Solicitation 18-23-I

Wastewater Treatment Plant Emergency Generator

Bid Designation: Public

City of Lewisville, Texas

Bid 18-23-I
Wastewater Treatment Plant Emergency Generator

Bid Number	18-**23**-I
Bid Title	Wastewater Treatment Plant Emergency Generator
Bid Start Date	In Held
Bid End Date	Oct 11, 2018 2:00:00 PM CDT
Question & Answer End Date	Oct 4, 2018 2:00:00 PM CDT
Bid Contact	Tracey Ogurek Buyer Finance
Contract Duration	**300 days**
Contract Renewal	Not Applicable
Prices Good for	**60 days**
Pre-Bid Conference	**Oct 3, 2018 10:00:00 AM CDT** **Attendance is optional** **Location: City of Lewisville** **Public Services Conference Room** **1100 N. Kealy Street, Suite C** **Lewisville, TX 75057**
Standard Disclaimer	**All goods and services provided to the City must be compliant with the Americans with Disabilities Act ("ADA") and all regulations promulgated pursuant to the ADA. The successful bidder will be required to certify compliance, if applicable.**
Bid Comments	**The City of Lewisville is accepting bids for the Wastewater Treatment Plant Emergency Generator Project.** **Basis of award will be lowest responsible bidder.** **Bidders are required to submit a cashier's or certified check issued by a bank satisfactory to the City of Lewisville, or a Bid Bond (with proper Power of Attorney) from a surety licensed to do business in the State of Texas, payable without recourse to the City of Lewisville, in an amount not less than fire (5%) percent of the total amount of the base bid submitted to insure that the successful bidder will enter into a contract and execute all necessary bonds within fifteen (15) days after notice of award of the contract to him. The bid security must be uploaded with bid documents to Bidsync or included within bid envelope along with the bid sheet for the bidder to be considered responsive. The successful bidder will be required to furnish performance, payment and maintenance bonds as described in the specifications.** **All documents that require a signature are to be signed and uploaded to Bidsync or provided within vendor's bid if delivered to the City of Lewisville.** **The successful bidder shall begin work under this contract within 15 days after receiving notice to proceed. All insurance certificates and bonds are to be provided and approved by the City prior to commencement of any work. The completion of work, including clean-up, shall be completed 300 calendar days from notice to proceed.**

Item Response Form

Item **18-23-I--01-01 -** Mobilization/Start Up
Quantity **1 lump sum**
Unit Price
Delivery Location **City of Lewisville, Texas**
Prairie Creek Wastewater Treatment Plant
City of Lewisville
897 Treatment Plant Rd
Lewisville TX 75057
Qty 1

Description
Mobilization/Start up (Bonds, Insurance, Move In, Sanitary Facilities) NOTE: This item may not exceed 5% of the total amount bid.

Item **18-23-I--01-02 -** 15kV Generator and Neutral Grounding Resistor Roof
Quantity **1 lump sum**
Unit Price
Name of Manufacturer
Delivery Location **City of Lewisville, Texas**
Prairie Creek Wastewater Treatment Plant
City of Lewisville
897 Treatment Plant Rd
Lewisville TX 75057
Qty 1

Description
Furnish and install 15kV generator and neutral grounding resistor roof complete and in place.
Provide name of Generator Manufacturer.

Item **18-23-I--01-03 -** 18kV Automatic Transfer Switch Gear, Auxiliary Control panel & Battery System
Quantity **1 lump sum**
Unit Price
Delivery Location **City of Lewisville, Texas**
Prairie Creek Wastewater Treatment Plant
City of Lewisville
897 Treatment Plant Rd
Lewisville TX 75057
Qty 1

Description
Furnish and install 15kV automatic transfer switch gear, auxiliary control panel and battery system complete and in place.

Item **18-23-I--01-04 -** Underground Duct Banks
Quantity **1 lump sum**
Unit Price
Delivery Location **City of Lewisville, Texas**

Prairie Creek Wastewater Treatment Plant
City of Lewisville
897 Treatment Plant Rd
Lewisville TX 75057
Qty 1

Description
Furnish and install underground duct banks complete and in place.

Item **18-23-I--01-05 -** 15kV Cable and Accessories
Quantity **1 lump sum**
Unit Price
Delivery Location **City of Lewisville, Texas**
Prairie Creek Wastewater Treatment Plant
City of Lewisville
897 Treatment Plant Rd
Lewisville TX 75057
Qty 1

Description
Furnish and install 15kV cable and accessories complete and in place.

Item **18-23-I--01-06 -** Cable Tray and Exposed Conduit
Quantity **1 lump sum**
Unit Price
Delivery Location **City of Lewisville, Texas**
Prairie Creek Wastewater Treatment Plant
City of Lewisville
897 Treatment Plant Rd
Lewisville TX 75057
Qty 1

Description
Furnish and install cable tray and exposed conduit and complete and in place.

Item **18-23-I--01-07 -** 480 Volt and Less Cable and Wiring
Quantity **1 lump sum**
Unit Price
Delivery Location **City of Lewisville, Texas**
Prairie Creek Wastewater Treatment Plant
City of Lewisville
897 Treatment Plant Rd
Lewisville TX 75057
Qty 1

Description
Furnish and install 480 volt and less cable and wiring complete and in place.

Item **18-23-I--01-08 -** Site Work
Quantity **1 lump sum**

Unit Price

Delivery Location **City of Lewisville, Texas**
Prairie Creek Wastewater Treatment Plant
City of Lewisville
897 Treatment Plant Rd
Lewisville TX 75057
Qty 1

Description
Furnish and install site work complete and in place.

Item **18-23-I--01-09 -** Concrete Pads
Quantity **1 lump sum**
Unit Price

Delivery Location **City of Lewisville, Texas**
Prairie Creek Wastewater Treatment Plant
City of Lewisville
897 Treatment Plant Rd
Lewisville TX 75057
Qty 1

Description
Furnish and install concrete pads for generator neutral grounding resistor and switch gear building complete and in place.

Item **18-23-I--01-10 -** Project Record Drawings
Quantity **1 lump sum**
Unit Price

Delivery Location **City of Lewisville, Texas**
Prairie Creek Wastewater Treatment Plant
City of Lewisville
897 Treatment Plant Rd
Lewisville TX 75057
Qty 1

Description
Provide Project Record Drawings (as-Builts), Complete.

Item **18-23-I--01-11 -** O&M Manuals and Training Documentation
Quantity **1 lump sum**
Unit Price

Delivery Location **City of Lewisville, Texas**
Prairie Creek Wastewater Treatment Plant
City of Lewisville
897 Treatment Plant Rd
Lewisville TX 75057
Qty 1

Description
Provide O&M Manuals and Training Session Documentation, Complete.

Finance Department
Purchasing Division
August 29, 2018

INVITATION TO BID

BID NAME: **Wastewater Treatment Plant Emergency Generator**

PROJECT NO: **U1501** **BID NUMBER: 18-23-I**

Sealed bids will be received at www.bidsync.com or the Finance Administration - Purchasing Division at 151 West Church Street, Lewisville, Texas 75057 until **2:00 p.m. local time, October 11, 2018.** Bids will be publicly opened and read aloud by a Purchasing Division Representative for the construction project listed above at 2:30 pm, October 11, 2018. **If a paper bid is provided, envelopes are to be clearly marked with the bid number, bid opening date and company submitting the bid.**

The City will accept an Excel spreadsheet in lieu of a manual bid sheet. Please note that the spreadsheet needs to contain an authorized signature of the bidder, along with the name of the bidder. In addition, each bidder is to note that unit prices as recorded in the spreadsheet will prevail over any discrepancies with mathematical extension of total prices and the quantities and descriptions listed on the original bid sheets prevail over any discrepancies in regard to quantities or descriptions listed in the spreadsheet.

A pre-bid conference will be held at Public Services Conference Room at **1100 N. Kealy Street, Suite C Lewisville, Texas 75057 at 10:00 a.m. on October 3, 2018.** While attendance of the pre-bid conference is not mandatory, it is recommended due to the nature of the project.

The project includes but is not limited to construction of a precast concrete building and associated conduit, piping, electrical raceways, ventilation; provision and installation of transformers, generator, switchgear; associated site work, including drainage, grading, and paving; electrical power distribution to support proposed improvements.

BID BOND REQUIREMENTS

If the project total is $100,000 or greater, bidders are required to submit a cashier's or certified check issued by a bank satisfactory to the City of Lewisville, or a Bid Bond (with proper Power of Attorney) from a surety licensed to do business in the State of Texas, payable without recourse to the City of Lewisville, in an amount not less than five (5%) percent of the total amount of the base bid submitted to insure that the successful bidder will enter into a contract and execute all necessary bonds within fifteen (15) days after notice of award of the contract to him. . **This bid security must be uploaded to BidSync or included in the bid envelope along with the bid sheet for the bidder to be considered responsive.**

PAYMENT, PERFORMANCE, AND MAINTENANCE BOND REQUIREMENTS AFTER ACCEPTANCE OF SUCCESSFUL BIDDER

The successful bidder will be required to furnish the following bonds from a surety licensed to do business in the State of Texas. These bonds, along with proper insurance papers, will be incorporated as part of the final contract documents and will remain in effect until the completion and acceptance of the project. Maintenance bonds shall be in effect based on their stated term after final acceptance of the project:

Project amount $10,001 to $24,999 – a payment bond at the project amount and a maintenance bond for one year from the date of final payment.

Project amount $25,000 to $99,999 – a payment bond at the project amount and a maintenance bond for two years from the date of the final payment.

Project amount $100,000 and greater – a bid bond equal to 5% of the project amount is to be included with the sealed bid; a payment bond and performance bond at the project amount and a maintenance bond for two years from the date of the final acceptance.

All bidders are notified that all bid documents including the qualification statement provided in the bid documents must be completed and submitted with the bid. Failure to include these completed forms with your bid may cause your bid to be disqualified as non-responsive.

Specifications, instructions to bidders, and bidding documents are available through Bidsync.

Any questions are to be posted on BidSync. Bidders may post questions up to 2:00 pm Thursday, October 4, 2018. All questions will be responded to by 2:00 pm Monday, October 8, 2018.

The City is not responsible for any costs associated with the preparation of the bid from any vendor. Also, should a vendor bid an alternate; any test costs to prove equality of product will be at the expense of the vendor, not the City of Lewisville.

Each bidder is expected to inspect the site of the work and to inform himself regarding all local conditions. Ignorance of existing conditions of the site will not be a basis for any changes after the award of the bid.

Bids cannot be altered or amended after the submission deadline. Any interlineation, alteration, or erasure made before opening time must be initialed by the signee of the bid, guaranteeing authenticity.

In conformance with applicable statutes utilizing Federal Davis Bacon Wage Rates as adopted by the General Services Commission, the general prevailing wage rates in the locality in which the work is to be performed have been ascertained and such rate shall be the minimum paid for labor employed on this project; unless federal monies are used, in which case, specific wage decisions will be listed as part of the overall bid documents.

The City of Lewisville reserves the right to reject any and all bids, in whole or in part; to waive any informality in any bid. Award will be issued on the basis of lowest responsible bidder.

CITY OF LEWISVILLE

Todd White, C.P.M., Purchasing Manager

Publication Dates:
Sept. 21 & 28, 2018

PROPOSAL

City of Lewisville
Purchasing Office
151 West Church Street
P.O. Box 299002
Lewisville, Texas 75029-9002

PROJECT NO. U1501 - Wastewater Treatment Plant Emergency Generator

Proposal of _____
(hereinafter called Bidder), a corporation organized and existing under the laws of the State of _____, a partnership, or an individual doing business as _____
(Strike out inapplicable terms).

To the City of Lewisville, Texas (Owner)

The undersigned Bidder, in response to the Notice to Bidders for the construction of the above project and in conformity with the bidding documents; having examined the plans, specifications, related documents and the site of the proposed work; being familiar with all of the conditions relating to the construction of the proposed project, including the availability of materials and labor, hereby proposes to furnish all labor, materials, supplies, equipment, staking, testing, traffic control, superintendence, etc., for the construction of the project in accordance with the plans, specifications, and contract documents at the unit prices proposed herein.

The undersigned Bidder proposes, acknowledges and agrees to construct the entire project as shown on the plans, fully in accordance with the requirements of the plans, specifications, and the contract documents for the prices included in this Proposal and fully understands and agrees that the various items of material, labor and construction not specifically enumerated and provided for herein are considered subsidiary to the several items for which direct payment is specifically provided. Further, the undersigned agrees that one such subsidiary item is the protection, adjustment, maintenance, repair or replacement of all underground lines and services, whether shown on the plans or not, all to the full satisfaction of the City Engineer in a timely manner.

The undersigned Bidder agrees to begin work under the contract on or before the date specified in the written Notice to Proceed, and to fully complete the project within **300 calendar days**. It is specifically stated and understood that the entire construction including clean up shall be completed within the above stated time.

PROJECT NO. U1501 - Wastewater Treatment Plant Emergency Generator

A 5% contingency line item will be included with the resulting contract and purchase order for this project. The contingency shall be used at the City's discretion and only upon written approval from the City. The amount listed as a contingency is not an obligation for payment from the City. Any unused contingency is retained by the City and is not payable to the Contractor.

The undersigned Bidder has contacted, within 72 hours prior to the bid opening, the Project Engineer (McCreary & Associates) (972) 458-8745, and has determined that all Addenda are as follows:

Addendum No. 1 dated _____ _____
(Signature)

Addendum No. 2 dated _____ _____
(Signature)

Addendum No. 3 dated _____ _____
(Signature)

The undersigned Bidder acknowledges that the Owner reserves the right to waive any informality and to reject any or all proposals.

The undersigned Bidder acknowledges and agrees that this Proposal shall be good and may not be withdrawn for 60 days from the date of bid opening.

The undersigned Bidder has shown unit prices and amounts and agrees that in the case of discrepancy, the unit prices shown in figures shall stand and that the amounts and total will be adjusted to correspond to the unit prices shown.

