including, but not limited to, furnishing and installing electrical conduit and wiring, breaker panel, and rack; removing wiring from existing conduit and rewiring; removal of existing pedestal; installation of company switch provided by the City; pavement removal and replacement and site restoration.

Notice to Proceed will be issued after April 30, 2023. The allotted time for construction is 90 calendar days.

The Information for Bidders, Form of Bid, Form of Contract, Plans, Specifications, Bond Forms, and other contract documents may be viewed and ordered online by registering with CIVCAST at www.civcastusa.com and on the city's website at <https://www.ennistx.gov/PublicNotices>.

The Contractor is hereby advised that virtual Pre-Bid Conference will be held on April 11, 2023 at 2:00 pm CST. Log-in information for the virtual pre-bid conference is provided in Section 00 2113 Instruction to Bidders, 1.10 Pre-Bid Conference. Attendance at the Pre-Bid Conference is highly encouraged, but is not mandatory.

All questions should be directed to Bridget Shealy with Gresham Smith at bridget.shealy@greshamsmith.com or posted in CIVCAST. Questions shall be submitted by April 18, 2023.

PROJECT MANUAL

Gresham Smith Project No. 46006.00

ELECTRICAL IMPROVEMENTS AT INTERSECTION OF MCKINNEY AND KNOX

City Bid No. 23-316-11

Ennis, Texas

March 2023



Texas Registered Engineering Firm F-3629

ARCHITECTS / ENGINEERS

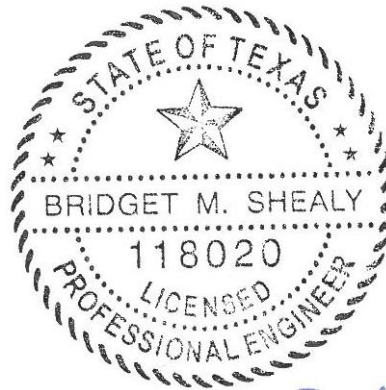
500 North Akard Street, Suite 3210

Dallas, Texas 75201

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1.1 DESIGN PROFESSIONALS OF RECORD

- A. CIVIL ENGINEER
Bridget M. Shealy, P.E.
License #118020
The following Sections:
01 2219



Bridget M. Shealy
3/21/2023

B. ELECTRICAL
ENGINEER

George Luke, P.E.

License #60900

The following Sections:

26 0000, 26 0519, 26 0526,

26 0529, 26 0533, 26 2416,

26 4313

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-	Certificate of Interested Parties Form 1295
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EXHIBIT 1 – U.S. Post Office Property – Public Utility Easement	
The following are incorporated into the Project Manual by reference:	
City of Ennis Infrastructure Design Standards, Latest Edition	
North Central Texas Council of Governments Public Works Construction Standards, Fifth Edition	

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Notice to Proceed will be issued after April 30, 2023. The allotted time for construction is 90 calendar days.

The Information for Bidders, Form of Bid, Form of Contract, Plans, Specifications, Bond Forms, and other contract documents may be viewed and ordered online by registering with CIVCAST at www.civcastusa.com.

The City of Ennis reserves the right to waive any informalities or to reject any or all bids.

Each bidder must deposit his bid security in the amount, form and subject to the conditions provided in Section 00 2113 Instructions to Bidders.

No bidder may withdraw his bid within 60 days after the actual date of the opening thereof.

All bidders must be licensed General Contractors of the State of Texas and qualified for the type of construction being bid upon.

The Contractor is hereby advised that virtual Pre-Bid Conference will be held on April 11, 2023 at 2:00 pm CST. Log-in information for the virtual pre-bid conference is provided in Section 00 2113 Instruction to Bidders, 1.10 Pre-Bid Conference. Attendance at the Pre-Bid Conference is highly encouraged, but is not mandatory.

All questions should be directed to Bridget Shealy with Gresham Smith at bridget.shealy@greshamsmith.com or posted in CIVCAST. Questions shall be submitted by April 18, 2023.

It is the responsibility of the Contractor to ensure he has received and acknowledged all addenda prior to final submission of his bid. There is space for acknowledgement on the first sheet of the Bid Form (Section 00 4100). Please reference each individual addendum by number in the space provided. Failure to acknowledge all addenda may render the bid incomplete at the discretion of the Owner.

END OF DOCUMENT

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1.1 DEFINITIONS

- A. Bidding Documents include Bidding Requirements and proposed Contract Documents. Bidding Requirements consist of the Advertisement for Bids, Instructions to Bidders, Bid Form, and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Schedules, and all Addenda issued before and all Modifications issued after execution of the Contract.
- B. Definitions set forth in the Standard General Conditions of the Construction Contract, EJCDC Document C-700, or in other Contract Documents are applicable to the Bidding Documents.
- C. Addenda: Written or graphic instruments issued by the Engineer before execution of the Contract that modify or interpret the Bidding Documents by additions, deletions, clarifications, or corrections.
- D. Project Manual: The volume or volumes that includes Bidding Requirements, Sample Forms, Conditions of the Contract, Specifications, and other printed documents.
- E. Bid: Complete and properly signed proposal to do the Work for the sums stipulated therein that is submitted in conformance to the Bidding Documents and statutory requirements in the State in which bids are received.
- F. Base Bid: The sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which work may be added or from which work may be deleted for sums stated in Alternates.
- G. Alternate (or Alternate Bid): An amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.
- H. Unit Price: Amount stated in the Bid as a price per unit of measurement for materials or services as described in the Bidding Documents.
- I. Bidder: Person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.
- J. Sub-Bidder: Person or entity who submits a proposal to a Bidder for materials or labor for a part of the Work.

1.2 BIDDER'S REPRESENTATIONS

- A. The Bidder by submitting a Bid represents that:
 - 1. Bidder has read and understands the Bidding Documents, to the extent that such documentation relates to the Work for which the Bid is submitted, and for other portions of the Project, if any, being bid concurrently or presently under construction
 - 2. The Bid is made in compliance with the Bidding Documents.
 - 3. Bidder has visited the place of the Work, has become familiar with local conditions under which the Work will be performed, and has correlated the Bidder's personal observations with the requirements of the Bidding Documents.
 - 4. The Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception.

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- B. The failure or omission of a Bidder to receive or examine any form, instrument, or document or to visit the site and acquaint itself with existing conditions shall not relieve the Bidder from obligations with respect to its Bid.

1.3 BIDDING DOCUMENTS

- A. Bidding documents will be made available to bidders as stated in Document 00 1113 Advertisement for Bids.
- B. Bidders shall use complete sets of Bidding Documents in preparing Bids. Neither the Owner nor Engineer shall have any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- C. In making copies of the Bidding Documents available on the above terms, the Owner and the Engineer do so only for the purpose of obtaining Bids for the Work and do not thereby confer a license or grant permission for other use of Bidding Documents.
- D. Interpretation or Clarification Of Bidding Documents:
 - 1. Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall at once report to the Engineer errors, inconsistencies, or ambiguities discovered.
 - 2. Bidders requiring clarification or interpretation of the Bidding Documents shall make written request that shall reach the Engineer via Civcast. Requests by e-mail will also be acceptable. Sub-bidders shall make requests only through a Bidder.
 - 3. Interpretations, corrections and changes of the Bidding Documents will be made by Addendum. Interpretations, corrections, or changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon them.
- E. Substitutions:
 - 1. Products and procedures described in the Bidding Documents for the Work establish the standard of required function, dimension, appearance, and quality to be met by any proposed substitution.
 - 2. No substitutions will be considered during the bidding period.
 - 3. After execution of the Contract, Substitutions will be considered only according to requirements and limitations in the Conditions of the Contract.
 - 4. Refer to the Specifications for limitations and procedures for requesting substitutions after execution of the Contract.
- F. Addenda:
 - 1. Addenda will be transmitted electronically to entities to whom set of Bidding Documents were issued and plan website provider listed in Document 00 1113 Advertisement for Bids. Bidders are responsible for notifying their sub-bidders about Addenda.
 - 2. Addenda will be issued no later than 4 days before the date for receipt of Bids except an Addendum withdrawing the request for Bids or an Addendum that includes postponement of the date for receipt of Bids.
 - 3. Each Bidder shall ascertain before submitting its Bid that it has received all Addenda issued, and the Bidder shall acknowledge their receipt in its Bid.

1.4 BIDDING PROCEDURES

- A. Preparation of Bids:

1. Submit Bids on forms identical to the form included with the Bidding Documents.
 2. All blanks on the Bid Form shall be legibly executed in non-erasable medium.
 3. Where so indicated, indicate sums in both words and numerals. In case of discrepancy, the amount written in words shall govern.
 4. Interlineations, modifications, or erasures must be initialed by the signer of the Bid.
 5. All requested Alternates shall be bid. If no change in the Base Bid is required, enter the words "No Change to Base Bid."
 6. Where two or more Bids for designated parts of the Work are requested, the Bidder may, without forfeiture of its bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall make no added stipulations on the Bid Form nor qualify the Bid in any other manner.
 7. Each copy of the Bid shall include the legal name of the Bidder and the nature of legal form of the Bidder. Bidder shall provide evidence of legal authority to perform within the jurisdiction of the Work. Each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have its corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Bidder.
 8. Bid security shall be submitted with each bid in the amount of 5 percent of the bid amount.
 9. The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and will supply bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to supply such bonds, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. The amount of the bid security shall not be forfeited to the Owner in the event the Owner fails to comply with Paragraph 1.5.B.
 10. Surety bonds shall be written on EJCDC Document C-430, Bid Bond, unless otherwise provided in the Bidding Documents, and the attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of the power of attorney.
 11. The Owner shall have the right to retain the bid security of Bidders to whom an award is being considered until either (a) the Contract has been executed and bonds, if required, have been supplied, or (b) the specified time has elapsed so that Bids may be withdrawn, or (c) all Bids have been rejected.
- B. Submission of Bids:
1. All copies of the Bid, the bid security and other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope conforming to Texas law. Address the envelope to the entity receiving the Bids and list the Project name, City Bid No. 23-316-11, the Bidder's name, address, license number, and other information required by law. If the Bid is sent by mail, enclose the sealed envelope in a separate mailing envelope with the notation "SEALED BID ENCLOSED" typed on its face.
 2. Deliver Bids at the designated location before the bid time on the bid date. Bids received after the bid time on the bid date will be returned unopened.
 3. Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.
 4. Bids transmitted by e-mail, facsimile, or other method are invalid and will not be considered.
 5. Bidders shall be licensed Contractors in the State of Project as required by law.
 6. Bids will be publicly opened and read aloud on the date, time and place indicated in 00 1113 Advertisement for Bid.
- C. Modification or Withdrawal of Bid:

1. A Bid may not be modified, withdrawn, or canceled by the Bidder during the time period stipulated in Document 00 1113 Advertisement for Bids following the time and date designated for receipt of Bids, and each Bidder so agrees in submitting a Bid.
 2. Before the time and date designated for receipt of Bids, a Bid submitted may be modified or withdrawn by notice to the entity receiving Bids at the place designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder or by fax. If notification is given by e-mail, fax, mail and postmark written confirmation over the signature of the Bidder must be received before the time and date designated for receipt of Bids. A change shall be so worded as not to reveal the amount of the original Bid.
- D. Withdrawn Bids may be resubmitted up the date and time designated for receipt of Bids, provided that they are then fully in conformance with the Bidding Requirements.
1. Bid security shall be in an amount sufficient for the Bid as resubmitted.
- E. Rejection of Bids:
1. The Owner shall have the right to reject any or all Bids.
 2. A Bid not accompanied by required bid security or by other data required by the Bidding Documents, or a Bid that is in any way incomplete or irregular is subject to rejection.
- F. Award of Contract:
1. The Owner intends to award a Contract to the lowest qualified Bidder, provided the Bid has been submitted in accordance with the Bidding Documents and does not exceed the available funds. The Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid, which in the Owner's judgment, is in the Owner's own best interests.

1.5 POST-BID INFORMATION

- A. Submittals:
1. The Bidder shall, after submitting its Bid and within five days of Owner's request, submit the following information:
 - a. Written description of present commitments;
 - b. Financial data;
 - c. Evidence of Bidder's authority to do business in the State of Texas;
 - d. Designation of the Work to be performed with the Bidder's own forces;
 - e. Documentation that all subcontractors meet qualification requirements set forth in Paragraph 1.6.
 2. A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.
 3. No requirement to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.
 4. Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.
 5. Before award of the Contract, the Engineer will notify the Bidder in writing if either the Owner or Engineer, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Engineer has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, (1) withdraw the Bid, or (2) submit an acceptable substitute person or entity with an adjustment in the Base Bid or Alternate Bid to cover the difference in cost caused by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. If either withdrawal or disqualification occurs, bid security will not be forfeited.

6. Persons and entities proposed by the Bidder and to whom the Owner and Engineer have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Engineer.

1.6 BONDS AND INSURANCE

A. Bond Requirements:

1. Before the execution of the Contract, the successful Bidder shall provide bonds covering the faithful performance of the Contract, payment of all obligations arising thereunder, and guaranteeing the workmanship performed under the Contract. Bonds may be secured through the Bidder's usual sources.
2. The cost for such bonds shall be included in the Bid.

B. Time of Delivery and Form of Bonds

1. Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to be started before that date in response to a letter of intent, the Bidder shall, before starting the Work, submit evidence satisfactory to the Owner that such bonds will be provided and delivered in accordance with this Subparagraph.
2. Performance and payment bond shall be written on EJCDC Documents C-610 Performance Bond and C-615 Payment Bond, respectively. All bonds shall be written in the amount of the Contract Sum.
3. Bonds shall be dated on or after the date of the Contract.
4. Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

C. Insurance Requirements

1. The successful Bidder shall submit evidence of required insurance on an original ACORD certificate or Texas Department of Insurance-approved form at the time of request. Insurance requirements are set forth in Section 00 7200, EJCDC C-700 Standard General Conditions of the Construction Contract and Section 00 7300, Supplementary Conditions of EJCDC C-700. The bidder will have no longer than fifteen (15) calendar days following notification of award to submit the required form. The City of Ennis shall be identified as an additional insured party to all applicable coverage, including materials, equipment, or supplies provided by the City. A current insurance form must be submitted upon policy changes, renewal, or upon request by the City.
2. The City of Ennis reserves the right to require or receive any additional documents necessary to confirm that the insurance requirements are being met, including but not limited to, policies and endorsements.
3. A certificate of insurance is not required at the time of bid. However, an insurance certificate is required to be on file with the City prior to the start of work.

1.7 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

A. Agreement Form:

1. The agreement for the Work will be written on EJCDC Document C-520, Suggested Form of Agreement Between Owner and Contractor for Construction Contract (Stipulated Price)
2. Bidder to whom the Contract is awarded by the Owner shall, within 7 days after notice of award and receipt of Agreement forms, sign and deliver to the Owner all required copies of the Agreement.

1.8 PRE-BID CONFERENCE

- A. A virtual pre-bid meeting will be held on Google Meets on Tuesday, April 11, 2023 at 2:00 pm CST. Log in to the virtual meeting at meet.google.com/ryk-vwvp-sco or join by phone at 1-208-696-2743 (PIN: 344744362). The meeting will be open to Bidders and Sub-bidders. Attendance is not mandatory, but highly encouraged.

1.9 TIME OF CONSTRUCTION

- A. Contract Time: The Agreement will include a condition that the Work be Substantially Complete by number of calendar days provided by the Contractor on the Bid Form. The Contract Time will be stipulated in the Agreement and the Notice to Proceed.
- B. Liquidated Damages: The Agreement will include a stipulation that liquidated damages will be assessed in the amount of \$250 for each consecutive calendar day after the substantial completion date that the Work is not substantially complete.

END OF DOCUMENT

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1.1 MATERIAL STORAGE AND STAGING AREAS

- A. City will provide an approximately 60' x 250' area on the east side of N.W. Main Street between Baylor Street and W. Belknap Street for Contractor to store materials and for staging at no additional cost to the Contractor.

1.2 DOWNTOWN EVENTS

- A. The City of Ennis holds multiple events throughout the year in and around the Project Area. Information on these events is provided below. Additional events may also occur during the construction time. The Notice To Proceed will be issued after April 30, 2023 to avoid conflicts with the Bluebonnet Trails Festival. The Contractor may need to adjust its work schedule to accommodate other events to be held in the vicinity of the Project Area. The Contractor shall work with the City prior to these events to provide temporary protection of incomplete work and additional traffic control measures. Any additional protection or control measures are considered incidental to the Work and will not be paid for as a separate pay item.
- B. Downtown Calendar of Events
 1. The Bluebonnet Market at Minnie McDowal Park – Saturdays from 8am-12pm, April-October 2023
 2. National Polka Festival - May 26 - 28, 2023
 3. Main Street Midway Festival – June 24th – 26th, 2023

1.3 DISPOSAL OF WASTE MATERIAL AND TRASH

- A. Contractor is responsible for disposal of all waste material generated as part of the Work. For any material that is not removed by dump truck or trash that is not removed from the site on a daily basis, the City of Ennis has an agreement in place requiring waste removal services are to be provide exclusively by Republic Services so no outside dumpster service shall be permitted. This is considered incidental to the Work and will not be paid for as a separate pay item.

1.4 ACCESS TO PRIVATE PROPERTY

- A. Access to private property shall be maintained throughout the project. Contractor is responsible for providing, installing and maintaining temporary ramps or any other measures needed to maintain access to private property. This is considered incidental to the Work and will not be paid for as a separate pay item. Short-term closures may be permitted subject to prior approval by the City of Ennis. Contractor is responsible for coordinating any potential access restrictions with the City of Ennis least 14 calendar days prior to Work.

1.5 PRECONSTRUCTION CONFERENCE

- A. Before any Work is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in this Section; coordination with adjacent construction, franchise utilities; procedures for handling Shop Drawings and other submittals; processing Applications for Payment; and maintaining required records.

1.6 SEQUENCE OF CONSTRUCTION

- A. Contractor shall develop a construction phasing plan and submit to the City for approval at least two weeks prior to construction.

- B. Construction phasing plan shall provide for emergency vehicle and garbage pickup access throughout construction to the maximum extent practicable. Any required short-term street closures should be clearly indicated in the plan and are subject to approval by the City.

1.7 TRAFFIC CONTROL

- A. Lane closures are not anticipated to be needed for this project. The Contractor is responsible for keeping all adjacent streets open to vehicles. If Contractor determines a lane closure is needed to perform the Work, the Contractor shall develop a detailed traffic control plan in accordance with the Texas Manual on Uniform Traffic Control Devices (TMUTCD), latest version, and submit to the City for approval within two weeks prior to date of proposed lane closure. The Contractor is responsible for providing and maintaining all traffic control devices. This is considered incidental to the Work and will not be paid for as a separate pay item.

1.8 CONSTRUCTION COORDINATION MEETINGS

- A. Contractor project manager and superintendent shall plan to attend ongoing construction meetings as frequently as bi-weekly to discuss progress, issues, and shall provide overall schedule updates and 2-week look ahead updates to the City and Engineer at each meeting. This is considered incidental to the Work and will not be paid for as a separate pay item.

1.9 VERIFICATION NO BOYCOTT ISRAEL

- A. As required by Chapter 2270, Government Code, the Contractor hereby verifies that it does not boycott Israel and will not boycott Israel through the term of this Agreement. For purposes of this verification, "boycott Israel" means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes.

1.10 FOREIGN TERRORIST ORGANIZATIONS

- A. Pursuant to Chapter 2252, Texas Government Code, the Firm represents and certifies that, at the time of execution of this Agreement neither the Firm, nor any wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of the same (i) engages in business with Iran, Sudan, or any foreign terrorist organization as described in Chapters 806 or 807 of the Texas Government Code, or Subchapter F of Chapter 2252 of the Texas Government Code, or (ii) is a company listed by the Texas Comptroller of Public Accounts under Sections 806.051, 807.051, or 2252.153 of the Texas Government Code. The term "foreign terrorist organization" in this paragraph has the meaning assigned to such term in Section 2252.151 of the Texas Government Code.

END OF DOCUMENT

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TO: City of Ennis
115 West Brown Street
Ennis, Texas 75119

1. Pursuant to and in compliance with the Advertisement for Bid and the Bidding Documents relating to construction of:

Electrical Improvements at Intersection of McKinney and Knox, City Bid No. 23-316-11

Including Addenda _____

The undersigned, having become thoroughly familiar with the terms and conditions of the Bidding Documents and with local conditions affecting the performance and costs of the Work at the place where the Work is to be completed, and having fully inspected the site in all particulars, hereby proposes and agrees to fully perform the Work within the time stated and in strict accordance with the Bidding Documents, including furnishing any and all labor and materials, and to do all of the work required to construct and complete said Work in accordance with the Bidding Documents, for the following unit prices:

BID ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
1	Mobilization	LS	1		
2	Stormwater Pollution Prevention	LS	1		
3	Remove and Replace 4" Concrete Sidewalk	SY	18		
4	Remove and Salvage Existing Meter Pedestal	LS	1		
5	American Boxwood (3 Gal)	EA	6		
6	Yaupon Holly (45 Gal)	EA	1		
7	Top Soil (4" Depth)	SY	25		
8	Solid Block Sodding	SY	24		
9	2" Conduit/Wiring	LF	90		
10	Remove Existing Wiring and Install New Wiring in Existing 1-1/2" Conduit	LF	50		
11	Remove Existing Wiring and Install New Wiring in Existing 1" Conduit	LF	40		
12	Remove Existing Wiring and Install Pull String in Existing 1" Conduit	LF	18		
13	Remove Existing Wiring and Install New Wiring in Existing 3/4" Conduit	LF	45		
14	1" Conduit (Spare with Pull String)	LF	175		
15	Electrical Junction Box	EA	1		
16	200 Amp Elec Service Panel, Meter Base and Connections	LS	1		
17	Install Company Switch (Provided by City) and Provide and Install 3-phase Meter Base and Connections	LS	1		
18	Equipment Rack	LS	1		
19	Owner's Allowance	LS	1	\$5,000.00	\$5,000.00
				TOTAL BID PRICE:	

TIME OF COMPLETION

Bidder agrees that the Work will be substantially complete within 90 calendar days after the Contract Time date of commencement as set forth in Paragraph 2.03 of the General Conditions, and will be completed and ready for final payment in accordance with paragraph 14.07 of the General Conditions within 120 calendar days after the Contract Time commences.

Bidder accepts the provisions of the Contract Documents as to liquidated damages.

2. Bids shall include all taxes and fees, including sales tax (where required).

3. I understand that the Owner reserves the right to reject this Bid, but that this Bid shall remain open and not be withdrawn for a period of 60 days from the date prescribed for its receiving.

4. The Bidder, if awarded a contract, hereby agrees to commence work under the Contract on or before a date to be specified in the Notice to Proceed from the Owner and fully complete the project within the time specified in Division 00 Document "Instructions to Bidders". Bidder also accepts the provisions for liquidated damages in the event of failure to complete the Project on time.

5. If written notice of the acceptance of this bid is mailed or delivered to the undersigned within 30 days after the date set for the receiving of this bid, or at any other time thereafter before it is withdrawn, the undersigned shall execute and deliver the Contract Documents to the Owner in accordance with this Bid as accepted, and will also furnish and deliver to the Owner the Performance Bond, Labor and Material Payment Bond, and proof of insurance coverage, all within 15 days after personal delivery or after deposit in the mails of the notification of acceptance of this Bid.

6. Notice of acceptance, or request for additional information, may be addressed to the undersigned at the address set forth below.

7. Bidder declares that he understands any unit quantities shown on the Bid Form are approximate only and are subject to increase or decrease. Bidder agrees that should the quantities of any such items be decreased, no claim will be made for anticipated profits nor will the Owner honor such claims

8. The names of all persons interested in the foregoing Bid as principals are:

(IMPORTANT NOTICE: If Bidder or other interested person is a corporation, give legal name of corporation, state where incorporated, and names of president and secretary; if a partnership, give name of firm and names of all individual co-partners composing the firm; if Bidder or other interested person is an individual, give first and last names in full)

.....
.....
.....

licensed in accordance with an act for the registration of contractors, and with license number _____ in the State of _____.

SIGN HERE:

.....
.....
.....

Signature of Bidder

NOTE: If Bidder is a corporation, set forth the legal name of the corporation together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation. If bidder is a partnership, set forth the name of the firm together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership.

Business Address:

.....
.....

Telephone Number:

.....

Date of Proposal:

END OF DOCUMENT

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The Bid Bond, EJCDC Document C-430, 2007 edition, forms a part of the Construction Documents and is attached.

END OF DOCUMENT

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BID BOND

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER *(Name and Address)*:

SURETY *(Name and Address of Principal Place of Business)*:

OWNER *(Name and Address)*:

BID

Bid Due Date:

Description *(Project Name and Include Location)*:

BOND

Bond Number:

Date *(Not earlier than Bid due date)*:

Penal sum _____ \$ _____
(Words) (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

BIDDER

SURETY

Bidder's Name and Corporate Seal (Seal)

Surety's Name and Corporate Seal (Seal)

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Note: Above addresses are to be used for giving any required notice. Provide execution by any additional parties, such as joint venturers, if necessary.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
 - 3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
 - 3.2 All Bids are rejected by Owner, or
 - 3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

The Undersigned states the following is a full and complete list of the proposed Subcontractors on this Project and the class of work to be performed by each, and that such list will not be added to nor altered without written consent of the Owner through the Engineer. Bidder is required to attach additional sheets to indicate additional Subcontractors as necessary.

	Subcontractor and Address	Class of Work to be Performed	Percentage of Work to be Performed
(1)	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
(2)	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
(3)	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
(4)	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
(5)	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
(6)	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

Dated: _____

Bidder _____

By: _____

END OF DOCUMENT

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The "Suggested Form of Agreement Between Owner and Contractor for Construction Contract (Stipulated Price)", EJCDC Document C-520, 2007 edition, forms a part of the Construction Documents and is attached.

END OF DOCUMENT

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This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

SUGGESTED FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly by

ACEC

AMERICAN COUNCIL OF ENGINEERING COMPANIES



ASCE American Society
of Civil Engineers

P/E National Society of
Professional Engineers
Professional Engineers in Private Practice

AMERICAN COUNCIL OF ENGINEERING COMPANIES

ASSOCIATED GENERAL CONTRACTORS OF AMERICA

AMERICAN SOCIETY OF CIVIL ENGINEERS

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
A Practice Division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

Endorsed by



CONSTRUCTION SPECIFICATIONS INSTITUTE

This Suggested Form of Agreement has been prepared for use with the Standard General Conditions of the Construction Contract (EJCDC C-700, 2007 Edition). Their provisions are interrelated, and a change in one may necessitate a change in the other. The language contained in the Suggested Instructions to Bidders (EJCDC C-200, 2007 Edition) is also carefully interrelated with the language of this Agreement. Their usage is discussed in the Narrative Guide to the 2007 EJCDC Construction Documents (EJCDC C-001, 2007 Edition).

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American Council of Engineering Companies
1015 15th Street N.W., Washington, DC 20005
(202) 347-7474
www.acec.org

American Society of Civil Engineers
1801 Alexander Bell Drive, Reston, VA 20191-4400
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www.asce.org

Associated General Contractors of America
2300 Wilson Boulevard, Suite 400, Arlington, VA 22201-3308
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www.agc.org

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INTRODUCTION

This Suggested Form of Agreement between Owner and Contractor for Construction Contract (Stipulated Price) (“Agreement”) has been prepared for use with the Suggested Instructions to Bidders for Construction Contracts (“Instructions to Bidders”) (EJCDC C-200, 2007 Edition); the Suggested Bid Form for Construction Contracts (“Bid Form”) (EJCDC C-410, 2007 Edition); and the Standard General Conditions of the Construction Contract (“General Conditions”) (EJCDC C-700, 2007 Edition). Their provisions are interrelated, and a change in one may necessitate a change in the others. See also the Guide to the Preparation of Supplementary Conditions (EJCDC C-800, 2007 Edition), and the Narrative Guide to the 2007 EJCDC Construction Documents (EJCDC C-001, 2007 Edition).

This Agreement form assumes use of a Project Manual that contains the following documentary information for a construction project:

- Bidding Requirements, which include the advertisement or invitation to bid, the Instructions to Bidders, and the Bid Form that is suggested or prescribed, all of which provide information and guidance for all Bidders; and
- Contract Documents, which include the Agreement, performance and payment bonds, the General Conditions, the Supplementary Conditions, the Drawings, and the Specifications.

The Bidding Requirements are not Contract Documents because much of their substance pertains to the relationships prior to the award of the Contract and has little effect or impact thereafter, and because many contracts are awarded without going through the bidding process. In some cases, however, the actual Bid may be attached as an exhibit to the Agreement to avoid extensive rekeying. (The definitions of terms used in this Agreement, including “Bidding Documents,” “Bidding Requirements,” and “Contract Documents,” are set forth Article 1 of the General Conditions.)

Suggested provisions are accompanied by “Notes to User” to assist in preparing the Agreement. The provisions have been coordinated with the other forms produced by EJCDC. Much of the language should be usable on most projects, but modifications and additional provisions will often be necessary. When modifying the suggested language or writing additional provisions, the user must check the other documents thoroughly for conflicts and coordination of terms and make appropriate revisions in all affected documents.

All parties involved in construction projects benefit significantly from a standardized approach in the location of subject matter throughout the documents. Experience confirms the danger of addressing the same subject matter in more than one location: doing so frequently leads to confusion and unanticipated legal consequences. When preparing documents for a construction project, careful attention should be given to the guidance provided in the Uniform Location of Subject Matter (EJCDC N-122).

EJCDC has designated Section 00520 for this Agreement. If this convention is used, the first page of the Agreement would be numbered 00520-1. If CSI’s MasterFormat 04™ is being used for the Project Manual, consult MasterFormat 04 for the appropriate section number and number the pages accordingly.

For brevity, paragraphs of the Instructions to Bidders are referenced with the prefix “I,” those of the Bid Form are referenced with the prefix “BF,” and those of this Agreement are referenced with the prefix “A.”

NOTE: EJCDC publications may be purchased from any of the organizations listed on the page immediately following the cover page of this document.

**SUGGESTED FORM OF AGREEMENT
BETWEEN OWNER AND CONTRACTOR
FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)**

THIS AGREEMENT is by and between _____ (“Owner”) and
_____ (“Contractor”).

Owner and Contractor hereby agree as follows:

ARTICLE 1 – WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

ARTICLE 2 – THE PROJECT

2.01 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

ARTICLE 3 – ENGINEER

3.01 The Project has been designed by _____ (Engineer), which is to act as Owner’s representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – CONTRACT TIMES

4.01 *Time of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Dates for Substantial Completion and Final Payment*

- A. The Work will be substantially completed on or before _____, and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions on or before _____.

[or]

4.02 *Days to Achieve Substantial Completion and Final Payment*

- A. The Work will be substantially completed within _____ days after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions within _____ days after the date when the Contract Times commence to run.

4.03 *Liquidated Damages*

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner \$_____ for each day that expires after the time specified in Paragraph 4.02 above for Substantial Completion until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner \$_____ for each day that expires after the time specified in Paragraph 4.02 above for completion and readiness for final payment until the Work is completed and ready for final payment.

NOTE TO USER

If failure to reach a Milestone on time is of such consequence that the assessment of liquidated damages for failure to reach one or more Milestones on time is to be provided, appropriate amending or supplementing language should be inserted here.

ARTICLE 5 – CONTRACT PRICE

- 5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to Paragraphs 5.01.A, 5.01.B, and 5.01.C below:

- A. For all Work other than Unit Price Work, a lump sum of: \$_____

All specific cash allowances are included in the above price in accordance with Paragraph 11.02 of the General Conditions.

- B. For all Unit Price Work, an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work times the actual quantity of that item:

<u>Item No.</u>	<u>Description</u>	<u>UNIT PRICE WORK</u>			<u>Bid Price</u>
		<u>Unit</u>	<u>Estimated Quantity</u>	<u>Bid Unit Price</u>	

Total of all Bid Prices (Unit Price Work) \$ _____

The Bid prices for Unit Price Work set forth as of the Effective Date of the Agreement are based on estimated quantities. As provided in Paragraph 11.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer as provided in Paragraph 9.07 of the General Conditions.

- C. For all Work, at the prices stated in Contractor’s Bid, attached hereto as an exhibit.

NOTES TO USER

1. *If adjustment prices for variations from stipulated Base Bid quantities have been agreed to, insert appropriate provisions.*
2. *Depending upon the particular project bid form used, use 5.01.A alone, 5.01.A and 5.01.B together, 5.01.B alone, or 5.01.C alone, deleting those not used and renumbering accordingly. If 5.01.C is used, Contractor’s Bid is attached as an exhibit and listed as a Contract Document in A-9.*

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

- A. Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

- A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor’s Applications for Payment on or about the ____ day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below. All such payments will be measured by the schedule of values established as provided in Paragraph 2.07.A of the General

Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 14.02 of the General Conditions.
 - a. _____ percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and
 - b. _____ percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
- B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to _____ percent of the Work completed, less such amounts as Engineer shall determine in accordance with Paragraph 14.02.B.5 of the General Conditions and less _____ percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the tentative list of items to be completed or corrected attached to the certificate of Substantial Completion.

NOTE TO USER

Typical values used in Paragraph 6.02.B are 100 percent and 200 percent respectively.

6.03 *Final Payment*

- A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.07 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 14.07.

ARTICLE 7 – INTEREST

- 7.01 All moneys not paid when due as provided in Article 14 of the General Conditions shall bear interest at the rate of _____ percent per annum.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

- 8.01 In order to induce Owner to enter into this Agreement, Contractor makes the following representations:
 - A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.

- B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities), if any, that have been identified in Paragraph SC-4.02 of the Supplementary Conditions as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in Paragraph SC-4.06 of the Supplementary Conditions as containing reliable "technical data."

NOTE TO USER

Modify the above paragraph if there are no such reports or drawings.

- E. Contractor has considered the information known to Contractor; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents; and (3) Contractor's safety precautions and programs.

NOTE TO USER

If the Contract Documents do not identify any Site-related reports and drawings, modify this paragraph accordingly.

- F. Based on the information and observations referred to in Paragraph 8.01.E above, Contractor does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.
- G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 Contents

- A. The Contract Documents consist of the following:
1. This Agreement (pages 1 to __, inclusive).
 2. Performance bond (pages ____ to ____, inclusive).
 3. Payment bond (pages ____ to ____, inclusive).
 4. Other bonds (pages ____ to ____, inclusive).
 - a. ____ (pages ____ to ____, inclusive).
 - b. ____ (pages ____ to ____, inclusive).
 - c. ____ (pages ____ to ____, inclusive).
 5. General Conditions (pages ____ to ____, inclusive).
 6. Supplementary Conditions (pages ____ to ____, inclusive).
 7. Specifications as listed in the table of contents of the Project Manual.
 8. Drawings consisting of ____ sheets with each sheet bearing the following general title: ____ [or] the Drawings listed on attached sheet index.
 9. Addenda (numbers ____ to ____, inclusive).
 10. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid (pages ____ to ____, inclusive).
 - b. Documentation submitted by Contractor prior to Notice of Award (pages ____ to ____, inclusive).
 - c. *[List other required attachments (if any), such as documents required by funding or lending agencies].*
 11. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
 - a. Notice to Proceed (pages ____ to ____, inclusive).
 - b. Work Change Directives.
 - c. Change Orders.

NOTE TO USER

If any of the items listed are not to be included as Contract Documents, remove such item from the list and renumber the remaining items.

- B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 9.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the General Conditions.

ARTICLE 10 – MISCELLANEOUS

10.01 *Terms*

- A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

10.02 *Assignment of Contract*

- A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 *Severability*

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05 *Contractor's Certifications*

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:
1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process or in the Contract execution;
 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

10.06 *Other Provisions*

NOTES TO USER

1. *If Owner intends to assign a procurement contract (for goods and services) to the Contractor, see Notes to User at Article 23 of Suggested Instructions to Bidders for Procurement Contracts (EJCDC P-200, 2000 Edition) for provisions to be inserted in this Article.*
2. *Insert other provisions here if applicable.*

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement. Counterparts have been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or have been identified by Owner and Contractor or on their behalf.

NOTE TO USER

See I-21 and correlate procedures for format and signing of the documents.

This Agreement will be effective on _____ (which is the Effective Date of the Agreement).

NOTE TO USER

The Effective Date of the Agreement and the dates of any Construction Performance Bond (EJCDC C-610) and Construction Payment Bond (EJCDC C-615) should be the same, if possible. In no case may the date of any bonds be earlier than the Effective Date of the Agreement.

OWNER:

CONTRACTOR

By: _____

By: _____

Title: _____

Title: _____

(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: _____

Attest: _____

Title: _____

Title: _____

Address for giving notices:

Address for giving notices:

License No.: _____
(Where applicable)

(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

NOTE TO USER: Use in those states or other jurisdictions where applicable or required.

Agent for service of process:

The Performance Bond, EJCDC Document C-610, 2007 edition, forms a part of the Construction Documents and is attached.

END OF DOCUMENT

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PERFORMANCE BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

CONTRACTOR (*Name and Address*): SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

CONTRACT

Effective Date of Agreement:
Amount:
Description (*Name and Location*):

BOND

Bond Number:
Date (*Not earlier than Effective Date of Agreement*):
Amount:
Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal (Seal)

Surety's Name and Corporate Seal (Seal)

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Note: Provide execution by additional parties, such as joint venturers, if necessary.

Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Contract, which is incorporated herein by reference.

1. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 2.1.
2. If there is no Owner Default, Surety's obligation under this Bond shall arise after:
 - 2.1 Owner has notified Contractor and Surety, at the addresses described in Paragraph 9 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor, and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and
 - 2.2 Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 2.1; and
 - 2.3 Owner has agreed to pay the Balance of the Contract Price to:
 1. Surety in accordance with the terms of the Contract; or
 2. Another contractor selected pursuant to Paragraph 3.3 to perform the Contract.
3. When Owner has satisfied the conditions of Paragraph 2, Surety shall promptly, and at Surety's expense, take one of the following actions:
 - 3.1 Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or
 - 3.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
 - 3.3 Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 5 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or
 - 3.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
 1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or
 2. Deny liability in whole or in part and notify Owner citing reasons therefor.
4. If Surety does not proceed as provided in Paragraph 3 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 3.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.
5. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 3.1, 3.2, or 3.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To the limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

- 5.1 The responsibilities of Contractor for correction of defective Work and completion of the Contract;
- 5.2 Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions of or failure to act of Surety under Paragraph 3; and
- 5.3 Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.

6. Surety shall not be liable to Owner or others for obligations of Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than Owner or its heirs, executors, administrators, or successors.

7. Surety hereby waives notice of any change, including changes of time, to Contract or to related subcontracts, purchase orders, and other obligations.

8. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located, and shall be instituted within two years after Contractor Default or within two years after Contractor ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

9. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.

10. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

11. Definitions.

- 11.1 Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.
- 11.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.
- 11.3 Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.
- 11.4 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – <i>(Name, Address and Telephone)</i> Surety Agency or Broker: Owner's Representative <i>(Engineer or other party)</i> :
--

The Payment Bond, EJCDC Document C-615, 2007 edition, forms a part of the Construction Documents and is attached.

END OF DOCUMENT

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PAYMENT BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

CONTRACTOR (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

CONTRACT

Effective Date of Agreement:

Amount:

Description (*Name and Location*):

BOND

Bond Number:

Date (*Not earlier than Effective Date of Agreement*):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal (Seal)

Surety's Name and Corporate Seal (Seal)

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Note: Provide execution by additional parties, such as joint venturers, if necessary.

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.
2. With respect to Owner, this obligation shall be null and void if Contractor:
 - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and
 - 2.2 Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.
3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.
4. Surety shall have no obligation to Claimants under this Bond until:
 - 4.1 Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
 - 4.2 Claimants who do not have a direct contract with Contractor:
 1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
 2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and
 3. Not having been paid within the above 30 days, have sent a written notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.
5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.
6. When a Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at Surety's expense take the following actions:
 - 6.1 Send an answer to that Claimant, with a copy to Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
 - 6.2 Pay or arrange for payment of any undisputed amounts.
7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.
8. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.

9. Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated to the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders, and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. Definitions

15.1 Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms “labor, materials or equipment” that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor’s subcontractors, and all other items for which a mechanic’s lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

15.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract, or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – *(Name, Address, and Telephone)*

Surety Agency or Broker:

Owner’s Representative *(Engineer or other)*:

The Contractor's Application for Payment, EJCDC Document C-620, 2002 edition, forms a part of the Construction Documents and is attached.

END OF DOCUMENT

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Contractor's Application For Payment No. _____

	Application Period:	Application Date:
To (Owner):	From (Contractor):	Via (Engineer)
Project:	Contract:	
Owner's Contract No.:	Contractor's Project No.:	Engineer's Project No.:

APPLICATION FOR PAYMENT

Change Order Summary

Approved Change Orders		
Number	Additions	Deductions
TOTALS		
NET CHANGE BY CHANGE ORDERS		

1. ORIGINAL CONTRACT PRICE	\$	_____
2. Net change by Change Orders	\$	_____
3. CURRENT CONTRACT PRICE (Line 1 ± 2)	\$	_____
4. TOTAL COMPLETED AND STORED TO DATE (Column F on Progress Estimate)	\$	_____
5. RETAINAGE:		
a. ____ % x \$ _____ Work Completed.....	\$	_____
b. ____ % x \$ _____ Stored Material	\$	_____
c. Total Retainage (Line 5a + Line 5b)	\$	_____
6. AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5c).....	\$	_____
7. LESS PREVIOUS PAYMENTS (Line 6 from prior Application).....	\$	_____
8. AMOUNT DUE THIS APPLICATION	\$	_____
9. BALANCE TO FINISH, PLUS RETAINAGE (Column G on Progress Estimate + Line 5 above)	\$	_____

CONTRACTOR'S CERTIFICATION

The undersigned Contractor certifies that: (1) all previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with Work covered by prior Applications for Payment; (2) title of all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to Owner at time of payment free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to Owner indemnifying Owner against any such Liens, security interest or encumbrances); and (3) all Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

By: _____	Date: _____
-----------	-------------

Payment of:	\$ _____	(Line 8 or other - attach explanation of other amount)
is recommended by:	_____	_____ (Date)
	(Engineer)	
Payment of:	\$ _____	(Line 8 or other - attach explanation of other amount)
is approved by:	_____	_____ (Date)
	(Owner)	
Approved by:	_____	_____ (Date)
	Funding Agency (if applicable)	

Stored Material Summary

Contractor's Application

For (contract):					Application Number:				
Application Period:					Application Date:				
A	B	C	D		E		F		G
Invoice No.	Shop Drawing Transmittal No.	Materials Description	Stored Previously		Stored this Month		Incorporated in Work		Materials Remaining in Storage (\$) (D + E - F)
			Date (Month/Year)	Amount (\$)	Amount (\$)	Subtotal	Date (Month/Year)	Amount (\$)	
		Totals							

The "Standard General Conditions of the Construction Contract", EJCDC Document C-700, 2007 Edition, forms a part of the Construction Documents and is attached.

END OF DOCUMENT

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This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly by

ACEC

AMERICAN COUNCIL OF ENGINEERING COMPANIES



ASCE American Society
of Civil Engineers

P/E National Society of
Professional Engineers
Professional Engineers in Private Practice

AMERICAN COUNCIL OF ENGINEERING COMPANIES

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Endorsed by



CONSTRUCTION SPECIFICATIONS INSTITUTE

These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor (EJCDC C-520 or C-525, 2007 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the Narrative Guide to the EJCDC Construction Documents (EJCDC C-001, 2007 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (EJCDC C-800, 2007 Edition).

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
 3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
 5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 6. *Bidder*—The individual or entity who submits a Bid directly to Owner.
 7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
 8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.
 9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.
 10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
 11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.
15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.
16. *Cost of the Work*—See Paragraph 11.01 for definition.
17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
19. *Engineer*—The individual or entity named as such in the Agreement.
20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.
21. *General Requirements*—Sections of Division 1 of the Specifications.
22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.
23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
28. *Notice to Proceed*—A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.
29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.
30. *PCBs*—Polychlorinated biphenyls.
31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.
37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
41. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.
46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.
47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.
48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
49. *Unit Price Work*—Work to be paid for on the basis of unit prices.
50. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.
51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an

addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 *Terminology*

A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives:*

1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. *Day:*

1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective:*

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. *Furnish, Install, Perform, Provide:*

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 Delivery of Bonds and Evidence of Insurance

- A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 Copies of Documents

- A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 Commencement of Contract Times; Notice to Proceed

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:
 - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;
 - 2. a preliminary Schedule of Submittals; and
 - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.07 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
 - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on

Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.
- C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

- A. Standards, Specifications, Codes, Laws, and Regulations
 1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies:*

1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.
2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
 - a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.
- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;
2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or
3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

- A. Contractor and any Subcontractor or Supplier shall not:
1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or
 2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

- A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
 - 1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and
 - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
 - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
 - 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 - 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:

1. is of such a nature as to establish that any “technical data” on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or
2. is of such a nature as to require a change in the Contract Documents; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer’s Review:* After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner’s obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer’s findings and conclusions.