ENGINEER'S SPECIAL SUPPLEMENTAL GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Adapted from EJCDC C-700, Standard General Conditions of the Construction Contract (2007 Edition)

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

GENERAL CONDITIONS

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.1 *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's 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* or *CONTRACTOR* – The individual or entity with whom Owner has entered into the Agreement.

16. *Cost of the Work* – See Paragraph 11.01.A 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* or *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 01 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* or *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.

1.2 T*erminology*

A. The words and terms referenced in this Paragraph 1.02 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 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

2.1 *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.

2.2 *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.

2.3 *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.

2.4 *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.

2.5 *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;

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.

2.6 *Preconstruction Conference; Designation of Authorized Representative*

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.

2.7 *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

3.1 *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.

3.2 *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.

3.3 *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, 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).

3.4 *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.

3.5 *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 Engineer's 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.

3.6 *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

4.1 *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. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.2 *Subsurface and Physical Conditions*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site; that Engineer has used in preparing the Contract Documents; and

2. those drawings of physical conditions in or relating to existing surface or subsurface at or contiguous to the Site (except Underground Facilities) that Engineer has used in preparing the Contract Documents.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely on the general 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.

4.3 *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.

1. It should be noted that variations in the level of naturally occurring ground water is typical in the project site area. Variations in ground water levels from that shown or discovered during subsurface investigations shall not be grounds for changed conditions. The contractor shall conduct whatever investigations or historical reviews such that he/she has anticipated potential naturally occurring variations in ground waters that could impact construction and soil conditions during the course of thie project.

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.

4.4 *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.

4.5 *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.

4.6 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* The Owner knows of no known Hazardous Environmental Conditions that have been identified at the Site.

B. *Limited Reliance by Contractor on Technical Data Authorized:* The Owner does have limited drawings of site facilities however the accuracy and reliability are not guaranteed by the Owner or Engineer.

1. The Contractor shall excavate or due preliminary investigations to determine completeness of Owner drawings. The encountering of conditions different that shown on the engineer's drawings or the Owner's historic drawings should immediately be reported to the Engineer.

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 to Contractor written notice:: (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, 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.G shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's sole negligence.

H. 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

5.1 *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.

5.2 *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.

5.3 *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.

5.4 *Contractor's Liability 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 insurance;

   a. such insurance shall remain in effect for at least two years after final payment, and

   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.

5.5 *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.

5.6 (Not Used)

5.7 (Not Used)

5.8 (Not Used)

5.9 (Not Used)

5.10 *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.

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.1 *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. Unless the Owner shall otherwise agree in writing, the superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or received from the superintendent shall be binding on Contractor.

6.2 *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.

6.3 *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.

6.4 *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.

6.5 *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; and

      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; and

   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.

6.6 *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 anything in the Contract Documents 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.

6.7 *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, 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.

6.8 *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.

6.9 *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 primary 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 and 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 that are applicable to the Work.

D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety programs 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 indicated use, 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 Drawing 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:

1. is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of real or personal property (other than the Work itself), including the loss of use resulting therefrom; and

2. is caused by any 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, regardless of whether or not caused in part by an individual or entity indemnified hereunder or whether liability is imposed upon such indemnified party by Laws or Regulations.

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 be limited in any way by the amount or types of insurance provided by Contractor under Article 5 of the General Conditions.

D. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the sole negligence or willful misconduct of Owner or Engineer or of the officers, directors, members, partners, employees, agents, and consultants and subcontractors of each and any of them.

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

7.1 *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 shall

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, Contractor may cut or alter the work of others 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.

7.2 *Legal Relationships*

A. Paragraph 7.01.A is 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 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 action or inactions.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.1 *Communications to Contractor*

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

8.2 *Furnish Data*

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

8.3 *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.

8.4 *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 or contiguous to the Site.

8.5 *Insurance*

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

8.6 *Change Orders*

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

8.7 *Inspections, Tests, and Approvals*

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

8.8 *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.

8.9 *Undisclosed Hazardous Environmental Condition*

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

8.10 *Evidence of Financial Arrangements*

A. If and to the extent Owner has agreed to furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents, Owner's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

8.11 *Compliance With Safety Programs*

A. While on 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.B.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.1 *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 and will not be changed without written consent of Owner and Engineer.

9.2 *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, or have control over Contractor's Work, nor shall Engineer have authority over or responsibility for the means, methods, techniques, sequences, or procedures of construction selected by Contractor, for safety precautions and programs incident to Contractor's Work in progress, nor for any failure of Contractor to comply with Laws and Regulations applicable to Contractor's furnishing and performing the Work.

9.3 *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.

9.4 *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.

9.5 *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.

9.6 *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, if any,

1. as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21;

2. as to Change Orders, see Articles 10, 11, and 12; and

3. as to Applications for Payment, see Article 14.

9.7 *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.

9.8 *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.

9.9 *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 Programs*

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

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.1 *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.

10.2 *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.B.

10.3 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are:

a) ordered by Owner pursuant to Paragraph 10.01.A,

b) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or

c) 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.

10.4 *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.

10.5 *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

11.1 *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, 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, expediters, 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.

11.2 *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.

11.3 *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

12.1 *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 Paragraph 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.

12.2 *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.

12.3 *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. 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.

C. If Owner, Engineer, 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.

D. 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 other

contractors or utility owners, 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.D.

E. Owner and Engineer and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each of them 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.

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

13.1 *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.

13.2 *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 Site safety procedures and programs so that they may comply therewith as applicable.

13.3 *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 said 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.

13.4 *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.

13.5 *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.

13.6 *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.

13.7 *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.

13.8 *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.

13.9 *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

14.1 *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.

14.2 *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, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and to 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.

14.3 *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.

14.4 *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.

14.5 *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.

14.6 *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.

14.7 *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:

   a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and

   b) 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.

14.8 *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.

14.9 *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

15.1 *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.

15.2 *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 disregard of the authority of Engineer; or

4. Contractor's repeated 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.

15.3 *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.

15.4 *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. Dispute resolution methods and procedures, if any, shall be as set forth in the Supplementary Conditions. If no method and procedure has been set forth, and subject to the provisions of Paragraph 10.05, Owner and Contractor may exercise such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any dispute.

ARTICLE 17 – MISCELLANEOUS

17.1 *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.

17.2 *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.

17.3 *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.

17.4 *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.

17.5 *Controlling Law*

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

17.6 *Headings*

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

+ + END OF ENGINEER'S SPECIAL SUPPLEMENTAL GENERAL CONDITIONS + +

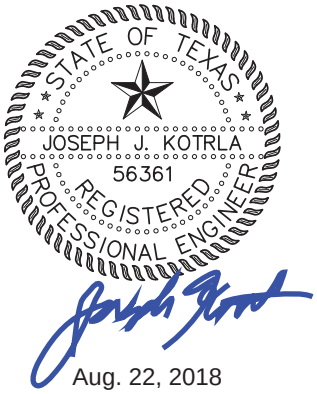
TECHNICAL SPECIFICATIONS

FOR THE

CITY OF LEWISVILLE
WASTE WATER TREATMENT PLANT
EMERGENCY GENERATOR

BID DOCUMENT No. 18-23-I

PROJECT No. U1501



Aug. 22, 2018

Prepared By

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS
Firm No. F-338
DALLAS, TEXAS
(972) 458-8745

August 2018

TECHNICAL SPECIFICATIONS INDEX

DIVISION 32 - EXTERIOR IMPROVEMENTS

DIVISION 1

GENERAL REQUIREMENTS

SECTION 01 01 10 - SUMMARY OF WORK

PART 1 - GENERAL

1.01 SCOPE

A. This section shall include summary of work to be performed in accordance with the contract documents.

1.02 CONTRACT DESCRIPTION

A. The work will be at the Lewisville Wastewater Treatment Plant located at 897 Treatment Plant Rd, Lewisville, Texas 75057.

B. Work of the project includes addition of a new 1500 kW Emergency Generator, automatic transfer switchgear, a pre-cast switchgear building, and associated electrical, mechanical and SCADA work.

C. Work shall include concrete pads and site work as indicated on the civil and structural drawings and specifications.

D. Perform Work of Contract under bid item descriptions in accordance with Conditions of the Contract.

E. Drawings and technical specifications cover Work of the Contract.

PART 2 – PRODUCTS [NOT USED]

PART 3 – EXECUTION[NOT USED]

SECTION 01 57 23
Temporary Storm Water Pollution Control

PART 1 - GENERAL

1.01 Section Includes:

A. Work included in this Section, while not inclusive but listed as a guide, shall include:

1. Furnishing of all labor, tools, equipment and incidentals required to complete the work.
2. Layout of work and inspection and maintenance.
3. Installation of silt fences.
4. Placement of riprap.
5. Erosion Control matting.
6. Other required BMP measures.
7. Clean-up.
8. Complete all required plans, reports, forms, and applications.

1.02 Definitions

A. A/E, Architect, Engineer of Record – The licensed design professional applying stamp and signature to the drawings regardless of their contractual relationship to the Owner.

B. BMP – Best Management Practices

C. Contractor – Firm responsible for providing prime construction services for the project under contract with the Owner. Refers to the General Contractor, Prime Contractor, Construction Manager at Risk or Design Build firm under various contract types.

D. CSN –Construction Site Notice (TCEQ Form)

E. NOI & NOT – Notice of Intent and Notice of Termination for TPDES permits. (TCEQ forms)

F. SWPPP OR SWP3 – Storm Water Pollution Prevention Plan

G. TCEQ – Texas Commission on Environmental Quality

H. TPDES – Texas Pollutant Discharge Elimination System

I. Large Construction Activities – Construction activities including clearing, grading and excavating that result in land disturbance of equal to or greater than five (5) acres

J. Small Construction Activities - Construction activities including clearing, grading and excavating that result in land disturbance of equal to or greater than one (1) acre and less than five (5) acres of land.

K. Owner’s Representative – Representative authorized by the Owner to represent interest. Architect, Engineer or other as appointed by Owner.

1.03 Related Sections, Documents and Applicable Work

A. Coordinate the work of this Section with the Work of other Sections as required to properly execute the Work and as necessary to maintain satisfactory progress of the Work of other Sections. Other Sections containing related work include but are not limited to the following:

1. Site Clearing – Section 31 10 00

2. Earth Moving – Section 31 20 00
3. Subgrade Preparation - Section 31 23 13

B. The TCEQ TPDES General Permit No. TXR150000, March 5, 2013 (or current version) and the project SWPPP. This specification requires compliance with all provisions of the TCEQ with regards to the TPDES general permit. The TCEQ requirements currently pertain to large construction activities of five (5) acres or more and small construction activities which disturb one (1) to less than five (5) acres. Contractor required to produce SWPPP when disturbed area of project is one (1) acre or greater or part of a common development as defined by TCEQ. **Estimated** disturbed area must be verified by the Contractor and include Contractor storage areas per General Permit requirements.

C. Any Information to Respondents, Agreement, Uniform General Conditions, Supplementary General Conditions and Special Conditions shall be carefully read for provisions pertaining to this work. In the event of conflict, the better quality or greater quantity shall prevail.

D. The work described in this section is applicable to any and all sections of the Contract Documents. Any and all work that would disturb the existing site conditions or present the potential for site run-off shall adhere fully to this specification section.

E. Unless specifically notified to the contrary by the Owner, in writing, all aspects of this specification shall apply to this project.

1.04 References:

Meet requirements and recommendations of applicable portions of Standards listed.

A. ASTM D698 - Laboratory Compaction Characteristic of Soil Using Standard Effort (12,400 lb/ft^3).

B. ASTM D4318 - Liquid Limit, Plastic Limit and Plasticity Index of Soils.

C. Texas Department of Transportation Standard Specifications for Construction of Highways, Streets, and Bridges, 2004, TxDOT.

D. TCEQ and any MS4 (usually City) with jurisdiction.

E. City of Lewisville Stormwater Pollution Prevention related City Ordinance(s).

1.05 Contractor Responsibilities

A. This project requires implementation of storm water “Best Management Practices” (BMP) for control devices and monitoring by the Contractor. The Contractor must fulfill all Texas Pollutant Discharge Elimination System (TPDES) regulatory requirements, including the filing of a NOI and NOT (if required by permit) and/or signing and posting of the Construction Site Notice (CSN). *This project is estimated to be under five acres disturbed, so project is considered a small construction site. Contractor shall produce SWPPP booklet and post CSN on-site, mailing a copy to City MS4, if disturbed area is one (1) acre or more (or part of common plan of development). Filing NOI and NOT with TCEQ for permit will not be required unless disturbed area exceeds five acres or part of a common plan of development. Contractor is ultimately responsible for verifying actual disturbed area and determining if it exceeds one/five acres. Contractor storage areas must be included in the calculation per General Permit requirements.*

B. The Contractor shall provide signatures of a corporate Officer for the NOI, CSN and NOT and any other forms or applications as required by the TPDES General Permit TXR150000. The Contractor shall also provide delegated authorization to sign reports per 30 TAC 305.128. Individuals conducting site inspections shall be qualified to the satisfaction of the Owner's Rep. Documented qualifications shall be included in the SWPPP booklet.

C. Contractor signs the NOI and/or CSN (as required by general permit) and forwards it to the Owner. The application fee must accompany the NOI. The Owner signs his NOI and sends both NOI's and application fees to TCEQ. The Contractor shall insert a copy of the signed NOI or CSN into the SWPPP booklet to be kept at the jobsite.

D. The SWPPP booklet (REQUIRED ON THIS PROJECT IF DISTURBED AREA IS ONE (1) ACRE OR MORE) kept at the jobsite shall also contain the following items in addition to General Permit requirements:

1. A letter delegating signature authority to the field personnel for both the Contractor and the Owner.
2. A copy of TPDES permit when received. (ONLY IF LARGE CONSTRUCTION ACTIVITY and NOI submitted to TCEQ)
3. Construction Site Notice for large or small construction activities

E. The Contractor shall produce and review SWPPP and verify existing conditions at the site before determining scope of implementation of site controls. Site survey and site plan drawings shall be used for additional reference. The Contractor shall notify the Owner, in advance, of this site review to allow for Owner participation.