C. *Possible Price and Times Adjustments:*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor’s cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and
 - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
 - a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
 - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and

contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

- c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and
2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all such information and data;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents;
 - c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and
 - d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the

consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.
- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.
- F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.
- G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

- H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.
- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also

meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

- A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.
- B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.
- C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.
- D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor's Insurance*

- A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
 - 2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
 - 3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
 - 4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

- a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or
 - b. by any other person for any other reason;
5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
 6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.
- B. The policies of insurance required by this Paragraph 5.04 shall:
1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
 2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
 3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;
 4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);
 5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
 6. include completed operations coverage:
 - a. Such insurance shall remain in effect for two years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;
 2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.
 3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
 4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
 5. allow for partial utilization of the Work by Owner;
 6. include testing and startup; and
 7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.
- B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors,

members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.

- C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.
- D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.
- E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

- A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.
- B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

- A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's

interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

- A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 – CONTRACTOR’S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

6.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner’s written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.
 - 1. "*Or-Equal*" Items: If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

- 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and
 - 3) it has a proven record of performance and availability of responsive service.
- b. Contractor certifies that, if approved and incorporated into the Work:
- 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. *Substitute Items:*

- a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.
- b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.
- c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.
- d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - 1) shall certify that the proposed substitute item will:
 - a) perform adequately the functions and achieve the results called for by the general design,
 - b) be similar in substance to that specified, and
 - c) be suited to the same use as that specified;
 - 2) will state:
 - a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,
 - b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and

- c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
 - 3) will identify:
 - a) all variations of the proposed substitute item from that specified, and
 - b) available engineering, sales, maintenance, repair, and replacement services; and
 - 4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.
- B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.
- C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.
- D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- F. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be

required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

- B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.
- C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor
 2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.
- F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner,

Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas:*

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.
2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought

by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and

shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

- C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
- D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is

required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

- a. Submit number of copies specified in the General Requirements.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples:*

- a. Submit number of Samples specified in the Specifications.
- b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Submittal Procedures:*

1. Before submitting each Shop Drawing or Sample, Contractor shall have:

- a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
- b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
- c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
- d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.
3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

- A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 - 1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 - 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
 - 1. observations by Engineer;
 - 2. recommendation by Engineer or payment by Owner of any progress or final payment;
 - 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 - 4. use or occupancy of the Work or any part thereof by Owner;
 - 5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;
 - 6. any inspection, test, or approval by others; or
 - 7. any correction of defective Work by Owner.

6.20 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .

- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
 - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

- E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 – OTHER WORK AT THE SITE

7.01 Related Work at Site

- A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
1. written notice thereof will be given to Contractor prior to starting any such other work; and
 2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.
- C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 Coordination

- A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:
1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
 2. the specific matters to be covered by such authority and responsibility will be itemized; and
 3. the extent of such authority and responsibilities will be provided.

- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

- A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.
- B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.
- C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

- A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

- A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents.

9.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or

continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

- A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

- A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

- A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.
- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.
- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not

exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:
 - 1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;
 - 2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and
 - 3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data

shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
1. deny the Claim in whole or in part;
 2. approve the Claim; or
 3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.
- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

- A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of

said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
- e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.
2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not

limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.
- C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.
- D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances:*
 1. Contractor agrees that:
 - a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 - b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance:*
 1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to

the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:
 - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 - 2. there is no corresponding adjustment with respect to any other item of Work; and
 - 3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 Change of Contract Price

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:
 - 1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or
 - 2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or
 - 3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee*: The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or
2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
 - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
 - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or

neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

- B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.
- D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 Notice of Defects

- A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 Access to Work

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
 - 1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;
 - 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and
 - 3. as otherwise specifically provided in the Contract Documents.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.
- E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.
- F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

- A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.
- B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

- C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.
- D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).
- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or
 2. correct such defective Work; or
 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.
- C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

- A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. *Applications for Payments:*

- 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an

Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. Review of Applications:

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or

- involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
- b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
 5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
 - d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due:

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. *Reduction in Payment:*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:
 - a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
 - b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
 - c. there are other items entitling Owner to a set-off against the amount recommended; or
 - d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.
3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before

final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.
- E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

14.05 *Partial Utilization*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
 - 1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.
 - 2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. *Application for Payment:*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;
 - b. consent of the surety, if any, to final payment;
 - c. a list of all Claims against Owner that Contractor believes are unsettled; and
 - d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. *Engineer's Review of Application and Acceptance:*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying

documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Payment Becomes Due:*

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

- A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:
 1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
 2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will justify termination for cause:
1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
 2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
 3. Contractor's repeated disregard of the authority of Engineer; or
 4. Contractor's violation in any substantial way of any provisions of the Contract Documents.
- B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:
1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);
 2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and
 3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when

so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.
- E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.
- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

15.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
 - 3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and
 - 4. reasonable expenses directly attributable to termination.
- B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days

to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 – DISPUTE RESOLUTION

16.01 Methods and Procedures

- A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.
- B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.
- C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:
1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or
 2. agrees with the other party to submit the Claim to another dispute resolution process; or
 3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 – MISCELLANEOUS

17.01 Giving Notice

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or
2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

- A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

The following supplements modify the "Standard General Conditions of the Construction Contract", EJCDC Document C-700, 2007 Edition. Where a portion of the General Conditions is modified or deleted by these Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect.

ARTICLE 2 – PRELIMINARY MATTERS

2.02 COPIES OF DOCUMENTS

Delete paragraph 2.02.A in its entirety and insert the following in its place:

A. Owner shall furnish to Contractor up to 3 printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.05 BEFORE STARTING CONSTRUCTION

Add the following subparagraph to 2.05, A:

4. An estimate draw schedule indicating estimated monthly draw requests for duration of project.

**ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS;
REFERENCE POINTS**

4.02 SUBSURFACE AND PHYSICAL CONDITIONS

Delete paragraphs 4.02 and 4.02B in their entirety and insert the following:

A. A geotechnical investigation is being performed at the Project Site by Gorrondona and Associates, Inc. The geotechnical report will be provided to CONTRACTOR.

4.04 UNDERGROUND FACILITIES

Add the following before paragraphs "A" and "B":

"Neither OWNER nor ENGINEER makes any warranties or representations about any subsurface conditions that may be encountered within the Scope of Work. The CONTRACTOR shall satisfy himself of subsurface conditions that may be encountered by performing on-site inspections, core drilling or other methods. The risk of encountering and correcting such subsurface conditions shall be borne solely by the CONTRACTOR, and the Contract Price shall include the cost of performing the work complete in-place within the Contract Time and in accordance with the terms and conditions of the Contract Documents."

ARTICLE 5 - BONDS AND INSURANCE

5.04 CONTRACTOR'S LIABILITY INSURANCE

Add the following new paragraphs immediately after 5.04, B:

C. The limits of liability for the insurance required by paragraph 5.04 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations.

-
1. Workers' Compensation, and related coverages, under paragraphs 5.04, A.1 and 5.04, A.2 of the General Conditions:
 - (a.) State: Statutory
 - (b.) Applicable Federal (e.g.; Longshoremen's): Statutory
 - (c.) Employer's Liability:

Each Accident	\$ 1,000,000
Policy Limit - Disease	\$ 1,000,000
Each Employee - Disease	\$ 1,000,000

 2. Contractor's General Liability under paragraphs 5.04, A.3 and A.6 of the General Condition which shall include completed operations and product liability coverages, and have no coverages removed by exclusions:
 - (a.) General Aggregate \$ 2,000,000
 - (b.) Products - Completed Operations Aggregate \$ 1,000,000
 - (c.) Personal and Advertising Injury \$ 1,000,000
 - (d.) Bodily Injury and Property Damage:

Each Occurrence	\$ 1,000,000
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 - (e.) Property Damage Liability insurance will provide Explosion, Collapse, and Underground coverages, where applicable.
 - (f.) Excess or Umbrella Liability:

General Aggregate	\$ 5,000,000
Each Occurrence	\$ 5,000,000

 3. Automobile Liability under paragraph 5.04, A.6 of the General Conditions. Coverage should be provided for any automobile, or hired and non-owned vehicle:
 - (a.) Bodily Injury:

Each person	\$ 500,000
Each Accident	\$ 1,000,000

 - (b.) Property Damage:

Each Accident	\$ 500,000
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 - (c.) Combined Single Limit per Accident
For Bodily Injury and Property Damage of \$ 1,000,000

 4. The Contractual Liability required by paragraph 5.04, B.4, of the General Conditions shall be provided by the Contractor as part of the Contractor's general liability coverage.
 - (a.) Bodily Injury:

Each Occurrence	\$ 1,000,000
Annual Aggregate	\$ 1,000,000

 - (b.) Property Damage:

Each Occurrence	\$ 5,000,000
Annual Aggregate	\$ 5,000,000

 5. Professional Liability Insurance: Contractor shall obtain and maintain at all times during the prosecution of the work under this Agreement a professional liability insurance. Limits of liability shall be \$1,000,000 per claim. Contractor shall maintain this policy for a period of four (4) years after the completion of the project or shall purchase extended reporting period or "tail" coverage insurance.
-

D. Additional Insurance Provisions

1. The City, its officials, employees and volunteers shall be named as an additional insured with a waiver of subrogation in favor of the City on the Commercial General Liability and Automobile Liability Insurance policies. These insurance policies shall contain the appropriate additional insured endorsement signed by a person authorized by that insurer to bind coverage on its behalf.
2. Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled, reduced in coverage or in limits, or materially changed, except after thirty (30) days prior written notice has been provided to the City. If the policy is cancelled for non-payment of premium, only ten (10) days' notice is required.
3. Insurance is to be placed with insurers with an A.M. Best rating of no less than A: VII. The company must also be duly authorized to transact business in the State of Texas. Revised 11-12-12.
4. Workers' Compensation and Employers' Liability Coverage: The insurer shall agree to waive all rights of subrogation against the City, its officials, employees, and volunteers for losses arising from the activities under this contract.
5. Certificates of Insurance and Endorsements effecting coverage required by this clause shall be forwarded to: Purchasing Agent, City of Ennis P.O. Box 220, 115 W. Brown St., Ennis, Texas 75120.
6. Workers' Compensation Insurance Coverage
 - a. 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.
 - b. 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.
 - c. 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.
 - d. 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.
 - e. The contractor must provide a certificate of coverage to the City prior to beginning work on the contract.
 - f. 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 City showing that coverage has been extended.
 - g. The contractor shall obtain from each person providing services on a project, and provide to the City:
 - i. a certificate of coverage, prior to that person beginning work on the project, so the City will have on file certificates of coverage showing coverage for all persons providing services on the project; and

- ii. no later than seven (7) 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.
- h. The contractor shall retain all required certificates of coverage for the duration of the project and for one (1) year thereafter.
- i. The contractor shall notify the City in writing by certified mail or personal delivery, within ten (10) 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.
- j. The contractor shall post on each project site a notice, in the text, form and manner prescribed by the Texas Workers' Compensation Commission, 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 lack of coverage.
- k. The contractor shall contractually require each person with whom it contracts to provide services on a project, to:
 - i. 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;
 - ii. 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;
 - iii. 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;
 - iv. obtain from each other person with whom it contracts, and provide to the contractor a certificate of coverage, prior to the other person beginning work on the project; and 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;
 - v. retain all required certificates of coverage on file for the duration of the project and for one (1) year thereafter;
 - vi. notify the governmental entity in writing by certified mail or personal delivery, within ten (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
 - vii. contractually require each person with whom it contracts, to perform as required by paragraphs i - vii, with the certificates of coverage to be provided to the person for whom they are providing services.
- l. By signing this contract or providing or causing to be provided a certificate of coverage, the contractor is representing to the City 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.
- m. The contractor's failure to comply with any of these provisions is a breach of contract by the contractor which entitles the City to declare the contract void if the contractor does not remedy the breach within ten (10) days after receipt of notice of breach from the City.

7. Any of the insurance policies required by the city may be written in combination with any of the others, where legally permitted, but none of the specified limits may be lowered thereby.

8. Companies issuing the insurance policies and contractor shall have no recourse against City for payment of any premiums, or assessments for any deductible, as all such premiums are the sole responsibility and risk of contractor.
9. Approval, disapproval or failure to act by City regarding any insurance supplied by contractor (or any subcontractors) shall not relieve contractor of full responsibility or liability for damages and accidents as set forth in the Contract documents. Neither shall the insolvency or denial of liability by the insurance company exonerate contractor from liability.
10. All liability policies required herein, shall be written with an "occurrence" basis coverage trigger.

5.06 PROPERTY INSURANCE

Delete Paragraph 5.06.A in its entirety and insert the following in its place:

- A. Contractor shall purchase and maintain property insurance upon the work at the site in the amount of the full replacement cost thereof. Contractor shall be responsible for any deductible or self-insured retention. This insurance shall:
 1. include the interests of Owner, Contractor, Subcontractors, Engineer and the officers, directors, partners, employees, agents and other consultants and subcontractors of any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or loss payee;
 2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss and damage to the work, temporary buildings, falsework, and materials and equipment in transit and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by floor), and such other perils or causes of loss as may be specifically required these Supplementary Conditions;
 3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
 4. cover materials and equipment stored at the site or at another location that was agreed to in writing by Owner prior to being incorporated in the work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
 5. allow for partial utilization of the work by Owner;
 6. include testing and startup;
 7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued; and
 8. comply with the requirements of paragraph 5.06.C of the General Conditions.

Delete Paragraph 5.06.B in its entirety and replace with the following:

- B. Contractor shall purchase and maintain any other additional property insurance required by Laws and Regulations, which insurance will include the interest of Owner, Contractor, Subcontractors, and Engineer and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.05 SUBSTITUTES AND "OR-EQUALS"

Amend the paragraph by making two subparagraphs under the Title C. Engineer's Evaluation. The paragraph text is re-titled, 6.05,C.2 After Effective Date of Agreement. A new paragraph is added before this paragraph to read as follows:

1. During Bidding. The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, or "or-equal" materials and equipment as defined in paragraph 6.05 of the General Conditions, or those substitute or materials and equipment approved by the ENGINEER and identified by Addendum. The materials and equipment described in the Bidding Documents establish a standard of required type, function, and quality to be met by any proposed substitute or "or-equal" item. Request for ENGINEER's clarification of materials and equipment considered "or-equal" prior to the Effective Date of the Agreement must be received by the ENGINEER at least 5 days prior to the date for receipt of Bids. No item of material or equipment will be considered by ENGINEER as a substitute unless written request for approval has been submitted by Bidder and has been received by ENGINEER at least 15 days prior to the date for receipt of Bids. Each request shall conform to the requirements of paragraph 6.05 of the General Conditions. The burden of proof of the merit of the proposed item is upon the Bidder. ENGINEER's decision of approval or disapproval of a proposed item will be final. If ENGINEER approves any proposed substitute item, such approval will be set forth in an Addendum issued to all prospective Bidders. Bidders shall not rely upon approvals made in any other manner.

6.06 CONCERNING SUBCONTRACTORS, SUPPLIERS, AND OTHERS

Add a new paragraph immediately after Paragraph 6.06.G:

H. Owner or Engineer may furnish to any subcontractor or supplier, to the extent practicable, information about amounts paid to Contractor on amount of work performed for Contractor by a particular subcontractor or supplier.

6.13 SAFETY AND PROTECTION

Add the following language immediately after the first sentence of paragraph 6.13.A.

"Such responsibility does not relieve subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations."

Insert new paragraphs 6.13, B. and C. Existing General Condition paragraphs 6.13, B. and C. shall become 6.13, D. and E., respectively.

B. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the work.

C. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the site.

6.17 SHOP DRAWINGS AND SAMPLES

Add the following new paragraphs immediately after Paragraph 6.17.E:

F. Contractor shall furnish required submittals with sufficient information and accuracy in order to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing subsequent submittals of Shop Drawings, samples or other items requiring approval and Contractor shall reimburse Owner for Engineer's charges for such time. The expenses will be deducted from the Contractor's final payment as provided on the Bid Form.

G. In the event that Contractor requests a change of a previously approved item, Contractor shall reimburse Owner for Engineer's charges for its review time unless the need for such change is beyond the control of Contractor.

6.19 CONTRACTOR'S GENERAL WARRANTY AND GUARANTEE

Add the following language to the end of the first sentence of Paragraph 6.19, A., of the General Conditions:

"for a period of one (1) year beginning on the date of Substantial Completion. "

ARTICLE 7 – OTHER WORK AT THE SITE

Add the following new paragraph immediately after paragraph 7.03.

7.04 CLAIMS BETWEEN CONTRACTORS

A. Should Contractor cause damage to the work or property of any other contractor at the Site, or should any claim arising out of Contractor's performance of the Work at the Site be

made by any other contractor against Contractor, Owner, Engineer, or the construction coordinator, then Contractor (without involving Owner, Engineer, or construction coordinator) shall either (1) remedy the damage, (2) agree to compensate the other contractor for remedy of the damage, or (3) remedy the damage and attempt to settle with such other contractor by agreement, or otherwise resolve the dispute by arbitration or at law.

B. Contractor shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner, Engineer, the construction coordinator and the officers, directors, partners, employees, agents and other consultants and subcontractors of each and any of them from and against all claims, costs, losses and damages (including, but not limited to, fees and charges of engineers, architects, attorneys, and other professionals and court and arbitration costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any other contractor against Owner, Engineer, consultants, or the construction coordinator to the extent said claim is based on or arises out of Contractor's performance of the Work. Should another contractor cause damage to the Work or property of Contractor or should the performance of work by any other contractor at the Site give rise to any other Claim, Contractor shall not institute any action, legal or equitable, against Owner, Engineer, or the construction coordinator or permit any action against any of them to be maintained and continued in its name or for its benefit in any court or before any arbiter which seeks to impose liability on or to recover damages from Owner, Engineer, or the construction coordinator on account of any such damage or Claim.

C. If Contractor is delayed at any time in performing or furnishing the Work by any act or neglect of another contractor, and Owner and Contractor are unable to agree as to the extent of any adjustment in Contract Times attributable thereto, Contractor may make a Claim for an extension of times in accordance with Article 12. An extension of the Contract Times shall be Contractor's exclusive remedy with respect to Owner, Engineer, and construction coordinator for any delay, disruption, interference, or hindrance caused by any other contractor. This paragraph does not prevent recovery from Owner, Engineer, or construction coordinator for activities that are their respective responsibilities.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.02 VISITS TO SITE

Add the following language immediately after the first sentence of paragraph 9.02. A:

B. The Contractor shall reimburse the Owner for payments made to Engineer for additional services made necessary by the fault, neglect, or request of the Contractor.

9.03 PROJECT REPRESENTATIVE

Add the following language at the end of paragraph 9.03.A:

The Duties, Responsibilities, and Limitations of Authority of the Resident Project Representative will be as stated in the OWNER-ENGINEER Agreement, as amended and executed for this specific Project.

12.01 CHANGE OF CONTRACT PRICE

Delete the semicolon at the end of GC 12.01.C.2.c, and add the following language:

, provided, however, that on any subcontracted work the total maximum fee to be paid by Owner under this subparagraph shall be no greater than 27 percent of the costs incurred by the Subcontractor who actually performs the work;

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.02 PROGRESS PAYMENTS

A. Applications for Payments:

Delete the second sentence of Subparagraph 1. and replace with the following:
Partial payment for stockpiled (or stored) items will not be allowed under this Contract."

Delete Subparagraph 3. and replace with the following:

3. Five percent (5%) retainage will be withheld initially from each Pay Request. Upon satisfactorily completing 50% of the Work, no additional retainage will be withheld.

C. Payment Becomes Due

Delete the word "Ten" and replace it with the word "Seven".

ARTICLE 17 – MISCELLANEOUS

Add the following immediately after 17.06 – HEADINGS:

17.07 EQUAL OPPORTUNITY

The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, or national origin. The Contractor will take affirmative action to ensure that applicants are employed without regard to their race, creed, color or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training.

17.09 ADDITIONAL INFORMATION

- A. Field Engineering is incidental to the Work. No separate payment will be made.
- B. Contractor shall dispose of all waste material in a lawful manner. This is incidental to the Work and no separate payment will be made.
- C. Contractor shall be responsible for field location of all existing utilities in the area of the Work. The method of doing this is at the Contractor's discretion. However, Contractor agrees to be fully responsible for the ultimate location of existing utilities and their preservation during construction. Contractor is further responsible for clearly identifying all right of ways in areas of work to ensure alignment as intended by the Plans and Specifications. This is incidental to the Work and no separate payment will be made.
- D. Contractor agrees to be fully responsible for paying any and all fines and for fees associated with the interruption of or any damage to any utilities.
- E. Contractor shall furnish traffic control and erosion control sufficient to satisfy any and all federal, state and local laws and/or rules that have jurisdiction over the Work. Furthermore, the Contractor shall pay any and all fees and/or fines imposed associated with failure to procure, provide, maintain or adequately preserve either traffic control or erosion control. Determination of adequacy shall be solely the responsibility of the Contractor. This is incidental to the Work and no separate payment will be made unless specifically called for in the Bid Form and a provision for such is made.
- F. Contractor shall obtain any and all professional services required to complete any portion of the work or for procurement and maintenance of any and all required permits. No separate payment shall be made.
- G. Contractor shall notify all property owners of work to be performed in their area at least 48 hours in advance of commencing work.
- H. All products to be used on this project shall be domestically available and manufactured in the United States unless approved otherwise.
- I. All questions regarding this project, during bid and construction, shall be issued to the Engineer in writing. Questions not issued in writing shall not be considered.
- J. Contractor shall video existing site conditions in all areas of work prior to mobilization. Commentary shall be made as to particular area being shown as it relates to the Plans.
- K. Contractor shall return all disturbed areas to like or better condition upon completion of work. *Cleanup shall be done incrementally as the work progresses, not when all work is complete.* There will be no exceptions. Contractor shall clean up as required by Owner and Engineer at the end of each work day.

- L. Contractor will schedule and coordinate work with Engineer, Owner and others having jurisdiction.
- M. Construction schedule, per contract requirements, shall be furnished to Engineer and Owner prior to construction. There may be certain areas that it will be advantageous to all parties to construct at an early stage in the contract. The Owner and Engineer will advise if this is the case.
- N. Contractor shall follow all applicable safety regulations, rules and other requirements promulgated by any and all governing agencies.
- O. Contractor agrees that in the event he shall run over the contract time (the date of Final Completion), Owner reserves the right to assess any and all of Engineer's time required beyond the original Contract Time.
- P. Contractor assumes sole responsibility for his/her supplier's products or equipment to assure proper functionality, regardless of approval of submittal by Engineer, until such time that Engineer and Owner have determined that said products or equipment operate in conformance with the contract documents and the design intent. Failure of a supplier's products or equipment to operate as represented by said supplier and in conformance with the Contract Documents shall be deemed "Defective Work" pursuant to Article 13.

17.10 WORKING HOURS

- A. Working Hours: Normal Working Hours shall be 7 a.m. to 5 p.m. Monday through Friday. Generally, working hours may be extended to 7 a.m. to 7 p.m. Monday through Friday upon written approval of City.
- B. Work hours on Saturday will be considered on a case-by-case basis. Sunday work is not to be scheduled.
- C. Submit requests for extended work hours to City for approval at least 48 hours prior to working the extended work hours. Extended work hours may be considered by City for entire project duration or on a case by case basis, at the direction of the City.
- D. If an emergency situation arises, i.e., line break, sewer overflow, utility service interruption, that necessitates Contractor working after Normal Work Hours with little or no advance notice, Contractor shall immediately notify City. Contractor shall proceed with the emergency work only, taking care to minimize impacts of the situation.
- E. No additional compensation will be considered for extended work hours.

17.12 NOTIFICATION TO PROPERTY OWNERS

- A. It is the responsibility of the Contractor to notify in writing any property owner whose service could be affected by the work being performed in the area. Notification shall be done 48 hours prior to performing any work. The notification shall be on the Contractor's letterhead and will contain the following information:
 - 1. Date.
 - 2. Name of Project.
 - 3. Description of the type of work.
 - 4. Time of construction – start and end date.
 - 5. Project Manager, name and phone number.
 - 6. Project Superintendent, name and phone number.
 - 7. Project Foreman, name and phone number.

8. 24-hour emergency number.

17.15 SUBCONTRACTORS

- A. No Subcontractor will be allowed to perform Work on this project unless the Contractor's superintendent is on site to supervise their activities.

17.16 UNPERMITTED DISCHARGE PENALTIES

- A. Any discharge that occur shall be reported to the Engineer. The Owner will file all necessary documents and reports required by the TCEQ. Any resulting unpermitted discharge penalties are the responsibility of the Contractor.
- B. The Contractor shall owe the unpermitted discharge penalty to the Owner when the Owner reports any unpermitted discharge caused by the actions of the Contractor as an unpermitted discharge to TCEQ.
- C. The Contractor shall add a line item to the monthly pay estimate for the unpermitted discharge penalty. The line item shall be added to the monthly pay estimate after the first occurrence and shall be maintained on each monthly pay estimate thereafter.
- D. The Contractor shall add the penalty to the monthly pay estimate each time an unpermitted discharge report is filed. The penalty shall be added as would any liquidated damages, as a negative line item to be subtracted from the total amount due to the Contractor that month.
- E. The Contractor shall receive final payment in accordance with these documents less any unpermitted discharge penalties incurred.
- F. The determination if an unpermitted discharge is caused by the Contractor's actions shall be the sole authority of the Owner.

END OF DOCUMENT

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PART 1 - GENERAL

1.1 SUMMARY

- A. Payment for each item installed shall be made according to the unit price bid, as listed on the Bid Form, and will be considered as full compensation for the item, including all labor, materials, and equipment required to complete the item in accordance with the Contract Documents. Only those items appearing on the Bid Form will be considered for payment on a unit price basis.
- B. For work items included in the technical specifications and not listed herein, such work shall be considered part of or incidental to its related work.
- C. Pay items for the work are listed on the Bid Form and briefly described herein. All costs for items of work, which are not specifically mentioned to be included in a particular lump sum or unit price payment item, shall be considered incidental to the pay items and the cost of such shall be included in the pay item most closely associated with the work involved. The price and payment made for each item listed shall constitute full compensation for furnishing all labor, materials, machinery, equipment, tools, apparatus, service, and other necessary supplies and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for which separate payment is not otherwise provided.
- D. When actual field conditions differ from assumed design conditions and result in a reduction in materials, equipment, and appurtenances to be installed, a negative adjustment will be made to the Contract. If items are provided on the bid form, these items will be used for adjustment, otherwise, the Contractor shall provide costs for a Change Order.
- E. When actual field conditions differ from assumed design conditions and result in an additional quantity of a bid item, Contractor shall notify City prior to installing the item over the bid quantity. Upon review and approval of the requested additional quantity, a positive adjustment will be made to the Contract. If the Contractor installs the additional quantity of the bid item above the bid quantity without prior approval from the City, payment for the additional quantity may not be approved.
- F. The Contractor shall furnish all necessary labor, materials, machinery, equipment, tools, apparatus, service, and other necessary supplies and perform all work shown on the Drawings and/or described in the Specifications at the price listed on the Bid Form. The Work shall be complete-in-place and ready for operation.
- G. The Contractor has become thoroughly familiar with the terms and conditions of the Contract Documents and with local conditions affecting the performance and costs of the Work at the place where the Work is to be completed, and has fully inspected the site in all particulars informing himself fully regarding all conditions pertaining to the Work site.

1.2 SCHEDULE OF PAY ITEMS

- 1. Mobilization:** This work shall consist of the construction preparatory operations, including the movement of personnel and equipment to the project site and for the establishment of the Contractor's offices, buildings, and other facilities necessary to begin work.

Mobilization will not be measured but will be paid for at the Contract lump sum price. The cost of all required insurance and bonds will be incidental to the Mobilization item. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Payment of the Mobilization item will not be made more than once, regardless of the fact that the Contractor may have to, for any reason, shut the work down on the project, move their equipment away from the project and then back again.

- 2. Stormwater Pollution Prevention:** This work shall consist of furnishing and installing erosion and sediment control measures throughout the life of the project to control erosion and to minimize the sedimentation in rivers, streams, lakes, and reservoirs as specified in the Contract Documents or as directed by the City. Stormwater pollution prevention measures shall be applied to all disturbed areas.

This item will be paid for at the Contract lump sum price. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work. The maintenance, repair, resetting, and final removal of all erosion and sediment control devices will not be measured, but the cost will be incidental to this pay item.

- 3. Remove and Replace 4" Concrete Sidewalk:** This work shall consist of the full depth removal and disposal of existing 4" concrete sidewalk and installation of replacement 4" reinforced concrete sidewalk as specified in the Contract Documents or as directed by the City. Excavation, saw cutting, disposal of excavated material, subgrade preparation, sand cushion, concrete, forms, reinforcement steel, chairs, finishing, curing, joints, joint construction, and connection to existing pavement as specified in the Contract Documents are incidental to this pay item. Protection of items to remain is also incidental to this pay item. Any damage to items to be retained due to the Contractor's operations as determined by the City shall be repaired or replaced in a manner acceptable to the City at no additional cost.

Remove and Replace 4" Concrete Sidewalk will be measured and paid for at the Contract unit price per square yard of completed and accepted work. The payment will be full compensation for all work specified for the removal and replacement of 4" concrete sidewalk and for all material, labor, equipment, tools, and incidentals necessary to complete the work. Payment shall be limited to the quantity provided on bid form or additional quantity approved by the City prior to the completion of the additional work.

- 4. Remove and Salvage Existing Meter Pedestal:** This work shall consist of the removal of existing meter pedestal, disconnection of all wiring, and delivery of salvaged items to location designated by the City. Proper storage and utilization or disposal of all material is incidental to this pay item. Item includes protection of existing meter and pedestal during removal and coordination with Oncor for return of existing meter. Any damage to meter or pedestal due to the Contractor's operations as determined by the City shall be repaired or replaced in a manner acceptable to the City at no additional cost.

Remove and Salvage Existing Meter Pedestal will not be measured, but paid for at the Contract lump sum price for completed and approved work. The payment will be full

compensation for all work specified and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

- 5. – 6. Landscape Plants:** This work shall consist of furnishing and installing landscape plants as specified in the Contract Documents. Preparation of planting area and providing and installing soil fill is incidental to this item. Maintenance of plants (as defined in the Contract Documents) during construction and through the specified maintenance period is incidental to this pay item. Removal and replacement of unacceptable plants as determined by the City is incidental to this pay item.

The payment will be full compensation for all work specified and for all material, labor, equipment, tools, and incidentals necessary to complete the work. Payment shall be limited to the quantities provided on the bid form or additional quantity approved by the City prior to the installation of additional work. These items will be measured and paid for at the Contract unit price as follows:

- American Boxwood (3 Gal) per each of completed and approved work.
- Yaupon Holly (45 Gal) per each of completed and approved work.

- 7. Top Soil (4" Depth):** This work shall consist furnishing and installing a minimum of 4" depth of top soil, incorporating top soil into existing ground and preparing ground for sod installation in all non-paved areas disturbed by construction as specified in the Contract Documents.

Top Soil (4" Depth) shall be measured and paid for at the Contract unit price per square yard of completed and approved work. Payment shall be limited to the quantities provided in the bid form or approved by the City prior to the installation of the top soil. The payment will be full compensation for the specified work and for all labor, materials, equipment, tools and incidentals necessary to complete the work.

- 8. Solid Block Sodding:** This work shall consist furnishing and installing solid block sodding in all non-paved areas disturbed by construction as specified in the Contract Documents. Liming, fertilizing, watering (for the duration of construction) and placing grass sod on prepared areas are incidental to the work. Sod shall be either Bermuda, St. Augustine, or Buffalo grass.

Solid Block Sodding shall be measured and paid for at the Contract unit price per square yard of completed and approved work. Payment shall be limited to the quantity provided in the bid form or additional quantity approved by the City prior to the installation of the additional quantity. The payment will be full compensation for the specified work and for all labor, materials, equipment, tools and incidentals necessary to complete the work.

- 9. 2" Conduit/Wiring:** This work shall consist of furnishing and installing Sch. 40 PVC conduit and wiring as specified in the Contract Documents. This item includes, but is not limited to locating and protecting existing utilities; furnishing, transporting, and installing all conduit, wiring, jointing materials and any materials not otherwise provided for elsewhere in the Contract Documents; excavating, backfilling and compacting; constructing the specific bedding, including the furnishing, placing, and compacting; and removing and disposing of debris, excess excavated materials, and any damaged materials. All wiring connections are incidental to this pay item.

This item will be measured and paid at the Contract unit price per linear foot of completed and approved work. Payment shall be limited to the quantity provided in the bid form or additional quantity approved by the City prior to the installation of the additional quantity. The payment will be full compensation for all work specified for the installation of conduit and

wiring and for all labor, materials, equipment, tools and incidentals necessary to complete the work.

- 10. – 12. Remove Existing Wiring and Install New Wiring in Existing Conduit:** This work shall consist of removal and disposal of existing wiring in existing conduits and providing and installing new wiring into existing conduits as specified in the Contract Documents. Disconnections of existing wiring and connections of new wiring are incidental to this pay item. Protection of items to remain is also incidental to this pay item. Any damage to items to be retained due to the Contractor's operations as determined by the City shall be repaired or replaced in a manner acceptable to the City at no additional cost.

The payment will be full compensation for all work specified for the removal of existing wiring and installation of new wiring and for all labor, materials, equipment, tools and incidentals necessary to complete the work. Payment shall be limited to the quantity provided on the bid form or approved by the City prior to the installation. These items will be measured and paid at the Contract unit price as follows:

-Remove Existing Wiring and Install New Wiring in Existing 1-1/2" Conduit per linear feet of completed and approved work;

-Remove Existing Wiring and Install New Wiring in Existing 1" Conduit per linear feet of completed and approved work;

- 13. Remove Existing Wiring and Install Pull String in Existing 1" Conduit:** This work shall consist of removal and disposal of existing wiring in existing 1" conduit and providing and installing pull string into existing 1" conduit as specified in the Contract Documents. Disconnections of existing wiring are incidental to this pay item. Protection of items to remain is also incidental to this pay item. Any damage to items to be retained due to the Contractor's operations as determined by the City shall be repaired or replaced in a manner acceptable to the City at no additional cost.

Remove Existing Wiring and Install Pull String in Existing 1" Conduit shall be measured and paid for at the Contract unit price per linear feet of completed and approved work. Payment shall be limited to the quantity provided in the bid form or additional quantity approved by the City prior to the installation of the additional quantity. The payment will be full compensation for the specified work and for all labor, materials, equipment, tools and incidentals necessary to complete the work.

- 14. 1" Conduit (Spare with Pull String):** This work shall consist of furnishing and installing Sch. 40 PVC conduit with pull string as specified in the Contract Documents. This item includes, but is not limited to locating and protecting existing utilities; furnishing, transporting, and installing all conduit, jointing materials, pull string and any items not otherwise provided for elsewhere in the Contract Documents; excavating, backfilling and compacting; constructing the specific bedding, including the furnishing, placing, and compacting; and removing and disposing of debris, excess excavated materials, and any damaged materials.

This item will be measured and paid for at the Contract unit price per linear foot of completed and approved work. Payment shall be limited to the quantity provided in the bid form or additional quantity approved by the City prior to the installation of the additional quantity. The payment will be full compensation for all work specified for the installation of conduit and wiring and for all labor, materials, equipment, tools and incidentals necessary to complete the work

- 15. Electrical Junction Box:** This work shall consist of furnishing and installing the precast electrical junction box as specified in the Contract Documents. Excavation, backfill, and conduit connections are incidental to this pay item.

Electrical Junction Box will be measured and paid for at the Contract unit price per each of completed and approved work. Payment shall be limited to the quantity provided in the bid form or additional quantity approved by the City prior to the installation of the additional quantity. The payment will be full compensation for all work specified and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

- 16. 200 Amp Electrical Service Panel, Meter Base and Connections:** This work shall consist of furnishing and installing 200 Amp Electrical Service Panel, breakers, meter base, wiring, connections and any items not otherwise provided for elsewhere in the Contract Documents to complete the work as specified in the Contract Documents. Coordination with Oncor and the City as required is incidental to this pay item.

200 Amp Electrical Service Panel, Meter Base and Connections will be not be measured but will be paid for at the Contract lump sum price for completed and approved work. The payment will be full compensation for all work specified and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

- 17. Install Company Switch (Provided by City) and Provide and Install 3-Phase Meter Base and Connections:** This work shall consist of installing Company Switch (provided by the City) and providing and installing 3-phase meter base, wiring, connections and any items not otherwise provided for elsewhere in the Contract Documents to complete the work as specified in the Contract Documents. Coordination with the City and Oncor as required is incidental to this pay item.

This item will not be measured but will be paid for at the Contract lump sum price for completed and approved work. The payment will be full compensation for all work specified and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

- 18. Equipment Rack:** This work shall consist of providing and installing electrical equipment rack as specified in the Contract Documents. This item includes, but is not limited to locating and protecting existing utilities; removing existing vegetation as required; furnishing, transporting, and installing equipment rack, concrete footing, grounding and any items not otherwise provided for elsewhere in the Contract Documents; removing and disposing of debris, excess excavated materials, and any damaged materials. Coordination with the City and Oncor as required is incidental to this pay item.

This item will not be measured but will be paid for at the Contract lump sum price for completed and approved work. The payment will be full compensation for all work specified and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

- 19. Owner's Allowance:** This item to be used only as directed by the Engineer for City's purposes and only by Change Order that indicates amounts to be charged to the Allowance. Contractor's overhead, profit, and related costs for products and equipment ordered by City under the Allowance are included in the Allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs. Change Orders authorizing use of funds from the Allowance will include Contractor's related costs and reasonable overhead and profit margins. At Project closeout, unused amounts remaining in the Allowance will be credited to City by Change Order.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Furnish all labor, materials and equipment required to install, test, and provide an operational, electrical system as specified and as shown on the Drawings.
- B. All equipment described herein shall be submitted and furnished as an integral part of equipment specified elsewhere in these Specifications.
- C. All electrical work provided under any Division of the Specifications shall fully comply with the requirements of Division 26.
- D. The work shall include furnishing, installing, and testing the equipment and materials detailed in each Section of Division 26.
- E. The work shall include furnishing and installing the following:
 - 1. Electrical service from the Power Company.
 - 2. Provide a complete raceway system, wire and field connections for all motors, motor controllers, control devices, control panels and electrical equipment furnished under other Divisions. Coordinate construction schedule and electrical interface with the supplier of electrical equipment specified under other Divisions as required by the Contract Documents.
 - 3. Provide a complete raceway system, wiring and terminations for all field-mounted instruments furnished and mounted under other Divisions, including process instrumentation primary elements, transmitters, local indicators, and control panels. Lightning and surge protection equipment wiring at process instrumentation transmitters. Install vendor furnished cables specified under other Divisions as required by the Contract Documents.
 - 4. Provide a complete raceway system for the Data Cables and specialty cable systems, including those furnished under other Divisions. Install the Data Cables and other specialty cable systems, in accordance with the system manufacturers' installation instructions. Review the raceway layout, prior to installation, with the Process Control System supplier and the cable manufacturer to ensure raceway compatibility with the systems and materials being furnished. Where redundant cables are furnished, install the cables in separate raceways as required by the Contract Documents.
 - 5. Furnish and install precast electrical and instrumentation manholes, hand holes and light pole foundations as required by the Contract Documents.
 - 6. Pole foundations shall be designed and installed in accordance with the structural Divisions of these Specifications.
 - 7. Visit the site of the project, prior to submitting a bid, and satisfy themselves as to any question that they might have, relating to existing equipment, condition, or construction.
- F. Provide all tools, equipment, supplies, and shall perform all labor required to install the equipment specified in the Contract Documents to install, test, and place into satisfactory operation in the time specified for completion in the Contract Documents. Failure of any of the participants in executing the requirements of this Contract to perform the work as specified shall not constitute an acceptable reason for the Owner to grant any change in the Contract Price or additions to the Contract Time.

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- G. The work includes demolition of existing electrical equipment, associated conductors, and raceway. Reseed grass areas and repair streets or sidewalks disturbed by the removal of duct banks shown or specified to be removed. Remove wiring from abandoned conduit.
1. Materials and equipment shall be removed, and shall become the property of the Contractor, except items specifically listed to be relocated or delivered to the Owner. Materials and equipment designated to be removed shall be removed immediately from the job site.
 2. Electrical services and controls to items being removed must be disconnected and removed as a requirement of this section.
 3. Removal of any equipment must not interfere with existing operations.
 4. Remove unused raceways to the extent necessary to accommodate new work and where raceways are visible above the floor line. Unused raceways, which are concealed, or exposed raceways which do not interfere with the work, may remain in place unless noted or required to be removed. Seal abandoned conduit that remain in place behind walls or in floor slabs. Remove wiring from abandoned conduit.
 5. Electrical services which include raceways and conductors that are a part of the power and controls to items being removed shall be disconnected and removed.
 6. The Owner reserves First Right of Salvage.

1.2 REQUIRED ELECTRICAL WORK

- A. References made to other sections which may contain related work does not negate other related sections which may not be mentioned. The Contract Documents, is defined to include both the Drawings and the Specifications, shall be taken with every section related to every other section as required to meet the requirements specified.
1. The organization of the Contract Documents into specification divisions and sections is for organization of the documents themselves and does not relate to the division of suppliers or labor which may be employed in the execution of the Contract.
 2. Where references are made to other Sections and other Divisions of the Specifications, provide such information or additional work as may be required in those references, and include such information or work as may be specified.
 3. Examine all Sections of the Specifications and Drawings and determine the power and wiring requirements and provide external wiring and raceways, as required to provide a fully functioning power, control and process control systems. If the equipment requires more conductors and/or wiring, due to different equipment being supplied, provide the additional conductors, raceways and/or wiring, and include in the Contract Price and Schedule.
- B. Mechanical Divisions
1. Examine all Mechanical Equipment Specifications and Drawings, determining power and wiring requirements. Provide external wiring and raceways, as required to provide fully functioning Mechanical Equipment Control Systems. If the equipment requires more conductors and/or wiring, due to different equipment being supplied, furnish the additional conductors, raceways and/or wiring with no change in Contract Price or Schedule.

1.3 SUBMITTALS

- A. Submit Shop Drawings, in accordance with Division 1 requirements, for equipment, materials and all other items furnished under each Section of Division 26, except where specifically stated otherwise.

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1. An individually packaged submittal shall be made for each Section and shall contain all the information required by the Section.
 2. Partial submittals will not be accepted and will be returned without review.
- B. Submittals will not be accepted for Section 26 00 00.
- C. Each Section submittal shall be complete, contain all the items listed in the Specification Section, and shall be clearly marked to indicate which items are applicable on each cut sheet page. The Submittal shall list any exceptions to the Specifications and Drawings, and the reason for such deviation. Shop drawings, not so checked and noted, will be returned without review.
- D. All items listed in the Specification Section may not be provided by the supplier, manufacturer or vendor of the equipment specified.
1. The additional items listed shall be added to the submittal regardless of who supplies them.
 2. Excusing the omission by claiming the supplier, manufacturer or vendor does not manufacture or provide such items is not an acceptable excuse for the omission.
 3. Submittals not containing all listed items will be returned for revision and resubmission.
- E. Check shop drawings for accuracy and contract requirements prior to submittal to the Owner/Engineer.
1. Errors and omissions on approved shop drawings shall not provide relief from the responsibility of providing materials and workmanship required by the Specifications and Drawings.
 2. Shop drawings shall be stamped with the date checked and a statement indicating that the shop drawings conform to Specifications and Drawings.
 3. Only one Specification Section may be made per transmittal.
- F. Material shall not be ordered or shipped until the shop drawings have been approved. No material shall be ordered, or shop work started if the related shop drawings are marked "APPROVED AS NOTED CONFIRM", "APPROVED AS NOTED RESUBMIT", "REVISE AND RESUBMIT", "REJECTED", or "NOT APPROVED".
- G. All approved shop drawings shall be maintained on site for the Owner's Inspector and for the Owner's Engineer to verify at the time of delivery of equipment to the job site.
- H. Up-to-date Record Drawings shall be promptly furnished when the equipment installation is complete. Payment will be withheld until Record Drawings have been furnished and approved.
- I. All shop drawing submittals and all O&M submittals shall be submitted in hard copy format and in electronic format using PDF files including a Table of Contents which is indexed and hyperlinked to the various sections submitted on flash drives. Electronic submittals are mandatory and those which are received not indexed as specified will be returned without review. Hard copy submittals may not be required if stipulated in the Contract Documents. No change in Contract Price or Contract Time will be allowed for delays due to unacceptable submittals.