F. If the disturbed area greater than one (1) acre, the Contractor shall construct a Project SWPPP sign and place it at the main entrance to the project site. This sign shall include the NOI and TPDES permit along with Construction Site Notice; or the Construction Site Notice for small construction projects. The sign shall be constructed as detailed in the SWPPP or as Directed by Owner or MS4.

G. Contractor shall contact Owner for review of initial site controls in place prior to commencing site-disturbing activities, to ensure that any unusual circumstances or unforeseen site conditions with regard to erosion and sedimentation have been addressed.

H. The Contractor shall provide all material, labor, equipment and services required to implement, maintain and monitor all erosion and sedimentation controls in compliance with the Storm Water Pollution Prevention Plan (SWPPP). All controls implemented by the Contractor shall comply with the Texas Pollutant Discharge Elimination System (TPDES) regulations as issued by the Texas Commission on Environmental Quality (TCEQ) on March 5, 2013 (or current version) and the City (MS4). These controls shall remain in operation until project completion and reestablishment of the site or longer as directed by the Owner's Rep. The work shall include, but not be limited to the following:

1. All earthwork as required to implement swales, dikes, basins and other excavations for temporary routing of utilities, to protect against erosion or sediment-laden ("polluted") storm water runoff.
2. All structural controls as shown or specified, including silt fences, sediment traps, stabilized construction entrance, subsurface drains, pipe slope drains, inlet/outlet protection, reinforced soil retention, gabions, rock berms, etc.

3. All non-structural controls as shown or specified, including temporary or permanent vegetation, mulching, geotextiles, sod stabilization, preservation of vegetative buffer strips, preservation/protection of existing trees and other mature vegetation.
4. All modifications and revisions to SWPPP necessary to meet changing site conditions, and to address new sources of storm water discharges, as the work progresses.
5. All maintenance and repair of structural and non-structural controls in place shall continue until final stabilization is achieved or as directed by the Owner's Rep.
6. Weekly site inspections, or as required by the SWPPP, of pollutant sources, including hazardous sources, structural and non-structural controls, and all monitoring of SWPPP revisions and maintenance of inspection records.
7. Removal of all structural and non-structural controls as necessary upon completion, and only after final stabilization is achieved.
8. Filing of Notice of Termination (NOT) within 30 days of final stabilization being achieved, or of another Operator assuming control of the unstabilized portions of the site, if an NOI was filed for project.
9. SWPPP may require additional requirements to ensure compliance with TPDES and local regulations.

1.06 Quality Assurance

A. In order to minimize the discharge of pollutants to storm water, the Contractor shall implement all permanent and temporary site controls according to Texas Pollutant Discharge Elimination System (TPDES) Guidelines, as set forth by the Texas Commission on Environmental Quality and the City (MS4).

B. Implementation of site controls shall be performed by a qualified contractor experienced in the proper installation of such devices in accordance with manufacturers' specifications, and in keeping with recognized Best Management Practices (BMP's), and in keeping with TPDES regulations. Qualification of installing Contractor shall be reviewed with the Owner's Rep prior to entering into a contract for their services.

C. The Contractor shall inspect all BMP's weekly and after rain events as specified. Use standard Inspection forms for each inspection. Record all deficiencies of site controls and take immediate action to correct any deficiencies recorded. Keep records of inspections current and on file, available for review by EPA, TCEQ, MS4 operator and Owner's Rep.

1.07 Submittals

A. Submittals of products used in structural and non-structural controls shall be submitted in accordance with Construction Documents prior to installation on the site. The Contractor shall make available physical samples (as noted or requested) and product literature on all materials used in structural or non-structural controls during the course of the project prior to its implementation in the field. This includes but is not limited to soil, aggregate, wire, fencing, posts, pipe, filter fabric, mulch, seed, fertilizer, and etc.

B. Product data for drainage piping and specialties.

C. Product data and sample for geotextiles and erosion control matting.

D. Product data for grass seed and/or sod and compost mulch if used.

E. Product data and sample for soil retention blankets.

F. Product data for geotextile silt fence system.

G. Copy of SWPPP for Owner review and City of Lewisville's Stormwater Division approval at pre-construction meeting. Coordinate with Owner Rep. for required number to be submitted.

1.08 Summary:

A. This work shall consist of furnishing, installing, maintaining and removing devices to prevent silt from leaving the site, either through inlets or by overland flow. The quantities of temporary silt fence shown on the plans may be increased or decreased based on weather, construction procedures, and actual site conditions that occur during construction of the project. Such variations in quantity will not be considered as alterations in the details of construction or a change in the character of the work.

B. The contractor shall have the option of installing a silt fence construction of geotextiles or filter dikes.

PART 2 - PRODUCTS

2.01 Materials

Specific site control devices are identified in the Erosion Control Plan and/or the SWPPP. Where such devices are indicated, their material composition shall comply with this section.

A. Materials to be used in structural and non-structural site controls shall include, but not be limited to the following:

1. Silt Fences: implemented to filter, and remove sediment from storm water shall be composed of the following materials:
   a. Geotextile fabric – a non-woven, polypropylene, polyethylene, or polyamide fabric with non- raveling edges. It shall be non-biodegradable, inert to most soil chemicals, ultraviolet resistant, unaffected by moisture and other weather conditions, and permeable to water while retaining sediment. Fabric shall be 36 inches wide, with a minimum weight of 4.5 oz/yd.
   b. Posts – metal fence posts shall be made of hot rolled steel, galvanized or painted, a minimum of 4 feet long, with a Y-bar or TEE cross-section.
   c. Wire Backing – a galvanized, 2"x4", welded wire fencing, 12 gauge minimum. Width shall be sufficient to support geotextile fabric 24 inches above adjacent grades. Chain link fences located along the same lines as silt fences, may be used to support geotextile fabric. In this circumstance, the geotextile fabric shall be firmly attached to fence.
   d. Geotextile rolls shall be furnished with suitable wrapping for protection against moisture and extended ultraviolet exposure prior to placement. Each roll shall be labeled or tagged to provide product identification sufficient for inventory and quality control purposes. Rolls shall be stored in a manner which protects them from the elements.
   e. Prefabricated Fence: Prefabricated fence systems may be used provided they meet all of the above material requirements.
2. Triangular filter dikes: for use on surfaces or in locations where standard silt fence cannot be implemented, shall be composed of the following:
   a. Geotextile fabric - of the type described above, in a minimum width of 60 inches.
   b. Dike Structure - 6 gauge, 6x6 welded wire mesh, 60 inches wide, folded into a triangular form. Each side shall be 18 inches with an overlap of 6 inches.

c. Ties – metal shoat rings or standard wire/cable ties for attachment of wire mesh to itself, and for attachment of geotextile fabric to wire mesh.

3. Stabilized construction entrance: shall be composed of clean, open graded, 3" to 5" diameter crushed stone and shall include the following:
   a. A tire wash-down area shall be installed at the stabilized entrance. All vehicle tires shall be manually washed off with pressurized water to remove all mud and/or debris. This operation is intended to take place during rains or other muddy site conditions to prevent mud/debris on streets.
   b. The runoff from the tire wash operation shall be contained in a detention pit to prevent site runoff. The resulting discharge shall be disposed of properly.
4. Rock Berms: shall be composed of the following materials:
   a. Rock – clean open graded rock, with a maximum diameter of 3 inches.
   b. Wire Mesh Support – a galvanized, woven wire sheathing having a maximum opening size of 1 (one) inch, and a minimum wire diameter of 20 gauge.
   c. Ties – metal shoat rings or standard wire/cable ties.
5. Soil Retention Blanket:
   a. Short Term Protection.
      (1) Description. This item shall govern for providing and placing wood, straw or coconut fiber mat, synthetic mat, paper mat, jute mesh or other material as a soil retention blanket for erosion control on slopes, ditches and high traffic pedestrian areas of barren soil, for short term protection of seeded or sodded areas as shown on the plans or as specified by the Owner's Representative.
      (2) Soil Retention Blankets. Samples of all soil retention blankets must be submitted to the Owner's Representative prior to use. Materials shall be approved by the Owner's Representative.
      (3) Jute Mat – a plain fabric made of jute yarn, woven in a loose and simple manner, with a minimum unit weight of 2.7 pounds per square yard. Width shall be as required for the dimensions of the area to be covered.
      (4) Wood Fiber Mat – a mat composed of wood fibers, which are encased in nylon, cotton or other type of netting.
      (5) Synthetic Webbing Mat – a mat manufactured from polyvinyl chloride or polypropylene monofilaments, which are bonded together into a three-dimensional web to facilitate erosion control and/or re-vegetation.

   b. Long Term Protection.
      Geotextiles.
      (1) General. Geotextiles are woven or non-woven synthetic fabrics which are designed to be used for erosion control and soil stabilization applications.
      (2) Geotextiles used in Erosion Control and Stabilization Applications: The fabric shall conform to the following average roll minimum values (lot mean-2 standard deviations), as determined by Federal Highway Administration Task Force 25 guidelines cited below, measured in the weakest direction:

Designation	**Topic**	**Erosion***		**Stabilization**			
		PR	**UPR**	**LOADING**			
				Low	**Med.**	**Hi**	**VHI**
ASTM D 4632	Grab Strength(lbs)	90	200	90	130	180	27
ASTM D 4632	Grab Elongation	15%	15%	NA	NA	NA	NA
ASTM D 4533	Trapezoidal Tear(lbs)	30	50	30	40	50	75
ASTM D 751	Burst (psi)	140	320	145	210	290	430
ASTM D 751	Puncture (psi)	40	80	30	40	75	110
ASTM D 4751	Equivalent Opening Size (EOS) (mm)-soil retention						

For Soils in Which:	**EOS:**
50% or less passes a #200 mesh sieve	Greater than a #30 sieve
More than 50% passes a #20 mesh sieve	Greater than a #50 sieve
ASTM D 4491 Permeability (k)	

Type of Application	**Required Permeability**
Critical/Severe:	k (fabric) > 10k (soil)
Normal Applications:	k (fabric) > k (soil)

*PR: Protected Application (used in conjunction with a buffer)
UPR: Unprotected Application (used with no protective buffer)

(3) Fasteners. Fasteners shall conform to the manufacturer's recommendations.

6. Organic mulches: shall be used for covering bare soil, retaining moisture under existing vegetation being preserved, and for absorbing the energy of compaction caused by foot or vehicular traffic. Mulch shall be one or more of the following:
   a. Straw: from broken straw bales that are free of weed and grass seed where the grass from the seed is not desired vegetation for the area to be protected.
   b. Hay: from broken hay bales containing an approved species of grass and seed, for use where the germinated grasses from the hay bales is considered desirable vegetation in the area to be protected.
   c. Wood Chips – from chipped limbs of cleared trees on site, or delivered in chipped form, in bulk quantities of pine, cedar or cypress. Wood chips of all species shall be partially decomposed to alleviate nitrogen depletion of the soil in areas where existing vegetation is to be preserved and protected.
   d. Shredded Mulches – from pine, cypress or cedar, mechanically shredded, and capable of forming an interlocking mat following placement, and after sufficient wetting and drying has taken place naturally.
7. Topsoil: The topsoil shall be fertile soil, be easily cultivated, be free from objectionable material, have a relatively high erosion resistance and be readily able to support the growth of planting, seeding or sodding.
8. Sod: The sod shall consist of live, growing Bermuda grass, St. Augustine grass where shown on the plans or other acceptable grass secured from sources which are approved by the Owner's Representative. Bermuda grass sod, St. Augustine grass sod, or other grass sod as shown on the plans, shall have a healthy virile root system of dense, thickly matted roots throughout the soil of the sod for a minimum thickness of 1 inch. The Contractor shall not use sod from areas where the grass is thinned out, nor where the grass roots have been dried out by exposure to the air and sun to such an extent as to damage its ability to grow when transplanted.
9. Fertilizer:
   a. General: Fertilizer shall be a commercial product, uniform in composition, free flowing and suitable for application with approved equipment. Fertilizer shall be delivered to the site in fully labeled original containers. Fertilizer, which has been exposed to high humidity and moisture, has become caked or otherwise damaged, making it unsuitable for use, shall be rejected.
   b. Initial Planting Application. Fertilizer for the initial planting application shall be of an organic base containing by weight the following (or other approved) percentages of nutrients: 15-10-5 (N-P-K); also containing 1--15 percent sulphate and traces of iron and zinc as required and approved by the Owner.
   c. Specification Submittal. Submit a sample label or specification of the fertilizer proposed to be used for the Owner's approval.
   d. Post Planting Application. Fertilizer for the post planting application shall be a chemical base fertilizer containing by weight the following percentages of nutrients:

21-0-0 (N-P-K) ammonium sulphate; or the nitrogen equivalent of 33-0-0 ammonium nitrate.

12. Any other materials indicated on Erosion Control Plan or in SWPPP.

PART 3 - EXECUTION

3.01 General

A. The Contractor shall provide a complete installation of all site control devices and measures (BMPs) as indicated in the Erosion Control Plan and/or SWPPP booklet, including the Site Erosion and Sedimentation Control Drawing and as specified herein. These BMPs must be confirmed as fully operational with the Owner's Rep. before any work that disturbs the site can begin.

B. The Contractor shall provide all inspection, monitoring of controls in place, and shall perform all revisions and updating of SWPPP booklet. An accurate, chronological record of all Contractor inspections, revisions and additional controls, shall be kept on file at the project site for review, with a copy of the SWPPP booklet.

C. The Contractor shall submit their Notice of Termination (NOT) if required by permit, to the Owner after all disturbed areas are re-established (stabilized) with vegetative cover following completion of construction. Following acceptance of stabilized areas, all site controls that are no longer necessary shall be removed.