1.4 REFERENCE CODES AND STANDARDS

- A. Electric equipment, materials and installation shall comply with the National Electrical Code (NEC) and with the latest edition of the following codes and standards:
1. National Electrical Safety Code (NESC)
 2. Occupational Safety and Health Administration (OSHA)

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3. National Fire Protection Association (NFPA)
 4. National Electrical Manufacturers Association (NEMA)
 5. American National Standards Institute (ANSI)
 6. Insulated Cable Engineers Association (ICEA)
 7. International Society of Automation (ISA)
 8. Underwriters Laboratories (UL)
 9. Factory Mutual (FM)
 10. City of Ennis Electrical Code
- B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.
- C. All material and equipment, for which a UL standard exists, shall bear a UL label. No such material or equipment shall be brought onsite without the UL label affixed.
- D. If the issue of priority is due to a conflict or discrepancy between the provisions of the Contract Documents and any referenced standard, or code of any technical society, organization or association, the provisions of the Contract Documents will take precedence if they are more stringent. If there is any conflict or discrepancy between standard specifications, or codes of any technical society, organization, or association, or between Laws and Regulations, the higher performance requirement shall be binding, unless otherwise directed by the Owner/Engineer.
- E. In accordance with the intent of the Contract Documents, compliance with the priority order specified shall not justify an increase in Contract Price or an extension in Contract Time nor limit in any way, full compliance with all Laws and Regulations is always required,

1.5 SERVICE AND METERING

- A. The power company serving this project is Oncor Electric. Service shall be obtained at 240/120 volts, single phase, three wire, 60 Hz from an overhead line.
- B. The power company will be responsible for the following work:
1. Termination of secondary cables to the service transformer.
 2. Furnishing meter base and enclosure.
- C. Include the following work in the Contract Price and Schedule:
1. Coordinate the electrical service installation with the Power Company.
 2. Remove and replace any materials or work that does not meet the requirements of the power company. No change in the Contract Price or Schedule allowed for the replacement of any unapproved work or materials.

1.6 CODES, INSPECTION AND FEES

- A. Equipment, materials, and installation shall comply with the requirements of the local authority having jurisdiction.
- B. Obtain all necessary permits and pay all fees required for permits and inspections.
- C. The Owner will negotiate with the electric utility for the costs of new or revised services and make payment to the electric utility for such costs. Include in the Contract Price and Schedule the time

and expense associated with coordinating with the electric utility during the installation of such services.

1.7 SIZE OF EQUIPMENT

- A. Investigate each space in the structure through which equipment must pass to reach its final location. Coordinate shipping splits with the manufacturer to permit safe handling and passage through restricted areas in the structure.
- B. The equipment shall be always kept upright during storage and handling. When equipment must be tilted for passage through restricted areas, brace the equipment to ensure that the tilting does not impair the functional integrity of the equipment.

1.8 RECORD DRAWINGS

- A. As the work progresses, legibly record all field changes on a set of Project Contract Drawings, hereinafter called the "Record Drawings". The Record Drawings and Specifications shall be kept up to date throughout the project.
- B. The Record Drawings shall be reviewed in a meeting with the Owner/Engineer monthly.
- C. Record Drawings shall accurately show the installed condition of the following items:
 - 1. One-line Diagram(s).
 - 2. Raceways and pull boxes.
 - 3. Conductor sizes and conduit fills.
 - 4. Panel Schedule(s).
 - 5. Control Wiring Diagram(s).
 - 6. Lighting Fixture Schedule(s).
 - 7. Lighting fixture, receptacle, and switch outlet locations.
 - 8. Underground raceway and duct bank routing.
 - 9. Planview, measured dimensions and locations of switchgear, distribution transformers, substations, motor control centers and panelboards. Provide actual coordinates of each corner of the equipment pad to show the location of the pad and provide the actual equipment mounting base measurements to the corners of the equipment pad.
- D. Submit a typical example of a schedule of control wiring raceways and wire numbers, including the following information:
 - 1. Circuit origin, destination, and wire numbers.
 - 2. Field wiring terminal strip names and numbers.
- E. As an alternate, submit a typical example of point-to-point connection diagrams in place of the schedule of control wiring raceways and wire numbers. The information shall include the following:
 - 1. Circuit origin, destination, and wire numbers.
 - 2. Field wiring terminal strip names and numbers
- F. Submit as a part of the record drawings and the schedule of control wiring raceways and wire numbers (or the point-to-point connection diagram) to the Owner/Engineer.

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- G. The point-to-point connection diagrams are a required line item on the pay estimate will not be considered complete until all the documentation has been submitted to and approved by the Owner/Engineer.
 - H. Review shop drawings of equipment furnished under other related Divisions and prepare coordinated wiring interconnection diagrams or wiring tables. Submit copies of wiring diagrams or tables with Record Drawings.

1.9 EQUIPMENT INTERCONNECTIONS

- A. Review shop drawings of equipment furnished under other related Divisions and prepare coordinated wiring interconnection diagrams or wiring tables. Submit copies of wiring diagrams or tables with Record Drawings.
- B. Furnish and install all equipment interconnections.

1.10 MATERIALS AND EQUIPMENT

- A. Materials and equipment shall be new, except where specifically identified on the Drawings to be re-used.
- B. Material or equipment from a manufacturer, not submitted and approved for this project shall not be brought on site. Use of any such material or equipment, will be rejected, and shall be removed and replaced, with the approved material and equipment, with no change allowed in the Contract Price or Schedule.
- C. Material and equipment shall be UL listed, where such listing exists.
- D. All material, products, equipment, and workmanship being furnished for the project shall be replaced if it does not meet the requirements of Contract Documents even if installed, with no change in Contract Price or Schedule.

1.11 JOBSITE DELIVERY, STORAGE AND HANDLING

- A. Prior to jobsite delivery, successfully complete all submittal requirements, and present to the Owner/Engineer upon delivery of the equipment, an approved copy of all such submittals. Delivery of incomplete constructed equipment, or equipment which failed any factory tests, will be rejected, and shall be removed and replaced with no change in Contract Price or Schedule.
- B. Equipment and materials shall be handled and stored in accordance with the manufacturer's instructions, and as specified in the individual Specification Sections.

1.12 WARRANTIES

- A. Manufacturer's warranties shall be provided as specified in each of the Specification Sections.

1.13 EQUIPMENT IDENTIFICATION

- A. Identify all equipment (disconnect switches, separately mounted motor starters, control stations, etc.) furnished under Division 26 with the name of the equipment it serves. Motor control centers,

control panels, panelboards, switchboards, switchgear, junction or terminal boxes, transfer switches, etc., shall have nameplate designations as shown on the Drawings.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 INTERPRETATION OF DRAWINGS

- A. The Drawings do not show exact locations of conduit runs. Coordinate the conduit installation with other trades and the actual supplied equipment.
- B. Install each three-phase circuit in a separate conduit unless otherwise shown on the Drawings.
- C. Unless otherwise approved by the Owner/Engineer, conduit shown exposed shall be installed exposed; conduit shown concealed shall be installed concealed. Submit a Request for Information for any conduit route which is not clearly identified as concealed or exposed in the Contract Documents prior to its installation.
- D. Circuits are shown as "home-runs" shall be field routed. The raceway system provided shall include all necessary fittings, supports and boxes for a complete code-compliant raceway installation. Field routed raceway shall avoid blocking access to equipment either existing or spaces planned for future equipment and shall avoid blocking personnel egress through doors or access hatches.
- E. Verify the exact locations and mounting heights of lighting fixtures, switches, and receptacles prior to installation.
- F. Except where dimensions are shown, the locations of equipment, fixtures, outlets, and similar devices shown on the Drawings are approximate only. Determine exact locations and obtain approval from the Owner/Engineer during construction. Obtain information relevant to the placing of electrical work and in case of any interference with other work, proceed as directed by the Owner/Engineer and furnish all labor and materials necessary to complete the work in an approved manner.
- G. Circuit layouts are not intended to show the number of fittings, or other installation details. Furnish all labor and materials necessary to install and place in satisfactory operation all power, lighting and other electrical systems shown.
- H. Redesign of electrical or mechanical work, which is required due to the use of a pre-approved alternate item shall include the arrangement of equipment and/or layout other than that which is specified or shown herein. All additional work and materials required shall be provided with no change in the contract price or schedule. Redesign and detailed plans shall be submitted to the Owner/Engineer for approval.
- I. Raceways and conductors for lighting, switches, receptacles and other miscellaneous low voltage power and signal systems as specified are not shown on the Drawings. Raceways and conductors shall be provided as required for a complete and operating system. Refer to riser diagrams for signal system wiring. Homeruns, as shown on the Drawings, identify raceways to be run exposed and raceways to be run concealed. Raceways installed exposed shall be near the ceiling or along walls of the areas through which they pass and shall be routed to avoid

conflicts with HVAC ducts, cranes hoists, monorails, equipment hatches, doors, windows, etc. Raceways installed concealed shall be run in the center of concrete floor slabs, above suspended ceilings, or in partitions as required.

- J. Provide all conduit and conductors or data highway cables to RTU and/or PLC termination cabinets, where designated on the Drawings or otherwise required by the Specifications, the manufacture of the equipment, or submitted and approved systems. The conduit and conductors or data highway cables as shown on the interface drawings may not necessarily be shown on the floor plan.
- K. Install conductors carrying low voltage signals (typically twisted shielded pair cables) in raceways totally separate from all other raceways containing power or 120-Volt control conductors. Do not combine conductors carrying low voltage signals in wireways without barriers or NEC code-compliant separation for their entire length in the wire way, and/or provide separate wireways to provide separation of the conductors. Low voltage signal conductors routed through manholes or hand holes shall be bundled and separated from other conductors.

3.2 EQUIPMENT PADS AND SUPPORTS

- A. Electrical equipment pads and supports, of concrete or steel including structural reinforcing and lighting pole foundations, are shown on the Structural Drawings.
- B. Electrical equipment or raceways shall not be attached to or supported from, sheet metal walls.
- C. Electrical equipment pads shall be provided for all free-standing equipment. Dimensions shall be 3¾ -inches high. With 3-inch extension from front of equipment for equipment mounted against the wall and 3-inch extension on front and rear sections when equipment is rear accessible. Include a ¼-inch chamfered edge on all exposed sides.

3.3 CUTTING AND PATCHING

- A. Coordinate with Divisions 2 and 3 for cutting and patching.
- B. Core drill holes in concrete floors and walls as required. Obtain written permission from the Owner/Engineer before core drilling any holes larger than two inches.
- C. Schedule the installation of work to provide the minimum amount of cutting and patching.
- D. Cutting or drilling holes for the installation of raceway through joists, beams, girders, columns, or any other structural members is strictly prohibited. If a structural member is cut or drilled, restore the structural member to its previous condition in complete accordance with the instructions of the Structural Engineer, with no change in contract price or schedule regardless of the extent of the repairs required to restore the member to its previous condition.
- E. Cut opening only large enough to allow easy installation of the conduit.
- F. Patching shall be of the same kind and quality of material as was removed.
- G. The completed patching work shall restore the surface to its original appearance or better.
- H. Patching of waterproofed surfaces shall render the area of the patching completely waterproofed.

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- I. Remove rubble and excess patching materials from the premises.
 - J. Fill existing conduits cut at the floor line of a wall with a suitable patching material approved by the Structural Engineer.

3.4 INSTALLATION

- A. Any work not installed according to the Drawings and this Section shall be subject to change as directed by the Owner/Engineer. No change in Contract Price or Schedule will be allowed for making these changes.
- B. All dimensions shall be field verified at the job site and coordinated with the work of all other trades.
- C. Electrical equipment shall always be protected against mechanical or water damage. Electrical equipment shall not be stored outdoors. Electrical equipment shall be stored in dry permanent shelters as required by each Specification Section. Do not install electrical equipment in its permanent location until structures are weather-tight. If any apparatus has been subject to possible injury by water, it shall be thoroughly dried out and tested as directed by the Owner/Engineer or shall be replaced with no change in Contract Price or Schedule, at the Owner/Engineer's discretion.
- D. Equipment that has been damaged shall be replaced or repaired by the equipment manufacturer, at the Owner/Engineer's discretion.
- E. Repaint any damage to the factory applied paint finish using touch-up paint furnished by the equipment manufacturer. If the metallic portion of the panel or section is damaged, the entire panel or section shall be replaced, at no additional cost to the Owner.
- F. NEMA 3R, 4 or 4X enclosures shall not have raceways entering from the top if the enclosure is installed in a damp or wet area. Should raceways be installed entering the top, the enclosure shall be replaced, and raceways re-routed to enter the side or bottom. Conductors, if installed, shall be removed, and replaced. Correction of raceways entering the top and conductor replacement shall be provided with no change in Contract Price or Schedule.
- G. Conduits exiting tray in airconditioned indoor electrical rooms will enter the top of electrical enclosures. The location of these conduits shall be coordinated with the HVAC duct vents such that cold air will not blow on the conduits causing condensation which will enter the electrical enclosures. After installation, inspect the conduits while the HVAC system is running to ensure no condensation is forming and entering any electrical enclosure. Re-direct the air flow if possible or re-route the conduits to avoid condensation. Conductors in re-routed conduits shall be replaced, re-terminated, retested and the operation of the equipment retested with no change in the Contract Price or Schedule.

3.5 PHASE BALANCING

- A. The Drawings do not attempt to balance the electrical loads across the phases. Circuits on motor control centers and panelboards shall be field connected to result in evenly balanced loads across all phases.
- B. Field balancing of circuits shall not alter the conductor color coding requirements as specified in Section 26 05 19.

3.6 MANUFACTURER'S SERVICE

- A. Provide manufacturer's services for testing and start-up of the equipment as listed in each individual Specification Section. All settings, including those settings required by the Power System Study, shall be made to the equipment, and approved by the Owner/Engineer prior to energizing of the equipment.
- B. Provide arc flash labels with the settings from the power system study on electrical equipment as specified.
- C. Testing and startup shall not be combined with training. Testing and start-up time shall not be used for manufacturer's warranty repairs.

3.7 TESTS AND SETTINGS

- A. Test systems and equipment furnished under Division 26 and repair or replace all defective work. Adjust the systems as specified and/or required.
- B. All tests required by the individual specification Sections shall be completed prior to energizing electrical equipment. Submit a sample test form or procedure, and submit the required test reports and data to the Owner/Engineer for approval at least two weeks prior to the startup of the tested equipment. Include names of all test personnel and initial each test.
- C. Check motor nameplates for correct phase and voltage. Check bearings for proper lubrication.
- D. Check wire and cable terminations for tightness.
- E. Check rotation of motors prior to energization. Disconnect driven equipment if damage could occur due to wrong rotation. If the motor rotates in the wrong direction, the rotation shall be immediately corrected, or tagged and locked out until rotation is corrected.
- F. Verify all terminations at transformers, equipment, capacitor connections, panels, and enclosures by producing a 1 2 3 rotation on a phase sequenced meter when connected to "A", "B" and "C" phases.
- G. Provide mechanical inspection, testing and setting of circuit breakers, disconnect switches, motor starters, control equipment, etc. for proper operation.
- H. Check interlocking, control, and instrument wiring for each system and/or part of a system to prove that the system will function properly as indicated by schematic and wiring diagrams.
- I. Check the ampere rating of thermal overloads for motors and submit a typed record to the Owner/Engineer of same, including MCC cubicle location and load designation, motor service factor, horsepower, full load current, temperature rise rating and starting code letter. If inconsistencies are found, new thermal elements shall be supplied and installed.
- J. Verify motor power factor capacitor ratings.
- K. Testing shall be scheduled and coordinated with the Owner/Engineer at least two weeks in advance. Provide qualified test personnel, instruments, and test equipment.
- L. Refer to the individual equipment sections for additional specific testing requirements.

- M. Adjust the systems and instruct the Owner's personnel in the proper operation of the systems.

3.8 TRAINING

- A. Provide manufacturer's training as specified in each individual section of the Specifications.

END OF SECTION

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Furnish, install, and test all wire, cable and appurtenances as shown on the Drawings and as specified herein.

1.2 RELATED WORK

- A. Refer to Division 26 00 00 and the Contract Drawings, for related work and electrical coordination requirements.

1.3 SUBMITTALS

- A. Submittals shall be made in accordance with the requirements of Division 1, Section 26 00 00, the Contract Documents and as specified herein submit the following:
 - 1. The manufacturers' names and product designation or catalog numbers for the types of materials specified or shown on the Drawings.
 - 2. Cut sheets for each individual item shall be submitted.
 - 3. All cut sheets shall be clearly marked to indicate which products are being submitted for use on this project.
 - 4. Unmarked cut sheets will cause the submittal to be rejected and returned for revision.
- B. All shop drawing submittals and all O&M submittals shall be submitted in accordance with the requirements listed in Division 1. No change in Contract Price or Schedule will be allowed for delays due to unacceptable submittals.
- C. Submit to the Owner/Engineer, shop drawings and product data, for the following:
 - 1. Submittals shall also contain information on related equipment to be furnished under this Specification. Incomplete submittals not containing the required information on the related equipment will also be returned without review.
 - 2. Submit catalog data of all wire and cable, connectors, lugs, and accessories, specified under this Section with all selections, options and exceptions clearly indicated. All cut sheets shall be clearly marked to indicate which products are being submitted for use on this project. Catalog data shall show compliance with the referenced codes and standards.
 - 3. Provide a written description of the megger testing procedure that will be used for testing and the model and type of megger tester that will be used. Include this description in the wire and cable submittal.
- D. Certified Tests
 - 1. Submit a report of pulling tensions for all wire and cable installed with mechanical means monitored by pulling tension equipment.
 - 2. Submit a test report of all installed wire insulation tests.

1.4 REFERENCE CODES AND STANDARDS

- A. The equipment in this specification shall be designed and manufactured according to latest revision of the following standards (unless otherwise noted):
 - 1. NFPA 70 – National Electrical Code (NEC)

2. NEMA WC-5 – Thermoplastic-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy
3. ANSI/TIA/EIA 606A – Standard for telecommunications Infrastructure

1.5 QUALITY ASSURANCE

- A. The general construction of the wire, cables and the insulation material used shall be like that used for cable of the same size and rating in continuous production for at least 15 years and successfully operating in the field in substantial quantities.
- B. Wire and cable with a manufacture date of greater than 12 months previous will not be acceptable.
- C. Wire and cable shall be in new condition, with the manufacturer's packaging intact, stored indoors since manufacture, and shall not have been subjected to the weather. Date of manufacture shall be clearly visible on each reel.
- D. The manufacturer of these materials shall have produced similar electrical materials for a minimum period of five years. When requested by the Owner/Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

1.6 JOBSITE DELIVERY, STORAGE AND HANDLING

- A. Prior to jobsite delivery, complete all submittal requirements, and present to the Owner/Engineer prior to delivery of the equipment, an approved copy of all such submittals. Delivery of incomplete constructed equipment, or equipment which failed any factory tests, will not be permitted.,
- B. Check for reels not completely restrained, reels with interlocking flanges or broken flanges, damaged reel covering or any other indication of damage. Do not drop reels from any height.
- C. Unload reels using a sling and spreader bar. Roll reels in the direction of the arrows shown on the reel and on surfaces free of obstructions that could damage the wire and cable.
- D. Store cable on a solid, well drained location. Cover cable reels with plastic sheeting or tarpaulin. Do not lay reels flat.

1.7 WARRANTY

- A. Provide warranties, including the manufacturer's warranty, for the equipment specified and the proper installation thereof, to be free from defects in material and workmanship for three years from date of final acceptance of the equipment and its installation. Within such period of warranty, all material and labor necessary to return the equipment to new operating condition shall be provided. Any warranty work requiring shipping or transporting of the equipment shall be provided at no expense to the Owner.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Wires and cables shall be annealed, 98% conductivity, soft drawn copper.

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- B. All conductors shall be Class B stranded.
 - C. Except for control, signal, and instrumentation circuits, wire smaller than #12 AWG shall not be used.

2.2 POWER & BUILDING WIRE

- A. All building wire shall be stranded copper conductors, Type XHHW-2

2.3 GROUNDING ELECTRODE CONDUCTOR

- A. Grounding electrode conductor shall be stranded copper conductor, Type XHHW-2 with green insulation.

2.4 BONDING JUMPER

- A. Bonding Jumper shall be bare stranded copper conductor.

2.5 CONTROL WIRE AND CABLE

- A. Control wire shall be NEC Type XHHW-2.
- B. Multi-conductor control cable, shall be stranded copper, #14 AWG 600-volt, XHHW-2, insulated, PVC outer jacket overall, Type TC, UL rated for underground wet location.

2.6 COMMUNICATION CABLES

- A. Cables for Ethernet and RS485 shall be rated and shall be:
 - 1. Category 5e above Grade shielded Cable
 - a. Conductors: Four bonded pair #24 AWG copper
 - b. Insulation: Polyolefin
 - c. Shield: 100% aluminum foil polyester tape with drain wire
 - d. Jacket: PVC with 600-volt rated and manufacturer's identification
 - e. UL21047 and UL1666 listed for indoor and dry locations use
 - 2. Category 5e above Grade un-shielded Cable
 - a. Conductors: Four bonded pair #24 AWG copper
 - b. Insulation: Polyolefin
 - c. Jacket: PVC with 300-volt rated and manufacturer's identification
 - d. NEC
 - e. UL1666 listed for indoor and dry locations use
 - 3. Category 6 above Grade shielded Cable
 - a. Conductors: Four bonded pair #23 AWG copper
 - b. Insulation: Polypropylene
 - c. Shield: 100% aluminum foil polyester tape with drain wire
 - d. Jacket: PVC with 600-volt rated and manufacturer's identification
 - e. Transmission Standards: Category 6 - TIA 568.C.2
 - f. NEC
 - g. Flame Test Method: UL1666 Vertical Riser listed for indoor and dry locations use
 - 4. Category 6 above Grade un-shielded Cable
 - a. Conductors: Four bonded pair #23 AWG copper

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- b. Insulation: Polyolefin
 - c. Jacket: PVC with 300-volt rated and manufacturer's identification
 - d. Transmission Standards: Category 6 - TIA 568.C.2
 - e. Nominal Velocity of Propagation: 72%
 - f. Flame Test Method: UL1666 Vertical Riser listed for indoor and dry locations use
5. Category 5e below Grade shielded Cable
 - a. Conductors: Four pair #24 AWG copper
 - b. Insulation: Polyolefin
 - c. Shield: 100% aluminum foil polyester tape with drain wire
 - d. Jacket: LLPE (Linear Low-Density Polyethylene) with 300-volt rated and manufacturer's identification
 - e. Misc.: NEMA WC-63.1, listed for outdoor and wet locations use
 - f. Water Blocking compound and listed for direct bury applications.
 6. Category 5e below Grade unshielded Cable
 - a. Conductors: Four pair #24 AWG copper
 - b. Insulation: Polyolefin
 - c. Jacket: LLPE (Linear Low-Density Polyethylene) with 300-volt rated and manufacturer's identification
 - d. Misc.: NEMA WC-63.1, listed for outdoor and wet locations use.
 - e. TIA-568-C.2 Category 5e compliance
 - f. Water Blocking compound and listed for direct bury applications.
 7. Category 6 below Grade Cable
 - a. Conductors: 4 pair 23AWG copper
 - b. Insulation: Polyolefin
 - c. Shield: 100 percent aluminum foil polyester tape with drain wire
 - d. Jacket: Polyethylene with 300 volts rated and manufacturer's identification
 - e. Misc.: Gel filled and NEMA WC-63.1, listed for outdoor and wet locations use
 8. 485 Communications Cable
 - a. Conductors: One pair #24 AWG copper
 - b. Insulation: Polyethylene
 - c. Shield: 100% aluminum foil polyester tape with copper drain wire
 - d. Jacket: PVC with 300-volt rated and manufacturer's identification
 - e. Misc.: UL2919 listed for indoor and dry locations use

2.7 TERMINATION MATERIALS

- A. Power Conductors: Provide termination materials of conductors at equipment as specified in the relevant equipment Section.
- B. Control and Instrumentation Conductors (including graphic panel, alarm, low- and high-level signals): Provide DIN-rail one-piece molded plastic blocks with tubular-clamp-screw type, with end barriers, dual side terminal block numbers and terminal group identifiers mounted terminal blocks for the termination of connectors. Provide terminal blocks rated for a maximum of 2 #14 stranded conductors with the color of terminals in compliance with NFPA 79.
- C. Lugs and Connectors
 1. Provide all lugs and connectors meeting the following requirements:
 - a. Tin plated copper.
 - b. Crimped type, installed with standard industry tooling.
 - c. Provide lugs and connectors matching the wire size used and clearly identified and color coded on the connector.

- d. Provide all connections made for stranded wire and when installed made electrically and mechanically secured.
- e. Provide lugs and connectors with a current carrying capacity equal to the conductors for which they are rated and meeting UL 486 requirements for 75°C.
- f. Provide ring terminal lugs for #14 AWG up to #6 AWG.
- g. Terminate conductors #4 AWG and larger with two-hole long barrel lugs with NEMA spacing.
- h. Provide all lugs with closed end construction to exclude moisture migration into the cable conductor.

2.8 SPLICE MATERIALS

A. Power Conductors

1. Install circuits from terminal to terminal, without splicing, except where splicing is shown on the Drawings. No other splicing is permitted.
2. Splicing is permitted in circuits from panelboards whose voltage to ground does not exceed 150 volts. For wires sizes #8 AWG and smaller, provide color coded wire nuts, with metal inserts, 3M or Ideal, rubber insulated with half lap and two layers minimum of Scotch 33 tape.
3. Splicing is permitted in circuits with voltages up to 300 volts to ground only as specifically shown or noted on the drawings. For wires greater than #8 AWG, provide a heat shrink insulated, color-coded, die-crimped splice lug, T&B 54XXX, or equal, rubber insulated, with half lap and two layers minimum of Scotch 33 tape.

B. Control and Instrumentation Conductors (including graphic panel, alarm, low- and high-level signals):

1. No splicing of control and instrumentation conductors is permitted.

2.9 WALL AND FLOOR SLAB OPENING SEALS

- A. Seal wall and floor slab openings with "FLAME-SAFE" as manufactured by the Thomas & Betts Corp. or equal.

2.10 WIRE AND CABLE TAGS

- A. Use the tagging formats for wire and cable as shown on the Drawings. Where modifications or additions are made to existing wire and cable runs, replace existing tags with new modified tags.
- B. Provide heat shrink type Raychem TMS-SCE or approved equal with the tag numbers typed with an indelible marking process, a minimum of 1/8-inch in height, for wire tags for wire sizes, #2 AWG and smaller. Handwritten tags shall not be acceptable. Where ends are not available, attach cable tags with nylon tie cord.
- C. Provide thermally printed polyethylene type tags, Brady TLS 2200 or approved equal, attached with nylon zip ties applied in accordance with the manufacturer's instructions for wires larger than #2 AWG and for all cables.
- D. Tags relying on adhesives or taped-on markers are not acceptable.
- E. Tagging shall be provided in accordance with the execution portion of these Specifications.

2.11 WIRE COLOR CODE

- A. Color code all wire or code wire using electrical tape in sizes #8 or greater, where colored insulation is not available. Where tape is used as the identification system, apply color code tape in all junction boxes, manholes and other accessible intermediate locations as well as at each termination.
- B. The following coding shall be used:
- | <u>System</u> | <u>Wire</u> | <u>Color</u> |
|------------------------------------|-------------|---|
| 1-Phase, 3 Wire | Phase A | Black |
| | Phase B | Blue |
| | Neutral | White |
| 208Y/120, Volts
3-Phase, 4 Wire | Phase A | Black |
| | Phase B | Red |
| | Phase C | Blue |
| | Neutral | White |
| 480/277, Volts
3-Phase, 4 Wire | Phase A | Brown |
| | Phase B | Orange |
| | Phase C | Yellow |
| | Neutral | Gray/White with one or more colored stripes |

2.12 CABLE TAG COLOR CODE

- A. Provide cable tags which are white with black printing.

PART 3 - EXECUTION

3.1 GENERAL

- A. Do not install conductors until the raceway system is in place. No conductor shall be installed between outlet points, junction points or splicing points, until raceway sections have been completed, and raceway covers are installed for protection of conductors from damage or exposure to the elements. Any conductor installed in an incomplete raceway system shall be removed from the raceway system and from project site. A complete inspection of such raceway sections shall be completed before new conductors are installed.
- B. Remove and replace installed unapproved wire. No change in the Contract Price or Schedule will be allowed.
- C. Completely swab raceway system before installing conductors. Do not use cleaning agents and lubricants which have a deleterious effect on the conductors or their insulation.
- D. Install all conductors into a raceway at one time, using wire pulling lubricant as needed to protect the wire.
- E. Install all wire and cable installation with tension-monitoring equipment except for hand-pulled conductors into raceways.

1. Using winches, vehicles or any other mechanical devices not intended for the installation of wire or cables wire and cables is prohibited. The use of pulling tension monitoring equipment for the installation of wire or cable pulled in using mechanical means is mandatory.
 2. Submit pulling tension records for each wire or cable pull done using mechanical means monitored by pulling tension equipment.
 3. Conductors which are found to have been installed using mechanical means without tension-monitoring shall be immediately removed from the raceways, permanently identified as rejected material, and removed from the jobsite. New conductors and cables shall be reinstalled, tagged and raceways resealed, with no change in the Contract Price or Schedule allowed.
- F. Do not exceed cable manufacturer's recommendations for maximum pulling tensions and minimum bending radii. Where pulling compound is used, use only UL listed compound compatible with the cable outer jacket and with the raceway involved.
- G. Tighten all screws and terminal bolts using torque type wrenches and/or drivers to tighten to the inch-pound requirements of the NEC and UL.
- H. Single conductors and cables in manholes, hand holes, vaults, cable trays, and other indicated locations are not wrapped together by some other means such as arc and fireproofing tapes, shall be bundled throughout their exposed length with nylon, self-locking, releasable, cable ties placed at intervals not exceeding four inches on centers.
- I. All wire and cable installed in cable trays shall be UL Listed as Type TC, for cable tray use.

3.2 CONDUCTORS 1000 VOLTS AND BELOW

- A. Provide conductor sizes indicated on Drawings, as a minimum.
- B. Use crimp connectors on all stranded conductors.
- C. Soldered mechanical joints insulated with tape are not acceptable.
- D. Arrange wiring in cabinets and panels neatly cut to proper length Remove surplus wire unless noted otherwise. Bridle or bundle and secure conductors in an acceptable manner. Identify all circuits entering motor control centers and all other control enclosures in accordance with the conductor identification system specified herein.
- E. Terminate control and instrumentation wiring with methods consistent with terminals provided, and in accordance with terminal manufacturer's instructions.
- F. Attach compression lugs, larger than #6 AWG, with a tool specifically designed for that purpose which provides a complete, controlled crimp where the tool will not release until the crimp is complete. Use of plier type crimpers is not acceptable.
- G. Cap spare conductors and conductors not terminated with the UL listed end caps.
- H. Remove all burrs, chamfer all edges, and install bushings and protective strips of insulating material to protect the conductors passing through holes or over edges in sheet metal enclosures.
- I. Provide at least 6 feet spare conductors in freestanding panels and at least two feet spare in other assemblies for all conductors which are to be terminated by others. Provide additional conductor

length in any assembly where it is obvious that more conductor will be needed to reach the termination point.

- J. Conductor installation:
1. Do not combine power conductors in the same raceway unless shown on Drawings.
 2. Do not run signal conductors carrying voltages less than 120 volts AC in the same raceway or junction box or wireway as conductors carrying higher voltages regardless of the insulation rating of the conductors.
 3. Do not share neutrals on branch circuits.

3.3 GROUNDING

- A. Provide a green wire equipment grounding conductor in all raceways whether the raceway is metallic or not. A ground conductor is required to be provided in accordance with the NEC and specification 26 05 26 in all conduits, motors, cabinets, outlets, and other equipment enclosures containing any electrical devices or equipment. Install ground wires exposed to mechanical damage in SCH 80 PVC conduit. Provide connections to ground rods using exothermic welds equal to the Cadweld process in accordance with Section 26 05 26 Grounding and Bonding System.

3.4 TERMINATIONS AND SPLICES

- A. Splices of wire and cable are not permitted, except where specifically approved by the Owner/Engineer in writing, or as shown on the Drawings.
- B. Power conductors: Provide terminations with connectors as specified. Make splices, where specifically allowed as stated above, in a Termination Cabinet (TC). Provide termination cabinets as follows:
1. Provide terminal blocks mounted to a back panel inside the termination cabinet to terminate ring terminal lugs for #14 AWG up to #6 AWG. Provide a terminal for each conductor. Double lugging is not permitted.
 2. Provide terminations for conductors #4 AWG and larger with two-hole long barrel lugs with NEMA spacing as specified. Provide tin-plated bus bars drilled to accept NEMA two-hole lugs installed with stand-off insulators mounted on a back panel inside the terminal cabinet. Provide pads drilled into the bus bars to accept each conductor entering the cabinet.
- C. Control Conductors: Splices of control conductors will not be permitted between terminal points. Make terminations with approved terminals as specified.
- D. Instrumentation Signal Conductors (including graphic panel, alarm, low- and high-level signals): Splices of Instrumentation conductors will not be permitted between terminal points. Make terminations with connectors as specified. Terminate each shield of pair shielded, and triad shielded on terminal strips. Provide dedicated terminal block to every conductor including shields. Double lugging terminations is not acceptable.

3.5 INSTRUMENTATION CABLES

- A. Install instrumentation cables in raceways as specified. Unless specifically shown on the Drawings, install all instrumentation circuits as single shielded twisted pair cables or single shielded twisted triads. Circuits be made up using conductors from different pairs or triads is prohibited in all cases. Provide triads wherever three wire circuits are required.

-
- B. Provide terminal blocks at all instrument cable junction boxes. Identify and tag all circuits at each junction.
 - C. Install shielded instrumentation wire, coaxial cable, data highway cable, discrete I/O, multiple conductor cable, and fiber optic cables without splices between instruments, terminal boxes, or panels. Insure that the cable shield is electrically continuous for the entire length of the circuit.
 - D. Ground shields at the PLC/RTU. Provide terminal blocks for inter-connecting shield drain wires at all junction boxes. Provide individual circuit shielding with its own block.
 - E. Wrap and tape shield wires at the transmitter end of the signal run. Before termination, peel back the outer sheath, leaving the shield intact. Wrap the drain wire around the conductors, leaving approximately two inches exposed. Wrap the drain wire with two layers of Scotch 33 tape.

3.6 WIRE TAGGING

- A. Tag all wiring at all termination points and at all major access points in the electrical raceways. A termination point is defined as any point or junction where a wire or cable is physically connected, including terminal blocks and device terminals. A major access point to a raceway is defined as any enclosure box conduit or space designed for wire or cable pulling or inspection and includes pull boxes, manholes, and junction boxes.
- B. Provide wire tags showing both origination and destination information to allow for a wire or cable to be traced from point in the field. Show information regarding its origination in parenthesis.
- C. Tag both the individual conductors and the overall cable in multiconductor cables. Conductors that are part of a multiconductor cable shall reference the cable identification number that they are a part of, as well as a unique conductor number within the cable.

3.7 CABLE TAGGING

- A. Tag all cables at all termination points and at all major access points in the electrical raceways as defined in the wire tag section of this Specification.
- B. Install cable tags where the cable enters and leaves each access point (e.g., junction box, manhole, etc.). In cases of limited access space, a single tag may be used that shows both equipment tag origination and destination. In the case where the jacket is stripped for terminations, install the tag at the end of the jacket.

3.8 RACEWAY SEALING

- A. Seal raceways entering junction boxes or control panels containing electrical or instrumentation equipment with 3M 1000NS Watertight Sealant or approved equal.
- B. The sealing requirement applies to all raceways in the conduit system.

3.9 FIELD TESTS

- A. Conductors under 600 volts
 1. Perform insulation resistance testing of all power circuits below 1000 volts with a 1000-volt megger, in accordance with the recommendations of the wire manufacturer.

2. Prepare a written test report of the results and submit to the Owner/Engineer prior to final inspection. Provide a written description of the megger testing procedure that will be used for testing and the model and type of megger tester that will be used. Include this description in the wire and cable submittal.
 3. Minimum acceptable value for insulation resistance is 100 megohms. Lower values shall be acceptable only by the Owner/Engineer's specific written approval.
 4. Disconnect equipment that might be damaged by this test. Perform tests with all other equipment connected to the circuit.
- B. Tests: After instrumentation cable installation and conductor termination by the instrumentation and control supplier, perform tests to ensure that instrumentation cable shields are isolated from ground, except at the grounding point in the instrumentation control panel. Remove all improper grounds.

END OF SECTION

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Furnish all labor, materials, equipment, and incidentals required to install a complete Grounding and Bonding System, in strict accordance with Article 250 of the National Electrical Code (NEC), and as shown on the Drawings and specified herein.
- B. The system shall include ground wires, ground rods, exothermic connections, mechanical connectors, structural steel connections, all as shown on the Drawings, and as specified herein, to provide a bonding to earth ground of all metallic materials likely to become energized.

1.2 RELATED WORK

- A. Refer to Division 26 00 00 and the Contract Drawings, for related work and electrical coordination requirements.

1.3 SUBMITTALS

- A. Submittals shall be made in accordance with the requirements of Division 1, Section 26 00 00, the Contract Documents and as specified herein the following:
 - 1. The manufacturers' names and product designation or catalog numbers for the types of materials specified or shown on the Drawings.
 - 2. Cut sheets for each individual item shall be submitted.
 - 3. All cut sheets shall be clearly marked to indicate which products are being submitted for use on this project.
 - 4. Unmarked cut sheets will cause the submittal to be rejected and returned for revision.
- B. All shop drawing submittals and all O&M submittals shall be submitted in accordance with the requirements listed in Division 1. No change in Contract Price or Schedule will be allowed for delays due to unacceptable submittals.
- C. Submittals shall also contain information on related equipment to be furnished under this Specification. Incomplete submittals not containing the required information on the related equipment will also be returned without review.
- D. Submit to the Owner/Engineer, shop drawings and product data, for the following:
 - 1. Grounding electrodes and conductors
 - 2. Grounding conduit hubs.
 - 3. Waterpipe ground clamps.
 - 4. Buried grounding connections.
 - 5. Compression lugs.
 - 6. Exothermic bonding system.

1.4 REFERENCE CODES AND STANDARDS

- A. All products and components shown on the Drawings and listed in this specification shall be designed and manufactured according to latest revision of the following standards (unless otherwise noted):
 - 1. NFPA 70 – National Electrical Code (NEC)
 - 2. UL 467-2007 --Grounding and Bonding Equipment
 - 3. NFPA 70E – Standard for Electrical Safety in the Workplace
- B. All equipment components and completed assemblies specified in this Section of the Specifications shall bear the appropriate label of Underwriters Laboratories.

1.5 QUALITY ASSURANCE

- A. The manufacturer of these materials shall have produced similar electrical materials and equipment for a minimum period of five years. When requested by the Owner/Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

1.6 JOBSITE DELIVERY, STORAGE AND HANDLING

- A. Prior to jobsite delivery, complete all submittal requirements, and present to the Owner/Engineer prior to delivery of the equipment, an approved copy of all such submittals. Delivery of incomplete constructed equipment, onsite factory work, or failed factory tests will not be permitted.
- B. Protect equipment during shipment, handling, and storage by suitable complete enclosures. Protect equipment from exposure to the elements and keep thoroughly dry.

1.7 WARRANTY

- A. Provide warranties, including the manufacturer's warrantee, for the equipment specified and the proper installation thereof, to be free from defects in material and workmanship for three years from date of final acceptance of the equipment and its installation. Within such period of warranty, all material and labor necessary to return the equipment to new operating condition shall be provided. Any warranty work requiring shipping or transporting of the equipment shall be provided at no expense to the Owner

PART 2 - PRODUCTS

2.1 RACEWAYS

- A. Provide raceway systems as specified under Section 26 05 33.
- B. Provide equipment grounding conductors in all raceways, conduits and ducts sized in accordance with the NEC. Minimum sizes shall be #12 AWG unless otherwise indicated on the drawings.

2.2 CONDUCTORS

- A. Provide conductors as specified under Section 26 05 19.
- B. Provide copper XHHW-2 insulated grounding conductors. Provide grounding conductors with green insulation where available from the wire manufacturers or marked with green tape as specified under 26 05 19.
- C. Provide bare copper grounding electrode conductors where direct buried or encased in concrete.

2.3 GROUNDING ELECTRODES

- A. Provide ground rods 3/4-inch in diameter and 10-foot in length (minimum) unless otherwise specified or shown on the drawings. Provide copper clad steel ground rods manufactured meeting the requirements of UL 467. The minimum copper thickness shall be 10 mils.
- B. Manufacturers for ground rods
 - 1. ERICO
 - 2. Copperweld
 - 3. Approved equal

2.4 CONNECTORS AND CONNECTIONS

- A. Provide waterpipe ground clamps, and other ground clamps where specified, made of cast bronze.
- B. Provide the correct size for the pipe.
- C. Manufacturers
 - 1. Thomas & Betts Co. Cat. JPT
 - 2. Burndy
 - 3. O.Z. Gedney Co.
 - 4. Cooper Power Systems
 - 5. Erico
 - 6. Harger
 - 7. Approved equal
- D. Provide exothermic weld connections for all concealed grounding system or lightning protection system connections unless otherwise specified.
 - 1. Manufacturers
 - a. T&B Furseweld SCR1
 - b. Burndy Thermoweld
 - c. Cadweld
 - d. Approved equal
 - 2. Exothermic welded connections shall be used in exposed locations as specified herein.

- E. Provide a Burndy Hyground Irreversible Compression System or equal in areas where the Owner's operations prevent the use of an exothermic welded connection. The use of a compression system ground connection is otherwise prohibited without written approval on a case-by-case basis from the Owner or Engineer. Permission shall be submitted through the RFI process. Compression connectors installed without permission shall be removed and replaced with exothermic weld connections with no change in the Contract Price or change in the Contract Schedule allowed.
- F. All grounding connections which would require exothermic welding in a Class 1 Division 1 Area as determined by NFPA 820, or the Engineer, or the NEC Authority Having Jurisdiction shall use a Burndy Hyground Irreversible Compression System, or equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Route exposed grounding electrode conductors in SCH 80 PVC to protect the conductors from damage. The rigid conduits shall be aluminum or PVC-coated aluminum conduits as specified in 26 05 33. Bond the protecting conduits to the grounding electrode conductors at both ends. Water pipe grounding connections shall not be painted. Painted connections shall be disassembled, replaced, and reconnected.
- B. Install wire type equipment grounding conductors in all raceways for the power, control, and instrumentation systems. Grounding conductors shall be independent conductors and shall be separate from all shield drain wires.
- C. Conduits and other raceways shall contain a wire type equipment grounding conductor whether the raceway is metallic or not. Conduits, motors, cabinets, outlets, and other equipment shall be properly bonded in accordance with NEC requirements. Where ground wire is exposed to mechanical damage, install wire in SCH 80 PVC conduit.
- D. In NEC classified areas, connection of grounding electrode connections to structural steel columns shall be made with long barrel type one-hole heavy duty copper compression lugs, bolted through 1/2-inch maximum diameter holes drilled in the column web, with stainless steel hex head cap screws and nuts.
- E. In new construction, bond each building column to the grounding electrode counterpoise system whether nor not specifically shown on the Drawings using grounding electrode conductors.
 - 1. Bond grounding electrode conductors rising from the counterpoise to bond to a column using an insulated conductor the same size as the conductors used to form the counterpoise. Route exposed grounding electrode conductors in rigid conduit as specified in Section 26 05 19 Low-Voltage Wires and Cables. Bond metallic conduits as specified.
- F. Terminate all metal conduits stubbed into any enclosure containing electrical equipment or devices with insulated grounding bushings and connected to the enclosure ground bus. Bond boxes mounted below the electrical enclosure to the enclosure ground bus. Size the grounding wire in accordance with NEC Table 250.122, except that a minimum #12 AWG shall be used.

- G. Provide bonding jumpers for liquid tight flexible metal conduit in sizes 1-1/2-inch and larger. Install bonding jumpers externally and parallel (not spiraled) to the liquid tight flexible conduit and fasten with plastic tie wraps.
- H. Ground transformer neutrals to the nearest available grounding electrode with a conductor sized as shown with a minimum size in accordance with NEC Article 250.66.
- I. Provide power system grounding electrodes (ground rods) no closer than twice the length of the ground rod.
- J. Provide a #1/0 AWG bare tinned grounding conductor the full length of each cable tray system.
 - 1. Bond each section and tray fitting to the tray grounding conductor.
 - 2. Route the tray grounding conductor along the outside of the cable tray.
 - 3. Install no grounding clamps on the inside of the tray to avoid damage to tray conductors.
 - 4. Bond the tray grounding conductor to the power system counterpoise grounding electrode system at the end of the tray, or for tray systems installed in a loop configuration, bond in at least two locations at opposite sides of the tray loop.
 - 5. Bond every enclosure to which tray conductors are routed to the tray grounding conductor.
 - 6. Bond every conduit or raceway routing tray conductors away from or to the tray system to the cable tray and to the cable tray grounding conductor.
- K. All equipment enclosures, motor and transformer frames, conduits systems, cable tray, cable armor, exposed structural steel and all other equipment and materials required by the NEC to be grounded, shall be grounded, and bonded in accordance with the NEC.
- L. Seal exposed connections between different metals with no-oxide paint, Grade A or equal.
- M. Lay all underground grounding conductors' slack and, where exposed to mechanical injury, protect by pipes or other substantial guards. If guards are iron pipe, or other magnetic material, electrically connect conductors to both ends of the guard. Make connections as specified herein.
- N. Ensure good ground continuity between the conduit system and equipment frames and enclosures. Where necessary or as required by the NEC, provide bonding jumper conductors.
- O. Ground all grounding type receptacles to the outlet boxes with a minimum, #12 AWG XHHW-2 stranded green conductor, connected to the ground terminal of the receptacle, and bonded to the outlet box by means of a green colored grounding screw.

3.2 INSPECTION AND TESTING

- A. Inspect the grounding and bonding system conductors and connections for tightness and proper installation.

END OF SECTION

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Furnish and install electrical support hardware, as shown on the Drawings and as specified herein.
- B. Hardware shall include anchor systems, adhesive anchor systems, metal framing systems, and other electrical support systems, as shown on the Drawings and specified herein.

1.2 RELATED WORK

- A. Refer to Section 26 00 00 and the Contract Drawings, for related work and electrical coordination requirements.

1.3 SUBMITTALS

- A. Submittals shall be made in accordance with the requirements of Division 1, Section 26 00 00, the Contract Documents and as specified herein the following:
 - 1. The manufacturers' names and product designation or catalog numbers for the types of materials specified or shown on the Drawings.
 - 2. Cut sheets for each individual item shall be submitted.
 - 3. All cut sheets shall be clearly marked to indicate which products are being submitted for use on this project.
 - 4. Unmarked cut sheets will cause the submittal to be rejected and returned for revision.
- B. All shop drawing submittals and all O&M submittals shall be submitted in accordance with the requirements listed in Division 1. No change in Contract Price or Schedule will be allowed for delays due to unacceptable submittals.
- C. Submittals shall also contain information on related equipment to be furnished under this Specification. Incomplete submittals not containing the required information on the related equipment will also be returned without review.
- D. Shop Drawings
 - 1. Submit catalog data of all support hardware components specified under this Section. Catalog data shall show compliance with the referenced codes and standards. All selections, options and exceptions shall be clearly indicated.
 - 2. The submittal information for anchor systems shall contain manufacturer's specifications and technical data as follows:
 - a. Acceptable base material conditions (i.e. cracked, un-cracked concrete)
 - b. Acceptable drilling methods
 - c. Acceptable bore hole conditions (dry, water saturated, water filled, under water)
 - d. Manufacturer's installation instructions including bore hole cleaning procedures and adhesive injection.
 - e. Cure and gel timetables
 - f. Temperature ranges (storage, installation, and in-service).

1.4 REFERENCE CODES AND STANDARDS

- A. All products and components shown on the Drawings and listed in this specification shall be designed and manufactured according to latest revision of the following standards (unless otherwise noted):
 - 1. NFPA 70 National Electrical Code (NEC)
 - 2. NFPA 70E Standard for Electrical Safety in the Workplace
 - 3. ASTM E 488-96 (2003); Standard Test Method for Strength of Anchors in Concrete and Masonry Elements, ASTM International.
 - 4. ASTM E 1512-93, Standard Test Methods for Testing Bond Performance of Adhesive-Bonded Anchors, ASTM International
 - 5. AC308; Acceptance Criteria for Post-Installed Anchors in Concrete Elements, Latest revision.
 - 6. SAE 316 Stainless Steel Grades
- B. All equipment components and completed assemblies having a UL standard specified in this Section of the Specifications, shall bear the appropriate label of Underwriters Laboratories.

1.5 QUALITY ASSURANCE

- A. The manufacturer of these materials shall have produced similar electrical materials and equipment for a minimum period of five years. When requested by the Owner/Engineer, a list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

1.6 JOBSITE DELIVERY, STORAGE AND HANDLING

- A. Prior to jobsite delivery, complete all submittal requirements, and present to the Owner/Engineer prior to delivery of the equipment, an approved copy of all such submittals. Delivery of equipment not completely constructed, onsite factory work, or failed factory tests will not be permitted.
- B. Materials shall be handled and stored in accordance with manufacturer's instructions.
- C. Adhesive Anchor Systems.
 - 1. Deliver materials undamaged in Manufacturer's clearly labeled, unopened containers, identified with brand, type, and ICC-ES Evaluation Report number.
 - 2. Coordinate delivery of materials with scheduled installation date, minimizing storage time at job-site.
 - 3. Store materials under cover and protect from weather and damage in compliance with Manufacturer's requirements, including temperature restrictions.
 - 4. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.
 - 5. Do not use damaged or expired materials.
 - 6. Storage restrictions (temperature range) and expiration date must be supplied with product
- D. Metal Framing Systems

1. Material shall be new and unused, with no signs of damage from handling.

1.7 WARRANTY

- A. Provide warranties, including the manufacturer's warranty, for the equipment specified and the proper installation thereof, to be free from defects in material and workmanship for three years from date of final acceptance of the equipment and its installation. Within such period of warranty, all material and labor necessary to return the equipment to new operating condition shall be provided. Any warranty work requiring shipping or transporting of the equipment shall be provided at no expense to the Owner.

PART 2 - PRODUCTS

2.1 DRILLED-IN WEDGE ANCHORING SYSTEMS

- A. Acceptable Manufacturers
 1. Subject to compliance with the Contract Documents, the following Manufacturers are acceptable:
 - a. HILTI
 - b. Approved equal
 2. The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety.
- B. Product Description
 1. Provide torque-controlled expansion anchors consisting of anchor body, expansion element (wedges), washer and nut. Provide torque-controlled expansion anchors for anchor sizes less than 3/8 inch.
 2. Provide all parts made of 316 stainless steel materials conforming to SAE 316 standards.
 3. UL 203 Rated.

2.2 ADHESIVE ANCHORING SYSTEMS

- A. Acceptable Manufacturers
 1. Subject to compliance with the Contract Documents, the following Manufacturers are acceptable:
 - a. HILTI
 - b. Approved equal
 2. The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety.
- B. Product Description
 1. Provide an anchor body with helical cone shaped thread on the embedded end and standard threads on the exposed end, with washer and nut, inserted into Injection adhesive. Provide adhesive anchors for anchor sizes 3/8 inch and larger.

2. Provide all parts made of 316 stainless steel materials conforming to SAE 316 standards.

2.3 STRUT SUPPORT SYSTEMS

A. Acceptable Manufacturers

1. Subject to compliance with the Contract Documents, the following Manufacturers are acceptable:
 - a. Tyco Unistrut
 - b. B-Line
 - c. Super-Strut
 - d. Approved equal
2. The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety.

B. Product Description

1. Metal framing system for use in the mounting or support of electrical systems, panels and enclosures, and including lighting fixture supports, trapeze hangers and conduit supports.
2. Provide components shall consist of telescoping channels, slotted back-to-back channels, end clamps all threads and conduit clamps.
3. Minimum sizes shall be 13/16-inch through 3-1/4 inch.
4. Provide components assembled by means of flat plate fittings, 90-degree angle fittings, braces, clevis fittings, U-fittings, Z-fittings, Wing-fittings, Post Bases, channel nuts, washers, etc.
5. Field welding of components will not be permitted.
6. Unless otherwise specified or shown on the Drawings, provide all parts made of 316 stainless steel material conforming to SAE 316.
7. Framing systems for chlorine and ammonia rooms shall be structural fiberglass.

2.4 STAINLESS TIES

A. Acceptable Manufacturers

1. Subject to compliance with the Contract Documents, the following Manufacturers are acceptable:
 - a. PANDUIT
 - b. PHONIX CONTACT
 - c. Gardner Bender
 - d. Approved equal
2. The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety.

A. Product Description

1. Cable Ties for securing and supporting of flexible raceway and conductors.
2. Self-locking mechanism.

3. Provide cable ties made of 304 Stainless Steel unless otherwise directed as shown on the drawings.
- B. Locations for Use
1. Provide stainless steel cable ties in any damp or wet environment, in all process areas whether indoors or outdoors, and in all outdoor locations.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install all equipment strictly in accordance with the manufacturer's instructions and the Contract Drawings.
- B. The locations of devices are shown as general on the Drawings and may be varied within reasonable limits as to avoid any piping or other obstruction without change in the Contract Price or Schedule, subject to the approval of the Owner and Engineer. Coordinate the installation of the devices for piping and equipment clearance.
- C. Attaching electrical equipment or raceways to or supporting from, sheet metal walls is prohibited in all cases.
- D. Install required safety labels.
- E. Electrical support channel shall be used to construct support assemblies as shown on the drawings.
1. Horizontal braces attached to concrete or CMU walls, or structural building steel are permitted if the space between the back of the support structures and the attachment points are too small to permit a walk space.
 2. No attachments to sheet metal are permitted as specified above.
 3. Incorporate additional channel materials and/or provide assemblies of double channel with enough vertical and horizontal members to form a rigid structure whether such additional materials or the use of double channel materials are shown or specified.
 4. Support structures shall be rigid without the use of channels to form angle supports between the back or front of the assembly and the ground. Angle supports are strictly prohibited because they provide tripping hazards.
 5. Outdoor support structures shall be able to support the equipment with the structural strength to withstand wind gusts up to 90 mph without damage.

3.2 FIELD QUALITY CONTROL

- A. Inspect installed equipment for anchoring, alignment, grounding and physical damage.
- B. Check tightness of all accessible electrical connections. Minimum acceptable values are specified in manufacturer's instructions.

3.3 POST INSTALLED ANCHOR SYSTEMS

- A. Prior to installation of the anchor systems, the hole shall be clean and dry in accordance with the manufacturer's instructions.

3.4 CLEANING

- A. Remove all rubbish and debris from inside and around the installation. Remove dirt, dust, or concrete spatter from the interior and exterior of the equipment using brushes, vacuum cleaner, or clean, lint free rags. Do not use compressed air.

END OF SECTION

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Furnish and install complete raceway systems as shown on the Drawings and as specified herein. A raceway system shall consist of materials designed expressly for containing wires and cables, including but not limited to, conduit, device bodies, conduit bodies, raceway boxes, enclosures containing electrical devices, controls, and related materials.

1.2 RELATED WORK

- A. Refer to Division 26 00 00 and the Contract Drawings, for related work and electrical coordination requirements.

1.3 SUBMITTALS

- A. Submittals shall be made in accordance with the requirements of Division 1, Section 26 00 00, the Contract Documents and as specified herein submit the following:
 - 1. The manufacturers' names and product designation or catalog numbers for the types of materials specified or shown on the Drawings.
 - 2. Cut sheets for each individual item shall be submitted.
 - 3. All cut sheets shall be clearly marked to indicate which products are being submitted for use on this project.
 - 4. Unmarked cut sheets will cause the submittal to be rejected and returned for revision.
- B. Submit to the Owner/Engineer, certification that the electricians installing the PVC coated conduit have a five-year minimum experience, in the installation of the product.
- C. All shop drawing submittals and all O&M submittals shall be submitted in accordance with the requirements listed in Division 1. No change in Contract Price or Schedule will be allowed for delays due to unacceptable submittals.
- D. Submittals shall also contain information on related equipment to be furnished under this Specification. Incomplete submittals not containing the required information on the related equipment will also be returned without review.
- E. Submit to the Owner/Engineer, shop drawings and product data, for the following:
 - 1. Submit catalog data of all conduit, conduit fittings, boxes, enclosures, and accessories, specified under this Section.
 - 2. Catalog data shall show compliance with the referenced codes and standards.
 - 3. All selections, options and exceptions shall be clearly indicated.

1.4 REFERENCE CODES AND STANDARDS

- A. All products and components shown on the Drawings and listed in this specification shall be designed and manufactured according to latest revision of the following standards (unless otherwise noted):
 - 1. NFPA 70 – National Electrical Code (NEC)
 - 2. NFPA 70E – Standard For Electrical Safety in the Workplace
 - 3. UL 6A – Electrical Rigid Metal Conduit

- 4. ANSI C80.5 – Electrical Rigid Aluminum Conduit
- 5. UL 514B – Outlet Bodies

- B. All equipment components and completed assemblies specified in this Section of the Specifications shall bear the appropriate label of Underwriters Laboratories.

1.5 QUALITY ASSURANCE

- A. The manufacturer of these materials shall have produced similar electrical materials and equipment for a minimum period of five years. When requested by the Owner/Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.
- B. The manufacturer of the assembly shall be the manufacturer of the major components within the assembly. All assemblies shall be of the same manufacturer.
- C. The installer of materials specified herein, shall have a minimum of five years' experience in the installation of each type of material. Proof of experience shall be submitted, upon request of the Owner/Engineer, prior to installation.
- D. Used materials are unacceptable, will be rejected and shall be removed from the job site. Used materials, if installed, shall be removed and replaced with new materials. If new materials are installed with used materials, and the removal of the used materials renders the new materials in an unacceptable condition, such as new conductors installed in used raceway components, (determined by the Engineer/Owner alone) then the new materials shall be removed along with the used materials and replaced. No increase in the Contract Price nor in Contract Schedule will be allowed.

1.6 JOBSITE DELIVERY, STORAGE AND HANDLING

- A. Prior to jobsite delivery, complete all submittal requirements, and present to the Owner/Engineer prior to delivery of the equipment, an approved copy of all such submittals. Delivery of incomplete constructed equipment, or equipment which failed any factory tests, will not be permitted.
- B. Materials shall be handled and stored in accordance with manufacturer's instructions.
- C. Materials shall not be stored exposed to sunlight. Such materials shall be completely covered.
- D. Materials showing signs of previous use, jobsite storage at another location, or exposure to the elements or other damage will be rejected.

1.7 WARRANTY

- A. Provide warranties, including the manufacturer's warranty, for the equipment specified and the proper installation thereof, to be free from defects in material and workmanship for three years from date of final acceptance of the equipment and its installation. Within such period of warranty, all material and labor necessary to return the equipment to new operating condition shall be provided. Any warranty work requiring shipping or transporting of the equipment shall be provided at no expense to the Owner.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide raceways and fittings as shown on the Drawings with a minimum 3/4-inch trade size.
- B. Provide device entries less than 3/4 inch with an adaptor to connect 3/4-inch or larger conduit. The following adaptors are acceptable:
 - 1. REA12SA, Cooper Crouse Hinds for aluminum
 - 2. ADAPT ADU302930, REDAPT for 316 stainless.
 - 3. Approved equal

2.2 CONDUIT RACEWAY

- A. PVC Coated Rigid Aluminum Conduit (CRMC)
 - 1. Provide PVC coated rigid aluminum conduit system including but not limited only to all conduit fittings, conduit bodies, and covers. Provide the PVC coated conduit system with a minimum 0.040-inch thick, polyvinyl chloride coating permanently bonded to rigid aluminum conduit and an internal chemically cured urethane or enamel coating with a minimum of 2 mil thickness on the interior.
 - 2. Provide rigid aluminum conduit extruded from AA 6063 alloy in temper designation T-1 and conforming to FED Spec WW-C-540C, ANSI C80.5 and UL 6A.
 - 3. Provide couplings, fittings, etc. with a minimum of one pipe diameter in length of PVC overlap on the ends.
 - 4. Provide elbows and couplings meeting the same specifications supplied by the same manufacturer for the PVC coating specified for the conduit system. Apply the PVC coating system specified to factory elbows and couplings provided by the same conduit manufacturer as the conduit.
- B. Liquid tight Aluminum Flexible Metal Conduit (LFMC)
 - 1. Provide liquid tight aluminum flexible metal conduit with an interlocked aluminum core, PVC jacket rated for 60 degrees C, and meeting NEC Article 351.
 - 2. Provide copper free aluminum liquid tight conduit fittings conforming to FEDSPEC AA50552, and UL-514B.
- C. Rigid Aluminum Conduit (RMC)
 - 1. Provide rigid Aluminum conduit extruded from AA 6063 alloy in temper designation T-1 and conforming to FED Spec WW-C-540C, ANSI C80.5 and UL 6A.
- D. Rigid PVC Schedule 40 Conduit (RNC)
 - 1. Provide schedule 40 PVC Rigid Nonmetallic Conduit (RNC) resistant to sunlight and designed for use underground as described in the NEC manufactured to NEMA TC-2, Federal Specification WC1094A and UL 651 specifications. Provide fittings resistant to sunlight and designed for use underground as described in the NEC manufactured to NEMA TC-3, Federal Specification WC1094A and UL 514B. Provide conduit and fittings with a UL Label.

2.3 WIREWAYS

- A. Provide NEMA 4X 316 rated stainless steel wireways, with gasketed hinged covers and stainless steel screws. Provide two breather/drains for each ten feet of wireway. Install each breather/drain in the bottom, near the ends of the wireway. Provide wireways with integral welded mounting lugs. Bolted-on mounting lugs are unacceptable.
- B. Manufacturers
 - 1. Industrial Enclosure Corporation
 - 2. Cooper B Line
 - 3. Approved equal
- C. Breather/Drains
 - 1. Eaton Crouse-Hinds 316 stainless steel
 - 2. Approved equal
- D. The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety.

2.4 RACEWAY BOXES AND EQUIPMENT ENCLOSURES

- A. The term box and enclosure are synonymous for this specification.
 - 1. Boxes and enclosures specified herein, include terminal boxes, junction boxes pull boxes, and boxes for switch, receptacles, and lighting.
 - 2. Provide enclosures used for electrical and instrumentation equipment, other than terminal boxes, as described in this section with references to this specification in other specification sections.
 - 3. Provide all raceway boxes and equipment enclosures with a common ground point,
 - 4. Provide all boxes and enclosures with a UL listing.
- B. Provide NEMA Type 3R steel boxes and enclosures
 - 1. Provide single point quarter turn latches (20-inch X 24-inch and smaller). Provide all others with three-point handle operated latches.
 - 2. Provide foam in place gasket
 - 3. Use for all locations unless otherwise shown or specified
 - 4. Provide integral welded-on mounting lugs or brackets welded on the box, suitable for wall mounting.
 - 5. Provide welded on mounting feet for self-standing enclosures.
 - 6. Boxes or enclosures manufactured with holes intended for mounting using bolted-on mounting lugs or feet are not acceptable. Drilling through the back of the box to mount is strictly prohibited and renders the box or enclosure unacceptable.
 - 7. Remove and replace unacceptable boxes or enclosures. Provide the following work as a minimum to effect the replacement of unacceptable boxes or enclosures:
 - a. Reconnect conduits
 - b. Conductors if installed, may be required to be removed and replaced at the Owner/Engineers discretion
 - c. If conductors are not required to be replaced, then re-terminate and re-test conductors and retest associated controls.

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- d. No change in the Contract Price or Schedule will be allowed for box or enclosure replacement.
 - 8. Provide boxes and enclosures with continuously welded seams ground smooth, and continuous hinged, foam in place gasketed doors.
 - 9. Provide box and enclosure bodies with wall and door thickness not less than 16 gauge.
 - 10. Provide three-point type latch with handle for boxes and enclosures larger than 24 inches X 20 inches.
 - 11. Provide 316 stainless steel luggage type quick release latches, or three-point latch system with all components 316 stainless steel for boxes or enclosures 24 inches X 20 inches or smaller.
 - 12. Latch systems requiring tools to open or close are unacceptable.
- C. Manufacturers
- 1. The listing of specific manufacturers does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed are not relieved from meeting these specifications in their entirety.
 - 2. Enclosures housing electrical equipment may be constructed by the manufacturer of that equipment but shall meet the all the physical requirements specified herein.
 - a. Eaton Crouse Hinds
 - b. Hoffman
 - c. Appleton Electric
 - d. EMF Company
 - e. NEMA Enclosures Company
 - f. Cooper B Line
 - g. Rittal EMF Company
 - h. NEMA Enclosures Company
 - i. Approved equal
- D. NEMA 1 or NEMA 1A boxes shall not be used.
- E. Malleable iron boxes shall not be used.

2.5 DEVICE BOXES

- A. Device boxes installed in aluminum raceway systems for switches and receptacle, etc., shall be copper free cast aluminum, and shall have tapered, threaded, hubs, with integral bushings. Boxes shall have internal grounding screw, and a minimum of two mounting feet. Boxes shall be type FD.
- B. Manufacturers
 - 1. Eaton Crouse-Hinds
 - 2. Appleton
 - 3. Approved equal

2.6 CONDUIT OUTLET BODIES

- A. Conduit outlet bodies and covers shall be Form 7, copper-free aluminum, with captive screw-clamp cover, neoprene gasket and stainless-steel screws and clamps for conduits up to and including 2-1/2 inches.
- B. Manufacturers

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1. Eaton Crouse-Hinds Form 7 with Mark 7 wedge-nut cover
 2. Appleton
 3. Approved equal
- C. Provide junction boxes for conduits larger than 2-1/2 inches.
- D. All outlet boxes and covers for Class 1 Division 2 areas shall be rated NEMA 4X aluminum or 316 stainless steel.
1. Manufacturers
 - a. Eaton Crouse-Hinds
 - b. Approved equal

2.7 CONDUIT HUBS

- A. Conduit hubs for use on raceway system pull and junction boxes shall be watertight, threaded aluminum, insulated throat, stainless steel grounding screw
- B. Manufacturers
1. T&B
 2. Approved equal

2.8 GROUNDING BUSHINGS

- A. Grounding bushings shall be insulated lay-in lug grounding bushings with tin-plated copper grounding path. Bushings shall have integrally molded noncombustible phenolic insulated surfaces rated 150°C. Each bushing shall be furnished with a plastic insert cap. The size of the lug shall be sufficient to accommodate the maximum ground wire size required by the NEC for the application.
- B. Manufacturers
1. O-Z/Gedney
 2. Approved equal

2.9 RACEWAY SEALANT

- A. Raceway sealant for use in the sealing of raceway hubs, entering or terminating in boxes or enclosures where such sealing is shown or specified, shall be 3M 1000NS Watertight Sealant, or approved equal.

2.10 KELLEMS GRIPS

- A. Provide Kellems grips cables supports made of 316 stainless steel.

2.11 CONDUIT MOUNTING EQUIPMENT

- A. Provide pull and junction box supports, spacers, conduit support rods, clamps, hangers, channel, nut, bolts, washers, etc. made of 316 stainless steel. Provide stainless steel tie wraps. Nylon tie wraps are not acceptable.

2.12 CONDUIT IDENTIFICATION TAGGING

- A. Tag all underground conduits at all locations exiting and entering from underground, including manholes and handholes.
- B. Use the tagging formats for conduits as shown on the Drawings.
- C. Provide embossed stainless conduit identification plates with stainless steel band, permanently secured to the conduit without screws. Nylon tie wraps are not acceptable..
- D. Identification plates shall be as manufactured by the Panduit Corp. or equal.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATIONS

- A. Unless exact locations are shown on the Drawings, coordinate the placement of raceway systems and related components with other trades and existing installations.
- B. Raceway Systems for the installation of Fiber Optic Cables shall not contain conduit bodies, device boxes, or raceway boxes containing less than twelve inches of bend radius.
- C. Unless shown on the Drawings or specified otherwise, the raceway type installed with respect to the location shall be as follows, including all materials:

Raceway System	Location
1. PVC Coated Aluminum (CRMC) Type	All embedded raceway bends, underground duct bank bends of more than 20 degrees, and all raceway stub-ups to a minimum of six inches above finished floor or grade and in Chlorine and Caustic rooms.
2. Liquid tight Flexible Aluminum (LFMC) Type	Raceway connection to vibrating equipment, and as shown on the Drawings in all areas.
3. Rigid Non-metallic, Schedule 40 PVC (RNC) Type	Underground encased in red dyed reinforced concrete.
4. Rigid Non-metallic, Schedule 80 PVC (RNC) Type	For use only in chlorine and rooms where caustic or acidic chemicals are present.
5. Flexible Aluminum (FMC) Type	Fixture whip connection to lighting fixtures in dry indoor air-conditioned areas (maximum 3-feet). BX or AC type prefabricated cables are not permitted.
6. Aluminum Rigid Metal (RMC) Type	All above grade areas, except for concrete embedded and those areas described in Locations 2 through 6 above.

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- D. All conduit of a given type shall be the product of one manufacturer.

3.2 BOX APPLICATIONS

- A. Provide all raceway junction, pull, and terminal boxes and electrical equipment enclosures with NEMA ratings for the location in which they are installed, and as specified herein.
- B. The distance between each raceway entry inside the box and the opposite wall of the box shall not be less than six times the metric designator (trade size) of the largest raceway in a row. This distance shall be increased for additional entries by the amount of the sum of the diameters of all other raceway entries in the same row on the same wall of the box. Each row shall be calculated individually, and the single row that provides the maximum distance shall be used.
- C. Provide cast aluminum conduit fittings for exposed switch, receptacle, and lighting outlet boxes.
- D. Provide all raceway boxes and wall – mounted electrical equipment with factory mounting integral welded mounting lugs.
1. Bolt-on gasketed mounting lugs attached through factory-drilled holes are not acceptable for any raceway box or electrical equipment enclosure.
 2. Drilling through the back of any box or enclosure is prohibited, and if so installed, shall be removed, and replaced, with no increase in the Contract Price or Construction Schedule.
- E. Top penetration of boxes or enclosures installed in wet or damp locations which contain electrical equipment (including but not limited to local control stations, manufacturer or contractor provided control panels, panelboards, MCCs switchgear, etc.) is prohibited and their installation is unacceptable.
1. Remove and replace boxes or enclosures found to be unacceptably installed.
 2. Return electrical equipment enclosures containing controls to the supplier or manufacturer for replacement of the enclosure.
 3. Remove all installed conductors from source to load.
 4. Remove and re-route conduits to avoid top entry.
 5. Replace, megger and re-terminate conductors and retest controls associated with those conductors where previously installed conductors are required to be replaced.
 6. No change in the Contract Price or Schedule will be allowed for materials, labor, or shipment to and from suppliers.

3.3 DEVICE BOX APPLICATIONS

- A. Provide device boxes for mounting wiring devices such as receptacles, switches, thermostats, lighting, and other permanently mounted devices. Install all device boxes with a minimum of 1/4-inch air space between the back of the box and the wall or back panel on which it is installed. The space may be created with enough 316 stainless steel washers to provide the required air space or may be mounted using 316 stainless steel slotted channel.

3.4 CONDUIT OUTLET BODIES APPLICATIONS

- A. Conduit outlet bodies may be used on conduits up to and including 2-1/2 inches, except where junction boxes are shown or otherwise specified. Provide junction boxes for conduits larger than 2-1/2 inches.

3.5 CONDUIT HUB APPLICATIONS

- A. Unless specifically stated herein or described on the Drawings, all raceways shall terminate at an outlet with a conduit hub. Locknut or double locknut terminations are not allowed.
- B. When conduits contain equipment grounding conductors the wire shall be grounded to the hub(s) associated with that grounding conductor.

3.6 INSULATED GROUNDING BUSHING APPLICATIONS

- A. Provide insulated grounding bushings to terminate raceways where the raceways enter pad-mounted electrical equipment or switchgear from the bottom where there is no wall or floor pan on which to anchor or terminate the raceway.
- B. All other raceways shall terminate on enclosures with a conduit hub, except for NEMA 7/4X areas.
- C. Grounding bushing caps shall remain on the bushing until the wire is ready to be pulled.

3.7 CONDUIT FITTINGS APPLICATIONS

- A. Install combination expansion-deflection fittings where conduits cross structure expansion joints, and where installed in exposed conduit runs such that the distance between expansion-deflection fittings does not exceed 150 feet of conduit run. Expansion-deflection fittings are acceptable in indoor locations out of exposure to direct sunlight or other outdoor locations which are shaded.
- B. Expansion-deflection fittings are not acceptable for use outdoors unless approved in writing on a case-by-case basis from the Engineer/Owner. Where combination expansion-deflection fittings with exposed non-metallic sections, are approved by the Engineer/Owner for use where exposed to sunlight or other outdoor locations which are shaded, an aluminum wrap shall be installed loosely over the non-metallic portion, extending at least two inches beyond the ends. The wrap shall be loosely secured, to permit movement, with at least two 316 SS fasteners. Nylon tie-wraps are not acceptable.
- C. Provide an expansion fitting with a minimum of six inches available movement shall be installed on the exposed side of under to above grade conduit transitions. Expansion-deflection fittings shall not be provided unless approved and protected as specified above.

3.8 CONDUIT PENETRATION SEALS APPLICATIONS

- A. Conduit wall seals shall be used where underground conduits penetrate walls or at other locations shown on the Drawings.
- B. Conduit sealing bushings shall be used to seal conduit ends exposed to the weather and at other locations shown on the Drawings.

3.9 CONDUIT TAG APPLICATIONS

- A. Tag all conduits within one foot of the entry of equipment, and wall and floor penetrations.
- B. Tag all underground conduits and ducts at all locations, exiting and entering from underground, including manholes and handholes.

3.10 RACEWAY SEALING

- A. All raceways entering junction boxes, terminal junction boxes, electrical equipment enclosures or control panels containing electrical, or instrumentation equipment shall be connected to the box, enclosure or panel using conduit hubs and shall be sealed with Raceway Sealant, as specified herein.

3.11 PVC RACEWAY TO PVC COATED ALUMINUM RACEWAY TRANSITIONS IN CONCRETE ENCASEMENT

- A. Transitions from PVC raceway to PVC coated aluminum raceway in concrete encasements shall be made as follows:
 1. Terminate the PVC conduit in a threaded PVC female adapter.
 2. Terminate the PVC coated aluminum conduit in a threaded male adaptor.
 3. Thread the male PVC-coated aluminum conduit adaptor into the female threaded PVC adapter.
- B. Tighten the joint securely, then double layer wrap the joint with two-inch vinyl electrical tape for a distance of two inches each side of the threaded joint to prevent any contact between any exposed aluminum threads and concrete.

3.12 RACEWAY INSTALLATION

- A. Do not install pull wires and conductors until the raceway system is in place. No wire shall be installed between outlet points, junction points or splicing points, until all raceway sections are complete, and all raceway covers are installed for protection of conductors from damage or exposure to the elements. Conductors installed into incomplete raceway systems are considered improperly installed and are in violation of the NEC. The occurrence of wire installed in an incomplete installation, shall require the removal of such conductors from the project site, and replacement of the conductors at with no increase in Contract Price or Schedule. The raceway system shall be completed and inspected by the Engineer/Owner before new conductors are installed.
- B. No conduit smaller than 3/4-inch electrical trade size, shall be used, nor shall any have more than the equivalent of three 90-degree bends in any one run. Pull boxes shall be provided as necessary. Conduit reducers which are the same type of the raceway shall be installed where manufacturer-provided enclosures are not available with conduit hubs larger than 1/2-inch at the enclosure to terminate 3/4-inch conduit. The raceway fill shall be adjusted to accommodate the smaller opening in the manufacturer-provided enclosure. Notify the Engineer/Owner prior to the installation of the raceway into enclosures with openings smaller than the specified minimum. Raceways installed without notice are considered unacceptable and may be required to be removed at the Engineer's/Owner's discretion with no increase in the Contract Price or Schedule allowed.
- C. All raceways, installed underground, shall be installed in accordance with Section 26 05 43 Underground System, and be a minimum size of two-inch trade size unless otherwise shown in the plans.
- D. Raceways entering or leaving the raceway system, which could be subjected to the entry of moisture, rain or liquid of any type, shall be tightly sealed, using 3M 1000NS Watertight Sealant, or approved equal at any possible moisture entry point both before and after the installation of cables to prevent the entry of water or moisture to the Raceway System at any time. Any damage

to new or existing equipment, due to the entrance of moisture from unsealed raceways, shall be corrected by complete replacement of such equipment. No increase in the Contract Price or Schedule will be allowed. Cleaning or drying of such damaged equipment will not be acceptable.

- E. Conduit supports, other than for underground raceways, shall be spaced at intervals no further apart than as required by the NEC and closer together as required to obtain rigid construction. Conduits shall be supported near the entry into any enclosure in accordance with the NEC. Conduits shall not be used to support other conduits, nor shall conduits be supported from cable tray.
- F. Single conduits shall be supported by means of one-hole conduit clamps in combination with one-screw back plates, to raise conduits from the surface.
- G. Multiple runs of conduits shall be supported on trapeze type hangers with horizontal members and threaded hanger rods. The rods shall be not less than 3/8-inch diameter. Multiple conduits mounted on walls shall be supported using strut and 316 stainless steel conduit clamps, screws, nuts, and washers.
- H. Surface mounted panel boxes, junction boxes, conduit, etc. shall be supported as specified herein.
- I. Conduit hangers shall be attached to structural steel by means of beam or channel clamps. Where attached to concrete surfaces, anchors shall be as specified in Section 26 05 29 Electrical Support Hardware.
- J. No electrical equipment enclosures, boxes, terminal junction boxes or raceways shall be attached to or supported from, sheet metal walls.
- K. All conduits on exposed work shall be run at right angles to and parallel with the surrounding wall and shall conform to the form of the ceiling. No diagonal runs will be allowed. Bends in parallel conduit runs shall be concentric. Offsets in conduit runs shall all be done at the same point and shall all be the same angle, so the entire installation appears to be parallel or concentric at every point. All conduits shall be run perfectly straight and true.
- L. Conduits terminated into enclosures shall be perpendicular to the walls where flexible liquid tight or rigid conduits are required. The use of short seal tight elbow fittings for such terminations will not be permitted, except for connections to instrumentation transmitters, where multiple penetrations are required.
- M. Conduits containing equipment grounding conductors and terminating in boxes shall have insulated throat grounding bushings. The grounding conductor shall be grounded to the box.
- N. Conduits shall be installed using threaded fittings. Running threads will not be permitted.
- O. Provide glued type conduit fittings on PVC conduit.
- P. Conduits installed which are not in compliance with these requirements shall be removed and reinstalled at the Engineer's/Owner's discretion. If conductors are installed when the improper installation is discovered, the conductors shall be removed from the raceway, discarded and removed them from the job site, replaced, re-terminated, retagged, and retested in accordance with the specifications. The function of the system shall be retested in its entirety. No increase in Contract Time or Schedule will be allowed.

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- Q. Liquid tight flexible metallic conduit shall be used for the primary and secondary of transformers, generator terminations and other equipment where vibration is present. Use in other locations is not permitted, except for connections to instrumentation transmitters, where multiple penetrations are required. Liquid tight flexible metallic conduit shall have a maximum length not greater than that of a factory manufactured elbow of the conduit size being used. The maximum bending radius shall not be less than that shown in the NEC Chapter 9, Table 2, "Other Bends". BX or AC type prefabricated cables will not be permitted.
- R. Seal the remaining openings or spaces of conduits passing through openings in walls or floor slabs to prevent the passage of flame or smoke where additional openings or space around the conduits are present.
- S. Conduit ends exposed to the weather or corrosive gases shall be sealed with conduit sealing bushings.
- T. Raceways terminating in Control Panels or enclosures which contain electrical equipment or terminal blocks, shall not enter from the top of the enclosure.
1. Locations: Outdoors or any wet or damp location or any location where plant process equipment is located or any location not otherwise specifically designated as a dry electrical room, control room or office space.
 2. All raceways entering the enclosures specified above shall be sealed with a watertight sealant as specified herein.
 3. Enclosures entered from the top where top entry is prohibited, will be rejected and shall be removed and replaced regardless of the Division which contains the specification for the enclosure. The use of UL Listed conduit closures to restore the NEMA rating of the enclosure will not be accepted.
 4. Conduit entering the top of the enclosures shall be removed and re-routed to enter the enclosure from the side or bottom. Conductors installed in top entering conduits shall be pulled back to the nearest conduit body or junction box and re-routed with the conduit, provided the conductors are long enough to be re-terminated. Conductors found to be insufficient in length to be re-terminated shall be completely removed and replaced, re-tested, re-tagged, re-tested and the control function of the panel shall be re-tested.
 5. If the enclosure is provided by an OEM, the enclosure and its contents shall be returned to the OEM for a new enclosure.
 6. No increase in Contract Price or Schedule will be allowed for making these corrections.
- U. All conduits from external sources entering or leaving a multiple compartment enclosure shall be stubbed up into the bottom horizontal wire way or other manufacturer designated area, directly below the vertical section in which the conductors are to be terminated. Conduits entering from cable tray shall be stubbed into the upper section.
- V. Conduit sealing and drain fittings shall be installed in areas designated as NEMA 4X or 7 and all wet locations.
- W. A conduit identification plate shall be installed on all power, instrumentation, alarm and control conduits at each end of the run and at intermediate junction boxes, manholes, etc. Conduit plates shall be installed before conductors are pulled into conduits. Exact identification plate location shall be coordinated with the Owner/Engineer at the time of installation to provide uniformity of placement and ease of reading. Conduit numbers shall be exactly as shown on the Drawings.
- X. Mandrels shall be pulled through all existing conduits that will be reused and through all new conduits two inches in diameter and larger prior to installing conductors.

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- Y. 3/16-inch polypropylene pull lines shall be installed in all new conduits noted as spares or designated for future equipment.
 - Z. All conduit that may under any circumstance contain liquids such as water, condensation, liquid chemicals, etc. shall be arranged to drain away from the equipment served. If conduit drainage is not possible, conduit seals shall be used to plug the conduits at the point of attachment to the equipment.
 - AA. Conduits shall not cross pipe shafts, access hatches or vent duct openings. They shall be routed to avoid such present or future openings in floor or ceiling construction.
 - BB. The use of running threads is prohibited. Where such threads are necessary, a three-piece union shall be used.
 - CC. Conduits passing from heated to unheated spaces, exterior spaces, refrigerated spaces, cold air plenums, etc. shall be sealed with Watertight Sealant as specified herein.
 - DD. Conduits shall be located a minimum of three inches from steam or hot water piping. Where crossings are unavoidable, the conduit shall be kept at least one inch from the covering of the pipe crossed.
 - EE. Conduits terminating at a cable tray shall be supported independently from the cable tray and shall have a clamp to secure it to the cable tray in accordance with NEC requirements. Provide a conduit support within one foot of the cable tray. The weight of the conduit shall not bear on the cable tray. The end of the conduit shall terminate within 6-inches of the cable tray. Conduits shall be grounded to the cable tray..
 - FF. Conduits entering the top of electrical equipment enclosures from cable tray or otherwise routed from above the equipment in airconditioned dry indoor spaces shall coordinate their placement with the HVAC duct vents such that cold air from the HVAC system will not blow directly on the vertical conduits causing condensation. Conduits which cannot be located away from direct exposure to cold air from the HVAC system shall be insulated to prevent condensation from forming inside the conduits or shall be re-routed. In all cases, condensation caused by cold air from the HVAC system shall be prevented from entering electrical enclosures. Equipment damaged by water from condensation shall be removed, replaced, conductors re-terminated, and its operation retested with no change in the contract price or schedule.
 - GG. All changes of direction on PVC coated conduit greater than 20 degrees shall be accomplished using long radius bends. Any field bends shall be made using equipment designed to prevent damage to the PVC coating.

END OF SECTION

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Furnish and install panelboard(s) as specified herein and as shown on the Drawings.
- B. The provisions of this Section shall apply to all panelboards, except as indicated otherwise.

1.2 RELATED WORK

- A. Refer to Division 26 00 00 and the Contract Drawings, for related work and electrical coordination requirements.

1.3 SUBMITTALS

- A. Submittals shall be made in accordance with the requirements of Division 1, Section 26 00 00, the Contract Documents and as specified herein the following:
 - 1. The manufacturers' names and product designation or catalog numbers for the types of materials specified or shown on the Drawings.
 - 2. Cut sheets for each individual item shall be submitted.
 - 3. All cut sheets shall be clearly marked to indicate which products are being submitted for use on this project.
 - 4. Unmarked cut sheets will cause the submittal to be rejected and returned for revision.
- B. All shop drawing submittals and all O&M submittals shall be submitted in accordance with the requirements listed in Division 1. No change in Contract Price or Schedule will be allowed for delays due to unacceptable submittals.
- C. Submittals shall also contain information on related equipment to be furnished under this Specification. Incomplete submittals not containing the required information on the related equipment will also be returned without review
- D. The original equipment manufacturer, (OEM) shall create all equipment shop drawings, including all wiring diagrams, in the manufacturer's Engineering department. All equipment shop drawings shall bear the original equipment manufacturer's logo, drawing file numbers, and shall be maintained on file in the OEM's archive file system. Photocopies of the Engineer's ladder schematics are unacceptable as shop drawings.
- E. The following information shall be submitted to the Engineer:
 - 1. Master drawing index
 - 2. Front view elevation
 - 3. Top view
 - 4. Nameplate schedule
 - 5. UL Listing of the completed assembly
 - 6. Conduit entry/exit locations
 - 7. Assembly ratings including:
 - a. Short-circuit rating
 - b. Voltage
 - c. Continuous current

8. Major component ratings including:
 - a. Voltage
 - b. Continuous current
 - c. Interrupting ratings
 9. Descriptive bulletins
 10. Product data sheets.
 11. Cable terminal sizes.
- F. Operation and Maintenance Manuals.
1. Operation and maintenance manuals shall include the following information:
 - a. Manufacturer's contact address and telephone number for parts and service.
 - b. Instruction books and/or leaflets
 - c. Recommended renewal parts list
 - d. Record Documents for the information required by the Submittals paragraph above.

1.4 REFERENCE CODES AND STANDARDS

- A. The low voltage panelboard assembly and all components in this specification shall be designed and manufactured according to latest revision of the following standards (unless otherwise noted):
1. UL 67 - Panelboards
 2. UL 50 - Cabinets and Boxes
 3. NEMA PB-1 2006 - Panelboards
 4. Fed. Spec. W-P-115C

1.5 QUALITY ASSURANCE

- A. The manufacturer of this equipment shall have produced similar equipment for a minimum period of ten years. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.
- B. The manufacturer of the assembly shall be the manufacturer of the major components within the assembly. All assemblies shall be of the same manufacturer. Equipment that is manufactured by a third party and "brand labeled" shall not be acceptable.
- C. All components and material shall be new and of the latest field proven design and in current production. Obsolete components or components scheduled for immediate discontinuation shall not be used.
- D. For the equipment specified herein, the manufacturer shall be ISO 9001 2000 certified.
- E. Equipment submitted shall fit within the space shown on the Drawings. Equipment which does not fit within the space is not acceptable.

1.6 JOBSITE DELIVERY, STORAGE AND HANDLING

- A. Prior to jobsite delivery complete all submittal requirements, and present to the Owner/Engineer upon delivery of the equipment, an approved copy of all such submittals. Delivery of incomplete constructed equipment, onsite factory work, or failed factory tests will not be permitted.

- B. Equipment shall be handled and stored in accordance with manufacturer's instructions. Two copies of these instructions shall be included with the equipment at time of shipment, and shall be made available to the Contractor and Owner. The instructions shall include detailed assembly instructions including but not limited to wiring interconnection diagrams, rigging for lifting, skidding, jacking, and moving using rolling equipment to place the equipment, bolt torqueing requirements for bus and all other components which require the installation of bolted connections, and instructions for storing the equipment prior to energizing.
- C. Equipment shall be stored indoors and protected from moisture, dust and other contaminants.
- D. Equipment shall not be installed until the location is finished and protected from the elements.

1.7 WARRANTY

- A. Provide warranties, including the manufacturer's warranty, for the equipment specified and the proper installation thereof, to be free from defects in material and workmanship for two years from date of final acceptance of the equipment and its installation. Within such period of warranty, all material and labor necessary to return the equipment to new operating condition shall be provided. Any warranty work requiring shipping or transporting of the equipment shall be provided at no expense to the Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the following Manufacturers are acceptable.
 - 1. ABB
 - 2. Eaton
 - 3. Schneider Electric Company
 - 4. Approved equal
- B. The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety.