3.02 Control Devices

Execution of specific site control devices is described in the following paragraphs. Refer to the Erosion Control Plan and/or the SWPPP for applicable devices, extent and location.

A. SILT FENCE

1. Silt fences shall consist of geotextile fabric, attached to wire fabric backing to support the geotextile. The wire fabric should be galvanized 2" x 4" welded wire, 12-gauge minimum. Attach non-woven geotextile fabric to fence with shoat or standard cable/wire ties, leaving a "toe" of fabric at the bottom of the fence of not less than 6 (six) inches. Steel posts as specified shall be driven to a depth of 1 (one) foot minimum and spaced not more than 6 (six) feet on center. Tilt posts slightly, in an "uphill" direction for additional strength. Attach fencing to posts with standard cable/wire ties. Dig a 6 (six) inch deep by 6 (six) inch wide trench on the disturbed side of the fence, bury geotextile fabric in trench, backfill and tamp. Abutting ends of geotextile fabric shall be overlapped a minimum of 12 (twelve) inches.
2. Maintain silt fence daily as necessary to repair breaches in geotextile fabric. Maintain steel posts as specified in tilted condition. When siltation has occurred, it shall be removed when it has reached a depth of 6 (six) inches. Silt that has been removed shall be redistributed in an appropriate location on site, or legally disposed of off-site.
3. Remove silt fence when the disturbed areas protected by silt fence have been completely stabilized as specified. Minimize site disturbance while removing silt fence and posts.
4. Filter Dikes: shall be installed per the details shown on the plans.
5. Contractor shall ensure that the silt fences are properly located for effectiveness. Where deficiencies exist, additional silt fences shall be installed. Should the silt fence become

damaged or otherwise ineffective while the barrier is still necessary, it shall be repaired promptly.

B. CURB INLET PROTECTION

1. Cover curb storm inlet with geotextile fabric covered wire fabric. Wire fabric to be 2”X4” – W1.4XW1.4. Extend fabric 2(two) feet beyond inlet opening at each end and 12” (twelve) in front of opening in the gutter. Remove strip of filter fabric approx. 2 1/2” (two and one half) high for the length of the protection to act as overflow. Extend fabric over the top of opening to allow placement of sandbags. Anchor fabric with 20 lb. Gravel bags placed 3 (three) feet on center.
2. Maintain inlet protection daily as necessary to repair breaches in geotextile fabric. When siltation has occurred, it shall be removed when it has reached a depth of 2 (two) inches. Silt that has been removed shall be redistributed in an appropriate location on site, or legally disposed of off-site.

C. STABILIZED CONSTRUCTION EXIT

1. Stabilized construction entrance shall be composed of clean, open graded, 3” to 5” diameter crushed stone placed over a layer of geotextile fabric. The stabilized entrance shall include the following:
   a. A tire wash-down area shall be installed if required, at the stabilized entrance. All vehicle tires shall be manually washed off with pressurized water to remove all mud and/or debris. This operation is intended to take place during rains or other muddy site conditions to prevent mud/debris on streets.
   b. The runoff from the tire wash operation shall be contained in a detention pit to prevent site runoff. The resulting discharge shall be disposed of properly.
   c. Solids washdown need to be from vehicles coordinated with City supervisor, in accordance with SWPPP and City’s stormwater permit.

D. ROCK BERM

1. Rock berm shall consist of riprap type rock, secured within wire sheathing as specified, and installed at the toe of slopes, or at the perimeter of developing or disturbed areas. Height of berm shall be a minimum of 18 (eighteen) inches from top of berm to uphill toe of berm. Top width shall be a minimum of 24 (twenty-four) inches, with side slopes of 2:1 or flatter. Uphill toe of berm shall be buried a minimum of 4 (four) inches into existing grade. Rock berm shall have a minimum flow-through rate of 60 (sixty) gallons per minute, per square foot of berm face.
2. Maintain rock berm in a condition that allows the sediment to be removed when the depth of sediment has reached 1/3 (one third) the height of the berm. Berm shall be reshaped as needed, and silt buildup removed, to maintain specified flow through berm.
3. Rock berm shall be removed when the disturbed areas served have been stabilized as specified.

E. DIVERSION DIKE

1. Diversion dikes shall be formed and shaped using compacted fill and shall not intercept runoff from more than 10 (ten) acres. Dike shall have a minimum top width of 24 (twenty-four) inches, and a minimum height of 18 (eighteen) inches. Soil shall have side slopes of 3:1 or flatter and shall be placed in 8 (eight) inch lifts. Compact soil to 95% standard proctor density. Where protected slopes exceed 2 (two) percent, the uphill side of diversion dike shall be stabilized with crushed stone or erosion control matting – to a

distance of not less than 7 (seven) feet from toe of dike. The channel, which is formed by the diversion dike, must have positive drainage for its entire length to a stabilized outlet, such as a rock berm, sandbag berm, or stone outlet structure. Storm water shall not be allowed to overflow the top of diversion dike at any point other than the stabilized outlet.

2. Maintain diversion dike in a condition that allows the storm water runoff to be diverted away from exposed slopes. Repair any failures at top of dike and remove sediment as necessary behind dike to allow positive drainage to a stabilized outlet.
3. Remove diversion dike when the expose slopes being protected are stabilized with vegetation or other permanent cover.

F. INTERCEPTOR SWALE

1. Interceptor swale shall be implemented to prevent on or off-site storm water from entering a disturbed area or prevent sediment-laden runoff from leaving the site or disturbed area. Interceptor swale shall be excavated as required by the SWPPP drawing/s, with side slopes of 3:1 or flatter. This shall include all labor and equipment associated with the installation and maintenance of the swale as shown on the construction documents. Constructed swale may be v-shaped or trapezoidal with a flat bottom, depending on the volume of water being channeled. Sediment laden runoff from swale shall be directed to a stabilized outlet or sediment-trapping device. Flow line of swale shall have a continuous fall for its entire length and shall not be allowed to overflow at any other point/s along its length.
2. Maintain interceptor swale in a condition that allows the storm water runoff to be channeled away from disturbed areas. Remove sediment in swale as necessary to maintain positive drainage to a stabilized outlet.
3. Fill in or remove swale after the disturbed area/s being protected are completely stabilized as specified.

G. SOIL RETENTION BLANKETS

1. Remove all rocks, debris, dirt clods, roots, and any other obstructions, which would prevent the matting from lying in direct contact with the soil. 6 inch by 6-inch anchor trenches shall be dug along the entire perimeter of the installation. Bury matting in trenches, backfill and compact. Fasten matting to the soil using 10-gauge wire staples, 6 inches in length and 1 inch wide. Use a minimum of one staple per 4 square feet of matting, and at 12 inches on center along all edges. Install parallel to flow of water and overlap joining strips a minimum of 12 inches.
2. Maintain erosion control matting by repairing any bare spots. Missing or loosened matting shall be promptly replaced or re-anchored.
3. Remove matting where protection is no longer required. In areas where permanent vegetation is established along with matting, matting can be left in place permanently.
4. Soil retention Blankets shall be installed in accordance with Manufacturer’s recommendations.

H. MULCHES

1. Apply specified mulches in areas identified on the SWPPP, to a depth of 3 inches or as otherwise specified.
2. Temporary Seeding - Seed or seed mixture, in the quantity specified, shall be uniformly distributed over disturbed areas or where directed. Seed and fertilizer to be distributed as a water slurry, and the mixture shall be applied to that area to be seeded within 30 minutes after all components are placed in the equipment. After planting, the seed shall

be raked or harrowed into the soil to a depth of approximately 1/4 inch (6mm). The planted area shall then be rolled with a smooth roller, developing 15 to 25 psi (100 to 170 kp) contact pressure upon the planted surface area and giving a smooth surface without ruts or tracks. After compacting is completed, the planted area shall be watered sufficiently to assure uniform moisture from the surface to a minimum of six inches (150 mm) in depth.

I. BPM Details

1. Refer to Erosion Control Plans and/or SWPPP.

3.03 Inspections and Record Keeping

A. Contractor shall inspect all BMP's on 7-day intervals minimum, and after rain events. Use standard Inspection forms for each inspection. Record all deficiencies of site controls and take immediate action to correct any deficiencies recorded. Exception is rock berms located in a streambed. Any rock berm located in a streambed shall be inspected daily. Keep records of inspections current and on file, available for review by EPA, TCEQ, MS4 operator Representative and Owner's Representatives.

B. Contractor shall keep records of all Contractor inspections on file at project site and make available for review by Owner's Representative/s, EPA, TCEQ or MS4 Operator requesting review of inspection records. One copy of each inspection report shall be delivered to the Owner's Rep.

C. Contractor shall submit copies of all inspection records, logs, reports, drawings and etc., to the Owner's Rep. at project completion.

3.04 Maintenance

A. All erosion and sediment control measures and other protective measures required for this project, must be maintained in effective operating condition. If through inspections the Contractor or the Owner's Representative determines that BMP's are not operating effectively, maintenance must be performed before the next anticipated storm event or as necessary to maintain the continued effectiveness of storm water controls. If maintenance prior to the next anticipated storm event is impracticable, maintenance must be scheduled and accomplished as soon as practicable. Erosion and sediment controls that have been intentionally disabled, run-over, removed or otherwise rendered ineffective must be replaced or corrected immediately upon discovery.

END OF SECTION

DIVISION 3

CONCRETE

SECTION 03 10 00
Concrete Formwork and Accessories

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. Scope

Furnish all labor, materials, tools, equipment and related items required to install formwork and shoring for cast-in-place concrete, and installation into formwork of items furnished by others, such as anchor bolts, setting plates, bearing plates, anchorages, inserts, frames, nosings and other items to be embedded in concrete.

B. Location

The work to be performed is located at McGuire Air Force Base, New Jersey

C. Related work specified in other sections:
1. Portland Cement Concrete Paving - Section 02 51 40
2. Concrete Reinforcement - Section 03 20 00
3. Cast-in-Place Concrete - Section 03 30 00

1.2 QUALITY ASSURANCE

A. It is Contractor's responsibility to design and engineer formwork.

B. Reference Standards:
1. ACI 301, Specifications for Structural Concrete for Buildings.
2. U.S. Product Standard for Softwood Plywood, Construction and Industrial PS-1.

C. Allowable Tolerances: Except when close coordination and fitting of various trades' work precludes allowance of tolerance, maximum total permissible deviations from established lines, grades and dimensions shall be as stated below. See and maintain forms in such manner as to ensure completed work within specified tolerance limits.
1. Variation from plumb:
   a. In lines and surfaces of arises:
      In any 10 ft of length ..... 1/4 in.
      Maximum for the entire length ..... 1 in.
   b. For exposed conspicuous lines:
      In any 20 ft of length ..... 1/4 in.
      Maximum for the entire length ..... 1/2 in.
2. Variation in sizes and location of sleeves, floor and wall openings .....+/-1/4 in.
3. Variation in cross-sectional dimensions of beams in thickness of slabs:
      Minus ..... 1/4 in.
      Plus ..... 1/2 in.
4. Variation in steps ..... 1/4 in.
5. Variation in location of anchor bolts unless provided with sleeves or other means of adjustment..... 1/4 in.

D. Max. deflection of form facing materials at concrete surfaces exposed to view shall be 1/240 of span between structural members.

E. Shop Drawings: Diagram of proposed construction joints not indicated on drawings.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Forms: Wood, metal or other approved material that will not adversely affect surface of concrete and will provide or facilitate obtaining specified surface finish.
   1. Wood:
      a. Unexposed Surfaces:
         1. No.2 Common or Better Southern Yellow Pine lumber, sufficient thickness to sustain loads to be imposed, dressed to uniform smooth contact surfaces, readily removable, or:
         2. Commercial Standard Douglas-Fir, moisture resistant, concrete form plywood, not less than 5 ply, at least 3/4" thick, one side smooth.
      b. Exposed Surfaces: Non-absortive overlay plywood such as medium or high density overlay, Finn-Form or equal.

B. Carton Forms (Void Boxes): Shall be corrugated cardboard cartons, as manufactured by SureVoid Products, Inc., Englewood, Co. All surfaces of void box forms shall be moisture-resistant. Forms shall have interior cross walls forming a uniform cellular configuration. Carton forms shall be manufactured from medium wax impregnated paper using waterproof adhesive.
   1. Slabs: Use "Regular" strength with interior cell sizes 8" x 8" or smaller, capable of sustaining a working load of 1000 psf. "SlabVoid."
   2. Grade beams and walls: Trapezoidal shape as shown on details. Provide end caps at end of forms and corners. Provide pre-manufactured curve-ended units, “ArcVoid” or “SureRound PierVoid”, against tops of drilled piers for tight fit. Cartons shall be capable of sustaining a working load of 150 PSF times the height of pour, in feet, without significant deformation.
   3. Piers: At interior piers supporting slab over carton forms use "SureRound Pier Void" or equal to provide tight fit around pier

C. Form Accessories:

   1. Form ties: Bolt rods or patented devices having a minimum tensile strength of 3,000 pounds when fully assembled. Ties shall be adjustable in length and free of lugs, cones, washers or other features which would leave a hole larger than 1" in diameter. Ties shall be of such construction that, when forms are removed, there will be no metal remaining within 1" of finished surface.
   2. Form Release Agent: Non-Staining, wax barrier type, Symons Corp., "Magic Cote" or equal.
   3. Construction Joint Form: Burke Concrete Products "Keyed Kold Joint" or equal.

PART 3 - EXECUTION

3.1 PERFORMANCE

A. Formwork Construction:
   1. Construct forms tight to prevent loss of mortar. Use chamfer strips in corners of forms to produce beveled edges on permanently exposed surfaces.
   2. Camber formwork to compensate for deflections in formwork prior to concrete attaining design strength.
   3. Adjust shores and struts to take up settlement caused by concrete placement.
   4. Provide temporary openings in formwork to allow cleaning and observation.