2.2 RATINGS

- A. Provide the service voltage, overall short circuit withstand, and interrupting rating of the equipment and components as shown on the Drawings.
 - 1. The minimum interrupting rating shall be 22,000 amperes RMS symmetrical for 240/120 volt single-phase or 208Y/120 volt three-phase.
 - 2. The minimum interrupting for 480Y/277 volt three-phase shall be 65,000 amperes RMS symmetrical.
 - 3. Panelboards employing series connected ratings for main, feeder and branch devices are not acceptable and will be rejected.
- B. Provide UL Listed and Labeled panelboards suitable for use as service equipment.

- C. Provide UL 67 Listed panelboards that are shown or specified to contain SPDs. Provide SPDs as specified below.
- D. Provide panelboards designed for continuous operation at rated current, in a 40°C ambient.
- E. Refer to the Drawings for additional ratings and construction notes.

2.3 CONSTRUCTION

- A. General
 - 1. Refer to the Drawings for actual layout and location of equipment and components, and other required details.
 - 2. Nameplates
 - a. Provide nameplates listing manufacturer's name, panel type and rating.
 - b. Nameplate construction: engraved, laminated impact acrylic, matte finish, not less than 1/16-inch thick by 3/4-inch by 2-1/2-inch, Rowmark 322402, or equal.
 - c. Attach nameplates using 316 SS screws to all enclosures except for NEMA 4 and 4X.
 - d. Attach nameplates on NEMA 4 and 4X enclosures with double faced adhesive strips, TESA TUFF TAPE 4970, .009 X 1/2 inch, or equal.
 - 1) Thoroughly cleaned the metal surface prior to mounting with 70% alcohol until all residues has been removed.
 - 2) Epoxy adhesive or foam tape are not acceptable.
- B. Enclosures
 - 1. General
 - a. Provide enclosures meeting the requirements of Section 26 05 33 Raceways, Boxes, Enclosures and Fittings.
 - b. Where an enclosure is not otherwise defined or shown on the Drawings, provide the following:
 - 1) NEMA 3R Steel
 - 2) Foam in-place gasket
 - 2. NEMA 1 or NEMA 1A boxes shall not be used.
- C. Exteriors
 - 1. Unless otherwise noted, provide panelboards designed for surface mounting.
 - 2. Factory drilled holes or knockouts are not acceptable.
 - 3. Provide integral welded on mounting lugs on non-metallic enclosures and on NEMA 4 or 4X enclosures.
 - 4. Bolt-on mounting lugs or drilling holes through the back of enclosures are unacceptable and will be rejected.
- D. Doors
 - 1. Provide hinged doors covering all circuit breaker handles.
 - 2. Provide doors with semi-flush type cylinder lock and catch
 - 3. Door hinges shall be concealed.
 - 4. Provide a vault handle and three-point latch, complete with lock, arranged to fasten door at top, bottom and center on doors which are over 48 inches in height.
 - 5. Furnish two keys for each lock. All locks shall be keyed alike.
 - 6. Provide a directory frame and card having a transparent cover on each door.

- E. Interiors
 - 1. Provide least four studs for mounting the panelboard interior.
 - 2. Provide interiors designed to allow circuit breakers to be replaced without disturbing adjacent units and without removing the main bus connectors
 - 3. Provide interiors designed that circuits may be changed without machining, drilling or tapping.
 - 4. Provide factory assembled interiors with circuit breakers, wire connectors, etc. installed. Field installation is not acceptable.
 - 5. Except for screw terminals, provide wire anti-turn solderless type connectors.
 - 6. Provide all terminals suitable for copper wire sized to terminate the sizes indicated.

- F. Busses
 - 1. Phase busses:
 - a. Tin plated copper phase busses, full height without reduction.
 - b. Tin plated copper bus cross connectors.
 - c. Size bus spaces for future circuit breakers for the maximum device that can be accommodated.
 - d. Arrange branch circuits using double row construction except when narrow column panels are indicated.
 - e. Branch circuits numbering by the manufacturer.
 - 2. Neutral busses:
 - a. Full size.
 - b. Individual lug for each neutral conductor.
 - c. Tin plated copper.
 - 3. Ground busses:
 - a. Individual lug for each ground conductor.
 - b. Tin plated copper.

- G. Surge Protective Devices (SPDs)
 - 1. Provide a factory installed internal Type 2 SPD on panelboards shown or specified to include an SPD.
 - a. Provide SPDs meeting the requirements of Section 26 43 13 for specifications of the SPDs.
 - b. The required submittals for the SPD shall be included under this Section.
 - c. Submittals not containing the required information in Section 26 43 13 will be returned un-reviewed.
 - 2. SPD installation
 - a. Install the SPD immediately following the load side of the main breaker.
 - b. Install the SPD in main lug only panelboards immediately following the incoming main lugs.
 - c. Install SPDs inside the panelboard via a direct bus bar connection.
 - d. SPD installation limiting or interfering with the use of through-feed lugs, sub-feed lugs and sub-feed breakers is not acceptable.

2.4 CIRCUIT BREAKERS

- A. Provide frame size and trip settings as shown on the Drawings.
- B. Molded case, bolt-on type. Plug-on breakers are not acceptable.

- C. Minimum 22,000 amps RMS symmetrical interrupting rating for 208Y/120-volt, three phase, or 120/240-volt single phase.
- D. Minimum 65,000 amperes RMS symmetrical interrupting rating for 480Y/277 volt and 480-volt.
- E. Provide ground fault interrupters (GFI) with trip rating as shown on the Drawings.
 - 1. 5-milliamp ground fault trip for GFI breakers connected to receptacles.
 - 2. 30-milliamp ground fault trip for GFI breakers connected to equipment.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Mount boxes for surface mounted panelboards so there is at least 1/2-inch air space between the box and the wall.
- B. Connect panelboard branch circuit loads so that the load is distributed as equally as possible between the phase busses.
- C. Type circuit directories giving location and nature of load served. Install circuit directories in each panelboard.

END OF SECTION

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. This Section of the Specifications describes the requirements for low voltage AC surge protective devices (SPDs 1Kv and less), to be furnished under other Sections of the Specifications.
- B. All equipment described herein shall be submitted, and factory installed, as an integral part of equipment specified elsewhere in these Specifications.

1.2 RELATED WORK

- A. Refer to Division 26 00 00 for related work and electrical coordination requirements.

1.3 SUBMITTALS

- A. Submittals for equipment specified herein shall be made as a part of equipment furnished under other Sections. Individual submittals for equipment specified herein will not be accepted and will be returned unreviewed.
- B. Submittals shall be made in accordance with the requirements of Division 1, Section 26 00 00, the Contract Documents and as specified herein the following:
 - 1. The manufacturers' names and product designation or catalog numbers for the types of materials specified or shown on the Drawings.
 - 2. Cut sheets for each individual item shall be submitted.
 - 3. All cut sheets shall be clearly marked to indicate which products are being submitted for use on this project.
 - 4. Unmarked cut sheets will cause the submittal to be rejected and returned for revision.
- C. All shop drawing submittals and all O&M submittals shall be submitted in accordance with the requirements listed in Division 1. No change in Contract Price or Schedule will be allowed for delays due to unacceptable submittals.
- D. Submittals shall also contain information on related equipment to be furnished under this Specification. Incomplete submittals not containing the required information on the related equipment will also be returned without review.
- E. Submit to the Owner/Engineer, shop drawings and product data, for the following:
 - 1. Submit catalog data for all items supplied from this specification Section as applicable. Submittal shall include catalog data, functions, ratings, inputs, outputs, displays, etc., enough to confirm that the SPD provides every specified requirement. Any options or exceptions shall be clearly indicated, with the reason for such deviations. Acceptance of any deviation will be at the sole discretion of the Owner/Engineer. Shop drawings, not so checked and noted, will be returned unreviewed.
 - 2. Dimensional drawing of each SPD type.
 - 3. UL 1449 Third Edition Listing, Standard for Safety, Surge Protective Devices, documentation. Provide verification that the SPD complies with the required ANSI/UL 1449 3rd Edition listing by Underwriters Laboratories (UL) or other Nationally Recognized Testing Laboratory (NRTL).
 - 4. UL 1283 Listing, Electromagnetic Interference Filters, documentation.

5. ANSI/IEEE C6241 and C6245, Category C3 (20kV-1.2/50, 10kA-8/20 μ s waveform) clamping voltage test results.

F. Operation and Maintenance Manuals.

1. Operation and Maintenance manuals shall include the following information:
 - a. Manufacturer's contact address and telephone number for parts and service.
 - b. Instruction books and/or leaflets
 - c. Recommended renewal parts list
 - d. Record Documents for the information required by the Submittals above.

1.4 REFERENCE CODES AND STANDARDS

- A. The equipment in this specification shall be designed and manufactured according to latest revision of the following standards (unless otherwise noted):
1. UL 1449 Third Edition – Surge Protective Devices
 2. UL 1283 Electromagnetic Interference Filters
 3. ANSI/IEEE C62.41.2-2002 – IEEE Recommended Practice on Characterization of Surge Voltages in Low Voltage AC Power Circuits
 4. ANSI/IEEE C62.45-2002 – IEEE Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage AC Power Circuits.
 5. NEC Article 285 - Surge Protective Devices
 6. NEMA/ISCI – 109 Transient Overvoltage Withstand Test
 7. IEEE Std. 472/ANSI C37.90A Surge Withstand Capability Tests
 8. IEC 255.4 Surge Withstand Capability Tests
- B. All SPDs and their installation shall comply with the requirements of the National Electric Code and Underwriters Laboratories (UL) where applicable.
- C. Each specified device shall also conform to the standards and codes listed in the individual device paragraphs.

1.5 QUALITY ASSURANCE

- A. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of five years. When requested by the Owner/Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.
- B. The manufacturer of the SPD shall be the same as the manufacturer of the service entrance and distribution equipment in which the devices are installed and shipped. The protected electrical equipment, after installation of the SPD, shall be fully tested and certified to the following UL standards:
1. UL 67 - Panelboards.
 2. UL 845 - Motor Control Centers.
 3. UL 891 - Switchboards.
 4. UL 1558 - Low Voltage Switchgear.
- C. For the equipment specified herein, the manufacturer shall be ISO 9001 or 9002 certified.

1.6 WARRANTY

- A. Provide warranties, including the manufacturer's warranty, for the equipment specified and the proper installation thereof, to be free from defects in material and workmanship for three years from date of final acceptance of the equipment and its installation. Within such period of warranty, all material and labor necessary to return the equipment to new operating condition shall be provided. Any warranty work requiring shipping or transporting of the equipment shall be provided at no expense to the Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the following Manufacturers are acceptable (Type 1 and Type 2):
1. Eaton
 2. ABB
 3. Schneider Electric Company
 4. Rockwell Automation
 5. Approved equal.
- B. Subject to compliance with the Contract Documents, the following Manufacturers are acceptable (Type 3):
1. Edco SLAC Series
 2. Phoenix Contact
 3. Brick Wall Model PWOM20
 4. No equal.

2.2 SERVICE ENTRANCE AND DISTRIBUTION EQUIPMENT

- A. General
1. All SPDs shall be internal to the equipment being protected. Externally housed SPDs will not be acceptable.
 2. All SPDs shall be marked with a short-circuit current rating and shall meet or exceed the available fault current at the connection point.
 3. UL 1449 Usage Classifications.
 - a. Type 1 – Permanently connected SPDs intended for installation between the secondary of the service transformer and the line side of the service equipment overcurrent device and intended to be installed without an external overcurrent protective device.
 - b. Type 2 – Permanently connected SPDs intended for installation on the load side of service equipment overcurrent device; including SPDs located at the branch panel.
 - c. Type 3 – Point of utilization SPDs, installed at a minimum conductor length of 10 meters (30 feet) from the electrical service panel to the point of utilization, for example cord connected, direct plug-in, receptacle type and SPDs installed at the utilization equipment being protected. The distance (10 meters) is exclusive of conductors provided with or used to attach SPDs.
 4. Construction of Type 1 and Type 2.

- a. Fully Integrated Component Design: All the SPD's components and diagnostics shall be contained within one discrete assembly. SPDs or individual SPD modules that must be ganged together in order to achieve higher surge current ratings or other functionality will not be accepted.
- b. Overcurrent Protection: The unit shall contain thermally protected MOVs. The thermally protected MOVs shall have a thermal protection element packaged together with the MOV to achieve overcurrent protection of the MOV. The thermal protection element shall disconnect the MOV(s) from the system in a fail-safe manner should a condition occur that would cause them to enter a thermal runaway condition.
- c. Maintenance Free Design: The SPD shall be maintenance free and shall not require any user intervention throughout its life. SPDs containing items such as replaceable modules, replaceable fuses, or replaceable batteries are not acceptable. SPDs requiring any maintenance of any sort such as periodic tightening of connections are not acceptable.
- d. Balanced Suppression Platform: The surge current shall be equally distributed to all MOV components to ensure equal stressing and maximum performance. The surge suppression platform must provide equal impedance paths to each matched MOV. Designs incorporating replaceable SPD modules are not acceptable.
- e. Electrical Noise Filter: Each unit shall include a high-performance EMI/RFI noise rejection filter. Noise attenuation for electric line noise shall be up to 50 dB from 10 kHz to 100 MHz using the MIL-STD-220A insertion loss test method.
- f. Internal Connections: No plug-in component modules or printed circuit boards shall be used as surge current conductors. All internal components shall be soldered, hardwired with connections utilizing low impedance conductors.
- g. Power and ground connections shall be prewired within the protected equipment.
- h. Local Monitoring: Visible indication of proper SPD connection and operation shall be provided. The indicator lights shall indicate which phase as well as which module is fully operable. The status of each SPD module shall be monitored on the front cover of the enclosure as well as on the module. A push-to-test button shall be provided to test each phase indicator. Push-to-test button shall activate a state change of dry contacts for testing purposes.
- i. Surge Counter: The SPD shall indicate user how many surges have occurred at the location. The surge counter shall trigger each time a surge event with a peak current magnitude of a minimum of $50 \pm 20A$ occurs. A reset pushbutton shall also be standard, allowing the surge counter to be zeroed. The reset button shall contain a mechanism to prevent accidental resetting of the counter via a single, short-duration button press. To prevent accidental resetting, the surge counter reset button shall be depressed for a minimum of two seconds in order to clear the surge count total. The ongoing surge count shall be stored in non-volatile memory or UPS backup.
- j. Remote Monitoring: For remote monitoring, the SPDs shall provide the same discrete and analog signal and control functions as specified for local monitoring and the surge counter, to a terminal strip for outgoing connection to a PLC as shown on the Drawings. The functions shall be converted as specified for interface to the monitored equipment.
- k. The voltage surge suppression system shall incorporate thermally protected metal-oxide varistors (MOVs) as the core surge suppression component for the service entrance and all other distribution levels. The system shall not utilize silicon avalanche diodes, selenium cells, air gaps, or other components that may crowbar the system voltage leading to system upset or create any environmental hazards.
- l. SPD shall be Listed in accordance with UL 1449 Third Edition and UL 1283, Electromagnetic Interference Filters.

-
- m. Integrated surge protective devices (SPD) shall be Component Recognized in accordance with UL 1449 Third Edition, Section 37.3.2 and 37.4 at the standard's highest short circuit current rating (SCCR) of 200 kA, including intermediate level of fault current testing.
 - n. SPD shall be tested with the ANSI/IEEE Category C High exposure waveform (20kV-1.2/50 μ s, 10kA-8/20 μ s).
 - o. SPD shall provide suppression for all modes of protection: L-N, L-G, and N-G in WYE systems (7 Mode).
5. Construction of Type 3.
- a. Fully Integrated Component Design: All the SPD's components and diagnostics shall be contained within one discrete assembly. SPDs or individual SPD modules that must be ganged together in order to achieve higher surge current ratings or other functionality will not be accepted.
 - b. Maintenance Free Design: The SPD shall be maintenance free and shall not require any user intervention throughout its life. SPDs containing items such as replaceable modules, replaceable fuses, or replaceable batteries are not acceptable. SPDs requiring any maintenance of any sort such as periodic tightening of connections are not acceptable.
 - c. Electrical Noise Filter: Each unit shall include a high-performance EMI/RFI noise rejection filter. Noise attenuation for electric line noise shall be up to 50 dB from 10 kHz to 100 MHz using the MIL-STD-220A insertion loss test method.
 - d. Internal Connections: No plug-in component modules or printed circuit boards shall be used as surge current conductors. All internal components shall be soldered, hardwired with connections utilizing low impedance conductors.
 - e. Power and ground connections shall be prewired within the protected equipment.
 - f. Local Monitoring: Visible indication of proper SPD connection and operation shall be provided. The indicator light shall indicate that the module is fully operable. The status of each SPD module shall be monitored on the front cover of the module.
 - g. SPD shall be Listed in accordance with UL 1449 Third Edition and UL 1283, Electromagnetic Interference Filters.
 - h. SPD shall be tested with the ANSI/IEEE Category C High exposure waveform (20kV-1.2/50 μ s, 10kA-8/20 μ s).
- B. Applications.
1. Service Entrance Rated Equipment (Type 1).
- a. This applies to switchgear, switchboards, panelboards, motor control centers, and other devices installed as service entrance equipment where the SPD is to be permanently connected between the secondary of the service transformer and the line side of the service equipment overcurrent device.
 - b. Service entrance located SPDs shall be tested and demonstrate suitability for application within ANSI/IEEE C62.41 Category C environments.
 - c. The SPD shall be of the same manufacturer as the equipment
 - d. The SPD shall be factory installed inside the equipment, at the assembly point, by the original equipment manufacturer
 - e. Locate the SPD on the load side of the main disconnect device, as close as possible to the phase conductors and the ground/neutral bars.
 - f. The SPD shall be connected through a UL approved disconnecting means. The disconnect shall be in immediate proximity to the SPD. Connection shall be made via bus, conductors, or other connections originating in the SPD and shall be kept as short as possible.
 - g. The SPD shall be integral to the equipment as a factory standardized design.
 - h. All monitoring and diagnostic features shall be visible from the front of the equipment.

-
2. Distribution Equipment Applications (Type 2).
 - a. This applies to switchgear, switchboards, panelboards, motor control centers, and other non-service entrance equipment where the SPD is to be permanently connected on the load side of the equipment overcurrent device.
 - b. The SPD shall be of the same manufacturer as the equipment.
 - c. The SPD shall be included and mounted within the equipment by the manufacturer.
 - d. The manufacturer shall size and provide the overcurrent and disconnecting means for the SPD.
 - e. The SPD units shall be tested and demonstrate suitability for application within ANSI/IEEE C62.41 Category B environments.
 - f. The SPD shall be located within the panelboard, unless otherwise shown on the Drawings. SPDs shall be installed immediately following the load side of the main breaker. SPDs installed in main lug only panelboards shall be installed immediately following the incoming main lugs.
 - g. The SPD shall not limit the use of through-feed lugs, sub-feed lugs, and sub-feed breaker options.
 - h. All monitoring and diagnostic features shall be visible from the front of the equipment.
 3. Individual Control Panel and Related Equipment Protection (Type 3).
 - a. Locate the SPD on the load side of the ground and neutral connections.
 - b. The SPD shall be connected through a disconnect circuit breaker or fuse as shown on the drawings. The disconnecting means shall be in immediate proximity to the SPD. Connection shall be made via bus, conductors, or other connections originating in the SPD and shall be kept as short as possible.
 - c. All monitoring and diagnostic features shall be visible from the front of the equipment.
 4. Mechanical Equipment Manufacturer's Provided Control Panels (MEMs) and Electrical Manufacturer's Provided Control Panels (OEMs) Applications (Type 1, Type 2, and Type 3)
 - a. Where any such panel is installed as service entrance equipment, a Type 1 SPD shall be installed.
 - 1) The same requirements for other service entrance equipment listed above apply to this application except for the requirement that the Type 1 SPD shall not be required to be of the same manufacturer as the panel.
 - b. Where any such panel is installed as non-service entrance equipment, but within 50' of wire length of the incoming power line when that line is overhead.
 - 1) The same requirements for other non-service entrance equipment listed above apply to this application except for the requirement that the Type 2 SPD shall not be required to be of the same manufacturer as the panel.
 - 2) Where a Type 1 SPD is installed, a Type 2 SPD is not required on the same panel unless otherwise specifically shown on the drawings.
 - c. Where any such panel includes a PLC, a Type 3 SPD shall be installed.
 - 1) The same requirements for other individual control panel and related equipment listed above apply to this application.
 - 2) The SPD shall be integral to the MEM or OEM panel, as a factory standardized design.
- C. Ratings
1. Unit Operating Voltage: Refer to drawings for operating voltage and unit configuration.
 2. SPD shall be designed to withstand a maximum continuous operating voltage (MCOV) of not less than 115% of nominal RMS voltage.
 3. Minimum surge current rating shall be 240 kA per phase (120 kA per mode) for service entrance and 120 kA per phase (60 kA per mode) for distribution applications.

4. UL 1449 clamping voltage must not exceed the following: Voltage Protection Rating (VPR)

<u>Voltage</u>	<u>L-N</u>	<u>L-G</u>	<u>N-G</u>
240/120	1200/800V	800V	800V
208Y/120	800V	800V	800V
480Y.277	1200V	1200V	1200V
600Y/347	1500V	1500V	1500V

5. Pulse life test: Capable of protecting against and surviving 5000 ANSI/IEEE Category C High transients without failure or degradation of clamping voltage by more than 10%.
6. Minimum UL 1449 3rd edition withstand Nominal Discharge Current (In) rating to be 20kA per mode

2.3 ACCESSORIES

- A. Furnish nameplates for each device as indicated on drawings. Color schemes shall be as indicated on Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. All equipment specified herein shall be factory installed, field adjusted, tested and cleaned as an integral part of equipment specified elsewhere in the individual equipment Specification.
- B. Types 1 and 2 shall be grounded and bonded as a part of the individual equipment as specified in the individual equipment Section. Type 3 shall be grounded and bonded in accordance with the SPD manufacturer's instructions.

END OF SECTION

**Electrical Improvements at Intersection
of McKinney and Knox
Ennis, TX**

**Gresham Smith
Project No.: 46006.00**

EXHIBIT 1

U.S. Post Office Property – Public Utility Easement

NOTICE OF CONFIDENTIALITY RIGHTS: IF YOU ARE A NATURAL PERSON, YOU MAY REMOVE OR STRIKE ANY OR ALL OF THE FOLLOWING INFORMATION FROM ANY INSTRUMENT THAT TRANSFERS AN INTEREST IN REAL PROPERTY BEFORE IT IS FILED FOR RECORD IN THE PUBLIC RECORDS: YOUR SOCIAL SECURITY NUMBER OR YOUR DRIVER'S LICENSE NUMBER

PUBLIC UTILITY EASEMENT

STATE OF TEXAS §
 §
COUNTY OF ELLIS §

United States Postal Service, 205 N. McKinney Street, Ennis, TX 75119 (“Grantor”), for and in consideration of the sum of TEN AND NO/100 DOLLARS (\$10.00) and other good and valuable consideration in hand paid by the **CITY OF ENNIS, TEXAS**, (“Grantee”), a Texas home rule municipality, whose mailing address is 107 N. Sherman St., Ennis, Ellis County, Texas 75119, the receipt and sufficiency of which is hereby acknowledged, has **DEDICATED, GRANTED, SOLD AND CONVEYED**, and by these presents does **DEDICATE, GRANT, SELL AND CONVEY** unto Grantee, public utility easement over, along, across and under the following described property located in Ellis County, Texas (the “Easement Property”):

Being a Variable Width Public Utility Easement containing approximately 295 square feet or 0.0067 of an acre of land to the City of Ennis, Ellis County, Texas and being situated in the W. H. Bundy Survey, Abstract No. 65, Ellis County, Texas and being more particularly described in Exhibit “A,” said exhibit being attached hereto and incorporated herein by reference.

including the right of ingress, egress, and regress therein, to erect, construct, reconstruct, install, replace, repair, operate, use, inspect, modify, remove and maintain public utilities and appurtenances, equipment, improvements, and appurtenances used in connection with said public utilities and as deemed necessary thereto by said Grantee, over, along, across, under, into and through the Easement Property. Grantee will cause the initial installation of public utilities installed under this Easement to be constructed and installed in a lien-free and good and workmanlike manner.

Upon initial completion of any public utilities and other such facilities, equipment and improvement by Grantee, and upon completion of any subsequent repairs or replacements to same by Grantee, Grantee, at Grantee’s cost, will cause the surface of the Easement Property to be restored in all material respects to the condition in which it existed immediately prior to the respective work (with ordinary wear and tear excluded). If Grantor elects to perform or cause the performance of the work necessary to restore the surface of the Easement Property, Grantee shall reimburse Grantor for such costs not later than thirty (30) days following written demand for such reimbursement.

TO HAVE AND TO HOLD the above described property for Grantee's purposes as deemed necessary by the Grantee, with the right of ingress, egress, and regress therein, together with all and singular the usual rights thereto in anywise belonging, unto the said Grantee, its successors and assigns, forever, and Grantors do hereby bind themselves, their heirs, successors and assigns, to warrant and forever defend, all and singular, the said premises unto the said Grantee, its successors and assigns, against every person whomsoever lawfully claiming or to claim the same or any part thereof.

SIGNED this 20 day of March 2023.

GRANTOR:

United States Postal Service, 205 N. McKinney Street, Ennis, TX 75119

By: Chambers

Its: Tonya Chambers, Postmaster

GRANTOR ACKNOWLEDGMENT

STATE OF TEXAS

COUNTY OF Ennis

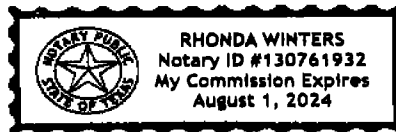
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This instrument was acknowledged before me on the 20 day of March, 2023, by Tony Chambers, the Postmaster of United States Postal Service, 205 N. McKinney Street, Ennis, TX 75119.

Rhonda Winters
Notary Public, State of Texas
My Commission expires: 8/1/2024

AFTER RECORDING RETURN TO:

City of Ennis
Attn: City Secretary
P.O. Box 220
Ennis, Texas 75120



GRANTEE:

Marty Nelson
Marty Nelson, City Manager
City of Ennis

ACKNOWLEDGMENT

STATE OF TEXAS §
COUNTY OF Ellis §

This instrument was acknowledged before me on the 20th day of March, 2023, by Marty Nelson.

Bethany Prewitt
Notary Public, State of Texas
My Commission expires: 01-17-2024

AFTER RECORDING RETURN TO:
City of Ennis
Attn: City Secretary
P.O. Box 220
Ennis, Texas 75120

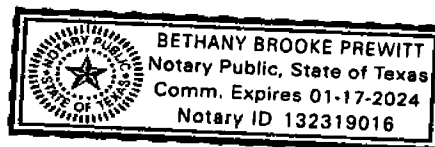


Exhibit "A"

PUBLIC UTILITY EASEMENT
W.H. BUNDY SURVEY, ABSTRACT NO. 65
ELLIS COUNTY, TEXAS

Being a Variable Width Public Utility Easement to the City of Ennis, Ellis County, Texas and being situated in the W. H. Bundy Survey, Abstract No. 65, Ellis County, Texas and being more particularly described by metes and bounds as follows

Beginning at a 3/4 inch iron rod found in concrete at the southeast corner of Lot 1, Block 108 Original Town of Ennis Texas same being at the intersection of the north right of way line of West Knox Street with the west right of way line of North McKinney Street and having State Plane Coordinates of N: 6807807.64, E: 2546355.29 ;

Thence South 59 degrees 03 minutes 00 seconds West, along said north right of way line of said West Knox Street, a distance of 17.92 feet to a point for corner;

Thence North 75 degrees 51 minutes 02 seconds West, departing said right of way line a distance of 10.40 feet to a point for corner;

Thence North 31 degrees 13 minutes 21 seconds West, a distance of 14.14 feet to a point for corner, said point being at the Post Office building wall;

Thence North 58 degrees 46 minutes 39 seconds East, along said wall a distance of 10.00 feet to a point for corner, said point being the building corner of said Post Office.

Thence South 31 degrees 13 minutes 21 seconds East, a distance of 10.00 feet to a point for corner;

Thence South 75 degrees 41 minutes 06 seconds East, a distance of 7.82 feet to a point for corner;

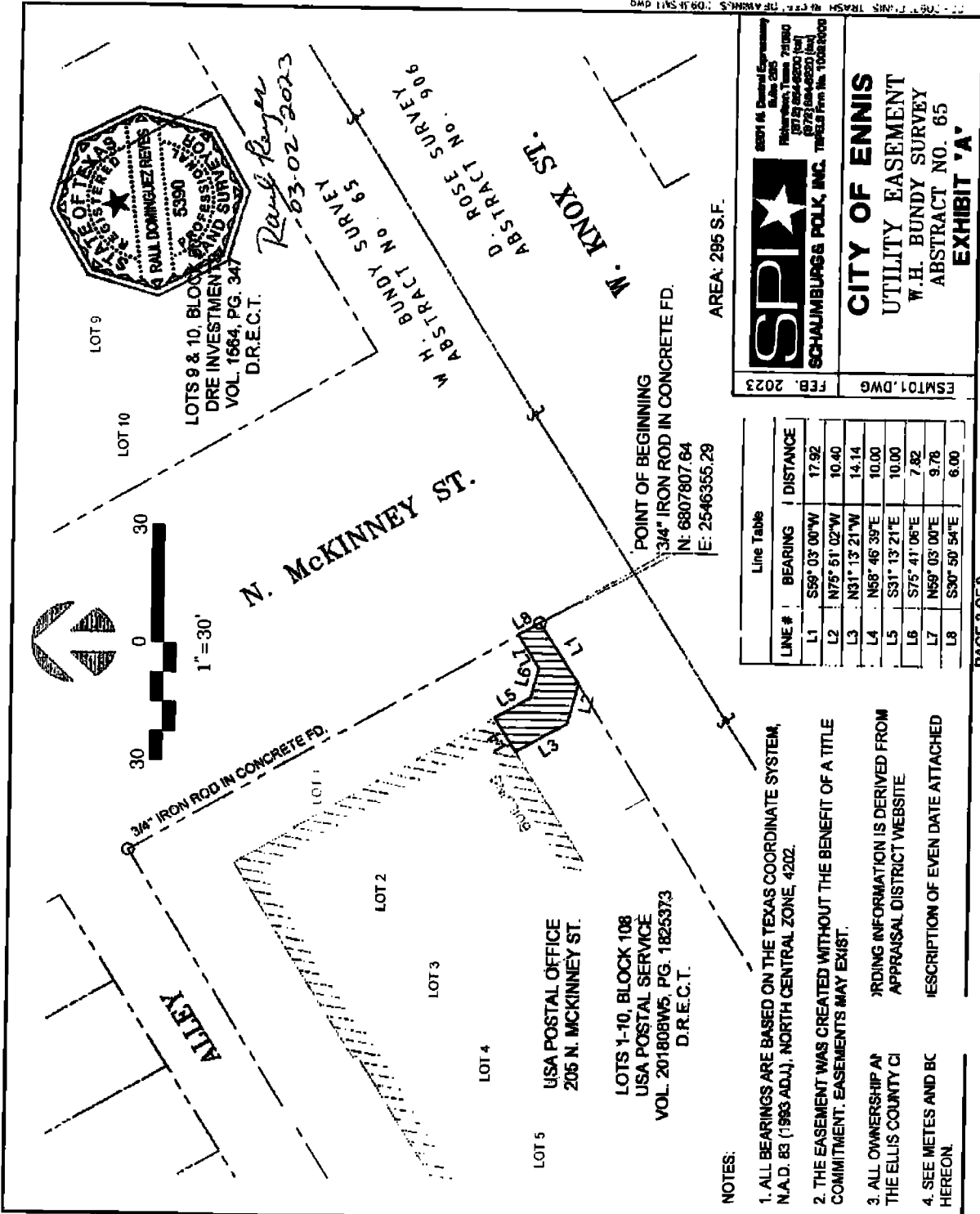
Thence North 59 degrees 03 minutes 00 seconds East, a distance of 9.78 feet to a point in the aforementioned west right of way line of North McKinney Street;

Thence South 30 degrees 50 minutes 54 seconds East, along said west right of way line a distance of 6.00 feet to the **Point of Beginning and containing 295 square feet or 0.0067 of an acre of land.**

1 of 2



Raul Reyes
03-02-2023



ESM101.DWG FEB. 2023

SPI
SCHAUMBURG POLK, INC.
18071 W. Central Expressway
Suite 200
Houston, Texas 77050
(713) 864-8200 (fax)
(713) 864-8200 (cell)
TRIBELS Firm No. 100280000

CITY OF ENNIS
UTILITY EASEMENT
W.H. BUNDY SURVEY
ABSTRACT NO. 65
EXHIBIT 'A'

PAGE 2 OF 2

FILED FOR RECORD - ELLIS COUNTY, TEXAS
INST NO. 2307472 on March 21, 2023 at 11:34 AM

STATE OF TEXAS COUNTY OF ELLIS
I hereby certify this instrument was filed on the date and time stamped hereon and was duly recorded in the records of Ellis County, Texas as stamped hereon.
COUNTY CLERK, ELLIS COUNTY, TEXAS



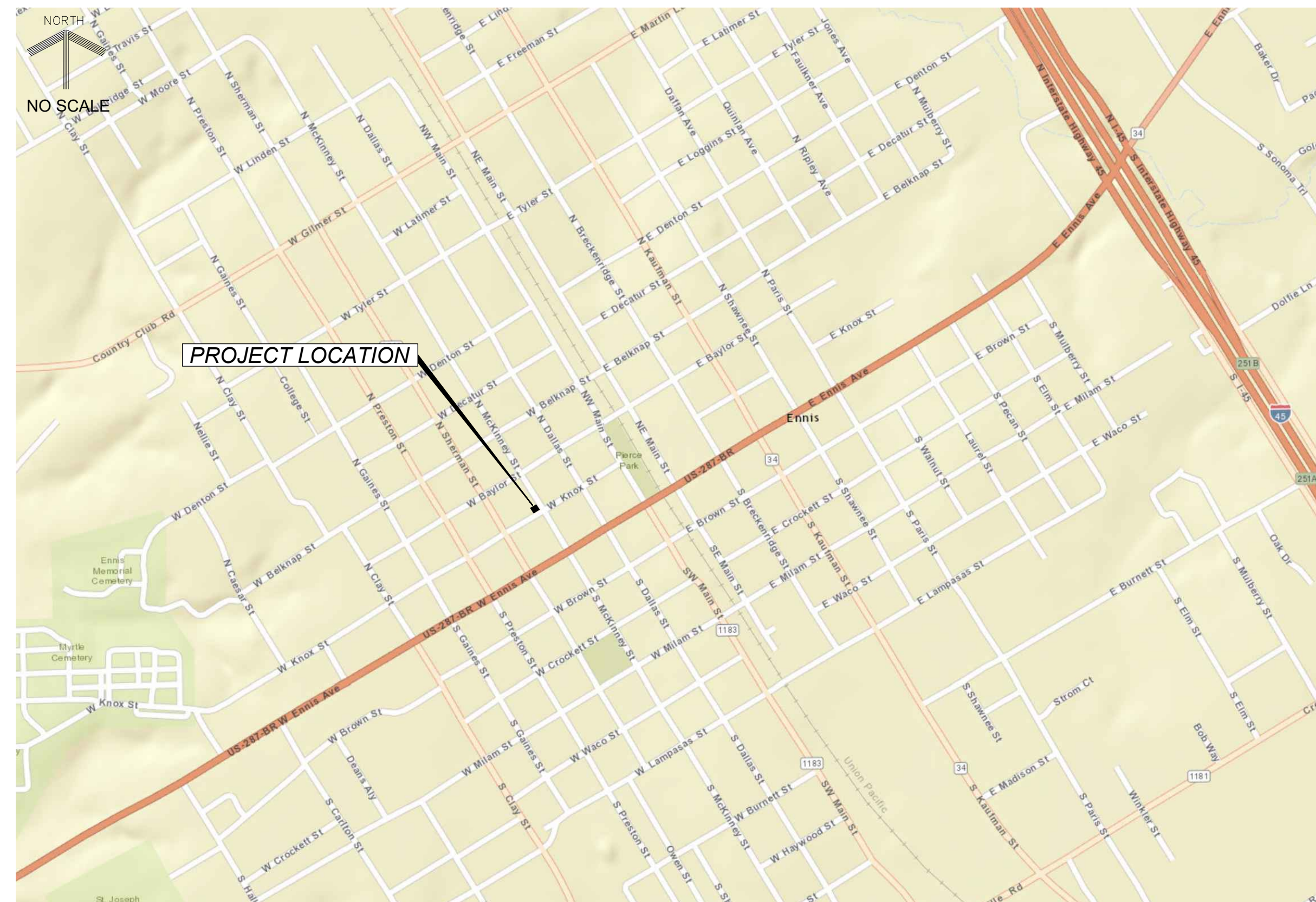
Hugo Valdez

CITY OF ENNIS, TEXAS

ELECTRICAL IMPROVEMENTS AT INTERSECTION OF MCKINNEY AND KNOX MARCH 2023

SHEET INDEX

SHEET NUMBER	DESCRIPTION
G0.01	COVER SHEET
G0.02	GENERAL NOTES (SHEET 1 OF 2)
G0.03	GENERAL NOTES (SHEET 2 OF 2)
C1.00	EROSION CONTROL AND PAVING REPAIR PLAN
C1.01	CIVIL DETAILS (SHEET 1 OF 2)
C1.02	CIVIL DETAILS (SHEET 2 OF 2)
E-01	LEGEND & SYMBOLS - I
E-02	LEGEND & SYMBOLS - II
E-03	GENERAL NOTES
E-04	ELECTRICAL PLAN
E-05	LP-1 PANEL SCHEDULE, ELECTRICAL DETAIL, AND RISER DIAGRAM

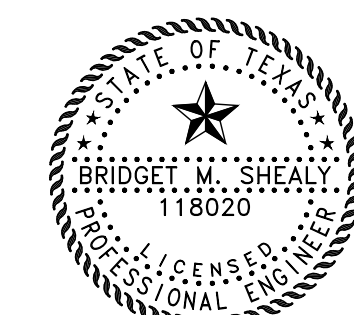


LOCATION MAP

PREPARED FOR:



CITY OF ENNIS
115 WEST BROWN STREET
ENNIS, TEXAS 75119



Bridget M. Shealy
3/21/2023



500 N. Akard Street
Suite 3210
Dallas, TX 75201
214.350.1500
WWW.GRESHAMSMITH.COM
TBPE REG. NO. F-3629



Gupta & Associates, Inc.
CONSULTING ENGINEERING
Texas Registration No. F-2593
13717 Neutron Road
Dallas, Texas 75244
Tel: 972-490-7661
Fax: 972-490-7125
email: vkgupta@gaiconsulting.com

Revision		
No.	Date	Description

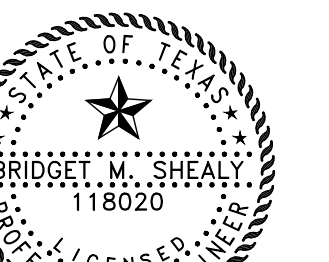


500 N. Akard Street
Suite 3210
Dallas, TX 75201
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CONSULTING ENGINEERING
Texas Registration No. F-2593

**ELECTRICAL
IMPROVEMENTS AT
INTERSECTION OF
MCKINNEY AND KNOX**



Bridget M. Shealy
3/21/2023

Revision		
No.	Date	Description

GENERAL NOTES (1 OF 2)

GO.02

PROJECT: 46006.00
DATE: MAR 2023

GENERAL:

- ALL WATER, SANITARY SEWER, STREET, LIGHTING, AND DRAINAGE IMPROVEMENTS WITHIN THE PUBLIC RIGHT-OF-WAY OR UTILITY EASEMENTS SHALL CONFORM TO THE REQUIREMENTS OF THE MOST CURRENT VERSION OF THE CITY OF ENNIS STANDARD CONSTRUCTION DETAILS & INFRASTRUCTURE DESIGN STANDARDS (IDS).
- ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THESE PLANS, CITY IDS, THE FINAL GEOTECHNICAL REPORT AND ALL ISSUED ADDENDA, CITY STANDARD CONSTRUCTION DETAILS, AND COMMONLY ACCEPTED CONSTRUCTION STANDARDS. THE CITY IDS SHALL GOVERN WHERE OTHER SPECIFICATIONS DO NOT EXIST. IN CASE OF CONFLICTING SPECIFICATIONS OR DETAILS, THE MORE RESTRICTIVE SPECIFICATION AND DETAIL SHALL BE FOLLOWED.
- THE CONTRACTOR SHALL COMPLY WITH CITY "GENERAL CONSTRUCTION NOTES" FOR CONSTRUCTION.
- THE CONTRACTOR SHALL FURNISH ALL MATERIAL AND LABOR TO CONSTRUCT THE FACILITY AS SHOWN AND DESCRIBED IN THE CONSTRUCTION DOCUMENTS IN ACCORDANCE WITH THE APPROPRIATE AUTHORITIES' SPECIFICATIONS AND REQUIREMENTS.
- THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING TO DETERMINE EXISTING CONDITIONS.
- THE EXISTING CONDITIONS SHOWN ON THESE PLANS WERE PROVIDED BY THE TOPOGRAPHIC SURVEY PREPARED BY THE PROJECT SURVEYOR, AND ARE BASED ON THE BENCHMARKS SHOWN. THE CONTRACTOR SHALL REFERENCE THE SAME BENCHMARKS.
- THE CONTRACTOR SHALL REVIEW AND VERIFY THAT THE EXISTING TOPOGRAPHIC SURVEY SHOWN ON THE PLANS REPRESENTS EXISTING FIELD CONDITIONS PRIOR TO CONSTRUCTION, AND SHALL REPORT ANY DISCREPANCIES FOUND TO THE DESIGN ENGINEER IMMEDIATELY.
- IF THE CONTRACTOR DOES NOT ACCEPT THE EXISTING TOPOGRAPHIC SURVEY AS SHOWN ON THE PLANS, WITHOUT EXCEPTION, THEN THE CONTRACTOR SHALL SUPPLY AT THEIR OWN EXPENSE, A TOPOGRAPHIC SURVEY BY A REGISTERED PROFESSIONAL LAND SURVEYOR TO THE DESIGN ENGINEER AND CITY FOR REVIEW.
- CONTRACTOR SHALL PROVIDE ALL CONSTRUCTION SURVEYING AND STAKING.
- CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL CONTROL, INCLUDING BENCHMARKS PRIOR TO COMMENCING CONSTRUCTION OR STAKING OF IMPROVEMENTS. PROPERTY LINES AND CORNERS SHALL BE UTILIZED FOR HORIZONTAL CONTROL.
- THE CONTRACTOR SHALL REVIEW AND VERIFY ALL DIMENSIONS, ELEVATIONS, AND FIELD CONDITIONS THAT MAY AFFECT CONSTRUCTION. ANY DISCREPANCIES ON THE DRAWINGS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER BEFORE COMMENCING WORK. NO FIELD CHANGES OR DEVIATIONS FROM DESIGN ARE TO BE MADE WITHOUT PRIOR APPROVAL OF THE ARCHITECT, DESIGN ENGINEER, AND THE CITY. NO CONSIDERATION WILL BE GIVEN TO CHANGE ORDERS FOR WHICH THE CITY AND DESIGN ENGINEER WERE NOT CONTACTED PRIOR TO CONSTRUCTION OF THE AFFECTED ITEM.
- CONTRACTOR IS STRONGLY CAUTIONED TO REVIEW THE FOLLOWING REPORTS DESCRIBING SITE CONDITIONS PRIOR TO BIDDING AND BEGINNING CONSTRUCTION:
 - ENVIRONMENTAL SITE ASSESSMENT PROVIDED BY THE OWNER,
 - ASBESTOS BUILDING INSPECTION REPORT(S) PROVIDED BY THE OWNER,
 - GEOTECHNICAL REPORT PROVIDED BY THE OWNER,
 - OTHER REPORTS THAT ARE APPLICABLE AND AVAILABLE.
- CONTRACTOR SHALL THOROUGHLY CHECK COORDINATION OF CIVIL, LANDSCAPE, MEP, ARCHITECTURAL, AND OTHER PLANS PRIOR TO COMMENCING CONSTRUCTION. DESIGN ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY PRIOR TO COMMENCING WITH CONSTRUCTION.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE VARIOUS UTILITY COMPANIES WHICH MAY HAVE BURIED OR AERIAL UTILITIES WITHIN OR NEAR THE CONSTRUCTION AREA BEFORE COMMENCING WORK TO HAVE THEM LOCATE THEIR EXISTING UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE 48-HRS MINIMUM NOTICE TO ALL UTILITY COMPANIES PRIOR TO BEGINNING CONSTRUCTION.
- CONTRACTOR SHALL USE EXTREME CAUTION AS THE SITE MAY CONTAIN VARIOUS KNOWN AND UNKNOWN PUBLIC AND PRIVATE UTILITIES.
- THE LOCATIONS, ELEVATIONS, DEPTH, AND DIMENSIONS OF EXISTING UTILITIES SHOWN ON THE PLANS WERE OBTAINED FROM AVAILABLE UTILITY COMPANY MAPS AND PLANS TOPOGRAPHIC SURVEY OF LOCATE FLAGS, AND CONSTRUCTION AS-BUILT RECORDS, AND ARE CONSIDERED APPROXIMATE AND INCOMPLETE. IT SHALL BE THE CONTRACTORS' RESPONSIBILITY TO VERIFY THE PRESENCE, LOCATION, ELEVATION, DEPTH, AND DIMENSION OF EXISTING UTILITIES SUFFICIENTLY IN ADVANCE OF CONSTRUCTION SO THAT ADJUSTMENTS CAN BE MADE TO PROVIDE ADEQUATE CLEARANCES. THE DESIGN ENGINEER SHALL BE NOTIFIED WHEN A PROPOSED IMPROVEMENT CONFLICTS WITH AN EXISTING UTILITY.
- THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING ANY ADJUSTMENTS AND RELOCATIONS OF EXISTING UTILITIES THAT CONFLICT WITH THE PROPOSED IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO, ADJUSTING EXISTING MANHOLES TO MATCH PROPOSED GRADE, RELOCATING EXISTING POLES AND GUY WIRES THAT ARE LOCATED IN PROPOSED DRIVEWAYS, ADJUSTING THE HORIZONTAL OR VERTICAL ALIGNMENT OF EXISTING UNDERGROUND UTILITIES TO ACCOMMODATE PROPOSED GRADE OR CROSSING WITH A PROPOSED UTILITY, AND ANY OTHERS THAT MAY BE ENCOUNTERED THAT ARE UNKNOWN AT THIS TIME AND NOT SHOWN ON THESE PLANS.
- CONTRACTOR SHALL ARRANGE FOR OR PROVIDE, AT ITS EXPENSE, ALL GAS, TELECOMMUNICATIONS, CABLE, OVERHEAD AND UNDERGROUND POWER LINE, AND UTILITY POLE ADJUSTMENTS NEEDED.
- CONTRACTOR IS RESPONSIBLE FOR COORDINATING INSTALLATION OF FRANCHISE UTILITIES THAT ARE NECESSARY FOR ON-SITE AND OFF-SITE CONSTRUCTION, AND SERVICE TO THE PROPOSED DEVELOPMENT.

- THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ALL DAMAGES DUE TO THE CONTRACTORS' FAILURE TO EXACTLY LOCATE AND PRESERVE ALL UTILITIES. THE OWNER OR ENGINEER WILL ASSUME NO LIABILITY FOR ANY DAMAGES SUSTAINED OR COST INCURRED BECAUSE OF THE CONTRACTORS' OPERATIONS IN THE VICINITY OF EXISTING UTILITIES OR STRUCTURES. IF IT IS NECESSARY TO SHORE, BRACE, SWING OR RELOCATE A UTILITY, THE UTILITY COMPANY OR DEPARTMENT AFFECTED SHALL BE CONTACTED BY THE CONTRACTOR AND THEIR PERMISSION OBTAINED REGARDING THE METHOD TO USE FOR SUCH WORK.
- BRACING OF UTILITY POLES MAY BE REQUIRED BY THE UTILITY COMPANIES WHEN TRENCHING OR EXCAVATING IN CLOSE PROXIMITY TO THE POLES. THE COST OF BRACING POLES WILL BE BORNE BY THE CONTRACTOR, WITH NO SEPARATE PAY ITEM FOR THIS WORK. THE COST IS INCIDENTAL TO THE VARIOUS UNIT BID PRICES OF THIS CONTRACT.
- CONTRACTOR SHALL USE ALL NECESSARY SAFETY PRECAUTIONS TO AVOID CONTACT WITH OVERHEAD AND UNDERGROUND POWER LINES. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LOCAL, STATE, FEDERAL AND UTILITY OWNER REGULATIONS PERTAINING TO WORK SETBACKS FROM POWER LINES.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN ALL REQUIRED CONSTRUCTION PERMITS, APPROVALS, AND BONDS PRIOR TO CONSTRUCTION.
- THE CONTRACTOR SHALL HAVE AVAILABLE AT THE JOB SITE AT ALL TIMES A COPY OF THE CONTRACT DOCUMENTS INCLUDING PLANS, GEOTECHNICAL REPORT AND ADDENDA, PROJECT AND CITY SPECIFICATIONS, AND SPECIAL CONDITIONS, COPIES OF ANY REQUIRED CONSTRUCTION PERMITS, EROSION CONTROL PLANS, SWPPP AND INSPECTION REPORTS.
- ALL SHOP DRAWINGS AND OTHER DOCUMENTS THAT REQUIRE ENGINEER REVIEW SHALL BE SUBMITTED BY THE CONTRACTOR SUFFICIENTLY IN ADVANCE OF CONSTRUCTION OF THAT ITEM, SO THAT NO LESS THAN 10 BUSINESS DAYS FOR REVIEW AND RESPONSE IS AVAILABLE.
- ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES, JURISDICTIONAL AGENCIES, AND/OR UTILITY SERVICE COMPANIES SHALL BE PERFORMED PRIOR TO USE OF THE FACILITY AND THE FINAL CONNECTION OF SERVICES.
- CONTRACTOR SHALL ARRANGE FOR REQUIRED CITY INSPECTIONS.
- CONTRACTOR'S BID PRICE SHALL INCLUDE ALL INSPECTION FEES.
- ALL SYMBOLS SHOWN ON THESE PLANS (E.G. FIRE HYDRANT, METERS, VALVES, INLETS, ETC...) ARE FOR PRESENTATION PURPOSES ONLY AND ARE NOT TO SCALE. CONTRACTOR SHALL COORDINATE FINAL SIZES AND LOCATIONS WITH APPROPRIATE CITY INSPECTOR.
- ALL CONSTRUCTION SHALL COMPLY WITH THE PROJECT'S FINAL GEOTECHNICAL REPORT (OR LATEST EDITION), INCLUDING SUBSEQUENT ADDENDA.
- CONTRACTOR IS RESPONSIBLE FOR ALL MATERIALS TESTING AND CERTIFICATION, UNLESS SPECIFIED OTHERWISE BY OWNER. ALL MATERIALS TESTING SHALL BE COORDINATED WITH THE APPROPRIATE CITY INSPECTOR AND COMPLY WITH CITY IDS AND GEOTECHNICAL REPORT. TESTING SHALL BE PERFORMED BY AN APPROVED INDEPENDENT AGENCY FOR TESTING MATERIALS. OWNER SHALL APPROVE THE AGENCY NOMINATED BY THE CONTRACTOR FOR MATERIALS TESTING.
- ALL COPIES OF MATERIALS TEST RESULTS SHALL BE SENT TO THE OWNER, ENGINEER AND ARCHITECT DIRECTLY FROM THE TESTING AGENCY.
- IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO SHOW, BY THE STANDARD TESTING PROCEDURES OF THE MATERIALS, THAT THE WORK CONSTRUCTED MEETS THE PROJECT REQUIREMENTS AND CITY SPECIFICATIONS.
- ALL CONTRACTORS MUST CONFINE THEIR ACTIVITIES TO THE WORK AREA. NO ENCROACHMENTS OUTSIDE OF THE WORK AREA WILL BE ALLOWED. ANY DAMAGE RESULTING THEREFROM SHALL BE CONTRACTOR'S SOLE RESPONSIBILITY TO REPAIR.
- THE CONTRACTOR SHALL PROTECT ALL EXISTING STRUCTURES, UTILITIES, MANHOLES, POLES, GUY WIRES, VALVE COVERS, VAULT LIDS, FIRE HYDRANTS, COMMUNICATION BOXES/PEDESTALS, AND OTHER FACILITIES TO REMAIN AND SHALL REPAIR ANY DAMAGES AT NO COST TO THE OWNER. REPAIRS SHALL BE TO THE SAME OR BETTER CONDITION.
- THE CONTRACTOR SHALL IMMEDIATELY REPAIR OR REPLACE ANY PHYSICAL DAMAGE TO PRIVATE PROPERTY OR PUBLIC IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO: FENCES, WALLS, SIGNS, PAVEMENT, CURBS, UTILITIES, SIDEWALKS, GRASS, TREES, LANDSCAPING, AND IRRIGATION SYSTEMS, ETC... TO ORIGINAL CONDITION OR BETTER AT NO COST TO THE OWNER.
- ALL AREAS IN EXISTING RIGHT-OF-WAY DISTURBED BY SITE CONSTRUCTION SHALL BE REPAIRED TO ORIGINAL CONDITION OR BETTER, INCLUDING AS NECESSARY GRADING, LANDSCAPING, CULVERTS, AND PAVEMENT.
- THE CONTRACTOR SHALL SALVAGE ALL EXISTING POWER POLES, SIGNS, WATER VALVES, FIRE HYDRANTS, METERS, ETC... THAT ARE TO BE RELOCATED DURING CONSTRUCTION.
- CONTRACTOR SHALL MAINTAIN ADEQUATE SITE DRAINAGE DURING ALL PHASES OF CONSTRUCTION, INCLUDING MAINTAINING EXISTING DITCHES OR CULVERTS FREE OF OBSTRUCTIONS AT ALL TIMES.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SUBMITTING A TRENCH SAFETY PLAN, PREPARED BY A PROFESSIONAL ENGINEER IN THE STATE OF TEXAS, TO THE CITY PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING TRENCH SAFETY REQUIREMENTS IN ACCORDANCE WITH CITY, STATE, AND FEDERAL REQUIREMENTS, INCLUDING OSHA FOR ALL TRENCHES. NO OPEN TRENCHES SHALL BE ALLOWED OVERNIGHT WITHOUT PRIOR WRITTEN APPROVAL OF THE CITY.
- THE CONTRACTOR SHALL KEEP TRENCHES FREE FROM WATER.
- SITE SAFETY IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.
- THESE PLANS DO NOT EXTEND TO OR INCLUDE DESIGNS OR SYSTEMS PERTAINING TO THE SAFETY OF THE CONTRACTOR OR ITS EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE ENGINEER'S SEAL HEREON DOES NOT EXTEND TO ANY SUCH

- SAFETY SYSTEM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTATION OF ALL REQUIRED SAFETY PROCEDURES AND PROGRAMS.
- CONTRACTOR OFFICE AND STAGING AREA SHALL BE AGREED ON BY THE OWNER, CONTRACTOR, AND THE CITY PRIOR TO BEGINNING OF CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR ALL PERMITTING REQUIREMENTS FOR THE CONSTRUCTION OFFICE, TRAILER, STORAGE, AND STAGING OPERATIONS AND LOCATIONS.
- LIGHT POLES, SIGNS, AND OTHER OBSTRUCTIONS SHALL NOT BE PLACED IN ACCESSIBLE ROUTES.
- ALL SIGNS, PAVEMENT MARKINGS, AND OTHER TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".
- TOP RIM ELEVATIONS OF ALL EXISTING AND PROPOSED MANHOLES SHALL BE COORDINATED WITH TOP OF PAVEMENT OR FINISHED GRADE AND SHALL BE ADJUSTED TO BE FLUSH WITH THE ACTUAL FINISHED GRADE AT THE TIME OF PAVING.
- CONTRACTOR SHALL ADJUST ALL EXISTING AND PROPOSED VALVES, FIRE HYDRANTS, AND OTHER UTILITY APPURTENANCES TO MATCH ACTUAL FINISHED GRADES AT THE TIME OF PAVING.
- THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION SEQUENCING AND PHASING, AND SHALL CONTACT THE APPROPRIATE CITY OFFICIALS, INCLUDING BUILDING OFFICIAL, ENGINEERING INSPECTOR, AND FIRE MARSHALL TO LEARN OF ANY REQUIREMENTS.
- CONTRACTOR IS RESPONSIBLE FOR PREPARATION, SUBMITTAL, AND APPROVAL BY THE CITY OF A TRAFFIC CONTROL PLAN (TCP) PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING AND IMPLEMENTING THE APPROVED TCP, MAINTAINING THROUGHOUT CONSTRUCTION, AND REMOVING UPON COMPLETION OF CONSTRUCTION.
- CONTRACTOR SHALL KEEP A NEAT AND ACCURATE RECORD OF CONSTRUCTION, INCLUDING ANY DEVIATIONS OR VARIANCES FROM THE PLANS. (REDLINE DRAWINGS).
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AS-BUILT PLANS TO THE ENGINEER AND CITY IDENTIFYING ALL DEVIATIONS AND VARIATIONS FROM THESE PLANS MADE DURING CONSTRUCTION.

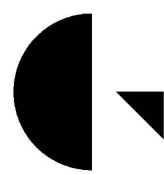
EROSION CONTROL AND STORM WATER DISCHARGE:

- THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL EROSION CONTROL AND WATER QUALITY REQUIREMENTS, LAWS, AND ORDINANCES THAT APPLY TO THE CONSTRUCTION SITE LAND DISTURBANCE.
- CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE "TCEQ GENERAL PERMIT TO DISCHARGE UNDER THE TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM TXR 150000".
- CONTRACTOR SHALL COMPLY WITH ALL TCEQ AND EPA STORM WATER POLLUTION PREVENTION REQUIREMENTS.
- THE CONTRACTOR SHALL ENSURE THAT ALL PRIMARY OPERATORS SUBMIT A NOI, IF APPLICABLE, TO TCEQ AT LEAST SEVEN DAYS PRIOR TO COMMENCING CONSTRUCTION, OR IF UTILIZING ELECTRONIC SUBMITTAL, PRIOR TO COMMENCING CONSTRUCTION. ALL PRIMARY OPERATORS SHALL PROVIDE A COPY OF THE SIGNED NOI TO THE OPERATOR OF ANY MS4 (TYPICALLY THE CITY) RECEIVING DISCHARGE FROM THE SITE.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE IMPLEMENTATION OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP), IF APPLICABLE, INCLUDING POSTING SITE NOTICE, INSPECTIONS, DOCUMENTATION, AND SUBMISSION OF ANY INFORMATION REQUIRED BY THE TCEQ AND EPA (E.G. NOI).
- ALL CONTRACTORS AND SUBCONTRACTORS PROVIDING SERVICES RELATED TO THE SWPPP SHALL SIGN THE REQUIRED CONTRACTOR CERTIFICATION STATEMENT ACKNOWLEDGING THEIR RESPONSIBILITIES AS SPECIFIED IN THE SWPPP.
- A COPY OF THE SWPPP, INCLUDING NOI, SITE NOTICE, CONTRACTOR CERTIFICATIONS, AND ANY REVISIONS, SHALL BE SUBMITTED TO THE CITY BY THE CONTRACTOR AND SHALL BE RETAINED ON-SITE DURING CONSTRUCTION.
- A NOTICE OF TERMINATION (NOT), IF APPLICABLE, SHALL BE SUBMITTED TO TCEQ BY ANY PRIMARY OPERATOR WITHIN 30 DAYS AFTER ALL SOIL DISTURBING ACTIVITIES AT THE SITE HAVE BEEN COMPLETED AND A UNIFORM VEGETATIVE COVER HAS BEEN ESTABLISHED ON ALL UNPAVED AREAS AND AREAS NOT COVERED BY STRUCTURES, A TRANSFER OF OPERATIONAL CONTROL HAS OCCURRED, OR THE OPERATOR HAS OBTAINED ALTERNATIVE AUTHORIZATION UNDER A DIFFERENT PERMIT. A COPY OF THE NOT SHALL BE PROVIDED TO THE OPERATOR OF ANY MS4 RECEIVING DISCHARGE FROM THE SITE.
- EROSION CONTROL DEVICES SHOWN ON THE EROSION CONTROL PLAN FOR THE PROJECT SHALL BE INSTALLED PRIOR TO THE START OF LAND DISTURBANCE.
- ALL EROSION CONTROL DEVICES ARE TO BE INSTALLED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS FOR THE PROJECT.
- CONTRACTOR IS SOLELY RESPONSIBLE FOR INSTALLATION, IMPLEMENTATION, MAINTENANCE, AND EFFECTIVENESS OF ALL EROSION CONTROL DEVICES, BEST MANAGEMENT PRACTICES (BMPs), AND FOR UPDATING THE EROSION CONTROL PLAN DURING CONSTRUCTION AS FIELD CONDITIONS CHANGE.
- CONTRACTOR SHALL DOCUMENT THE DATES OF INSTALLATION, MAINTENANCE OR MODIFICATION, AND REMOVAL FOR EACH BMP EMPLOYED IN THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IF APPLICABLE.
- AS STORM SEWER INLETS ARE INSTALLED ON-SITE, TEMPORARY EROSION CONTROL DEVICES SHALL BE INSTALLED AT EACH INLET PER APPROVED DETAILS.
- THE EROSION CONTROL DEVICES SHALL REMAIN IN PLACE UNTIL THE AREA IT PROTECTS HAS BEEN PERMANENTLY STABILIZED.
- CONTRACTOR SHALL PROVIDE ADEQUATE EROSION CONTROL DEVICES NEEDED DUE TO PROJECT PHASING.

- CONTRACTOR SHALL OBSERVE THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES AND MAKE FIELD ADJUSTMENTS AND MODIFICATIONS AS NEEDED TO PREVENT SEDIMENT FROM LEAVING THE SITE. IF THE EROSION CONTROL DEVICES DO NOT EFFECTIVELY CONTROL EROSION AND PREVENT SEDIMENTATION FROM WASHING OFF THE SITE, THEN THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
- OFF-SITE SOIL BORROW, SPOIL, AND STORAGE AREAS (IF APPLICABLE) ARE CONSIDERED AS PART OF THE PROJECT SITE AND MUST ALSO COMPLY WITH THE EROSION CONTROL REQUIREMENTS FOR THIS PROJECT. THIS INCLUDES THE INSTALLATION OF BMP'S TO CONTROL EROSION AND SEDIMENTATION AND THE ESTABLISHMENT OF PERMANENT GROUND COVER ON DISTURBED AREAS PRIOR TO FINAL APPROVAL OF THE PROJECT. CONTRACTOR IS RESPONSIBLE FOR MODIFYING THE SWPPP AND EROSION CONTROL PLAN TO INCLUDE BMP'S FOR ANY OFF-SITE THAT ARE NOT ANTICIPATED OR SHOWN ON THE EROSION CONTROL PLAN.
- ALL STAGING, STOCKPILES, SPOIL, AND STORAGE SHALL BE LOCATED SUCH THAT THEY WILL NOT ADVERSELY AFFECT STORM WATER QUALITY. PROTECTIVE MEASURES SHALL BE PROVIDED IF NEEDED TO ACCOMPLISH THIS REQUIREMENT, SUCH AS COVERING OR ENCRICLING THE AREA WITH AN APPROPRIATE BARRIER.
- CONTRACTORS SHALL INSPECT ALL EROSION CONTROL DEVICES, BMP'S, DISTURBED AREAS, AND VEHICLE ENTRY AND EXIT AREAS WEEKLY AND WITHIN 24 HOURS OF ALL RAINFALL EVENTS OF 0.5 INCHES OR GREATER, AND KEEP A RECORD OF THIS INSPECTION IN THE SWPPP BOOKLET IF APPLICABLE, TO VERIFY THAT THE DEVICES AND EROSION CONTROL PLAN ARE FUNCTIONING PROPERLY.
- CONTRACTOR SHALL CONSTRUCT A STABILIZED CONSTRUCTION ENTRANCE AT ALL PRIMARY POINTS OF ACCESS IN ACCORDANCE WITH CITY SPECIFICATIONS. CONTRACTOR SHALL ENSURE THAT ALL CONSTRUCTION TRAFFIC USES THE STABILIZED ENTRANCE AT ALL TIMES FOR ALL INGRESS/EGRESS.
- SITE ENTRY AND EXITS SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT THE TRACKING AND FLOWING OF SEDIMENT AND DIRT ONTO OFF-SITE ROADWAYS. ALL SEDIMENT AND DIRT FROM THE SITE THAT IS DEPOSITED ONTO AN OFF-SITE ROADWAY SHALL BE REMOVED IMMEDIATELY.
- THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL SILT AND DEBRIS FROM THE AFFECTED OFF-SITE ROADWAYS THAT ARE A RESULT OF THE CONSTRUCTION, AS REQUESTED BY OWNER AND CITY. AT A MINIMUM, THIS SHOULD OCCUR ONCE PER DAY FOR THE OFF-SITE ROADWAYS.
- WHEN WASHING OF VEHICLES IS REQUIRED TO REMOVE SEDIMENT PRIOR TO EXITING THE SITE, IT SHALL BE DONE IN AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP BMP.
- CONTRACTOR SHALL INSTALL A TEMPORARY SEDIMENT BASIN FOR ANY ON-SITE DRAINAGE AREAS THAT ARE GREATER THAN 10 ACRES, PER TCEQ AND CITY STANDARDS. IF NO ENGINEERING DESIGN HAS BEEN PROVIDED FOR A SEDIMENTATION BASIN ON THESE PLANS, THEN THE CONTRACTOR SHALL ARRANGE FOR AN APPROPRIATE DESIGN TO BE PROVIDED.
- ALL FINES IMPOSED FOR SEDIMENT OR DIRT DISCHARGED FROM THE SITE SHALL BE PAID BY THE RESPONSIBLE CONTRACTOR.
- WHEN SEDIMENT OR DIRT HAS CLOGGED THE CONSTRUCTION ENTRANCE VOID SPACES BETWEEN STONES OR DIRT IS BEING TRACKED ONTO A ROADWAY, THE AGGREGATE PAD MUST BE WASHED DOWN OR REPLACED. RUNOFF FROM THE WASH-DOWN OPERATION SHALL NOT BE ALLOWED TO DRAIN DIRECTLY OFF SITE WITHOUT FIRST FLOWING THROUGH ANOTHER BMP TO CONTROL SEDIMENTATION. PERIODIC RE-GRADING OR NEW STONE MAY BE REQUIRED TO MAINTAIN THE EFFECTIVENESS OF THE CONSTRUCTION ENTRANCE.
- TEMPORARY SEEDING OR OTHER APPROVED STABILIZATION SHALL BE INITIATED WITHIN 14 DAYS OF THE LAST DISTURBANCE OF ANY AREA, UNLESS ADDITIONAL CONSTRUCTION IN THE AREA IS EXPECTED WITHIN 21 DAYS OF THE LAST DISTURBANCE.
- CONTRACTOR SHALL FOLLOW GOOD HOUSEKEEPING PRACTICES DURING CONSTRUCTION, ALWAYS CLEANING UP DIRT, LOOSE MATERIAL, AND TRASH AS CONSTRUCTION PROGRESSES.
- UPON COMPLETION OF FINE GRADING, ALL SURFACES OF DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED. STABILIZATION IS ACHIEVED WHEN THE AREA IS EITHER COVERED BY PERMANENT IMPERVIOUS STRUCTURES, SUCH AS BUILDINGS, SIDEWALK, PAVEMENT, OR A UNIFORM PERENNIAL VEGETATIVE COVER.
- AT THE CONCLUSION OF THE PROJECT, ALL INLETS, DRAIN PIPE, CHANNELS, DRAINAGEWAYS AND BORROW DITCHES AFFECTED BY THE CONSTRUCTION SHALL BE DREDGED, AND THE SEDIMENT GENERATED BY THE PROJECT SHALL BE REMOVED AND DISPOSED IN ACCORDANCE WITH APPLICABLE REGULATIONS.

DEMOLITION:

- THIS PLAN IS INTENDED TO GIVE A GENERAL GUIDE TO THE CONTRACTOR, NOTHING MORE. THE GOAL OF THE DEMOLITION IS TO LEAVE THE SITE IN A STATE SUITABLE FOR THE CONSTRUCTION OF THE PROPOSED DEVELOPMENT. REMOVAL OR PRESERVATION OF IMPROVEMENTS, UTILITIES, ETC. TO ACCOMPLISH THIS GOAL ARE THE RESPONSIBILITY OF THE CONTRACTOR.
- CONTRACTOR SHALL CONTACT THE OWNER TO VERIFY WHETHER ADDITIONAL REPORTS OR AMENDMENTS TO THE ABOVE CITED REPORTS HAVE BEEN PREPARED AND TO OBTAIN/REVIEW/AND COMPLY WITH THE RECOMMENDATION OF SUCH STUDIES PRIOR TO STARTING ANY WORK ON THE SITE.
- CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS REGARDING THE DEMOLITION OF OBJECTS ON THE SITE AND THE DISPOSAL OF THE DEMOLISHED MATERIALS OFF-SITE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO REVIEW THE SITE, DETERMINE THE APPLICABLE REGULATIONS, OBTAIN THE REQUIRED PERMITS AND AUTHORIZATIONS, AND COMPLY.
- SURFACE PAVEMENT INDICATED FOR REMOVAL MAY OVERLAY OTHER HIDDEN STRUCTURES, SUCH AS ADDITIONAL LAYERS OF PAVEMENT, FOUNDATIONS OR WALLS, THAT ARE ALSO TO BE REMOVED.



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ELECTRICAL IMPROVEMENTS AT INTERSECTION OF MCKINNEY AND KNOX



Table with 3 columns: No., Date, Description. Header row: Revision

GENERAL NOTES (2 OF 2)

G0.03

PROJECT: 44595.00 DATE: MAR 2023

GRADING:

- 1. THE CONTRACTOR SHALL VERIFY THE SUITABILITY OF EXISTING AND PROPOSED SITE CONDITIONS INCLUDING GRADES AND DIMENSIONS BEFORE START OF CONSTRUCTION. THE CIVIL ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES.
2. CONTRACTOR SHALL OBTAIN ANY REQUIRED GRADING PERMITS FROM THE CITY.
3. UNLESS OTHERWISE NOTED, PROPOSED CONTOURS AND SPOT ELEVATIONS SHOWN IN PAVED AREA REFLECT TOP OF PAVEMENT SURFACE. IN LOCATIONS ALONG A CURB LINE, ADD 6-INCHES (OR THE HEIGHT OF THE CURB) TO THE PAVING GRADE FOR TOP OF CURB ELEVATION.

- 25. EXISTING TREE LOCATIONS SHOWN ON THESE PLANS ARE APPROXIMATE. CONTRACTOR SHALL REPORT ANY DISCREPANCIES FOUND IN THE FIELD THAT AFFECT THE GRADING PLAN TO THE CIVIL OWNER/ENGINEER/ARCHITECT.
26. CONTRACTOR SHALL FIELD VERIFY ALL PROTECTED TREE LOCATIONS, INDIVIDUAL PROTECTED TREE CRITICAL ROOT ZONES, AND PROPOSED SITE GRADING, AND NOTIFY THE ENGINEER/ARCHITECT OF ANY CONFLICTS WITH THE TREE PRESERVATION PLAN PRIOR TO COMMENCING THE WORK.
27. TREE PROTECTION MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE APPROVED TREE PRESERVATION PLANS.

PAVING:

- 1. ALL PAVING MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THESE PLANS, THE CITY IDS, THE FINAL GEOTECHNICAL REPORT AND ALL ISSUED ADDENDA, CITY CONSTRUCTION STANDARD DETAILS, AND COMMONLY ACCEPTED CONSTRUCTION STANDARDS. THE CITY IDS SHALL GOVERN WHERE OTHER SPECIFICATIONS DO NOT EXIST. IN CASE OF CONFLICTING SPECIFICATIONS OR DETAILS, THE MORE RESTRICTIVE SPECIFICATION/DETAIL SHALL BE FOLLOWED.
2. ALL PRIVATE ON-SITE PAVING AND PAVING SUBGRADE SHALL COMPLY WITH THE PROJECT'S FINAL GEOTECHNICAL REPORT INCLUDING ALL ADDENDA.
3. ALL FIRELANE PAVING AND PAVING SUBGRADE SHALL COMPLY WITH CITY IDS AND CITY STANDARD CONSTRUCTION DETAILS. IF THESE ARE DIFFERENT THAN THOSE IN THE GEOTECHNICAL REPORT, THEN THE MORE RESTRICTIVE SHALL BE FOLLOWED.

- 20. ALL SAWCUTS SHALL BE FULL DEPTH FOR PAVEMENT REMOVAL AND CONNECTION TO EXISTING PAVEMENT.
21. FIRE LANES SHALL BE MARKED AND LABELED AS A FIRELANE.
22. UNLESS THE PLANS SPECIFICALLY DICTATE TO THE CONTRARY, ON-SITE AND OTHER DIRECTIONAL SIGNS SHALL BE ORIENTED SO THEY ARE READILY VISIBLE TO THE ONCOMING TRAFFIC FOR WHICH THEY ARE INTENDED.
23. CONTRACTOR IS RESPONSIBLE FOR INSTALLING NECESSARY CONDUIT FOR LIGHTING, COMMUNICATIONS, IRRIGATION, ETC. PRIOR TO PLACEMENT OF PAVEMENT. ALL CONSTRUCTION DOCUMENTS (CIVIL, MEP, LANDSCAPE, IRRIGATION, AND ARCHITECT) SHALL BE CONSULTED.

STORM DRAINAGE:

- 1. ALL STORM SEWER MATERIALS AND CONSTRUCTION SHALL COMPLY WITH CITY STANDARD CONSTRUCTION DETAILS AND IDS.
2. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS AND APPURTENANCES NECESSARY FOR COMPLETE INSTALLATION OF THE STORM SEWER.
3. THE CONTRACTOR SHALL FIELD VERIFY THE SIZE, CONDITION, HORIZONTAL, AND VERTICAL LOCATIONS OF ALL EXISTING STORM SEWER FACILITIES THAT ARE TO BE CONNECTED TO, PRIOR TO START OF CONSTRUCTION OF ANY STORM SEWER, AND SHALL NOTIFY THE CITY OF ANY CONFLICTS DISCOVERED.
4. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS SHOWN, INCLUDING THE HORIZONTAL AND VERTICAL LOCATION OF CURB INLETS AND GRATE INLETS AND ALL UTILITIES CROSSING THE STORM SEWER.

WATER AND WASTEWATER:

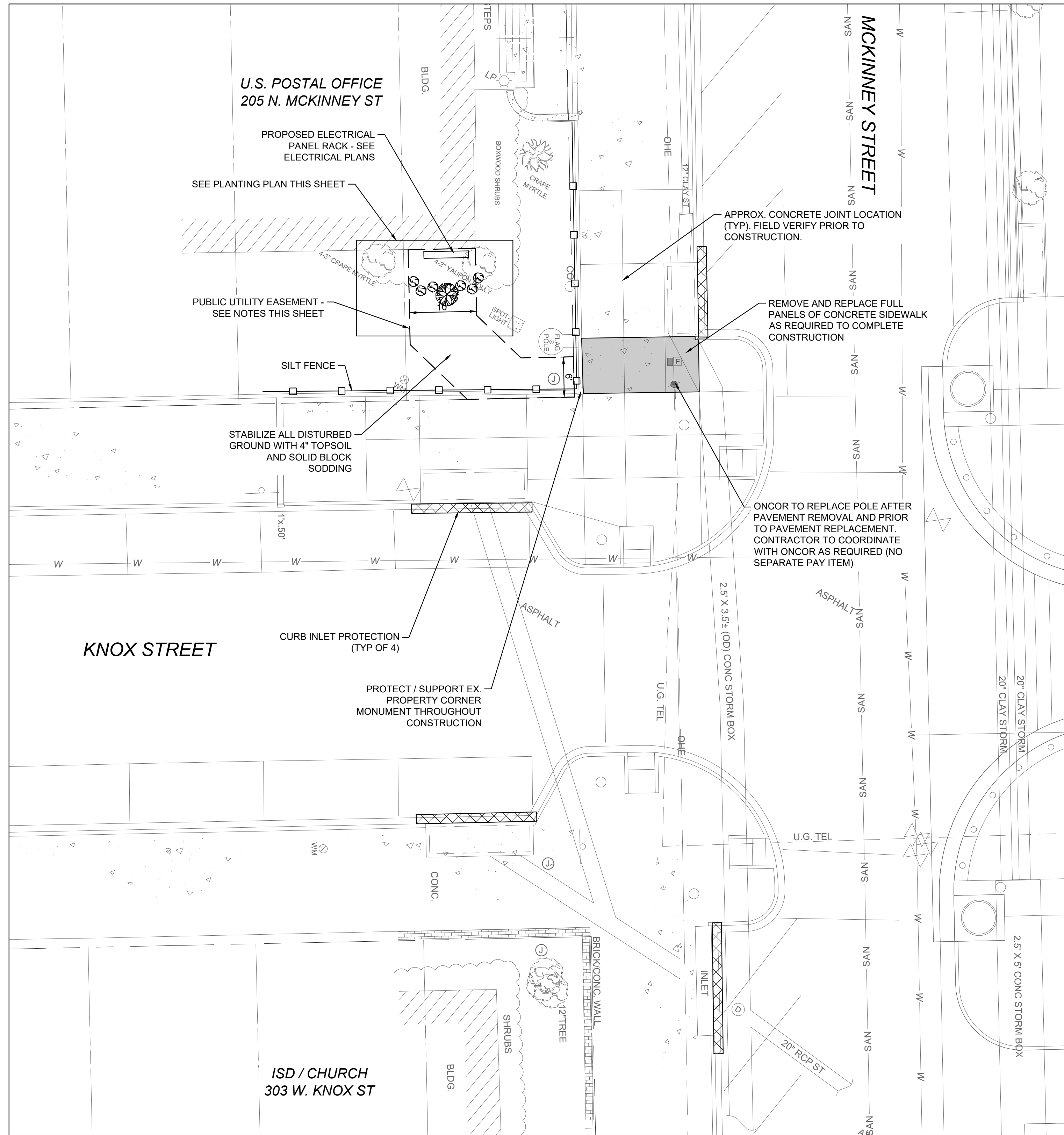
- 1. ALL WATER AND WASTEWATER MATERIALS AND CONSTRUCTION SHALL COMPLY WITH CITY STANDARD CONSTRUCTION DETAILS AND IDS.
2. CONTRACTOR SHALL FIELD VERIFY THE SIZE, CONDITION, HORIZONTAL, AND VERTICAL LOCATIONS OF ALL EXISTING WATER AND WASTEWATER FACILITIES THAT ARE TO BE CONNECTED TO, PRIOR TO START OF CONSTRUCTION OF ANY WATER OR WASTEWATER CONSTRUCTION, AND SHALL NOTIFY THE CITY OF ANY CONFLICTS DISCOVERED.
3. CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS SHOWN, INCLUDING THE HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITY SERVICES ENTERING THE BUILDING.

- 6. ALL PUBLIC WATER AND WASTEWATER CONSTRUCTION, PIPE, STRUCTURES, AND FITTINGS SHALL ADHERE TO CITY STANDARD CONSTRUCTION DETAILS AND IDS. CONTRACTOR SHALL ARRANGE FOR REQUIRED CITY INSPECTIONS.
7. ALL PRIVATE WATER AND WASTEWATER CONSTRUCTION, PIPE, STRUCTURES, AND FITTINGS SHALL ADHERE TO THE APPLICABLE PLUMBING CODE. CONTRACTOR SHALL ARRANGE FOR REQUIRED CITY INSPECTIONS.
8. FIRE SPRINKLER LINES SHALL BE DESIGNED AND INSTALLED BY A LICENSED FIRE SPRINKLER CONTRACTOR, AND COMPLY TO THE APPLICABLE CODES AND INSPECTIONS REQUIRED.
9. EMBEDMENT FOR ALL WATER AND WASTEWATER LINES, PUBLIC OR PRIVATE, SHALL BE PER CITY STANDARD CONSTRUCTION DETAILS AND IDS.

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- NOTES:
- PUBLIC UTILITY EASEMENT HAS BE RECORDED WITH ELLIS COUNTY, TEXAS. COPY OF EASEMENT DOCUMENTATION IS PROVIDED AS EXHIBIT 1 OF SPECIFICATIONS.
 - CONTRACTOR TO COORDINATE DIRECTLY WITH POST OFFICE FOR USE OF PROPERTY OUTSIDE OF EASEMENT DURING CONSTRUCTION.

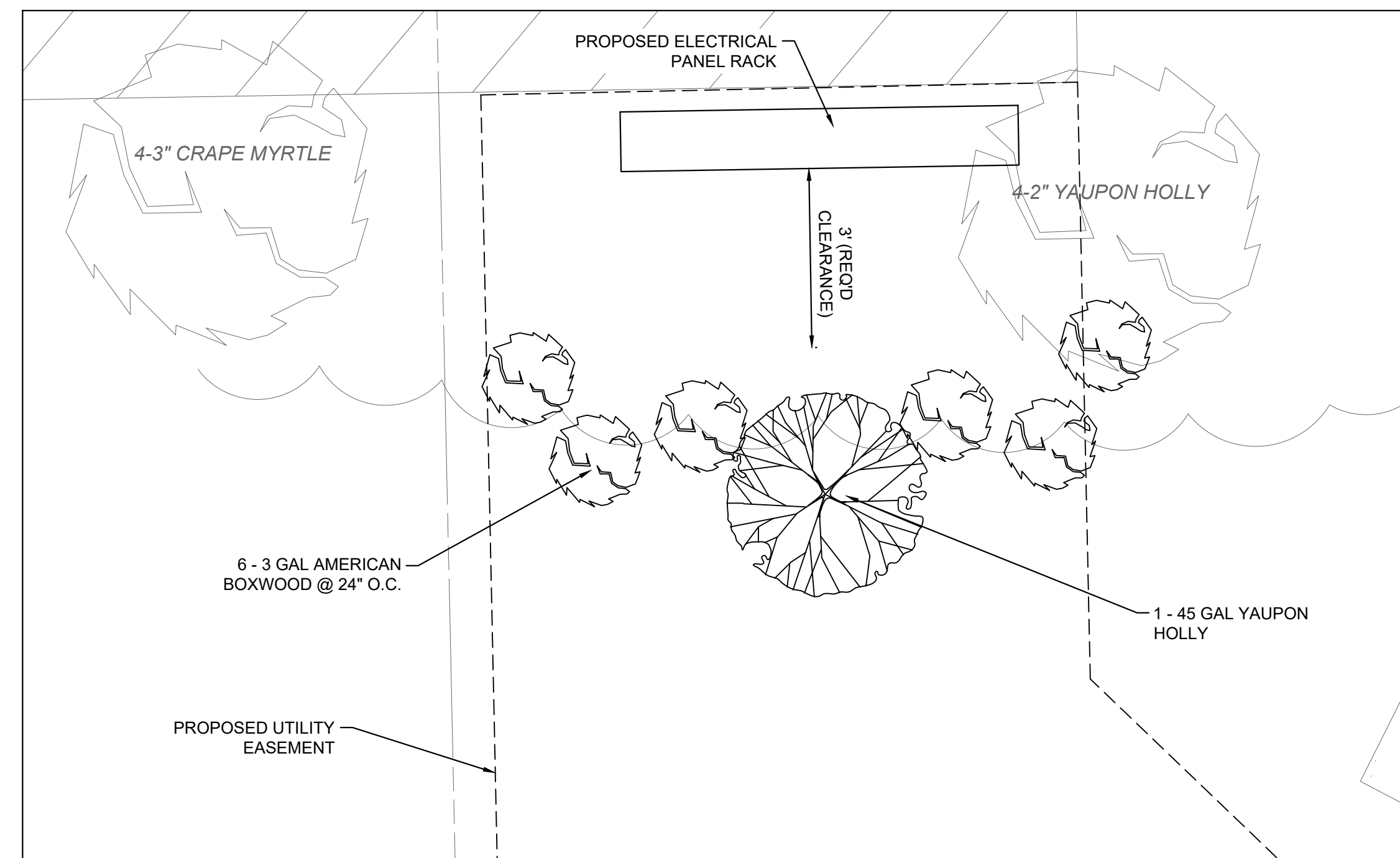


EROSION CONTROL AND PAVEMENT REPAIR PLAN

SCALE: 1" = 10'
0 10' 20'
GRAPHIC SCALE



DESIGN INTENT OF SITE RESTORATION



PLANTING PLAN

SCALE: 1" = 2'
0 1' 2' 4'
GRAPHIC SCALE

MAINTENANCE NOTES:
CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL PLANTINGS (INCLUDING SOD) UNTIL ESTABLISHED AS DETERMINED BY THE CITY.