5. Construct forms for beams and girders so that sides may be removed without disturbing bottom of form or its support.
6. Clean contact and screed surfaces of hardened concrete and foreign materials prior to assembly.

B. Form Coatings:
1. Apply specified form release agent; follow manufacturer's direction.
2. Do not allow agent to puddle in forms or to contact hardened concrete against which fresh concrete is to be placed.
3. Do not coat forms with material that will stain or disfigure exposed concrete surfaces; do not use forms coated with such material.

C. Form Accessories:
1. Form Ties: Coat ties that are to be pulled from walls with cup grease or other approved material to facilitate removal.

D. Construction Joints:
1. Locate and install construction joints, which are not shown on the drawings, so as not to impair strength and appearance of the structure, and as acceptable to the Structural Engineer.
2. Provide keyways at least 1-1/2" deep in construction joints in walls and slabs; accepted bulkheads designed for this purpose may be used for slabs.
3. Place construction joints perpendicular to the main reinforcement. Continue reinforcement across construction joints.
4. Construct isolation joints in slabs on ground at points of contact between slabs on ground and vertical surfaces, such as column pedestals, foundation walls, grade beams and elsewhere as indicated.

E. Installation of Embedded Items:
1. Set and build into work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of items to be attached thereto.

END OF SECTION

SECTION 03 20 00
Concrete Reinforcement

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, Bidding Requirements, Contract Forms, Conditions of the Contract and Division 1 – General Requirements apply to the work of this section.

1.2 DESCRIPTION OF WORK

A. Furnish all labor, materials, tools, equipment and related items required to fabricate and place reinforcement for cast-in-place concrete, including bars, welded wire fabric, ties and bar supports.

B. Related work specified in other sections:
   1. Testing Laboratory Services – Section 01 40 00
   2. Portland Cement Concrete Paving – Section 02 52 00
   3. Concrete Formwork – Section 03 10 00
   4. Cast-in-Place Concrete – Section 03 30 00

1.3 QUALITY ASSURANCE

A. Reference Standards (latest edition):
   1. ACI 301, Specifications for Structural Concrete for Buildings
   2. ACI 318, Building Code Requirements for Reinforced Concrete
   3. ASTM A615, Specification for Deformed Billet Steel Bars for Concrete.
   4. ASTM A185, Specifications for Welded Steel Wire Fabric for Concrete Reinforcement.
   5. Concrete Reinforcing Steel Institute, Manual of Standard Practice.
   6. “Details and Detailing of Concrete Reinforcement”, ACI 315

B. Allowable Tolerances:
   1. Fabricating:
      a. Sheared length: Plus or minus 1”
      b. Stirrups and ties: Plus or minus 1/2”.
      c. Members more than 8” but not over 2’-0” deep: Plus or minus 1/2”.
      d. Members more than 2’-0” deep: Plus or minus 1”.
      e. Crosswise of members: Space evenly within 2” of stated separation.
      f. Lengthwise of members: Plus or minus 2”.
   2. Maximum bar relocation to avoid interference with other reinforcing steel, conduits or other embedded item: 1 bar diameter.

C. Testing Laboratory Services. Refer to section 01 45 29.

1.4 SUBMITTALS

A. Shop Drawings: Include complete bending diagrams, assembly diagrams, splicing and laps, and rods, shapes, dimensions and details of bar reinforcing and accessories.
   1. Show diagrammatic elevations of walls at scale large enough to clearly show position and erection marks of marginal bars, around openings, dowels, splices, etc., for these bars.

2. Show complete layout plan for each layer of reinforcing of structural slabs and beams showing number, arrangement, spacing, location, marking, orientation, etc., of reinforcement required for layer being described.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver reinforcement to project site in bundles marked with metal tags indicating bar size, length and mark.

B. Unload reinforcing carefully to prevent damage. Store above ground in dry, well drained area; protect from mud, dirt and corrosion.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Reinforcing Bars: ASTM A615, deformed billet steel bars, domestic manufacture, Grades 60 and/or 75 as indicated on structural drawings.

B. Welded Wire Fabric Reinforcing: ASTM A185, domestic manufacture, steel wire spot welded at intersections and of size indicated. Furnish in flat sheets, not rolls.

C. Metal Accessories: Include spacers, chairs, bolsters, ties and other devices necessary for properly placing, spacing, supporting and fastening reinforcement in place, conforming to requirements to CRSI “Manual of Standard Practice for Detailing Reinforced Concrete Structures”. Metal accessories shall be galvanized where legs will be exposed in finished concrete surfaces.

D. Tie Wire: FS QQ-W-461, black enameled steel, 16 ga. min.

E. Reinforcing bars to be welded: ASTM A706, “Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.”

2.2 FABRICATION

A. In accordance with CRSI “Manual of Standard Practice”.

PART 3 – EXECUTION

3.1 PREPARATION

A. Cleaning: Before placing in work, thoroughly clean reinforcement of loose rust, mill scale, dirt, oil and other coating which might tend to reduce bonding. Reinspect reinforcing left protruding for future bonding, or following delay in work, and reclean if necessary.

3.2 INSTALLATION

A. Bar Placement: In accordance with ACI 301, ACI 318 and CRSI “Manual for Standard Practice”
   1. Bending: Bend bars cold; do not heat reinforcing or bend by makeshift methods. Discard bent, kinked or otherwise damaged bars.
   2. Splices: In accordance with ACI 301 and ACI 318.

B. Wire Fabric Placement:
   1. Install in longest practicable length.
   2. Do not make end laps midway between supporting beams, or directly over beams of continuous structures.
   3. Offset end laps in adjacent widths to prevent continuous lap.
   4. Keep wire in proper position during concrete placement.
   5. All wire fabric shall be delivered in flat sheets, not rolled.

END OF SECTION

SECTION 03 30 00
Cast-in-Place Concrete
Page 1 of 6

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, Bidding Requirements, Contract Forms, and Conditions of the Contract apply to the work of this section.

1.2 DESCRIPTION OF THE WORK

A. Furnish all labor, materials, tools, equipment and related items required to provide cast-in-place concrete consisting of portland cement, fine and coarse aggregate, water and selected admixtures; combined, mixed, transported, placed, finished and cured as herein specified.

B. Related work specified in other sections:

1. Concrete Formwork - Section 03 10 00
2. Concrete Reinforcement - Section 03 20 00

1.3 QUALITY ASSURANCE

A. Referenced Standards:

1. ACI 301, Specifications for Structural Concrete for Buildings.
2. ASTM C33, Standard Specifications for Concrete Aggregate.
3. ASTM C94, Standard Specifications for Ready-Mix Concrete.
4. ASTM C150, Standard Specifications for Portland Cement.
5. ASTM C260, Standard Specifications for Air-Entraining Admixtures for Concrete.
6. ASTM C494, Standard Specifications for Chemical Admixtures for Concrete.

B. Concrete Mix Design: Contractor shall employ and pay cost of a recognized independent Testing Laboratory to perform the following services:

1. Design concrete mixes in accordance with ACI 301.
2. For each concrete mix type proposed, make trial mix using aggregate proposed.
3. Determination of required average strength above specified strength shall be in accordance with ACI 301.
4. Make advance tests of trial mixes with proposed materials. Mold and cure in accordance with ASTM C31; test cylinders in accordance with ASTM C-39. Do not place concrete on project until laboratory reports and breaks of confirmation cylinders indicate that proposed mixes will develop required strengths.
5. Submit proposed mix designs to Architect for review min. 14 days prior to placing concrete. Show:

    a. Proportions of cement, fine and coarse aggregates and water.
    b. Combined aggregate gradation.
    c. Aggregate specific gravities and gradations.
    d. Water-cement ratio, design strength, slump and air content.
    e. Type of cement and aggregates.
    f. Type of dosage of admixtures.
    g. Type, color and dosage of integral coloring compounds, where applicable.
    h. Special requirements for pumping.
    i. Range of ambient temperature and humidity for which design is valid.
    j. Any special characteristics of mix which require precautions in mixing, placing, or finishing techniques to achieve finished product.

6. Mix designs based on record of past performance in accordance with ACI 301, method 2, may be submitted in lieu of mix designs required above, provided all necessary information is included.
7. Check mix designs and revise if necessary wherever changes are made in aggregates or in surface water content of aggregate or workability of concrete. Slump shall be minimum to produce workable mix. Laboratory shall prescribe maximum quantity of water.

C. Test Cylinders: Make at least one (1) test of each day's pouring or each fifty (50) cu. yards, whichever comes first, on each different portion or section of the work. Mold and cure specimens in accordance with ASTM C31, and test in accordance with ASTM C39. Test cylinders shall be made and tested by the laboratory. Footings, walls, and floor systems constitute different sections. Each test shall consist of five (5) specimens: two (2) to be tested at twenty-eight (28) days, two (2) to be tested at seven days, and one held in reserve. Determine temperature and air content for each set of test cylinders in accordance with ASTM C231.

D. Field Quality Control:

1. Determine slump for each strength test and whenever consistency of concrete appears to vary, in accordance with ASTM C143.
2. Monitor addition of water to concrete and length of time concrete is allowed to remain in truck.
3. Certify delivery tickets indicating class of concrete, amount of water added during initial batching, and time initial batching occurred.
4. Monitor work being performed in accordance with ACI (American Concrete Institute) recommendations as a standard of quality.

E. Source Quality Control: Periodically inspect and control concrete mixing and loading of transit mix trucks at batch plant at intervals as agreed to by Architect and laboratory personnel.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Mix and deliver concrete to project ready-mixed in accordance with ASTM C94. Mix concrete min. 70 revolutions of transit mix drum at mixing speed. Min. 40 revolutions shall be at production plant.

B. Schedule delivery so that continuity of any pour will not be interrupted for over 15 minutes.

C. Place concrete on site within 90 minutes after proportioning materials at batch plant.

1.5 JOB CONDITIONS

A. Weather Requirements:

1. Hot Weather Concreting:

   a. Follow ACI 301.
   b. Provide retarding type admixture conforming to ASTM C494-Type A or D in accordance with manufacturer's recommendations.

2. Cold Weather Concreting:

   a. Follow ACI 301.
   b. When ambient temperature at site is below 40 degrees F, or is expected to fall to that temperature within ensuing 24 hours, heat water and/or aggregates prior to adding to mix so that temperature of concrete will be between 60 degrees F and 90 degrees F at time of placement.

c. Maintain temperature of deposited concrete between 50 degrees F and 70 degrees F for min. 7 days after placing.

3. Temperature Changes: Maintain changes in concrete temperature as uniform as possible, but in no case exceed change of 5 degrees per hour or 25 degrees in any 25 hour period.
4. Admixture intended to accelerate hardening of concrete or produce higher than normal strength at early periods will not be permitted unless specified or prior approval is obtained from Architect.

1.6 SUBMITTALS

A. Concrete Mix Design.

B. Delivery Tickets: Furnish duplicate delivery tickets for each load of ready-mix concrete delivered to site, in accordance with ASTM C94. Show batch weights on each ticket.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Portland Cement: ASTM C-150, Type I. Type III may be used for cold weather concreting when approved by Architect.

B. Aggregate:

1. Fine: ASTM C-33, clean hard, durable, uncoated, natural non-staining sand free from silt, loam or clay.
2. Coarse: ASTM C-33, hard, durable, uncoated, crushed stone, gradation in accordance with size No.57, unless otherwise approved in mix design. Max. aggregate size in accordance with ACI 318.

C. Water: Clean and free from oil, acid and injurious amounts of vegetable matter, alkalies and other impurities.

D. Admixtures:

1. Water-reducing or water-reducing/set-retarding; ASTM C494.
2. Air entraining agent: ASTM C260.

E. Curing Materials:

1. Waterproof Paper: FS UU-P-265a.
2. Polyethylene Sheeting: Minimum 0.004" thick, free from defects, uniform in appearance, white.
3. Curing Compounds: L&M "CURE" by L & M Construction Chemicals, Inc., or approved equal, for interior concrete slab surfaces. Curing compound must be compatible with floor hardener and sealer.

F. Liquid Floor Hardener and Sealer: "Lapidolith" as manufactured by Sonneborn Building Products or approved equal.

G. Expansion Joint Filler: ASTM D1752, Type 1, non-asphaltic.

H. Non-shrinking Cement Grout: U.S. GrouT Corp. "Five Star Grout" or equal.

I. Non-Slip Stair Nosing: Equal to Wooster No. 101 "Alumograt" of required length.

2.2 MIXES

A. Strength: Concrete is classified and specified by ultimate compressive strength (f'c) at age 28 days.

B. Proportions: Proportions of cement, aggregate, and water to attain required plasticity and compressive strength shall be in accordance with ACI 318. Do not make changes in proportions without Architect's approval.

C. Design concrete to yield the following characteristics:

Type	Min 28 Day Compressive Strength	Cement Type	Min. Cement Content	Max. Dry Density	Slump Limits Min.	Slump Limits Max.
I	3000 psi	Portland	5*	NA	3”	5”
II	4000 psi	Portland	6*	NA	3”	5”

* bags per cu. yd.

D. Concrete Uses: Refer to structural drawings for type usage.

E. Concrete permanently exposed to weather: Contain air-entraining admixture to produce 5% +/- 1% air by volume of concrete.

F. Maximum Fly Ash content shall not exceed 20% by weight.

PART 3 - EXECUTION

3.1 PREPARATION

A. Notify Architect and Testing Laboratory at least 24 hours prior to when each concrete operation is to begin.

B. Allow various trades ample time to install anchor bolts, sleeves, conduit and inserts necessary for proper execution of their work. Accurately position in form. Do not cut reinforcing steel to facilitate installation of inserts or accessories.

C. If power screeds are to be used, recess sleeves and cap in manner to prevent water and cement from entering, but so that they may be located after finishing. Otherwise, extend sleeves 1" above finish floor.