ELECTRICAL IMPROVEMENTS AT INTERSECTION OF MCKINNEY AND KNOX

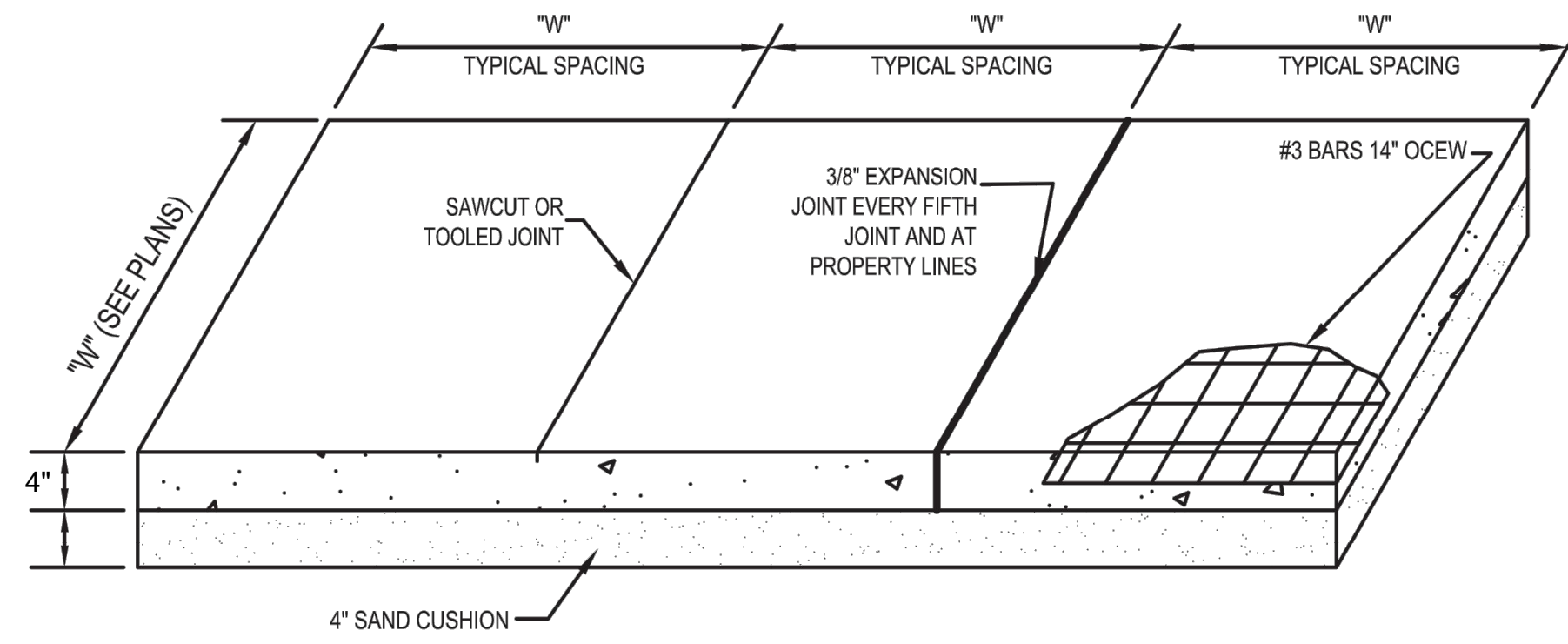


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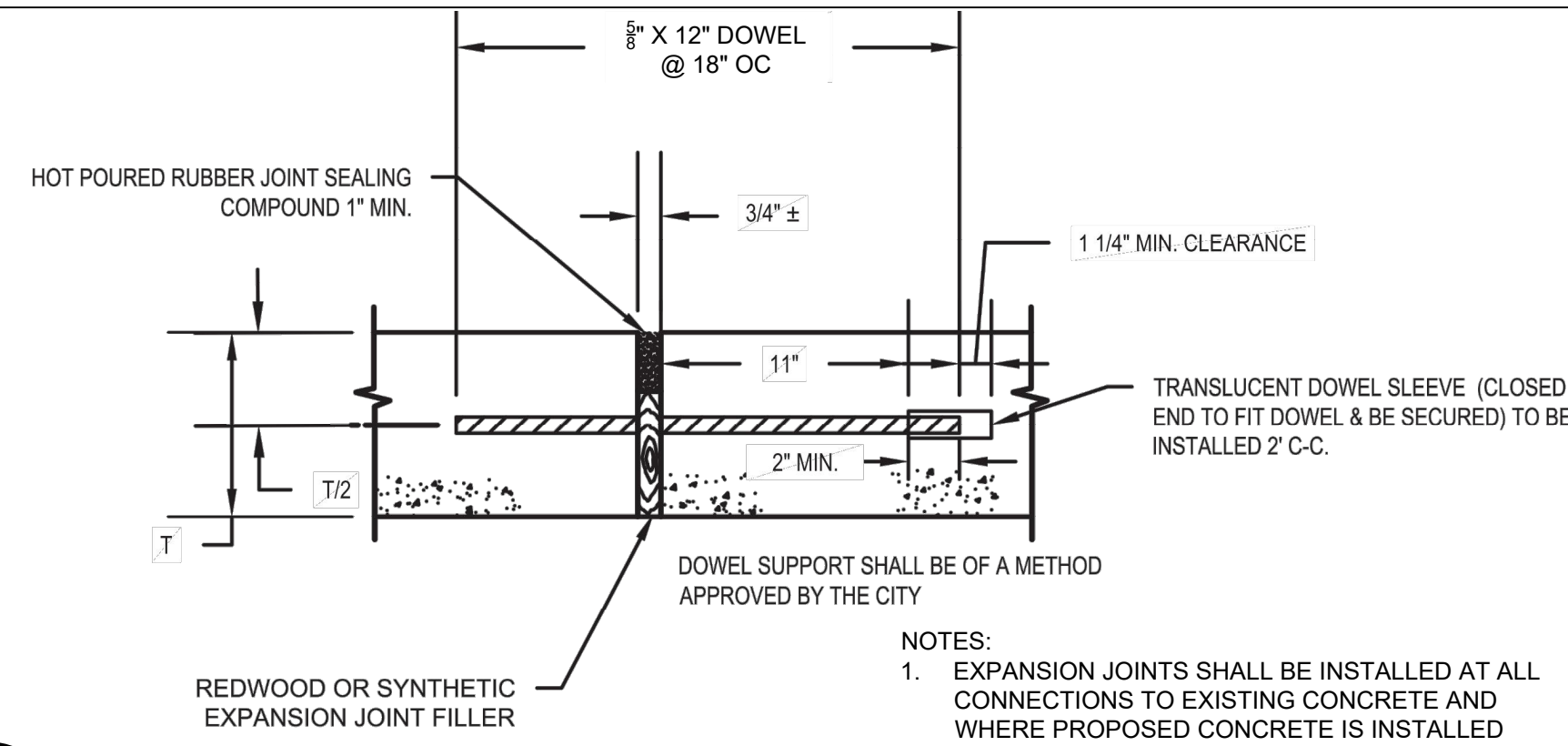
EROSION CONTROL AND SITE RESTORATION PLAN

C1.00

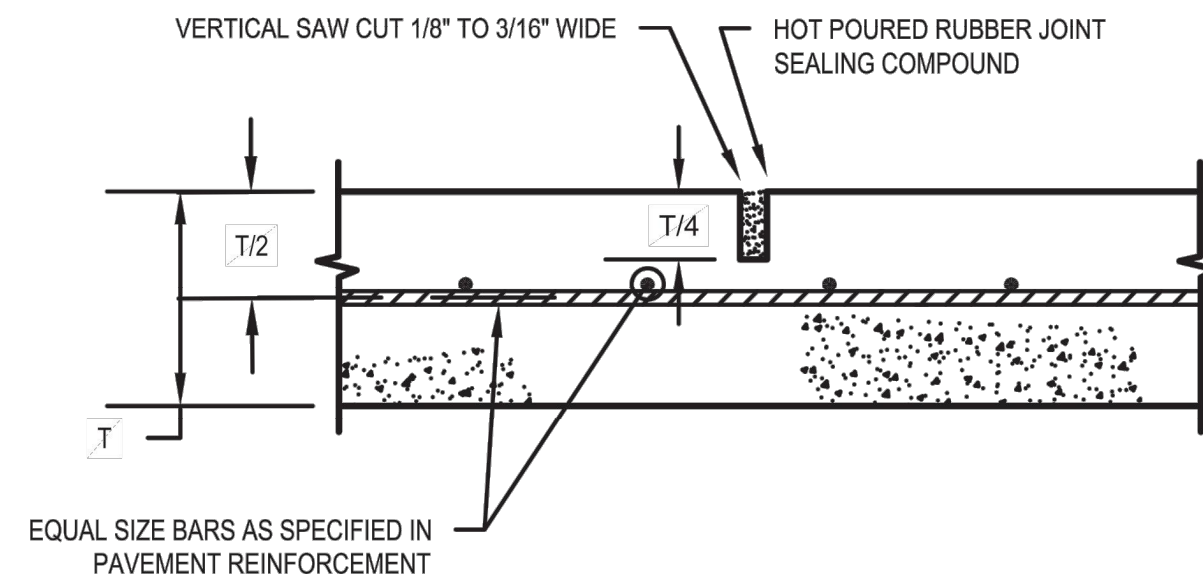
W = SEE PLANS FOR SIDEWALK WIDTH. 4' MINIMUM.



1 PEDESTRIAN CONCRETE PAVEMENT
NOT TO SCALE

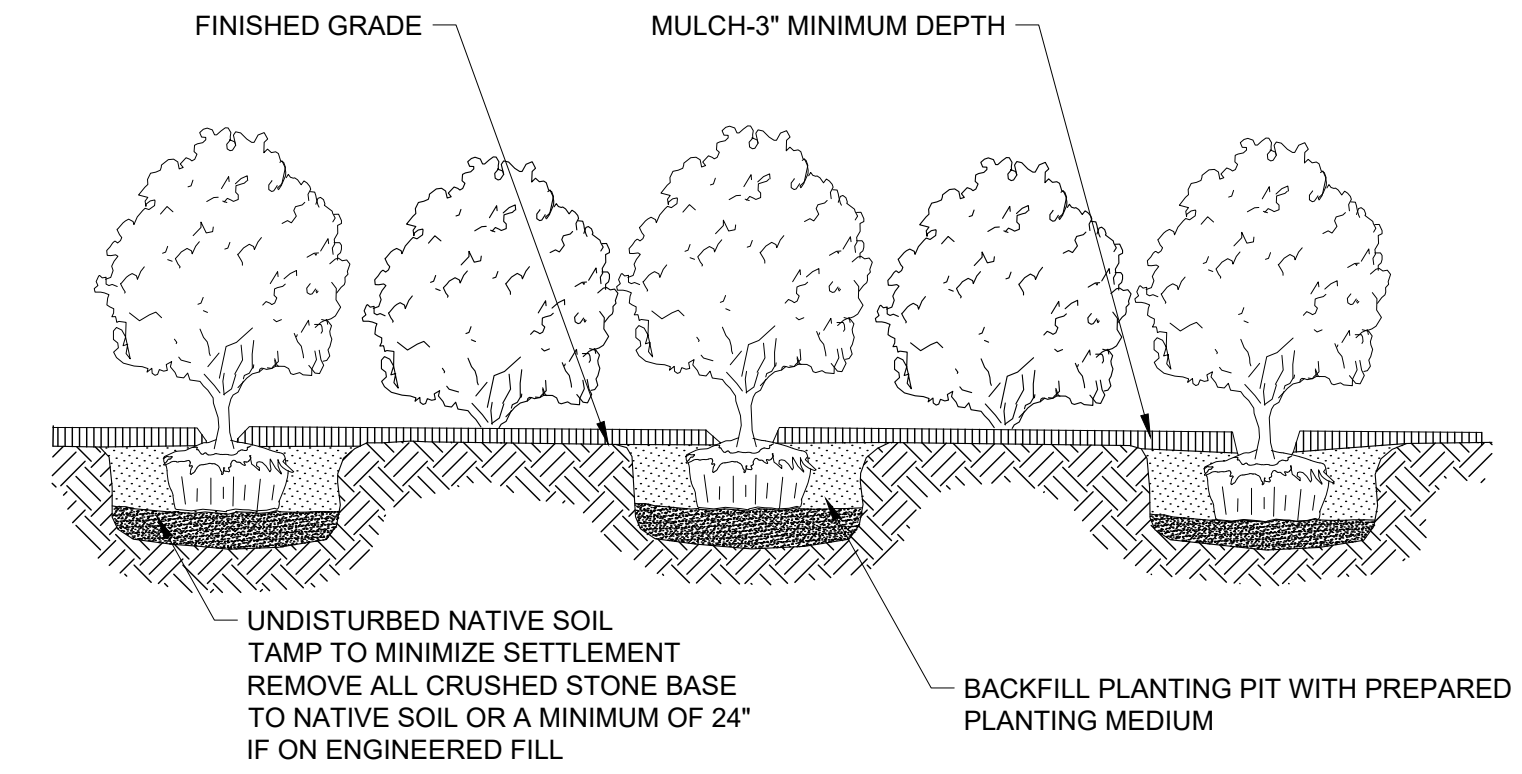


2 EXPANSION JOINT
NOT TO SCALE



3 SAW CUT JOINT
NOT TO SCALE

- NOTES:
1. PLANT MATERIAL SHALL CONFORM TO "THE AMERICAN STANDARD FOR NURSERY STOCK (ANSI 260.1; LATEST EDITION) FOR SIZE FORM AND QUALITY.
 2. SEE NCTCOG SPECIFICATION ITEM 204: LANDSCAPING FOR PROPER INSTALLATION PROCEDURES
 3. REMOVE ALL SYNTHETIC MATERIAL FROM AROUND ROOTBALL. REMOVE BURLAP AND ROPE FROM TOP 1/3 OF ROOTBALL



4 SHRUB PLANTING DETAIL
NOT TO SCALE

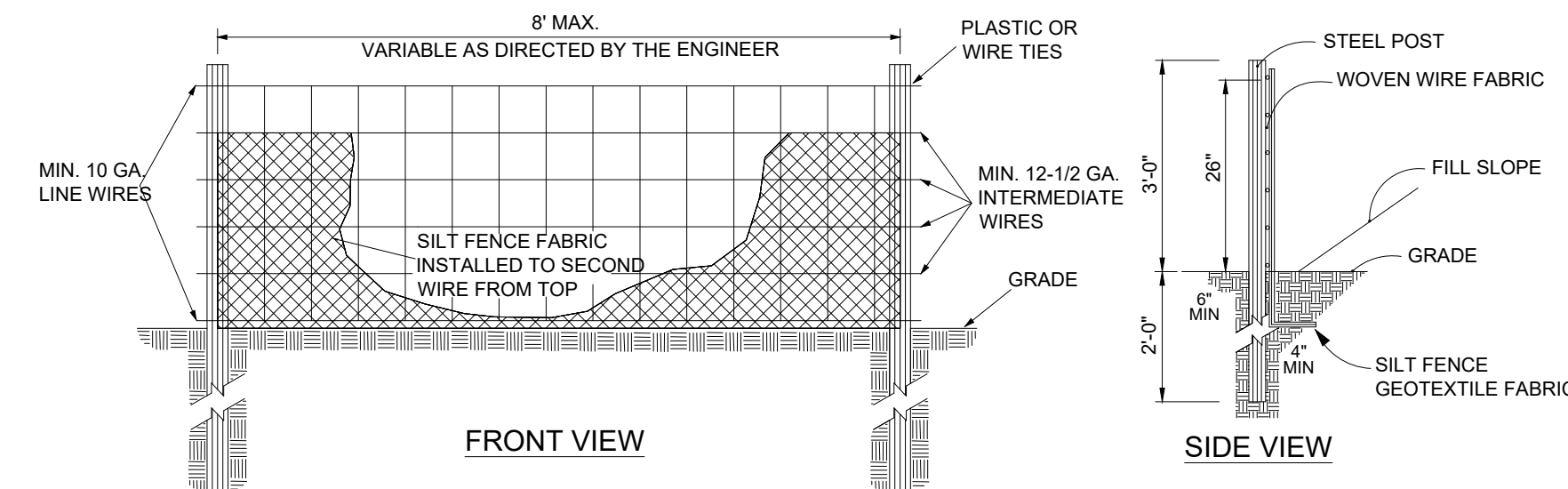
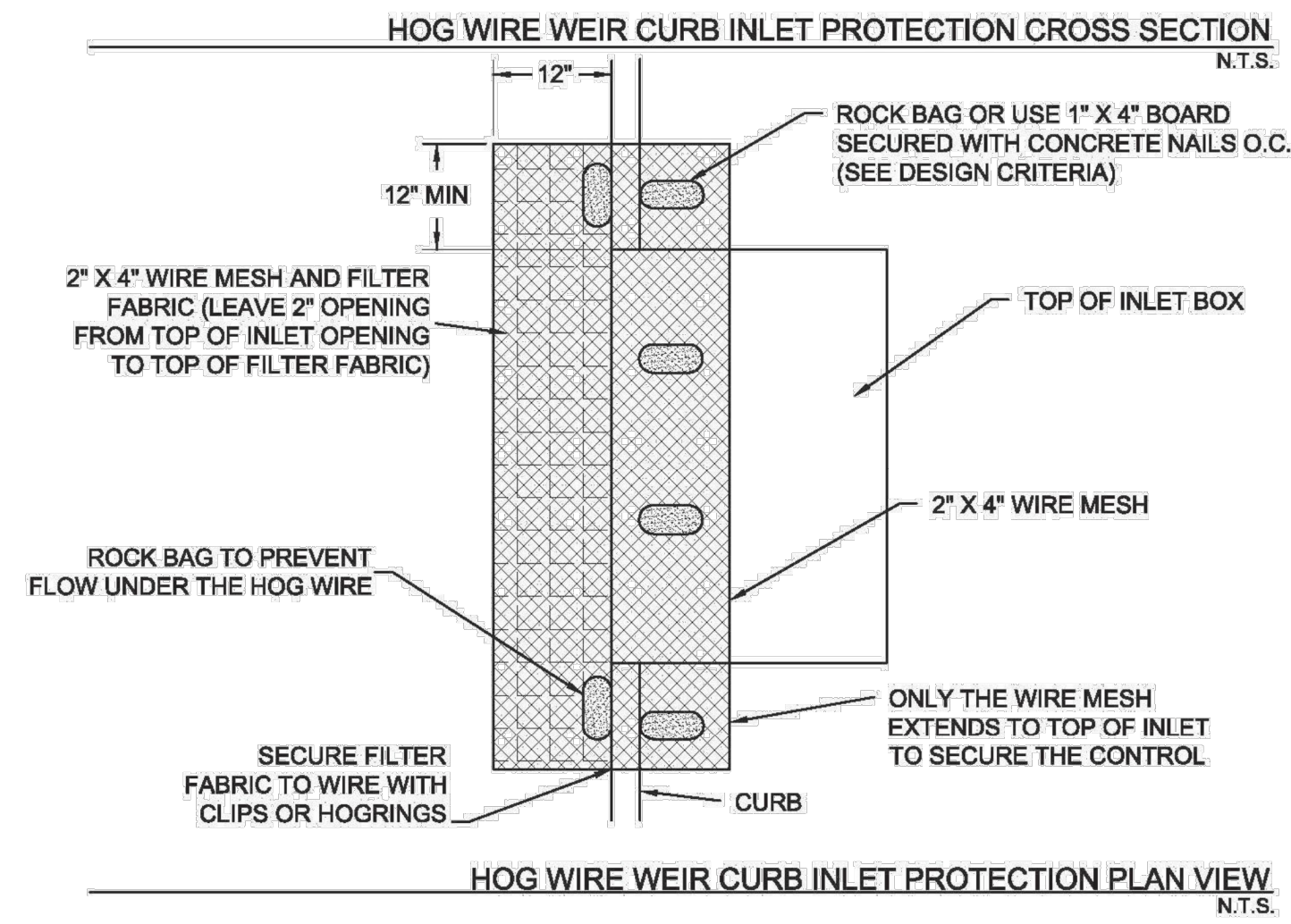
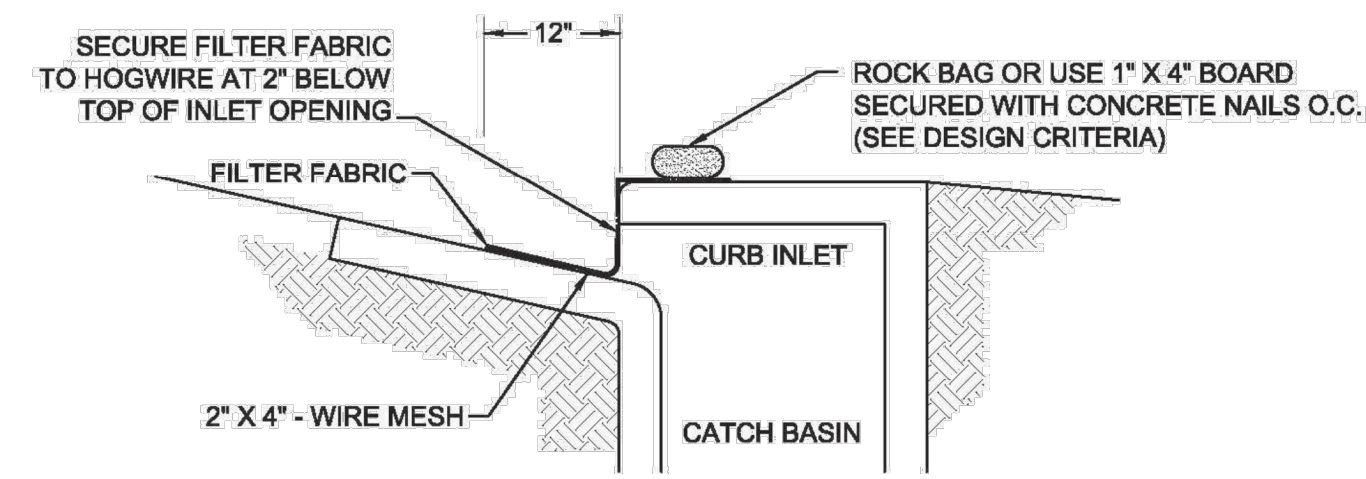
5 NOT USED
NOT TO SCALE

6 NOT USED
NOT TO SCALE

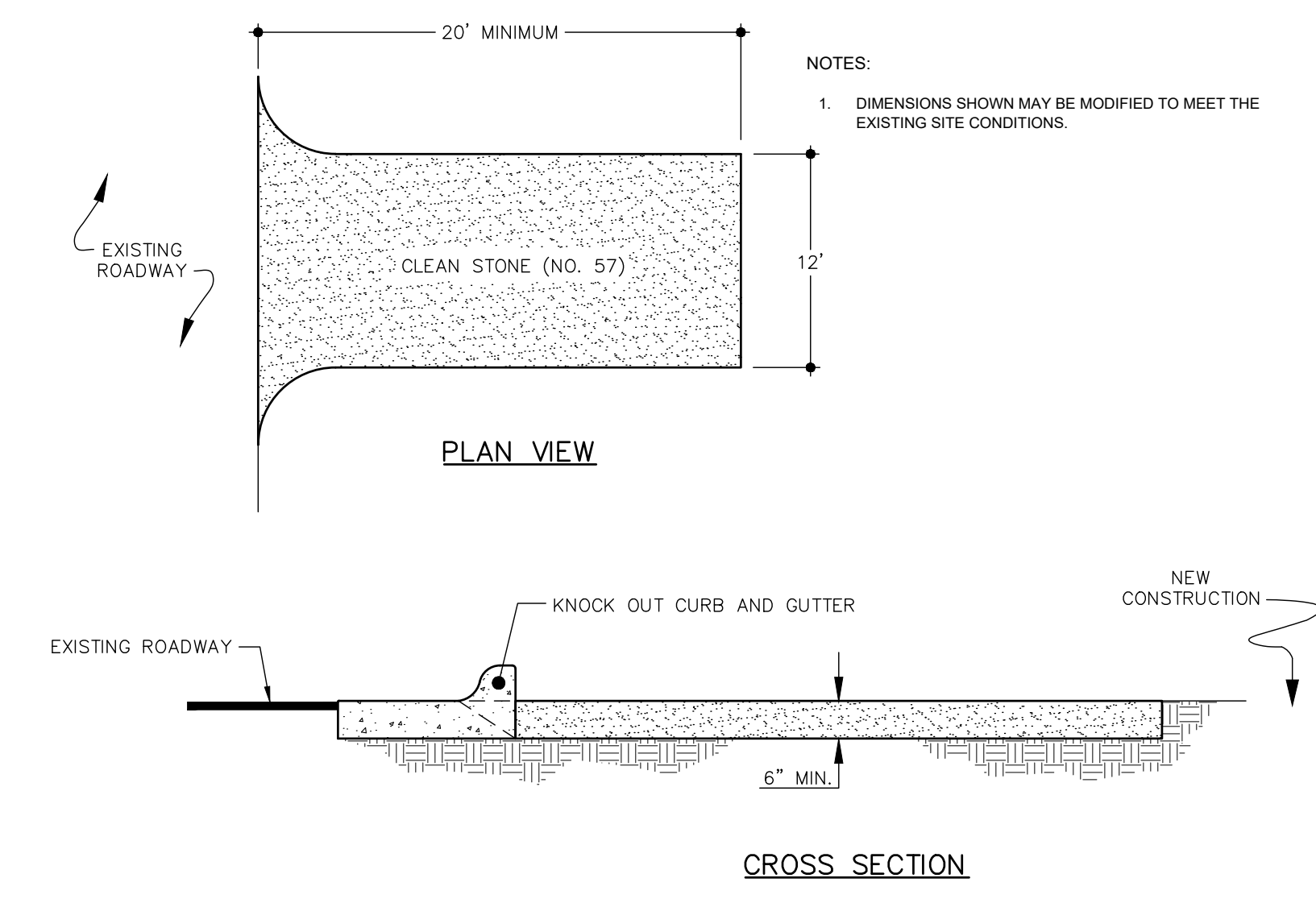
7 NOT USED
NOT TO SCALE

Revision		
No.	Date	Description

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- NOTES:
1. FLOW SHALL NOT RUN PARALLEL WITH THE FENCE.
 2. END OF SILT FENCE NEEDS TO BE TURNED UPHILL.
 3. FOR MAINTENANCE PURPOSES CLEAN OUT SILT FENCE WHEN CAPACITY HAS REACHED 50% OF IT'S MAXIMUM HEIGHT.
 4. MAXIMUM LIFE OF SILT FENCING BEFORE REPLACING WITH NEW FENCING IS BASED ON 6-9 MONTHS UNDER AVERAGE WEATHER CONDITIONS. REPLACE WHEN DAMAGED DUE TO EXTREME WEATHER CONDITIONS OR AS DIRECTED BY THE ENGINEER.



1 CURB INLET PROTECTION
NOT TO SCALE

2 SILT FENCE
NOT TO SCALE

3 CONSTRUCTION ENTRANCE / EXIT
NOT TO SCALE

4 NOT USED
NOT TO SCALE

5 NOT USED
NOT TO SCALE

6 NOT USED
NOT TO SCALE

Revision		
No.	Date	Description

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SYMBOLS	DESCRIPTION
	MEDIUM VOLTAGE DRAWOUT TYPE POWER CIRCUIT BREAKER CS-CONTROL SWITCH
	LOW VOLTAGE CIRCUIT BREAKER, 3 POLE UNLESS OTHERWISE NOTED. LSIG IF NOTED MCP IF NOTED ERMS IF NOTED
	COMBINATION MOTOR CIRCUIT PROTECTOR AND MAGNETIC MOTOR STARTER, FULL VOLTAGE NON-REVERSING UNLESS OTHERWISE NOTED: * FVR-FULL VOLTAGE REVERSING RVNR-REDUCED VOLTAGE NON-REVERSING 2S1W-TWO SPEED, ONE WINDING 2S2W-TWO SPEED, TWO WINDING
	NON-FUSIBLE DISCONNECT SWITCH, 600 VOLT, 3 POLE * AMPERE RATING NOTED IF OTHER THAN 30A
	FUSIBLE DISCONNECT SWITCH, 600 VOLT, 3 POLE, AMPERE RATING AND FUSE SIZE AS NOTED. * AMPERE RATING NOTED IF OTHER THAN 30A * FUSE RATING
	MOTOR ISOLATION SWITCH, HORSEPOWER RATED
	MEDIUM VOLTAGE VACUUM FAULT INTERRUPTER AND LOAD BREAK SWITCH, AMPERE RATING AS NOTED.
	DRAWOUT TYPE EQUIPMENT OR DEVICE
	MEDIUM VOLTAGE CABLE TERMINATION
	MEDIUM VOLTAGE AIR INTERRUPTER SWITCH
	MEDIUM VOLTAGE FUSED AIR INTERRUPTER SWITCH
	MEDIUM VOLTAGE FUSED MOTOR CONTROLLER
	TRANSFORMER, RATINGS AND CONNECTIONS AS NOTED, UNLESS OTHERWISE NOTED ON THE SINGLE LINE DIAGRAMS ALL DRY TYPE TRANSFORMERS SERVICING ADMINISTRATIVE AND LABORATORY SPACES SHALL HAVE A K FACTOR OF 13. ALL OTHER DRY TYPE TRANSFORMERS SHALL HAVE A K-4 RATING. ISOLATION TRANSFORMERS SHALL HAVE A K-20 RATING
	CURRENT TRANSFORMER: * QUANTITY A= PRIMARY AMPERES
	POTENTIAL TRANSFORMER: * QUANTITY PV= PRIMARY VOLTAGE SV= SECONDARY VOLTAGE
	GENERATOR, RATINGS AND CONNECTIONS AS NOTED
	TRANSFER SWITCH AUTOMATIC TRANSFER SWITCH (EG ATS-1) MANUAL TRANSFER SWITCH (EG MTS-1) "N" INDICATES NORMAL SOURCE "S" INDICATES STANDBY SOURCE 100A INDICATES CONTINUOUS CURRENT RATING
	VARIABLE SPEED DRIVE CONTROLLER * D.C.= D.C. DRIVE CONTROLLER SCR= SILICON CONTROLLED RECTIFIER VFD= VARIABLE FREQUENCY DRIVE AFD= ADJUSTABLE FREQUENCY DRIVE
	VACUUM CONTACTOR
	UNIT HEATER - ELECTRIC HEATING COIL AND FAN
	UNIT HEATER - STEAM OR WATER HEATING COIL AND FAN
	MOTOR, NUMERAL INDICATES HORSEPOWER

SYMBOLS	DESCRIPTION																
	SURGE PROTECTION DEVICE																
	VOLTMETER (WITH SWITCH IF 3-PHASE)																
	AMMETER (WITH SWITCH IF 3-PHASE)																
	METER * WM- WATTMETER WHM- WATTHOUR METER WHDM- WATTHOUR DEMAND METER WHDR- WATTHOUR DEMAND RECORDER PF- POWER FACTOR METER RT- RUNNING TIME METER TRANSDUCER AX- CURRENT TRANSDUCER WX- WATT TRANSDUCER																
	RELAY, NO. AS INDICATED 25- SYNCHRONISM CHECK RELAY 27- UNDER VOLTAGE RELAY 38- BEARING PROTECTIVE DEVICE 40- LOSS OF EXCITATION RELAY 42- RUNNING CONTACTOR/PILOT RELAY 46- REVERSE PHASE/PHASE BALANCE/CURRENT RELAY 47- PHASE SEQUENCE VOLTAGE RELAY 49- MACHINE OR TRANSFORMER THERMAL RELAY 50- INSTANTANEOUS OVERCURRENT RELAY 50G- INSTANTANEOUS GROUND 51- TIME OVER CURRENT RELAY 51G- TIME OVERCURRENT RELAY, GROUNDING RESISTOR TYPE 51N- TIME OVERCURRENT RELAY, RESIDUAL TYPE 51V- TIME OVERCURRENT RELAY WITH VOLTAGE RESTRAINT 60- NEGATIVE SEQUENCE VOLTAGE RELAY 62- TIME DELAY RELAY 63- OVER PRESSURE RELAY 67- AC DIRECTIONAL OVERCURRENT RELAY 83- AUTOMATIC SELECTIVE CONTROL OR TRANSFER RELAY 86- LOCKING-OUT RELAY 87- DIFFERENTIAL PROTECTIVE RELAY B- SUFFIX INDICATES "BUS" G- SUFFIX INDICATES "GENERATOR" GF- GROUND FAULT ST- SHUNT TRIP T- SUFFIX INDICATES "TRANSFORMER" X- SUFFIX INDICATES "AUXILIARY"																
	SPECIAL CAPACITOR * SC- SURGE CAPACITOR PF- POWER FACTOR CORRECTION CAPACITOR INCLUDING INDUCTIVE LINK AS NEEDED																
	PUSH BUTTON, MOMENTARY CONTACT, SPRING RETURN, NORMALLY CLOSED																
	PUSH BUTTON, MOMENTARY CONTACT, SPRING RETURN, NORMALLY OPEN																
	EMERGENCY STOP PUSH BUTTON WITH RED MUSHROOM HEAD OPERATOR (MAINTAINED CONTACT)																
	STOP PUSH BUTTON WITH RED HEAD OPERATOR (MAINTAINED CONTACT) WITH LOCKABLE OPTION * : E-STOP * : STOP																
	START-STOP PUSH BUTTON CONTROL STATION (MOMENTARY CONTACT) "L" DENOTES LOCKOUT TYPE																
	START-STOP PUSH BUTTON CONTROL STATION, MAINTAINED CONTACT WITH LOCKOUT DEVICE ON STOP																
	OFF/ON SELECTOR SWITCH																
	3 POSITION SELECTOR SWITCH, MAINTAINED CONTACT O-OPEN X-CLOSED <table border="1"> <thead> <tr> <th>POSITION</th> <th>TOP CONTACT</th> <th>MIDDLE CONTACT</th> <th>BOTTOM CONTACT</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>X</td> <td>O</td> <td>O</td> </tr> <tr> <td>B</td> <td>O</td> <td>O</td> <td>O</td> </tr> <tr> <td>C</td> <td>O</td> <td>O</td> <td>X</td> </tr> </tbody> </table> * NAMEPLATE (A/B/C) HOA- HAND/OFF/AUTO HOR- HAND/OFF/REMOTE LOR- LOCAL/OFF/REMOTE RSL- RAISE/STOP/LOWER TOA- TEST/OFF/AUTO NOTE: 2 POSITION MULTI-CONTACT SWITCH FOLLOWS SAME CONVENTION	POSITION	TOP CONTACT	MIDDLE CONTACT	BOTTOM CONTACT	A	X	O	O	B	O	O	O	C	O	O	X
POSITION	TOP CONTACT	MIDDLE CONTACT	BOTTOM CONTACT														
A	X	O	O														
B	O	O	O														
C	O	O	X														
	MOTOR STARTER COIL, NUMBER AS INDICATED																
	CONTROL RELAY COIL, NUMBER AS INDICATED																

SYMBOLS	DESCRIPTION
	PILOT LIGHT, COLOR AS NOTED * R- RED G- GREEN B- BLUE W- WHITE A- AMBER
	PILOT LIGHT, PUSH-TO-TEST TYPE, COLOR AS NOTED ABOVE.
	TIME DELAY RELAY RANGE AS NOTED SET POINT AS NOTED TDD-TIME DELAY AFTER DE-ENERGIZATION-OFF DELAY TDE-TIME DELAY AFTER ENERGIZATION-ON DELAY NOTC-NORMALLY OPEN, TIMED CLOSING WHEN ENERGIZED NCTO-NORMALLY CLOSED, TIMED OPENING WHEN ENERGIZED NOTO-NORMALLY OPEN, TIMED OPENING WHEN DE-ENERGIZED NCTC-NORMALLY CLOSED, TIMED CLOSING WHEN DE-ENERGIZED
	FIELD INSTRUMENT, TAG NO. OR LOOP # AS INDICATED *INDICATES INSTRUMENT TYPE DEFINED ON LOOP SHEETS ## - INDICATES LOOP NO.
	LIQUID LEVEL (FLOAT) SWITCH NORMALLY OPEN, CLOSSES ON RISING LEVEL NORMALLY CLOSED, OPENS ON RISING LEVEL NORMALLY OPEN, CLOSSES ON DROPPING LEVEL NORMALLY CLOSED, OPENS ON DROPPING LEVEL
	PRESSURE OR VACUUM SWITCH NORMALLY OPEN, CLOSSES ON RISING PRESSURE NORMALLY CLOSED, OPENS ON RISING PRESSURE NORMALLY OPEN, CLOSSES ON DROPPING PRESSURE NORMALLY CLOSED, OPENS ON DROPPING PRESSURE
	TEMPERATURE SWITCH OR THERMOSTAT NORMALLY OPEN, CLOSSES ON RISING TEMPERATURE NORMALLY CLOSED, OPENS ON RISING TEMPERATURE NORMALLY OPEN, CLOSSES ON DROPPING TEMPERATURE NORMALLY CLOSED, OPENS ON DROPPING TEMPERATURE
	FLOW SWITCH (AIR, WATER, ETC.) NORMALLY OPEN, CLOSSES ON INCREASED FLOW NORMALLY OPEN, CLOSSES ON DROPPING FLOW NORMALLY CLOSED, OPENS ON INCREASED FLOW NORMALLY CLOSED, OPENS ON DROPPING FLOW
	POSITION (LIMIT) SWITCH NORMALLY OPEN NORMALLY OPEN - HELD CLOSED NORMALLY CLOSED NORMALLY CLOSED - HELD OPEN
	TORQUE SWITCH NORMALLY CLOSED, OPENS ON HIGH TORQUE NORMALLY OPEN, CLOSSES ON HIGH TORQUE
	CONDUCTORS OR CONDUITS CROSSING PATHS BUT NOT CONNECTED
	CONDUCTORS ELECTRICALLY CONNECTED

SYMBOLS	DESCRIPTION
	LIGHTNING ARRESTER/SURGE CAPACITOR
	GROUND ROD
	GROUND ROD WELL
	FUSE, AMPERE RATING AS NOTED
	HEATER
	INDUCTOR
	TACHOMETER GENERATOR
	CONTACT, NORMALLY OPEN (NO)
	CONTACT, NORMALLY CLOSED (NC)
	OVERLOAD RELAY HEATER
	KEY INTERLOCK
	TERMINAL OR TEST BLOCK
	RESISTANCE TEMPERATURE DETECTOR
	VIBRATION DETECTOR
	DAMPER MOTOR
	ELAPSED TIME METER
	MOTOR OPERATED VALVE
	PUSHBUTTON STATION, REFER TO ELECTRICAL SCHEMATIC FOR NUMBER OF DEVICES.
	JUNCTION BOX
	POWER JUNCTION BOX
	4-20mA SIGNAL JUNCTION BOX
	CONTROL JUNCTION BOX
	PULL BOX
	TERMINATION CABINET
	REMOTE DEVICES
	MOV WITHOUT INTEGRATED DISCONNECT
	MOV WITH INTEGRATED DISCONNECT
	INDICATES LIMITS OF EQUIPMENT OR WIRING ENCLOSURE

Revision		
No.	Date	Description

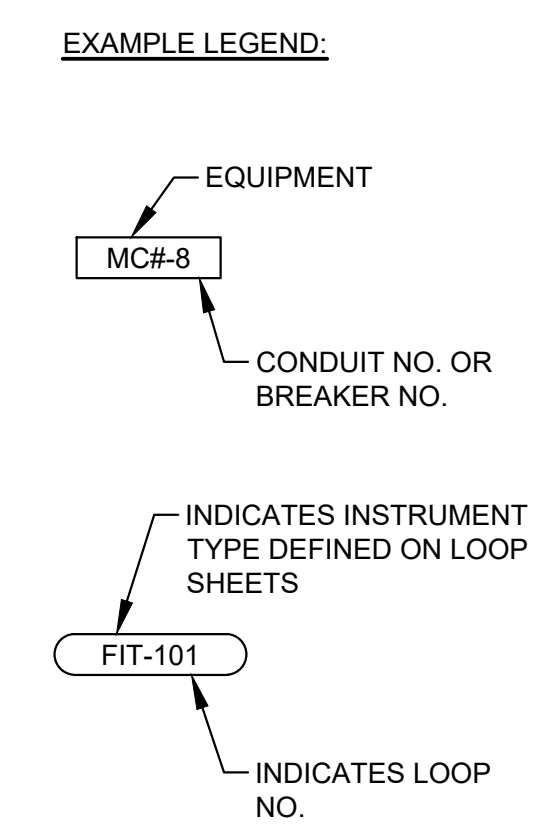
W:\Micro\03014_McKinney, Stearn and Knox Street Improvements\Drawings\Electrical\Working\014_E-02.dwg - Diana Palmer - 3/21/2023 1:47:09 PM

SYMBOLS	DESCRIPTION
	REFER TO LIGHT FIXTURE SCHEDULE FOR TYPE FIXTURE: "A"- FIXTURE TYPE "b"- CONTROLLED BY SWITCH "b" "LA-3"- CIRCUIT 3 FROM PANEL LA
	REFER TO LIGHT FIXTURE SCHEDULE FOR TYPE FIXTURE, NOTATIONS SAME AS ABOVE
	INDICATES LIGHT FIXTURES WHICH ARE NONSWITCHED, NOTATIONS SAME AS ABOVE "NS" - NONSWITCHED
	WALL MOUNTED LIGHTING FIXTURE, NOTATIONS SAME AS ABOVE
	POLE MOUNTED LIGHTING FIXTURE, NOTATIONS SAME AS ABOVE
	EMERGENCY LIGHTING BATTERY UNIT WITH TWO LAMP HEADS, NOTATIONS SAME AS ABOVE
	REMOTE EMERGENCY ADJUSTABLE WALL LIGHTING FIXTURE WITH TWO LAMP HEADS, NOTATIONS SAME AS ABOVE
	CEILING MOUNTED EXIT SIGN, NOTATIONS SAME AS ABOVE
	WALL OUTLET EXIT SIGN. ARROW INDICATES DIRECTION OF EGRESS, NOTATIONS SAME AS ABOVE
	CONDUIT, EXPOSED/SURFACE MOUNTED
	CONDUIT OR DUCTBANK, CONCEALED
	CONDUIT, EXPOSED/SURFACE MOUNTED, TURNING UP
	CONDUIT, EXPOSED/SURFACE MOUNTED, TURNING DOWN
	CONDUIT STUBBED OUT AND CAPPED
	DENOTES A QUANTITY OF 2 SETS OF THREE (3) NO.3/0 AWG CONDUCTORS AND 1 NO.4WG GROUND CONDUCTOR EACH INSTALLED IN 3" CONDUIT.
	DENOTES A QUANTITY OF TWO INSTRUMENT CABLES. EACH CONSISTS OF TWO NO.16 AWG CONDUCTORS TWISTED TOGETHER AND COVERED WITH A METALLIC SHIELD AND AN OVERALL PROTECTIVE JACKET. REFER TO THE SPECIFICATIONS FOR THE EXACT CABLE TO BE PROVIDED.
	DENOTES A QUANTITY OF THREE 4-INCH CONDUITS.
	FLEXIBLE METAL CONDUIT "WHIP" (2#12, #12G, 3/4"C UNLESS OTHERWISE NOTED) FOR RECESSED LIGHTING FIXTURES AND LIQUID TIGHT MOTOR CONNECTIONS
	HOMERUN, CIRCUITS 1 AND 3 RUN TO PANEL LP-1
	SINGLE POLE SWITCH "b"- INDICATES SWITCH LEG SHALL CONTROL LIGHT FIXTURES WITH "b" DESIGNATION
	MULTI POLE SWITCH "x"- INDICATES NUMBER OF POLE "b"- NOTATIONS SAME AS ABOVE
	SINGLE POLE SWITCH AND PILOT LIGHT, "b"- NOTATIONS SAME AS ABOVE
	DIMMER LIGHTING CONTROL SWITCH, "b"- NOTATIONS SAME AS ABOVE
	TIME SWITCH, "b"-NOTATIONS SAME AS ABOVE
	MANUAL MOTOR STARTER /DISCONNECT
	SINGLE POLE SWITCH WITH OCCUPANCY SENSOR
	SINGLE POLE DIMMER SWITCH
	SWITCH ENCLOSURE "x"- NOTATIONS SAME AS ABOVE "b"- NOTATIONS SAME AS ABOVE "xx"- INDICATES ENCLOSURE TYPE
	LIGHTING CONTACTOR WITH NUMBER OF POLES AS INDICATED

SYMBOLS	DESCRIPTION
	LIGHTING PANELBOARD (TYPICAL 120V/240V OR 120V/208V)
	DISTRIBUTION PANELBOARD (TYPICAL 277V/480V)
	DUPLEX RECEPTACLE, 20A, 120V, 2P, 3W : * GFI- GROUND FAULT INTERRUPTER TYPE WP- WEATHERPROOF "LA-3"- CIRCUIT 3 FROM PANEL LA
	RED FACE ISOLATED GROUND DUPLEX, 15A
	20A, 240V, 2P, 3W, RECEPTACLE
	CLASS 1, DIVISION 1, RATED TWIST LOCK RECEPTACLE, VOLTAGE AND AMPERAGE RATING AS NOTED
	SINGLE FACE, SINGLE GANG PEDESTAL WITH 20A, 120V, 2P, 3W DUPLEX RECEPTACLE, FURNISHED AND INSTALLED UNDER DIVISION 16 UNLESS OTHERWISE NOTED. * DENOTES FURNISHED UNDER OTHER DIVISIONS OF THE SPECIFICATIONS BUT INSTALLED UNDER DIVISION 16
	DOUBLE FACE, SINGLE GANG PEDESTAL WITH 20A, 120V, 2P, 3W DUPLEX RECEPTACLE AND 20A, 240V, 2P, 3W SINGLE RECEPTACLE, FURNISHED AND INSTALLED UNDER DIVISION 16 UNLESS OTHERWISE NOTED. * DENOTES FURNISHED UNDER OTHER DIVISIONS OF THE SPECIFICATIONS BUT INSTALLED UNDER DIVISION 16
	DOUBLE RECEPTACLE, 20A, 120V, 2P, 3W MOUNTED IN BOX CURB FURNISHED UNDER OTHER DIVISIONS OF THE SPECIFICATIONS BUT INSTALLED UNDER DIVISION 16
	SINGLE GANG 20A, 120V, 2P, 3W RECEPTACLE
	QUAD RECEPTACLE
	OCCUPANCY SENSOR CAPABLE OF VACANCY
	PHOTOCELL

TAGGING		
EQUIPMENT	EQUIPMENT TAG	CONDUIT TAG
MOTOR CONTROL CENTER	MCC-1	MC1-XX
SWITCHBOARD	SWBD-1	SB1-XX
SWITCHGEAR	SWGR-1	SG1-XX
PROGRAMMABLE LOGIC CABINET	PLC-1	PL1-XX
VARIABLE FREQUENCY DRIVE	VFD-1	VF1-P
LOW VOLTAGE TRANSFORMER	TX-LX OR TX-HX	TXLX-P OR TXHX-P
SERVICE TRANSFORMER	TX-1	TX1-P
GENERATOR	GEN-1	GN1-X
LIGHTING/POWER PANELBOARD	LP/PP-XX	XX-XX
AUTOMATIC TRANSFER SWITCH	ATS-1	AT1-XX
TYPICAL TAG FOR CONDUIT FROM THIS EQUIPMENT TO DOWN STREAM LOAD FOR EXAMPLE.		