D. Remove impounded water from forms and excavations before concrete is deposited. Close temporary drains by grouting or by other satisfactory means. Close openings left in forms for cleaning and inspection, after forms have been cleaned out, inspected and approved.

E. Remove debris from space to be occupied by concrete before concrete is deposited. Before beginning placement, remove hardened concrete and foreign substances from inner surface of mixing and conveying equipment.

F. Provide runways, pumps, conveyors, etc. to convey concrete to point of deposit in order not to disturb forms or reinforcement or segregate concrete. Do not allow conveying equipment directly over reinforcement.

G. Do not allow concrete to free-fall over 5'-0"; provide tremies, chutes or other approved means of conveyance when drop exceeds this amount.

3.2 INSTALLATION

A. Placing: Place concrete in accordance with requirements of ACI 301 and as modified herein. Direct concrete rapidly from mixer to forms and deposit as nearly as possible in its final position to avoid segregation due to re-handling or flowing. Do not place partially hardened, contaminated or re-tempered concrete.

B. Consolidation: Place concrete with aid of mechanical vibrating equipment unless otherwise approved by Architect. Apply vibration at point of deposit and in area of freshly placed concrete. Vibrate enough to accomplish thorough compaction and complete embedment or reinforcement and fixtures. Supplement vibration by hand-spading in corners and angles of forms to prevent honey-combing.

C. Bonding: Before depositing new concrete on concrete that has set, roughen and clean surface of set concrete of laitance, foreign matter and loose particles. Wet surface of set concrete just prior to placing new concrete.

D. Protection and Curing:

1. Protect concrete from frost damage and moisture loss.
2. Provide artificial heat to maintain temperature of concrete above minimum required herein for duration of curing period.
3. Keep forms sufficiently wet to prevent cracking of concrete or loosening of form joints.
4. Cure surfaces of exposed concrete by means of curing compound or sheeting method, as applicable.

E. Patching Formed Surfaces of Exposed Concrete:

1. After forms have been removed, inspect concrete surfaces and patch pour joints, voids, stone pockets, other defective areas and tie holes before concrete is thoroughly dry. Chip away defective areas to depth of not less than 1" with edges perpendicular to surface. Wet areas to be patched and spaced at least 6" wide entirely surrounding it, to prevent absorption of water from patching mortar. Do not patch concrete in freezing weather.
2. Apply chemical bonding agent to surface in accordance with manufacturer's recommendations, followed immediately by patching mortar. Make patch of same proportions as used for concrete except omit coarse aggregate. Add only enough water consistent with requirements for handling and placing.
3. Thoroughly compact mortar into place and screed off; leave patch slightly higher than surrounding surface. Leave undisturbed for one to two hours to permit initial shrinkage before final finishing. Finish patch to match texture and color of adjoining surface. Completely fill tie holes left by withdrawal of rods and holes left by removal of end of ties. For holes passing entirely through wall, force mortar through with plunger type grease gun. Cure all patches.

F. Finishing Formed Surfaces:

1. As - Formed Finish.

a. Provide at surfaces not exposed to view in completed work.
b. Remove fins by stoning, otherwise leave texture imparted by forms.

2. Rubbed Finish:
   a. Provide at exterior vertical surfaces exposed to view in completed work.
   b. After removal of forms, patching and repairing, and while concrete is still green, spread slurry consisting of 1 part portland cement and 1-1/1 part damp, loose sand by volume, over pre-dampened surface. Apply using burlap pads or sponge rubber floats. Remove surplus materials, then rub with clean burlap. Water for completed surfaces for 7 days min.

G. Flatwork:

1. Forms and Screeds: Set edge forms and intermediate screed strips accurately to produce designed elevations and contours in finished surfaces. Align concrete surface to contours of screed strips using strike-off templates or compacting type screeds. When formwork is cambered, set screeds to like camber to maintain proper concrete thickness.
2. Floated Finish: Provide at slab surfaces to precede other finishes. Begin floating after concrete has been struck off, consolidated and leveled, surface water has disappeared and surface is sufficiently hardened to support power driven float. Finish surface with impact type power driven float or hand float. Test surface with 10'-0" straightedge placed at min. 2 different angles; correct irregularities exceeding 1/4". Refloat repaired areas.
3. Trowel Finish: Provide at interior slab surfaces under carpet, vinyl composite floor tile and exposed concrete floors.
4. Light Broom Finish: Light broom finish under thin ceramic tile floors, ramps and steps.

H. Liquid Floor Hardener and Sealer:

1. Apply hardener and sealer for all finished concrete floors that will be left exposed, not receiving additional finish.
2. Apply hardener and sealer in separate coats in accordance with manufacturer's directions and using the maximum quantity recommended. Surface to be treated must be clean and dry, with all work above the floor completed before the hardener and sealer is applied. Upon completion, concrete surfaces shall be clean, without discrepancies, discoloration, or traces of excess hardener left on the surface.

END OF SECTION

DIVISION 13

SPECIAL CONSTRUCTION

SECTION 13 03 03
Precast Concrete Buildings
Page 1 of 2

PART 1 - GENERAL

1.01 SCOPE

A. This section refers to precast concrete buildings. Furnish and install as shown on the PLANS and as specified hereinafter. The building shall be a “drop-over” type to house the electrical equipment. The slab will be poured in place and designed for connections to vertical precast walls.

1.02 QUALITY ASSURANCE

A. Each building shall be constructed in accordance with the following design parameters:

Roof Live Load:	65 lbs/sf
Wind Load:	110 mph
Seismic:	Standard Design 50% g (IBC and ASCE7)

1.03 STANDARDS

A. The following standards shall apply where applicable:

ACI 318-11	Building Code Requirements for Reinforced Concrete
ASTM A-615 Grade 60	Rebar
ASTM A-1064	Mesh
UL 752, Level 4	Bullet Resistance

B. In addition, the Concrete Reinforcing Institute’s Manual of Standard Practices shall apply.

1.04 SUBMITTALS

A. Provide catalog submittals and shop drawings for the building per the General Conditions. Provide color samples for concrete finish.

PART 2 - PRODUCTS

2.01 GENERAL

A. Concrete shall be steel reinforced, polypropylene fiber reinforced, 5000 psi minimum 28 day compressive strength, air entrained, in accordance with ASTM C260. The walls and roof shall have a two hour fire rating.

B. The building shall be precast concrete with scheduled dimensions and 3” roof overhang on all sides. Interior and exterior walls shall have smooth steel form finish. The roof shall have smooth trowel finish sealed with a clear waterproofing.

C. Panels shall be securely fastened together with ¼” thick steel brackets. Anchoring and mounting hardware shall be hot-dipped-galvanized steel. Joints between panels shall be caulked on the exterior surface of the joints.

D. The precast building shall be installed on top of the slab as shown on the drawings. The walls shall be 10’0” as measured from the floor to the ceiling inside the building.

E. Doors and frames shall comply Steel Door Institute (SDI 100) “Recommended Specifications for Standard Steel Doors and Frames”, and as specified herein. The building shall be equipped with 18 gauge metal doors as scheduled, with insulated core, CECO Regent or equal. Door shall have a 5.5 R insulation value. Door frames shall be bonderized and painted with one coat of rust inhibitive primer, SF34300F6068RHRHA-601 and finished painted to match color scheme of doors on adjacent Prairie Creek Lift Station Building. Provide two doors, one on each end. One door shall be 4’0” by 7’0” wide to allow placement of switchboard sections. The 4’ wide door shall be placed in door frame with 12” removable transom.

F. Door hardware shall be vandal-proof and constructed of stainless steel. A deadbolt lockset with satin finish stainless steel and matching keys shall be provided. Surface bolts shall be stainless steel. Each door shall have panic hardware for emergency exit. An aluminum threshold with neoprene insert shall be provided. Door stops for securing the doors full open shall be provided.

G. Provide openings for air conditioning unit as indicated on the drawings. Insulation shall be R-11 rigid board type with moisture barrier. Ceiling shall be R-19 rigid board type with moisture barrier. Walls and ceiling shall have white 0.030" NuPoly Laminated to 1/2" thick moisture barrier.

H. Roof exterior shall have white elastomeric coating.

I. Concrete shall have permanent color treatment. Outside walls shall have pattern and color to match existing Prairie Creek Lift Station Building color scheme as close as possible. Exterior walls shall be finished with sealer. Submit color samples with submittals.

J. Pre-cast concrete building shall be Old Castle Precast, Inc. model 1220-RCS or approved equal.

PART 3 - EXECUTION

3.01 GENERAL

A. Install the building in accordance with the manufacturer’s recommendations and as shown on the Drawings. Bottom of panels shall be sealed and secured per manufacturer’s recommendations.

B. Upon installation, the building shall be weatherproof and level to within 0.01” in each direction, and plumb to within ¼”.

END OF SECTION

DIVISION 23

HEATING, VENTILATING AND AIR-CONDITIONING

SECTION 23 05 00
Heating, Ventilation and Air-Conditioning
Page 1 of 2

PART 1 GENERAL

1.01 SCOPE

A. Furnish and install ventilation system as specified herein and as indicated on the drawings.

B. Furnish all work, labor, tools, superintendence, material, equipment, and operations necessary to provide for a complete and workable system as shown on the PLANS and specified herein.

B. Auxiliary and accessory devices necessary for system operation or performance, such as supports, waterproofing, etc. shall be included. All registers, grilles, dampers, etc. shall be furnished as specified or as required.

C. It is the intent of the contract documents that upon completion of the mechanical work, the entire HVAC system shall be in a finished, workable condition.

1.02 CODES AND PERMITS

A. Secure all permits, licenses, and inspection as required by all authorities having jurisdiction. Give all notices and comply with all laws, ordinances, rules, regulations, and contract requirements bearing on the work.

B. Codes and ordinances having jurisdiction and specified codes shall serve as a minimum requirements; but, if the Contract Documents indicate requirements which are in excess of those minimum requirements, then the requirements of the Contract Documents shall be followed.

1.03 SUBMITTALS AND SHOP DRAWINGS

A. Submit the following in accordance with the requirements outlined in General Conditions.

B. Process catalog submittals for each item of mechanical equipment. Submit on the following:

1. Air-Conditioning Units

PART 2 PRODUCTS

2.01 AIR- CONDITIONING UNITS

A. Air-conditioners shall be as scheduled on the drawings.

PART 3 EXECUTION

3.01 GENERAL INSTALLATION

A. Install all equipment and materials as indicated on the PLANS. Align materials and equipment in such manner as to eliminate undue stress on equipment and connections.

B. Tighten all connectors to proper torques as specified herein or as specified by the manufacturer

C. Provide all anchorage of materials and equipment as specified by the manufacturer or as shown in the Contract Documents. All hardware shall be 304 stainless steel.

D. After systems have been cleaned and installed and are complete with all controls and accessories, etc., the CONTRACTOR shall adjust and test all systems for proper operation, air distribution, temperatures, noise, and vibration.

E. Remove all temporary labels, dirt, paint, grease and stains from all exposed equipment. Upon completion of work, clean equipment and the entire installation so as to present a first class job suitable for occupancy. No loose parts or scraps of equipment shall be left on the premises.

F. Equipment paint scars shall be repaired with paint kits supplied by the equipment manufacturer, or with an approved paint.

G. Clean interiors of each item of mechanical equipment. At completion of work, all equipment interiors shall be free from dust, dirt, and debris.

END OF SECTION

DIVISION 26

ELECTRICAL

SECTION 26 00 10
Electrical General Provisions
Page 1 of 7

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. The General Conditions and Requirements, Special Provisions, are hereby made a part of this Section.

B. The Electrical Drawings and Specifications under this Section shall be made a part of the Contract Documents. The Drawings and Specifications of other sections of this contract, as well as supplements issued thereto, information to bidders and pertinent documents issued by the Owner's Representative are a part of these Drawings and Specifications and shall be complied with in every respect. Failure to examine all documents shall not relieve the responsibility or be used as a basis for additional compensation.

C. Furnish all work, labor, tools, superintendence, material, equipment and operations necessary to provide for a complete and workable electrical system as defined by the Contract Documents. A licensed journeyman shall be on site at all times while electrical work is being performed and a licensed master electrician shall be in charge of the work. Submit license for master electrician and all journeymen.

D. Be responsible for visiting the site and checking the existing conditions. Ascertain the conditions to be met for installing the work and adjust bid accordingly. This project shall include electrical work as shown on the Location Map.

E. It is the intent of the Contract Documents that upon completion of the electrical work, the entire system shall be in a finished, workable condition.

F. All work that may be called for in the Specifications but not shown on the Drawings, or, all work that may be shown on the Drawings but not called for in the Specifications, shall be performed by the Contractor as if described in both. Should work be required which is not set forth in either document, but which work is nevertheless required for fulfilling of the intent thereof, then the Contractor shall perform all work as fully as if it were specifically set forth in the Contract Documents.

G. The definition of terms used throughout the Contract Documents shall be as specified by the following agencies:

1. Underwriters Laboratories
2. National Electrical Manufacturers Association
3. American National Standards Institute
4. Insulated Power Cable Engineers Association
5. National Electrical Code
6. National Fire Protection Association

H. The use of the terms "as (or where) indicated", "as (or where) shown", "as (or where) specified", or "as (or where) scheduled" shall be taken to mean that the reference is made to the Contract Documents, either on the Drawings or in the Specifications, or both documents.

I. The use of the words "furnish", "provide", or "install" shall be taken to mean that the item or facility is to be both furnished and installed under Division 16, unless stated to the contrary that the item or facility is to be either furnished under another Division or under another Contract, furnished under this Division and installed under another Division or under another Contract, or furnished and installed under another Division or under another Contract.

1.02 PERMITS AND CODES

A. Secure all permits, licenses, and inspection as required by all authorities having jurisdiction. Give all notices and comply with all laws, ordinances, rules, regulations and contract requirements bearing on the work.

B. The minimum requirements of the electrical system installation shall conform to the latest edition of the National Electrical Code, as well as state and local codes.

C. Codes and ordinances having jurisdiction and specified codes shall serve as minimum requirements, but, if the Contract Documents indicate requirements which are in excess of those minimum requirements, then the requirements of the Contract Documents shall be followed. Should there be any conflicts between the Contract Documents and codes, or any ordinances, report these with bid.

PART 2 - PRODUCTS

2.01 STANDARDS

A. All materials and equipment shall conform to the requirements of the Contract Documents. They shall be new, free from defects, and they shall conform to the following standards where these organizations have set standards:

1. Underwriters Laboratories (UL)
2. National Electrical Manufacturer's Association (NEMA)
3. American National Standards Association (ANSI)
4. Insulated Cable Engineers Association (ICEA)

B. All material and equipment of the same class shall be supplied by the same manufacturer, unless specified to the contrary.

C. All products shall bear UL labels where standards have been set for listing. All other products shall be UL labeled. Motor control centers, switchboards, and switchgear shall have UL labels. Custom panels, modified motor starters, control panels, and instrument panels and the like shall be manufactured by a fabricator approved as a UL508A shop and shall bear a UL 508A or UL Industrial Control Panel label.

D. When the Contractor provides a product for this project he shall be bound by the terms and conditions of the Contract Documents and he shall agree to warrant and to be liable for the merchantability and fitness of his product to the applications to which his product is applied under the Contract Documents.

2.02 SHOP DRAWINGS AND SUBMITTALS

A. Shop drawings and submittals shall comply with general conditions and as specified herein.

B. Shop drawings shall be taken to mean detailed drawings with dimensions, schedules, weights, capacities, installation details and pertinent information that will be needed to describe the material or equipment in detail.

C. Submittals shall be taken to mean catalog cuts, general descriptive information, catalog numbers and manufacturer's name.

D. Submit for review all shop drawings and submittals as hereinbefore called for.

E. Review of submittals or shop drawings shall not remove the responsibility for furnishing materials or equipment or proper dimensions, quantity and quality, nor will such review remove the responsibility for error in the shop drawings or submittals.

F. Failure to process submittals or shop drawings on any item and/or items specified shall make the Contractor responsible for the suitability for the item and/or items, even though the item and/or items installed appear to comply with the Contract Documents.

G. Assume all costs and liabilities which may result from the ordering of any material or equipment prior to the review of the shop drawings or submittals, and no work shall be done until the shop drawings or submittals have been reviewed. In case of correction or rejection, resubmit until such time as they are accepted by the Owner's Representative, and such procedures will not be cause for delay.

H. Submittals and shop drawings shall be compiled from the manufacturer's latest product data. Should there be any conflicts between this data and the Contract Documents, report this information for each submittal and/or shop drawing.

I. Shop drawings and submittals will be returned and unchecked if the specific items proposed are not clearly marked, or if the General Contractor's approval stamp is omitted.

J. When requested, furnish samples of materials for acceptance review. If a sample has been reviewed and accepted, then that item of material or equipment installed on the job shall be equal to the sample; if it is found that the installed item is not equal, then replace all such items with the accepted sample equivalent.

2.03 ACCEPTANCE AND SUBSTITUTIONS

A. All manufacturers named are a basis as a standard of quality and substitutions of any equal product will be considered for acceptance. The judgment of equality of product substitution shall be made by the Engineer.

B. Substitutions after award of Contract shall be made only within sixty (60) days after the notice to proceed. Furnish all required supporting data. The submittal of substitutions for review shall not be cause for time extensions.

C. Where substitutions are offered, the substituted product shall meet the product performance as set forth in the specified manufacturer's current catalog literature, as well as meeting the details of the Contract Documents.

D. The details on the drawings and the requirements of the Specifications are based on the first listed material or equipment. If any other than the first listed material or equipment is furnished, then assume responsibility for the correct function, operation, and accommodation of the substituted item. In the event of misfits or changes in work required, either in this section or other sections of the Contract, or in both, bear all costs in connection with all changes arising out of the use of other than the first listed item specified.

E. Substitutions of products under other sections may occur. Make necessary adjustments and additions to work under Division 26 to accommodate those substitutions. Such adjustments and additions shall be performed in compliance with Division 26 Specifications at no additional charge.

F. Energy efficiency of each item of power consuming equipment shall be considered one of the standards for evaluation.

PART 3 - EXECUTION

3.01 CUTTING AND PATCHING

A. Cutting and patching required under this section shall be done in a neat workmanlike manner. Cutting lines shall be uniform and smooth.

B. Use concrete saws for large cuts in concrete and use core drills for small round cuts in concrete.

C. Where openings are cut through masonry walls, provide lintel or other structural support to protect the remaining masonry. Adequate support shall be provided during the cutting operation to prevent damage to masonry.

D. Where large openings are cut through metal surfaces, attach metal angle around the opening.

E. Patch concrete openings that are to be filled with nonshrinking cementing compound. Finish concrete patching shall be troweled smooth and shall be uniform with surrounding surfaces.

3.02 WATERPROOFING

Provide waterproof flashing for each penetration of exterior walls and roofs.

3.03 CONSTRUCTION REQUIREMENTS

A. Except where specifically noted or shown, the locations and elevations of equipment are approximate and are subject to small revisions as may prove necessary or desirable at the time the work is installed. Locations changed substantially from that shown on the drawings shall be confirmed with the Engineer in advance of construction.

B. Where equipment is being furnished under another Division, request from Engineer an accepted drawing that will show exact dimensions of required locations or connections. Install the required facilities to the exact requirements of the accepted drawings.

C. All work shall be done in the best and most workmanlike manner by qualified, careful electricians who are skilled in their trade. The standards of work required throughout shall be of the first class only.

D. Unless shown in detail, the Drawings are diagrammatic and do not necessarily give exact details as to elevations and routing of raceways, nor do they show all offsets and fittings; nevertheless, install the raceway system to conform to the structural and mechanical conditions of the construction.

E. Holes for raceway penetration into sheet metal cabinets and boxes shall be accurately made with an approved tool. Cutting openings with a torch or other device that produces a jagged, rough cut will not be acceptable.

F. Cabling inside equipment shall be carefully routed, trained and laced. Cables so placed that they obstruct equipment devices will not be acceptable.

G. Equipment shall be set level and plumb. Supporting devices installed shall be set and so braced that equipment is held in a rigid, tight-fitting manner.

3.04 EQUIPMENT PROTECTION

A. Provide suitable protection for all equipment, work and property against damage during construction.

B. Assume full responsibility for material and equipment stored at the site.

C. Conduit openings shall be closed with caps or plugs during installation and made watertight. All outlet boxes and cabinets shall be kept free of concrete, plaster, dirt and debris.

D. Equipment shall be covered and tightly sealed against entrance of dust, dirt and moisture.

E. All dry-type transformers prior to energization shall be protected against moisture and dirt absorption by a suitable covering. Also, maintain heat inside the covering by means of 100 watt minimum lamps.

F. Interiors of and motor control centers shall be kept clean and dry prior to energization. Maintain heat inside each unit with one (1) 100 watt lamp located at bottom of each vertical section or energize section space heaters.

3.05 COOPERATION WITH WORK UNDER OTHER DIVISIONS

A. Cooperate with all other trades so as to facilitate the general progress of their work. Allow all other trades every reasonable opportunity for the installation of their work and the storage of their materials.

B. The work under this section shall follow the general building construction closely. Set all pipe sleeves, inserts, etc., and see that openings for chases, pipes, etc.., are provided before concrete is placed or masonry installed.

C. Work with other trades in determining exact locations of outlets, conduits, fixtures, and pieces of equipment to avoid interference with lines as required to maintain proper installation of other work.

D. Make such progress in work that will not delay the work of other trades. Schedule the work so that completion dates as established by the Engineer are met. Furnish sufficient labor or work overtime to accomplish these requirements if directed to do so.

3.06 INSTALLATION OF WORK UNDER ANOTHER DIVISION

A. Verify the electrical capacities of all motors and electrical equipment furnished under other sections, or furnished by the Owner, and request wiring information from the Engineer if wiring requirements are different from that specified under this Section. Do not make rough-ins until equipment verification has been received.

B. Install all motors, controllers, terminal boxes, pilot devices, and miscellaneous items of electrical equipment that are not integrally mounted with the equipment furnished under other divisions. All such equipment shall be securely mounted and adequately supported in a neat and workmanlike manner.

3.07 CLEAN-UP

A. Remove all temporary labels, dirt, paint, grease and stains from all exposed equipment. Upon completion of work, clean equipment and the entire installation so as to present a first class job suitable for occupancy. No loose parts or scraps of equipment shall be left on the premises.

B. Equipment paint scars shall be repaired with paint kits supplied by the equipment manufacturer or with an approved paint.

C. Clean interiors of each item of electrical equipment. At completion of work all equipment interiors shall be free from dust, dirt and debris.

3.08 TESTS

A. Test all systems furnished under Division 26 and repair or replace all defective work. Make all necessary adjustments to the systems and instruct the Owner's personnel in the proper operation of the system.

B. Make all circuit breaker and protective relay adjustments and settings.

C. Make the following minimum tests and checks prior to energizing the electrical equipment:

1. Check all wire and cable terminations for tightness.
2. Test all wiring as specified in Section 26 01 20.
3. Test grounding system as specified in Section 26 04 50.

4. Set all transformer taps as required to obtain the proper secondary voltage.
5. Carefully check all interlocking, control and instrument wiring for each system to ascertain that the system will function properly as indicated by schematics, wiring diagrams, or as specified herein.
6. Mechanical inspection of all low voltage circuit breakers, disconnect switches, motor starters, control equipment, etc. for proper operation.
7. Provide all instruments and equipment required for the above tests.

3.09 RECORD DRAWINGS

A. At the start and during the progress of the job, keep one separate set of blue-line prints for making construction notes and mark-ups.

B. Show conduit routing and wiring runs as constructed and identify each.

C. Record all deviations from the Contract Documents.

D. Submit set of marked-up drawings for review. The final payment will not be made until the review is complete.

3.11 OPERATIONS AND MAINTENANCE MANUALS

A. Compile an Operations and Maintenance Manual on each item of equipment. These manuals shall include detailed instructions and maintenance as well as spare parts lists.

B. Submit copies for review as hereinbefore specified.

C. Preliminary Operations and Maintenance Manuals shall be included with the initial shipments.

END OF SECTION

SECTION 26 01 10
Raceways
Page 1 of 9

PART 1 - GENERAL

1.01 SCOPE

A. This section shall include raceways, enclosures, supporting devices ancillary fittings and appurtenances. Furnish and install the complete raceway systems as shown on the Drawings and as specified herein.

B. Raceway is a broad-scope term that shall be defined by the National Electrical Code under Article 100.

1.02 APPLICATIONS

A. Except as otherwise shown on the Drawings, or otherwise specified, all underground and in-slab conduit raceways shall be of the following type:

1. Except as otherwise specified, all power and control underground conduit runs shall be made with schedule 40 PVC. Bends to grade shall be made with plastic coated rigid aluminum conduit.

B. Except as otherwise shown on the Drawings, or otherwise specified, all above grade conduit raceways shall be of the following type:

1. Indoor exposed power and control conduit shall be rigid aluminum conduit. Instrumentation, signal, and communication conduit shall be have 24” separation from power conduits.

2. Outdoor exposed power, control, and instrumentation, signal, and communication conduit shall be rigid aluminum conduit, except where areas are denoted as corrosive or NEMA 4X. In those area furnish plastic coated rigid aluminum conduit, fittings, and boxes.

3. Instrument conduits shall be separated by 24” from power conduits when run in parallel for more that 5’.

1.03 SUBMITTALS AND SHOP DRAWINGS

A. Process catalog submittals for the following:

1. Rigid Metallic Aluminum Conduit
2. Plastic Jacketed Rigid Aluminum Conduit
3. Rigid Non-Metallic Conduit
4. Liquid-tight Flexible Conduit
5. Liquid-tight Fittings
6. Conduit Bushings
7. Conduit Bodies
8. Conduit Sealing Fittings
9. Expansion-Deflection Fittings
10. Expansion Fittings
11. Cast Metal Boxes
12. Tape Products

13. Wiring Devices
14. Supporting Devices
15. Labels
16. Grounding Devices
17. Foam Sealant

PART 2 - PRODUCTS

2.01 RACEWAYS

A. Rigid metallic aluminum conduit shall be manufactured of 6063 alloy, T-1 temper, with no more than 0.02% copper content. All conduit couplings shall be threaded aluminum. All such conduit shall be listed with UL and comply with UL-6 and ANSI C80.5. Aluminum conduit shall be New Jersey Aluminum, or equal.

B. Plastic coated rigid aluminum conduit shall consist of rigid aluminum body that complies with above specifications for rigid aluminum conduit, plus conduit shall have 40 mil thick heat-fused PVC over outside and 2 mil coat of fully catalyzed phenolic inside. The inside coat shall have the chemical resistance of the outer coating and shall not dissolve in lacquer thinner. All couplings shall be equipped with PVC sleeves that extend one pipe diameter or 2", whichever is less, beyond the end of the coupling. All plastic coated conduit shall conform to NEMA Standard #RNI-1974 (Type A) and such conduit shall be manufactured by Robroy, Perma-Cote, or Kor-Kap.

C. Non-metallic rigid conduit shall be Schedule 40 PVC. Such conduit shall be UL listed for 90 degrees C and shall conform to NEMA TC-2 and UL-651 standards. Furnish Carlon, Sedco, or equal. Furnish manufacturer's approved solvent for joining couplings.

D. Liquid-tight flexible conduit shall be constructed of non-metallic sunlight resistant PVC with aluminum core. Furnish Anaconda or equal product.

2.02 CONDUIT FITTINGS

A. Conduit Hubs for rigid metallic conduit shall be constructed of aluminum. Furnish Meyers Hubs.

B. Conduit field-applied hubs for sheet metal enclosures shall be aluminum body with recessed neoprene sealing ring, threaded NPT insert, and shall be, T&B 370 AL series, or equal products by OZ/Gedney.