SYMBOLS	DESCRIPTION
COMMUNICATIONS SYSTEMS	
	TELEPHONE OUTLET
	DATA OUTLET
	DATA INPUT/OUTPUT CABLE OUTLET. "P" DENOTES PROCESS COMPUTER SYSTEM
	VOICE/DATA OUTLET
	PAGING SPEAKER HORN
	PAGING SPEAKER BI-DIRECTIONAL
	PAGING SPEAKER, CEILING MOUNTED TYPE
	PAGING SPEAKER, WALL MOUNTED TYPE
SECURITY SYSTEMS	
	SECURITY ALARM PANEL
	SECURITY ALARM DOOR SWITCH
	SECURITY ALARM KEY PAD
	SECURITY SYSTEM CARD ACCESS READER
	SECURITY ALARM WINDOW SWITCH
	SECURITY ALARM MOTION DETECTOR
	SECURITY CAMERA * CCTV- CLOSED CIRCUIT TV CAMERA PTZ- PAN, TILT, ZOOM CAMERA LENS CONTROLS
	GLASS BREAK DETECTOR
	ACCESS CONTROL PANEL
FIRE ALARM SYSTEMS	
	FIRE ALARM CONTROL PANEL
	SMOKE DETECTOR * D- DENOTES DUCT SMOKE DETECTOR R- DENOTES FIXED TEMPERATURE RATE-OF-RISE TYPE.
	FIRE ALARM MANUAL PULL STATION, MOUNT AT 4'-0"
	ALARM HORN, MOUNT AT 7'-6" * F- DENOTES FIRE ALARM
	ALARM STROBE, MOUNT AT 6'-8" * F- DENOTES FIRE ALARM
	ALARM HORN AND STROBE LIGHT COMBINATION, MOUNT AT 6'-8" * F- DENOTES FIRE ALARM



ABBREVIATIONS	
AC	ALTERNATING CURRENT
AFD	ADJUSTABLE FREQUENCY DRIVE
AFB	ABOVE FINISHED FLOOR
AG	ABOVE GRADE
ALUM	ALUMINUM
AMPIA	AMPERE
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CLF	CURRENT LIMITING FUSE
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
CS	CONTROL SWITCH
CT	CURRENT TRANSFORMER
CU	COPPER
DC	DIRECT CURRENT
DI	DOOR INTERLOCK
DN	DOWN
DWG	DRAWING
EG	ELECTRICAL HANDHOLE
EC	EMPTY CONDUIT
ELEC	ELECTRICAL
ELEV	ELEVATION
EM	EMERGENCY
EMH	ELECTRICAL MANHOLE
EO	ELECTRICALLY OPERATED
ERMS	ENERGY-REDUCING MAINTENANCE SWITCH
FBO	FURNISHED BY OTHERS
FO	FIBER OPTIC
FRP	FIBERGLASS REINFORCED POLYESTER
FU	FUSE
GCP	GENERATOR CONTROL PANEL
GEN	GENERATOR
G.GRD	GROUND
GFI	GROUND FAULT INTERRUPTER
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GO	GATE OPERATOR
GRS	GALVANIZED RIGID STEEL
HH	HANDHOLE
HT	HEIGHT
HTP	HEAT TRACE PANEL
HZ	HERTZ
IMH	INSTRUMENT MAN HOLE
INST	INSTRUMENT
LA	LIGHTNING ARRESTER
LC	LIGHTNING CONTACTOR
LCP	LOCAL CONTROL PANEL
LGTS	LIGHTS
LP	LIGHTING PANEL
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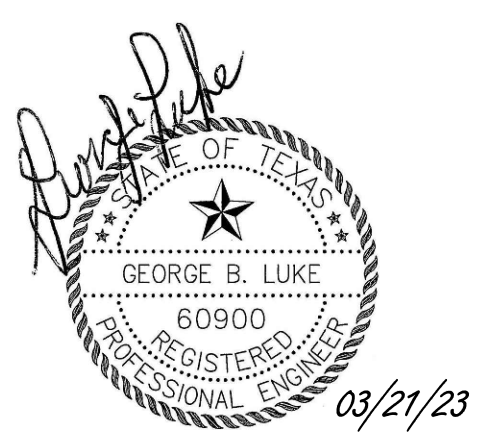
LSIG	LONG TIME/SHORT TIME/ INSTANTANEOUS/GROUND FAULT FEATURE INCLUDED
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MFR	MANUFACTURER
MH	MANHOLE
MLO	MAIN LUGS ONLY
MTG	MOUNTING
MTD	MOUNTED
MTS	MANUAL TRANSFER SWITCH
NC	NORMALLY CLOSED
NO	NORMALLY OPEN OR NUMBER
NTS	NOT TO SCALE
OL	OVERLOAD
OLX	OVERLOAD CONTROL RELAY
PB	PUSH BUTTON OR PULL BOX
PCC	PUMP CONTROL CONSOLE
PPR	PHASE PROTECTIVE RELAY
PFR	PHASE FAILURE RELAY
PH	PHASE
PNLBD	PANELBOARD
PR	PAIR
PT	POTENTIAL TRANSFORMER
PTT	PUSH TO TEST TYPE
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
RCP	RELAY CONTROL PANEL
RECP	RECEPTACLES
RVSS	REDUCED VOLTAGE SOFT STARTER
SC	SURGE CAPACITOR
SCH	SCHEMATIC
SCCR	SHORT CIRCUIT CURRENT RATING
SEC	SECONDS OR SECONDARY
SH	SHIELDED OR SHEET
SHT	SHEET
SN	SOLID NEUTRAL
SS	STAINLESS STEEL
ST	STARTER
SV	SOLENOID VALVE
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TC	TERMINATION CABINET
TEL	TELEPHONE
TO	TIME DELAY ON OPENING
TS	TEMPERATURE SWITCH
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TSW	TWISTED SHIELDED WIRE
TYP	TYPICAL
UG	UNDERGROUND
V	VOLTS
VFD	VARIABLE FREQUENCY DRIVE
VO	VALVE OPERATOR
W	WIRE
WP	WEATHERPROOF
XP	EXPLOSION PROOF
XFMR	TRANSFORMER



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ELECTRICAL IMPROVEMENTS AT INTERSECTION OF MCKINNEY AND KNOX



Revision		
No.	Date	Description

LEGEND & SYMBOLS - II

E-02

PROJECT: 48006.00
DATE: DEC 2022

ELECTRICAL GENERAL NOTES

- THE NOTES CONTAINED ON THIS SHEET ARE PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR WHEN WORKING IN THE FIELD, AND CONTAIN EXCERPTS FROM THE SPECIFICATION SECTIONS. HOWEVER THE CONTRACTOR IS HEREBY ADVISED THAT THE CONTRACT DOCUMENTS CONSIST OF BOTH THE DRAWINGS AND THE SPECIFICATIONS, AND THAT THE CONTRACTOR MUST COMPLY FULLY WITH BOTH THE BOUND DRAWINGS AND THE BOUND SPECIFICATIONS.
- ALL EQUIPMENT WIRING, RACEWAYS, ETC. SHALL BE INSTALLED AND GROUNDED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, LOCAL CODES, AND INDUSTRY STANDARDS (IE. UL, NEMA, IEEE, ANSI, ETC.) THE DRAWING NOTES AND DETAILS SHALL BE COMPLIED WITH IN ADDITION TO THE REQUIREMENTS IN THE SPECIFICATIONS. REFER TO EACH SPECIFICATION SECTION FOR SPECIFIC REQUIREMENTS.
- ALL RACEWAY INSTALLATIONS SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH EQUIPMENT AND STRUCTURAL CONDITIONS. ALL EXPOSED RACEWAY SHALL BE INSTALLED AS PER ANSI/NECA 1 PARALLEL TO BEAMS, CEILINGS, FLOORS AND WALLS. SEE SPECIFICATION ON RACEWAYS FOR ADDITIONAL REQUIREMENTS.
- CONDUITS SHALL BE TERMINATED IN A NEAT MANNER AND STRICTLY IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWING DETAILS.
- CONDUITS TERMINATED INTO ENCLOSURES SHALL BE PERPENDICULAR TO THE WALLS OF THE ENCLOSURE. THE USE OF SHORT SEALTIGHT ELBOW FITTINGS FOR SUCH TERMINATIONS IS NOT PERMITTED.
- ALL RACEWAY INSTALLATIONS, CROSSING EXPANSION JOINTS OR TRANSITIONS FROM BELOW GRADE TO EXPOSED ABOVE GRADE, SHALL HAVE EXPANSION OR EXPANSION/DEFLECTION TYPE FITTINGS AS SPECIFIED FOR THE APPLICATION. SEE THE DRAWINGS AND THE SPECIFICATION ON RACEWAYS FOR THE EXACT TYPE OF FITTING TO BE USED.
- NO CONDUIT SMALLER THAN 3/4", NOR WIRE SMALLER THAN NO. 12 AWG, SHALL BE USED UNLESS SPECIFICALLY NOTED.
- ALL UNDERGROUND SINGLE CONDUITS AND DUCTBANKS OF MULTIPLE CONDUITS SHALL BE RIGID PVC CONDUIT ENCASED IN REINFORCED RED CONCRETE. CONCRETE DYED RED BEFORE PLACEMENT. MINIMUM SIZE IS 2 INCH. FIELD VERIFY THE ROUTING OF ALL EXISTING UNDERGROUND CONDUIT AND DUCTBANKS. COORDINATE ROUTING OF NEW CONDUIT AND DUCTBANKS TO AVOID INTERFERENCE WITH EXISTING CONDUIT, DUCTBANKS, AND OTHER UNDERGROUND UTILITIES.
- ALL CHANGES OF DIRECTION GREATER THAN 20 DEGREES IN UNDERGROUND SINGLE, OR DUCTBANKS OF MULTIPLE CONDUITS, SHALL BE ACCOMPLISHED USING PVC COATED RIGID ALUMINUM LONG RADIUS BENDS. BENDS OF PVC CONDUIT GREATER THAN 20 DEGREES, OR THE USE OF FLEXIBLE CONDUIT OF ANY TYPE, WILL NOT BE PERMITTED. SEE THE SPECIFICATIONS FOR MORE REQUIREMENTS.
- LIQUID TIGHT FLEXIBLE ALUMINUM CONDUIT SHALL BE USED FOR THE PRIMARY AND SECONDARY OF TRANSFORMERS, GENERATOR TERMINATIONS AND OTHER EQUIPMENT WHERE VIBRATION IS PRESENT. USE IN OTHER LOCATIONS IS NOT PERMITTED, EXCEPT FOR CONNECTIONS TO INSTRUMENTATION TRANSMITTERS, WHERE MULTIPLE PENETRATIONS ARE REQUIRED. LIQUID TIGHT FLEXIBLE ALUMINUM CONDUIT SHALL HAVE A MAXIMUM LENGTH NOT GREATER THAN THAT OF A FACTORY MANUFACTURED LONG RADIUS ELBOW OF THE CONDUIT SIZE BEING USED. THE MAXIMUM BENDING RADIUS SHALL NOT BE LESS THAN THAT SHOWN IN THE NEC CHAPTER 9, TABLE 2. *OTHER BENDS*. BX OR AC TYPE PREFABRICATED CABLES WILL NOT BE PERMITTED.
- THE WIRING DIAGRAMS, BLOCK DIAGRAMS, QUANTITY/SIZES OF WIRES/CONDUITS REPRESENT A SUGGESTED ARRANGEMENT BASED UPON SELECTED STANDARD COMPONENTS OF ELECTRICAL EQUIPMENT. MODIFICATIONS ACCEPTABLE TO THE ENGINEER MAY BE MADE BY THE CONTRACTOR TO ACCOMMODATE EQUIPMENT ACTUALLY APPROVED. ALL MODIFICATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. THE BASIC SEQUENCE AND METHOD OF CONTROL MUST BE MAINTAINED AS INDICATED ON THE DRAWINGS AND/OR SPECIFIED.
- ALL JUNCTION BOXES, PULL BOXES AND TERMINATION BOXES IN NEMA 12 AREAS SHALL BE ALUMINUM. FOR NEMA 4X AREAS SEE SPECIFICATIONS FOR BOX DETAILS AND SPECIFICATIONS.
- SEAL ALL RACEWAYS ENTERING JUNCTION BOXES OR CONTROL PANELS CONTAINING ELECTRICAL OR INSTRUMENTATION EQUIPMENT WITH WATERTIGHT SEALANT. REFER TO THE SPECIFICATIONS FOR DETAILS.
- ALL EQUIPMENT AND ELECTRICAL EQUIPMENT ENCLOSURE LOCATIONS, OR TERMINAL BOX LOCATIONS, ARE APPROXIMATE. THE EXACT LOCATIONS SHALL BE COORDINATED WITH AND APPROVED BY THE OWNER/ENGINEER, DURING CONSTRUCTION, AT NO ADDITIONAL COST TO THE OWNER.
- ALL EQUIPMENT AND ELECTRICAL EQUIPMENT ENCLOSURES DIMENSIONS ARE APPROXIMATE. ALL EQUIPMENT AND ELECTRICAL EQUIPMENT ENCLOSURES OR TERMINAL BOX DIMENSIONS SHALL BE VERIFIED WITH THE EQUIPMENT SUPPLIER. ALLOW FOR LOCATION CHANGES AND INCLUDE IN THE CONTRACT PRICE. THE EXACT LOCATIONS OF ALL ELECTRICAL EQUIPMENT AND ROUTING OF ALL CABLES AND CONDUITS SHALL BE COORDINATED WITH AND APPROVED BY THE OWNER/ENGINEER DURING CONSTRUCTION.
- CORING OF AN EXISTING STRUCTURE SHALL BE COORDINATED WITH AND APPROVED BY THE OWNER/ENGINEER. CORING THROUGH STRUCTURAL BEAMS IS STRICTLY PROHIBITED WITHOUT PRIOR WRITTEN APPROVAL FROM THE OWNER/ENGINEER.
- THE LOCATION OF ALL ELECTRICAL EQUIPMENT AND ROUTING OF CABLES AND CONDUITS SHALL BE COORDINATED AND APPROVED BY THE OWNER.
- THE DUCTBANK ROUTING AS SHOWN ON THE DRAWING IS APPROXIMATE. FIELD VERIFY THE EXACT DUCTBANK ROUTING, CABLE LENGTH AND CONDUIT LENGTH.
- PROVIDE CONDUIT SEALS FOR CONDUIT PENETRATIONS AS PER NEC AND NFPA820.
- COORDINATE ALL WORK WITH THE OWNER.

- LOCATE ALL UNDERGROUND UTILITIES BEFORE DIGGING. COORDINATE THE EFFORT WITH THE OWNER.
- ALL SLOTTED CHANNEL, SLOTTED CHANNEL SUPPORT MATERIAL, WASHERS, SCREWS, NUTS, CONDUIT CLAMPS, ALL THREAD SPRING NUTS AND MISC. MOUNTING HARDWARE SHALL BE 316 STAINLESS STEEL.
- LIGHTING FIXTURES SHALL BE MOUNTED ACCORDING TO THE MOUNTING HEIGHT GIVEN ON THE DRAWINGS. THE MOUNTING HEIGHT SHALL BE MEASURED FROM THE BOTTOM OF THE LIGHTING FIXTURE TO THE FINISHED FLOOR.
- CONDUIT AND WIRE FOR THE HVAC EQUIPMENT AND MISCELLANEOUS DEVICES SHALL BE:
 - 3/4" (MIN) RIGID ALUMINUM.
 - NO. 14 XHHW CU. WIRE XHHW (MIN.).
 - IN ACCORDANCE WITH ALL ELECTRICAL AND HVAC SPECIFICATIONS REQUIREMENTS.
- INSTALL ALL CONDUITS AND WIRES SHOWN ON THE INTERFACE DIAGRAM SHALL BE INSTALLED BY THE CONTRACTOR. GROUPING OF CONDUIT AND WIRE MAY BE CHANGED, IF APPROVED BY THE ENGINEER AND OWNER.
- ALL CONDULETS SHALL BE FORM 7 AND SHALL HAVE 316 SS CLAMP COVERS WITH 316 SS CLAMPS AND SCREWS. SCREW DOWN COVERS ARE UNACCEPTABLE. REFER TO THE SPECIFICATIONS FOR MORE INFORMATION.
- ALL BARE COPPER GROUNDING CONDUCTORS SHALL BE TINNED, ALL GROUND RODS SHALL BE 3/4" BY 10' LONG. ALL EXPOSED COPPER GROUND CABLES SHALL BE GREEN INSULATED CONDUCTORS. PROVIDE XHHW INSULATION.
- WHERE NOTES ON THE DRAWING INDICATE THAT THE CONTRACTOR SHALL FIELD-VERIFY, THE INTENT IS FOR THE CONTRACTOR TO INVESTIGATE TO THE EXTENT NECESSARY TO PROVIDE THE WORK AND MATERIALS PRIOR TO BIDDING AND INCLUDE ALL COSTS IN THE BID PRICE. THE CONTRACT PRICE SHALL NOT BE INCREASED WHEN THE CONTRACTOR HAS NOT INVESTIGATED PER THE NOTES DIRECTING THAT BE DONE.

TYPICAL ENCLOSURE TYPES BY AREA TYPE

NON-HAZARDOUS AREAS	BOXES & ENCLOSURES					CONDUIT
	1	3R	4X	4X*	12	
OUTDOOR; GENERAL AREAS		X	X			RIGID ALUMINUM
OUTDOOR; CHEMICAL AREAS				X		SCHEDULE 80 PVC
INDOOR; CHEMICAL ROOM				X		SCHEDULE 80 PVC
INDOOR; CONDITIONED SPACE					X	RIGID ALUMINUM
INDOOR; NON-CONDITIONED SHOP SPACE					X	RIGID ALUMINUM
INDOOR; NON-CONDITIONED PROCESS AREA			X			RIGID ALUMINUM
INDOOR; ADMIN BUILDING	X					EMT/RIGID ALUMINUM
CLASS I, DIVISION 1	REFER TO NEC, NFPA-820, AND CONTRACT CONSTRUCTION SPECIFICATIONS					
CLASS I, DIVISION 2	REFER TO NEC, NFPA-820, AND CONTRACT CONSTRUCTION SPECIFICATIONS					
GENERAL NOTES:						
<ul style="list-style-type: none"> EQUIPMENT SUCH AS MOTOR CONTROL CENTER, SWITCHGEAR, VFDS, AND OTHER STAND-ALONE MOTOR STARTERS ARE AS SHOWN ON DRAWINGS. NEMA 1 ENCLOSURES ARE TO BE NEMA 1 GASKETED. NEMA 4X* ENCLOSURES ARE TO BE NON-METALLIC (ie PVC) NEMA 4X CONDUIT INSIDE ADMIN BUILDING LOCATION IS TO BE EMT IF CONCEALED IN DRY WALL (AKA SHEET ROCK WALL); OTHERWISE RIGID ALUMINUM. USE OF NEMA 3R OR 4X IN OUTDOOR GENERAL AREAS IS A SHOWN ON DRAWINGS. 						

CONDUIT TYPE	LOCATION
RIGID GALVANIZED CONDUIT	NOT ACCEPTABLE FOR USE ON THIS PROJECT EXCEPT FOR THE UTILITY COMPANY'S CONDUCTORS. ALL UTILITY COMPANY'S DUCTS SHALL BE AS SPECIFIED BY UTILITY COMPANY.
PVC COATED ALUMINUM CONDUIT	ALL EMBEDDED CONDUIT BENDS, UNDERGROUND DUCTBANK OF MORE THAN 20 DEGREES, AND ALL CONDUIT STUB-UPS TO A MINIMUM OF 6" ABOVE FINISHED FLOOR OR GRADE AND IN CHLORINE AND CAUSTIC ROOMS.
LIQUID TIGHT FLEXIBLE ALUMINUM CONDUIT	RACEWAY CONNECTION TO VIBRATING EQUIPMENT ONLY, IN ALL AREAS LIMITED TO 36" UNLESS APPROVED BY OWNER AND ENGINEER.
RIGID NON-METALLIC, SCHEDULE 40 PVC CONDUIT	UNDERGROUND ENCASED IN RED DYE REINFORCED CONCRETE. (AS WHERE SPECIFIED)
RIGID NON-METALLIC, SCHEDULE 80 PVC CONDUIT	FOR USE IN CHLORINE AND CAUSTIC ROOMS, AND UNDERGROUND. ENCASED IN RED DYED REINFORCED CONCRETE. (AS WHERE SPECIFIED)
FLEXIBLE ALUMINUM CONDUIT	FIXTURE WHIP CONNECTION TO LIGHTING FIXTURES IN NEMA 12 AREAS (MAXIMUM 3-FT). BX OR AC TYPE PREFABRICATED CABLES ARE NOT PERMITTED.
ALUMINUM RIGID METAL CONDUIT	ALL ABOVE GRADE AREAS, EXCEPT FOR CONCRETE EMBEDDED AND THOSE AREAS ALREADY DESCRIBED IN THIS TABLE
ELECTRIC METALLIC TUBING (EMT) CONDUIT	FOR USE ONLY ON CONCEALED, ABOVE GROUND, INTERIOR ELECTRICAL WIRING IN AIR-CONDITIONED ADMINISTRATIVE BUILDINGS REMOTE TO THE PROCESS AREA, AND CLEARLY DEFINED AS SUCH ON THE DRAWINGS OR IN THE SPECIFICATIONS.

DEMOLITION NOTES

- COORDINATE THE DEMOLITION OF ELECTRICAL CONDUIT, WIRE, EQUIPMENT AND DEVICES WITH THE GENERAL DEMOLITION AND SCHEDULE. THE DRAWINGS ARE INTENDED TO CONVEY THE GENERAL NATURE AND SCOPE OF THE DEMOLITION WORK. EVERY ITEM TO BE DEMOLISHED MAY NOT BE SHOWN. FIELD VERIFY, AND INCLUDE ALL DEMOLITION WORK IN THE CONTRACT PRICE.
- PROVIDE TEMPORARY WIRE AND CONDUIT FOR THE EQUIPMENT WHICH MAY BE AFFECTED BY THE DEMOLITION BUT TO REMAIN IN SERVICE.
- RELOCATE AND RECONNECT POWER AND CONTROL RACEWAYS AND CONDUCTORS TO EQUIPMENT AFFECTED BY DEMOLITION WORK.
- ALL CONDUCTORS BEING DEMOLISHED SHALL BE DISCONNECTED AND REMOVED FROM THE LOAD TO THE SOURCE. SURFACE MOUNTED CONDUITS AND MOUNTING HARDWARE SHALL BE REMOVED. UNDERGROUND CONDUITS WHICH ARE NOT BEING REMOVED OR OTHERWISE NOT BEING MADE UNUSABLE SHALL BE CAPPED AND TAGGED AS SPARE, WITH INFORMATION CLEARLY INDICATING THE LOCATION OF THE OTHER END.
- ALL SURFACES WHERE DEMOLISHED EQUIPMENT OR CONDUIT IS REMOVED SHALL BE CLEANED, PATCHED AND PAINTED TO MATCH THE SURROUNDING SURFACE.
- CHECK THE FUNCTION OF EACH CONDUCTOR BEFORE REMOVING OR DISCONNECTING.
- IF A CONDUCTOR WHICH HAS TO STAY IN SERVICE (NOT BEING DEMOLISHED) IS INSTALLED IN A COMMON CONDUIT WITH CONDUCTORS WHICH ARE BEING DEMOLISHED, THE CONTRACTOR SHALL REMOVE ALL CONDUCTORS FROM THE CONDUIT, PROVIDE NEW CONDUCTORS WHICH ARE REPLACEMENTS FOR THE CONDUCTORS THAT ARE TO REMAIN IN SERVICE AND RE-INSTALL THE NEW CONDUCTORS. AFTER THE CONDUCTORS ARE PULLED, MEGGER OR VFL TEST EACH CONDUCTOR. CONNECT BOTH ENDS OF THE NEW CONDUCTORS AND TEST THE SYSTEM FOR PROPER FUNCTION. DO NOT RE-PULL USED CONDUCTORS UNLESS SPECIFIED.
- WHERE EQUIPMENT IS BEING RE-FED FROM A NEW SOURCE, EXISTING CONDUIT MAY BE REUSED ONLY IF THE CONDUIT AND FITTINGS ARE OF THE TYPE SPECIFIED FOR NEW WORK ON THIS CONTRACT. IF NOT, THE CONDUIT AND CONDUCTORS SHALL BE REPLACED WITH NEW MATERIAL MEETING THE SPECIFICATIONS, AT NO ADDITIONAL COST TO THE OWNER.
- THE CONTRACTOR SHALL COORDINATE WITH THE OWNER/ENGINEER TO FLAG EXISTING UNDERGROUND CONDUITS BEFORE DIGGING.
- THE OWNER HAS THE RIGHT OF FIRST REFUSAL TO THE EQUIPMENT BEING REMOVED. THE CONTRACTOR SHALL DELIVER THE EQUIPMENT WHICH THE OWNER WISHES TO KEEP AT A LOCATION DESIGNATED BY THE OWNER. SEE SPECIFICATIONS.
- DO NOT MAKE ANY MODIFICATIONS TO THE EXISTING ELECTRICAL EQUIPMENT UNTIL THE FOLLOWING HAS BEEN DONE:
 - THE OWNER/CONTRACTOR SHALL WITNESS AND RECORD THE CONDITION OF THE EXISTING EQUIPMENT, THE CONTRACTOR SHALL NOTE DOWN ANY DEFECTS OR DEFICIENCIES.
 - THE OWNER SHALL OPERATE THE EQUIPMENT TO DEMONSTRATE THE CURRENT CONDITIONS. THE CONTRACTOR SHALL NOTE DOWN ANY DEFECTS OR DEFICIENCIES.
 - A WRITTEN AND PHOTOGRAPHIC RECORD OF THE OPERATION AND EXISTING CONDITION SHALL BE KEPT IN A THREE RING BINDER AT THE OWNER/CONTRACTOR TRAILER, IN FORM OF PICTURES AND INFORMATION.
 - A FORM SHALL BE GENERATED BY THE CONTRACTOR TO RECORD THE OBSERVATIONS. BOTH PARTIES SHALL SIGN ON THE FORM.
 - REPLACE ALL MATERIAL OR EQUIPMENT DAMAGED DURING THE COURSE OF WORK.
 - AFTER THE CHANGES ARE MADE, THE EQUIPMENT SHALL BE INSPECTED AND RE-TESTED TO DEMONSTRATE THAT IT FUNCTIONS CORRECTLY.
 - NO PORTION OF EXISTING CONDUCTORS SHALL BE SPLICED TO NEW CONDUCTORS FOR RE-USE WITHOUT SPECIFIC APPROVAL FROM THE OWNER/ENGINEER ON A CASE-BY-CASE BASIS.

MCC, CONTROL PANELS, PANELBOARDS

THESE NOTES APPLY TO CONTROL PANELS, MCC ETC WHICH HAS TO BE REFURBISHED, MODIFIED, DISCONNECTED & RECONNECTED OR REWORKED.

THE CONTRACTOR SHALL NOT MAKE ANY MODIFICATION UNTIL THE FOLLOWING HAS BEEN DONE:

- THE OWNER/CONTRACTOR SHALL WITNESS THE CONDITION OF THE EXISTING EQUIPMENT, THE CONTRACTOR SHALL NOTE DOWN ANY DEFECTS OR DEFICIENCY.
- THE OWNER SHALL OPERATE THE EQUIPMENT TO DEMONSTRATE THE CURRENT CONDITIONS. THE CONTRACTOR SHALL NOTE DOWN ANY DEFECTS OR DEFICIENCIES.
- A RECORD OF THE OPERATION AND EXISTING CONDITION SHALL BE KEPT IN A THREE RING BINDER AT THE OWNER/CONTRACTOR TRAILER, IN FORM OF PICTURES AND INFORMATION.
- A FORM SHALL BE GENERATED BY THE CONTRACTOR TO RECORD THE OBSERVATIONS. BOTH PARTIES SHALL SIGN ON THE FORM.
- REPLACE ALL MATERIAL OR EQUIPMENT DAMAGED DURING THE COURSE OF WORK.
- AFTER THE CHANGES ARE MADE, THE EQUIPMENT SHALL BE INSPECTED AND RE-TESTED TO DEMONSTRATE THAT IT FUNCTIONS CORRECTLY.



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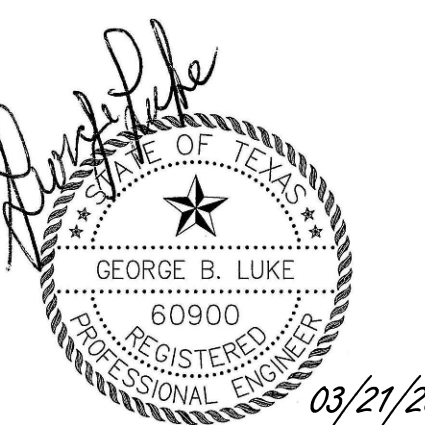
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ELECTRICAL IMPROVEMENTS AT INTERSECTION OF MCKINNEY AND KNOX



03/21/23

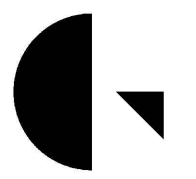
Revision

No.	Date	Description

GENERAL NOTES

E-03

PROJECT: 48006.00
DATE: DEC 2022



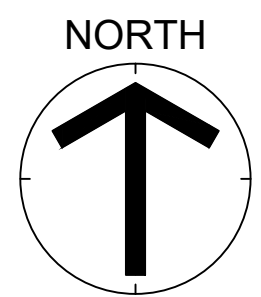
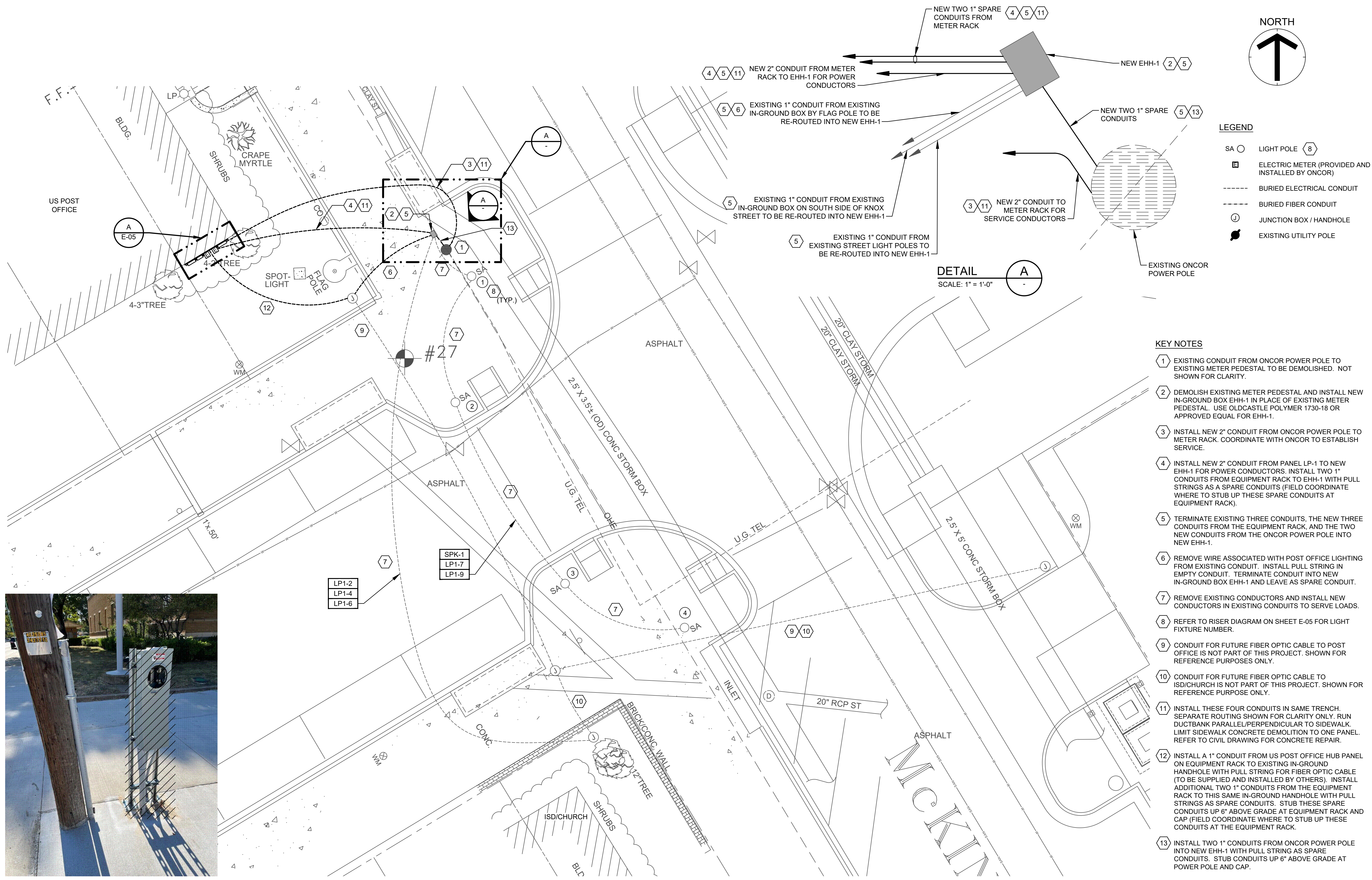
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LEGEND

- SA ○ LIGHT POLE (8)
- ELECTRIC METER (PROVIDED AND INSTALLED BY ONCOR)
- BURIED ELECTRICAL CONDUIT
- BURIED FIBER CONDUIT
- ⊙ JUNCTION BOX / HANDHOLE
- EXISTING UTILITY POLE

DETAIL A
SCALE: 1" = 1'-0"

KEY NOTES

- 1 EXISTING CONDUIT FROM ONCOR POWER POLE TO EXISTING METER PEDESTAL TO BE DEMOLISHED. NOT SHOWN FOR CLARITY.
- 2 DEMOLISH EXISTING METER PEDESTAL AND INSTALL NEW IN-GROUND BOX EHH-1 IN PLACE OF EXISTING METER PEDESTAL. USE OLDCASTLE POLYMER 1730-18 OR APPROVED EQUAL FOR EHH-1.
- 3 INSTALL NEW 2" CONDUIT FROM ONCOR POWER POLE TO METER RACK. COORDINATE WITH ONCOR TO ESTABLISH SERVICE.
- 4 INSTALL NEW 2" CONDUIT FROM PANEL LP-1 TO NEW EHH-1 FOR POWER CONDUCTORS. INSTALL TWO 1" CONDUITS FROM EQUIPMENT RACK TO EHH-1 WITH PULL STRINGS AS A SPARE CONDUITS (FIELD COORDINATE WHERE TO STUB UP THESE SPARE CONDUITS AT EQUIPMENT RACK).
- 5 TERMINATE EXISTING THREE CONDUITS, THE NEW THREE CONDUITS FROM THE EQUIPMENT RACK, AND THE TWO NEW CONDUITS FROM THE ONCOR POWER POLE INTO NEW EHH-1.
- 6 REMOVE WIRE ASSOCIATED WITH POST OFFICE LIGHTING FROM EXISTING CONDUIT. INSTALL PULL STRING IN EMPTY CONDUIT. TERMINATE CONDUIT INTO NEW IN-GROUND BOX EHH-1 AND LEAVE AS SPARE CONDUIT.
- 7 REMOVE EXISTING CONDUCTORS AND INSTALL NEW CONDUCTORS IN EXISTING CONDUITS TO SERVE LOADS.
- 8 REFER TO RISER DIAGRAM ON SHEET E-05 FOR LIGHT FIXTURE NUMBER.
- 9 CONDUIT FOR FUTURE FIBER OPTIC CABLE TO POST OFFICE IS NOT PART OF THIS PROJECT. SHOWN FOR REFERENCE PURPOSES ONLY.
- 10 CONDUIT FOR FUTURE FIBER OPTIC CABLE TO ISD/CHURCH IS NOT PART OF THIS PROJECT. SHOWN FOR REFERENCE PURPOSE ONLY.
- 11 INSTALL THESE FOUR CONDUITS IN SAME TRENCH. SEPARATE ROUTING SHOWN FOR CLARITY ONLY. RUN DUCTBANK PARALLEL/PERPENDICULAR TO SIDEWALK. LIMIT SIDEWALK CONCRETE DEMOLITION TO ONE PANEL. REFER TO CIVIL DRAWING FOR CONCRETE REPAIR.
- 12 INSTALL A 1" CONDUIT FROM US POST OFFICE HUB PANEL ON EQUIPMENT RACK TO EXISTING IN-GROUND HANDHOLE WITH PULL STRING FOR FIBER OPTIC CABLE (TO BE SUPPLIED AND INSTALLED BY OTHERS). INSTALL ADDITIONAL TWO 1" CONDUITS FROM THE EQUIPMENT RACK TO THIS SAME IN-GROUND HANDHOLE WITH PULL STRINGS AS SPARE CONDUITS. STUB THESE SPARE CONDUITS UP 6" ABOVE GRADE AT EQUIPMENT RACK AND CAP (FIELD COORDINATE WHERE TO STUB UP THESE CONDUITS AT THE EQUIPMENT RACK).
- 13 INSTALL TWO 1" CONDUITS FROM ONCOR POWER POLE INTO NEW EHH-1 WITH PULL STRING AS SPARE CONDUITS. STUB CONDUITS UP 6" ABOVE GRADE AT POWER POLE AND CAP.



EXISTING METER PEDESTAL

PHOTOGRAPH A (2)

PLAN
SCALE: 1/8" = 1'-0"
0 4 8 16 24'

ELECTRICAL IMPROVEMENTS AT INTERSECTION OF MCKINNEY AND KNOX



Revision		
No.	Date	Description

ELECTRICAL PLAN

E-04

PROJECT: 48008.00
DATE: DEC 2022

W:\MicroStation\0314_McKinney, Knox Street Improvements\Drawings\Electrical\Working\0314_E-04.dwg - Diana Palmer - 3/21/2023 1:48:12 PM

PANELBOARD: LP-1					MAIN BREAKER		LOCATION: MCKINNEY STREET AND KNOX STREET								
VOLTAGE: 120/208, 1PH, 3W					TYPE: CB		ENCLOSURE: NEMA 3R								
WITHSTAND RATING: 22 kA					RATING: 200 A		BUS SIZE: 200A								
MOUNTING: OUTDOOR							BUS TYPE: TIN-PLATED COPPER								
							SPD: REQUIRED								
NOTES	CKT NO.	BRKR AMPS / POLES	WIRE SIZE	COND SIZE	DESCRIPTION	L1 (VA)	L2 (VA)	L1 (VA)	L2 (VA)	DESCRIPTION	COND SIZE	WIRE SIZE	BRKR AMPS / POLES	CKT NO.	NOTES
	1	20/1	10		POST OFFICE ROOF LIGHTING	960		2160		ISD/CHURCH ROOF LIGHTING		6	30/1	2	
	3	20/1	10		SPARE				2160	ISD/CHURCH ROOF LIGHTING		6	30/1	4	
	5	20/1	10		POST OFFICE HUB PANEL	1920		1920		ISD/CHURCH HUB PANEL		8	20/1	6	
3	7	20/1	8		STREET LIGHT POLE LIGHTS		800							8	
3	9	20/1	8		STREET LIGHT POLE RECEPTACLES	240								10	
	11	20/1			SPARE									12	
	13													14	
	15													16	
	17													18	
SUBTOTAL VA BY PHASE						3120	800	4080	2160						
TOTAL VA BY PHASE						7200	2960								
TOTAL VA						10160									
L-L VOLTAGE						240									
TOTAL AMPS (AVERAGE PER LEG)						42.3									
GENERAL NOTES:						KEYED NOTES									
* CONDUIT SIZE SHOWN IS THE MINIMUM SIZE REQUIRED FOR INDIVIDUAL CIRCUITS. MULTIPLE CIRCUITS MAY BE COMBINED IN A SINGLE CONDUIT FOR FIELD ROUTING PROVIDED NEC MAXIMUM CONDUIT FILL IS NOT EXCEEDED.						1. 30 mA GFCI CIRCUIT BREAKER FOR EQUIPMENT PROTECTION ONLY (HEAT TRACE)									
* EACH SINGLE PHASE 120V CIRCUIT SHALL HAVE A SEPARATE NEUTRAL WIRE.						2. 5 mA GFCI CIRCUIT BREAKER									
						3. REFER TO RISER DIAGRAM FOR WIRE SIZING.									
						4.									
						5.									
						6.									

LEGEND

- Ⓝ LIGHT POLE IDENTIFIER. REFER TO SHEET E-04 FOR LOCATIONS.

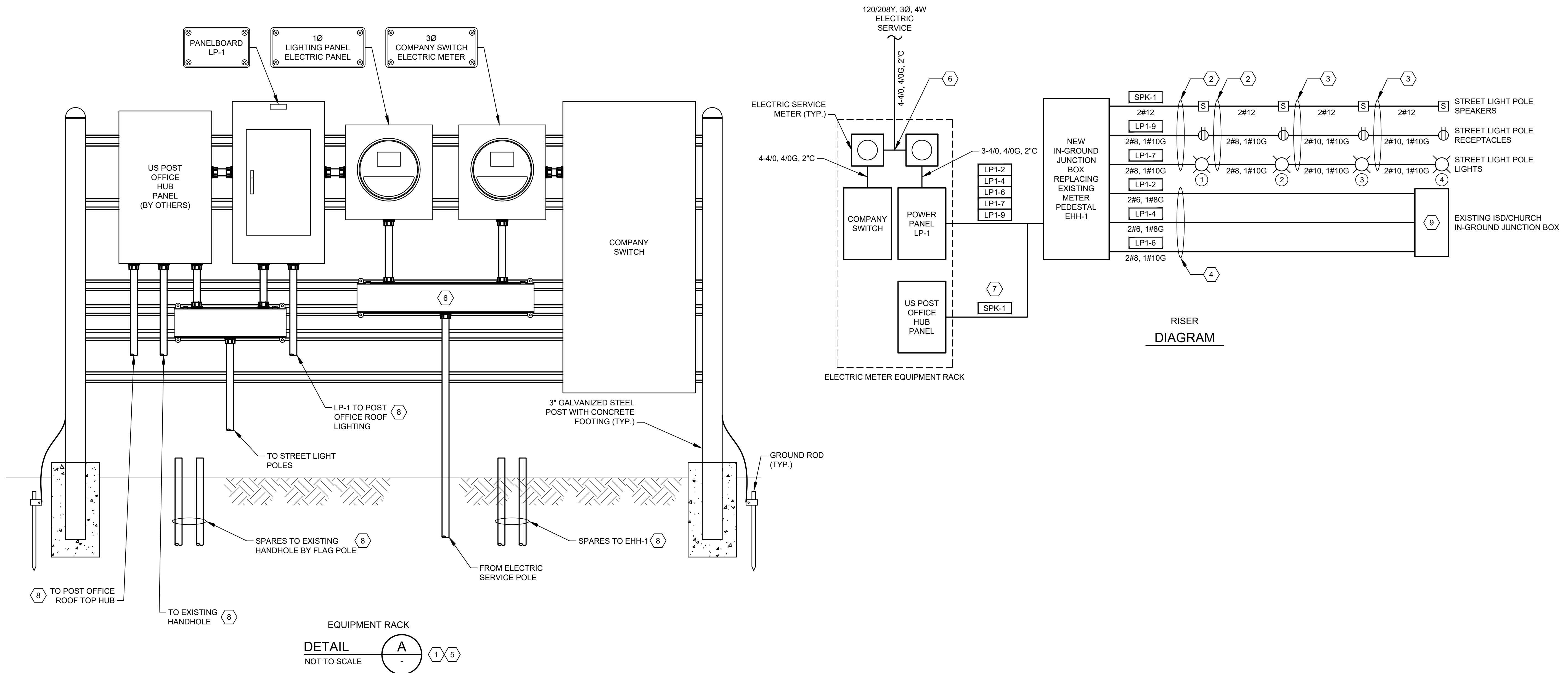
KEY NOTES

- NOT ALL CONDUITS SHOWN FOR CLARITY.
- INSTALL ALL CONDUCTORS IN EXISTING 1" RACEWAY.
- INSTALL ALL CONDUCTORS IN EXISTING 3/4" RACEWAY.
- INSTALL ALL CONDUCTORS IN EXISTING 1-1/2" RACEWAY.
- MAXIMUM DIMENSIONS OF EQUIPMENT RACK IS 80" WIDE AND 68" HIGH INCLUDING MOUNTED EQUIPMENT.
- PROVIDE ILSCO TYPE PDB-16-20/0-3 POWER DISTRIBUTION BLOCKS OR EQUAL INSIDE WIREWAY TO DISTRIBUTE INCOMING POWER TO BOTH ELECTRIC METERS.
- PROVIDE ONE PINK AND ONE PURPLE COLOR INSULATED #12 CONDUCTORS FROM US POST OFFICE HUB PANEL TO STREET LIGHT POLE SPEAKERS.
- INSTALL EMPTY CONDUITS PULL STRING ONLY. FIELD COORDINATE ROUTING AND TERMINATION OF CONDUITS.
- TERMINATE WIRING IN JUNCTION BOX TO CONDUCTORS FROM ISD/CHURCH. CONDUCTORS FROM ISD/CHURCH INSTALLED BY OTHERS. FIELD COORDINATE WHICH CIRCUITS FROM LP1 TO TERMINATE TO ISD/CHURCH WIRING.

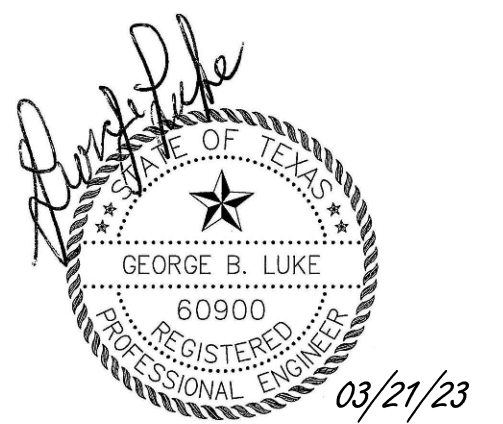


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ELECTRICAL IMPROVEMENTS AT INTERSECTION OF MCKINNEY AND KNOX



Revision		
No.	Date	Description

LP-1 PANEL SCHEDULE, ELECTRICAL DETAIL, AND RISER DIAGRAM

E-05

PROJECT: 48006.00
DATE: DEC 2022

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