C. Conduit hubs for non-metallic enclosures shall be fiberglass polyester reinforced with galvanized steel core, complete with locknut and grounding bushing. All such hubs shall be Crouse-Hinds Type NHU, or equal.

D. Rigid metallic conduit chase nipples, split couplings, slip fittings, unions, reducers, and enlargers, shall be aluminum.

E. Rigid metallic conduit short els and long els shall be rigid aluminum with NPT threaded hubs and male ends. Throats shall be smooth and free from burrs. All such fittings shall be OZ/Gedney Type "9" Series, Appleton, or equal.

F. Rigid metallic conduit split couplings shall made of aluminum and have threaded body with split tightening shelves with neoprene sandwich. Such fittings shall be OZ type "SSP", or equal.

G. Rigid metallic conduit grounding bushings shall be aluminum body with threaded hub, bakelite insulated throat, and tin-plated copper ground lug. Furnish OZ/Gedney type ABLG, or equal.

H. Liquid-tight flexible conduit fittings shall be suitable for the specified flexible conduit and shall be type B. Furnish straight or angle connectors as required. All such connectors shall be OZ/Gedney type 4QP, or equal.

I. Rigid metallic conduit expansion fittings shall consist of metallic barrel joined to hubs at each end. One hubs shall be threaded to barrel and other hub shall have slip fit to allow up to four (4") inches of conduit lateral movement. Provide external bonding jumper for each expansion joint. Shall have stainless steel clamps and aluminum straps. Furnish OZ Type "EXA", or equal for expansion fitting and OZ Type ABJ for jumper.

J. Conduit waterstops for sealing inside of conduit runs shall consist of aluminum pressure discs with sandwiched neoprene seal and with 316 stainless steel hardware. Furnish OZ/Gedney type "CS" series products, as indicated.

K. Conduit sealing bushings for penetrations in exterior walls shall be constructed of neoprene and shall have a stainless steel disk with stainless steel bolts and hardware. Furnish OZ/Gedney “CSM” series products. For existing walls core drill wall to size recommended by manufacturer of sealing bushing. Use two bushings per wall penetration, one each side. For newly constructed walls provide a PVC Schedule 40 sleeve in concrete pour. PVC sleeve shall have water stop and the sleeve size shall be as recommended by the manufacturer of the sealing bushing.

2.03 CONDUIT BODIES AND BOXES

A. Conduit bodies such as "C", "LB", "T" and the like pulling fittings shall be aluminum. Covers for damp and/or wet location use shall be gasketed cast metal with "wedge-nut" clamps. Covers for dry locations shall be cast aluminum and hardware shall be 316 stainless steel. All covers shall be equipped with clamp type clevises. Furnish Crouse-Hinds Form 7, or Appleton Form "FM7" products.

B. Conduit bodies for use in corrosive areas shall be as specified above but shall have 40 mil plastic coated PVC jacket and 2 mil interior coating as specified for plastic coated rigid metallic conduit. Furnish Robroy, Perma-Cote, or Kor-Kap

C. Conduit bodies such as "GUA", "GUAT", "GUAL", and the like pulling/splicing fittings shall be cast aluminum with threaded cast aluminum covers. All such conduit bodies shall be Killark "GE" series, or equal products by Crouse-Hinds or Appleton.

D. Outlet boxes, pullboxes, and junction boxes whose volume is smaller than 100 cubic inches shall be sand-cast, copper-free aluminum. All boxes shall have threaded hubs and integral cast mounting lugs. Furnish Crouse-Hinds "FD" style condulets, Appleton "FD" style Unilets, or equal.

E. Covers for cast metal boxes shall be gasketed cast metal covers with 316 stainless steel screws and shall be suitable for use in wet or damp locations.

F. Conduit and device boxes for use in concealed drywall applications only shall be pressed sheet steel type. Furnish Raco or equal.

2.04 PULL AND JUNCTION BOXES

A. Pullboxes and junction boxes whose volume is less than 100 cubic inches shall be furnished as specified hereinbefore except where sheet metal types are shown, in which case, furnish such sheet metal enclosures in NEMA 4X 316 stainless steel construction with gasketed covers of same material. Provide 316 SS quick release luggage type latches.

B. Pullboxes and junction boxes whose volume is 100 cubic inches and greater shall be NEMA 4X 316 grade stainless steel type with gasketed stainless steel covers. Provide print pocket and interior back panel for mounting of terminal strips where terminal strips are called for on the drawings. Sheet metal boxes shall be as manufactured by Hoffman or equal. Provide 316 SS quick release luggage type latches.

C. Covers for sheetmetal pullboxes and junction boxes over 100 cubic inches (and for smaller sized where shown) shall have hinged doors. All hardware shall be stainless steel.

D. Cast metal junction boxes shall be cast aluminum type with gasketed, cast metal covers, integral mounting lugs, and with stainless steel cover screws.

2.05 LABELS

A. Buried conduit marking tape for marking path of secondary buried conduits shall be four (4") inch nominal width strip of polyethylene with highly visible, repetitive marking "BURIED CONDUIT" or similar language, repeated along its length.

B. Voltage warning labels for cabinets shall be waterproof vinyl strips with adhesive back and shall have "DANGER (VOLTAGE) - DISCONNECT ALL SOURCES OF POWER BEFORE ENTERING". Letters shall be highly visible red color on white background.

C. Specify stainless steel or non-metallic machine printed conduit tags attached with stainless steel wire or nylon tie wraps.

2.06 SUPPORTING DEVICES

A. Mounting hardware, nuts, bolts, lockwashers, and washers, shall be Grade 316 stainless steel.

B. Unless otherwise indicated, channel framing and supporting devices shall be manufactured of ASTM 6063, TO6 grade aluminum; 1-5/8" wide x 3-1/4" deep (double opening type). Thickness shall be 0.105”. Clamp nuts for use with channels shall be grade 316 stainless steel.

C. Where indicated, furnish grade 316 stainless steel slotted channel members 1-5/8" wide x 1-5/8" deep or 1 5/8" x 3 1/4" deep, double-faced type, 12 gauge. All hardware and conduit clamps shall be grade 316 stainless steel.

D. Conduit clamp supports for terminating conduits onto cable trays shall be mechanically galvanized 316 SS or aluminum with adjustable angle clamp. Fittings shall be provided with 316 stainless steel hardware. Furnish OZ/Gedney type CTC products.

E. All such channel members and fittments shall be B-Line, Unistrut or equal.

F. Conduit straps, and associated nuts, lockwashers and bolts for use with channels shall be 316 stainless steel with 316 stainless steel hardware. Furnish B-Line products or equal.

G. After-set concrete inserts (drilled expansion shields "D.E.S.") shall consist of two types. For anchors to accommodate 5/16" diameter bolts and smaller, provide HILTI "HDI" series 316 stainless steel anchors. For anchors to accommodate 3/8" diameter and larger bolts, provide HILTI "HVA" series with 316 stainless steel threaded inserts.

H. Hanger rod shall be 3/8" minimum diameter Type 316 stainless steel all-thread.

I. Nest-back or clamp-back conduit supports shall be two-piece type constructed of copper free aluminum. Furnish Thomas & Betts 1976AL Series, or equal.

J. Conduit beam clamps shall be stainless steel or hardened aluminum and shall be as follows:

TYPE	MANUFACTURER
1. Right Angle	OZ/Gedney Type "UBCG", or equal.
2. Parallel	OZ/Gedney Type "UPCG", or equal.
3. Edge	OZ/Gedney Type "UECG", or equal.

K. Hanger rod beam clamps shall be clamp type with hardened 316 stainless steel, bolt, Steel City "500" Series, Crouse-Hinds type "MW", or equal. Furnish swivel stud for each rod make- up.

L. Conduit "J" hangers shall consist of stainless steel straddle with detachable bolt. Furnish Kindorf type "C-149", Unistrut "J-1200" Series, or equal.

M. Conduit "U" bolts shall be 316 stainless steel with 316 stainless steel hex-head bolts.

N. Equipment stands for supporting devices such as control stations, device boxes and the like, shall consist of a welded structural aluminum c-channel and plate aluminum floor plate as detailed on the drawings.

2.07 MISCELLANEOUS MATERIAL

A. Double bushings for insulating wiring through sheet metal panels shall consist of mating male and female threaded phenolic bushings. Phenolic insulation shall be high-impact thermosetting plastic rated 150 degrees C. Furnish OZ Type "ABB", or equal.

B. Conduit pull-cords for use in empty raceways shall be glass-fiber reinforced tape with foot-marked identification along its length. Furnish Thomas, Greenlee, or equal products.

C. Conduit thread coating compound shall be conductive, non-galling, and corrosion-inhibiting. Furnish Crouse- Hinds Type "STL", Appleton Type "ST", or equal.

D. Plastic compound for field-coating of ferrous material products shall be PVC in liquid form that sets-up semi- hard upon curing. Furnish Rob Roy "Rob Kote", Sedco "Patch Coat", or equal.

E. Foam sealant for waterproofing uses shall be Chase Technologies "Chase Foam", or equal.

PART 3 - EXECUTION

3.01 RACEWAYS

A. Install the conduit system to provide the facility with the utmost degree of reliability and maintenance free operation. The conduit system shall have the appearance of having been installed by competent workmen. Kinked conduit, conduit inadequately supported or carelessly installed, do not give such reliability and maintenance free operation and will not be accepted.

1. Parallel runs of conduit shall be parallel to each other throughout the entire run. Bends and offsets shall occur at the same point such that all offset angles are the same.
2. Conduits making vertical or horizontal changes in direction such that concentric bends are required are acceptable. All concentric bends shall have radii with the same center point.
3. Conduit installation shall be planned such that conduits crossing each other will be minimized.
4. Conduit installations not meeting these criteria in the sole judgment of the Owner or Engineer shall be removed and reinstalled at no charge in the contract price or schedule.
5. Conduits having conductors installed shall not be a reason to not remove and reinstall unacceptable conduit installations. The installed conductors shall be removed and replaced if present in unacceptable conduit systems.

B. Raceways shall be installed for all wiring runs, except as otherwise indicated.

C. Conduit sizes, where not indicated, shall be N.E.C. code-sized to accommodate the number and diameter of wires to be pulled into the conduit. Unless otherwise indicated, 3/4" trade-size shall be minimum size conduit.

D. Unless otherwise noted, conduit runs shall be installed exposed. Such runs shall be made parallel to the lines of the structure. Conduit shall be installed such that it does not create a tripping hazard or an obstruction for headroom.

E. All runs of rigid conduit shall be threaded, and all male threads shall be coated with non-galling thread compound prior to assembly.

F. Plastic coated metallic conduit lengths shall be joined with threaded metallic coupling that shall be each equipped with a 40 mil thickness sleeve that shall extend over the threads of the joined conduit. Each joint shall be watertight.

G. Field-cut threads in runs of plastic coated metallic conduit shall be cut with a special die that has rear reamed out oversize so as to slip over plastic coating. Do not attempt to cut threads on plastic coated conduit with regular dies, whereby plastic coating is skinned back to allow the incorrect die to be used. Coat all field-cut threads with cold-galvanizing spray, use two coats to provide 1-mil minimum coating thickness.

H. Conduit runs made in concrete pours or surface-mounted runs that are attached to the structure, shall be equipped with an expansion/deflection fitting where they cross an expansion joint, or at every 100 feet.

I. Unless otherwise shown, conduit penetrations through floors located below enclosures, shall be made each with couplings set flush with the outside faces of the concrete pour. Each pair of couplings shall be joined with a threaded spool piece. Use coated aluminum couplings.

J. Rigid metallic conduit runs shall have their couplings and connections made with screwed fittings and shall be made up wrench-tight. Check all threaded conduit joints prior to wire pull. Coat all male threads with Crouse-Hinds "STL" or equal, conductive lubricant prior to joining.

K. All conduit runs shall be watertight over their lengths of run, except where drain fittings are indicated. In which cases, install specified drain fittings.

L. Plastic jacketed flexible steel conduit shall be used to connect wiring to motors, limit switches, bearing thermostats, and other devices that may have to be removed for servicing. Unless otherwise indicated, maximum lengths of flex shall be three (3') feet.

M. Where plastic jacketed flex is installed, make up terminal ends with liquid-tight flex connectors. In wet locations, install sealing gaskets on each threaded male connector. Each flex connector shall be made-up tightly so that the minimum pull-out resistance is at least 150 lbs. Install external spirally-wrapped ground wire around each run of liquid-tight flex and bond each end to specified grounding-type fittings.

N. Empty conduits shall have pull-ropes installed. Identify each terminus as to location of other end and trade size of conduit. Use blank plastic waterproof write-on label and write information on each label with waterproof ink. Pull a mandrel through each conduit to check and clear blockage before installing pull-rope. Owner’s representative shall witness test. Provide documentation that all conduits are clear and ready for future use. Cap exposed ends of empty conduit with threaded plugs.

O. Conduit runs into boxes, cabinets and enclosures shall be set in a neat manner. Vertical runs shall be set plumb. Conduits set cocked or out of plumb will not be acceptable.

P. Conduit entrances into equipment shall be carefully planned. Cutting away of enclosure structure, torching out sill or braces, and removal of enclosure structural members, will not be acceptable. No top entry into NEMA 4X where installed outdoors.

Q. Use approved hole cutting tools for entrances into sheet metal enclosure. Use of cutting torch or incorrect tools will not be acceptable. Holes shall be cleanly cut and they shall be free from burrs, jagged edges, and torn metal.

R. All raceways shall be swabbed clean after installation. There shall be no debris left inside. All interior surfaces shall be smooth and free from burrs and defects that would injure wire insulation.

S. Outdoor aluminum runs of raceways shall be installed with expansion fittings and supports as required to accommodate thermal expansion due to changes in temperature appropriate with the structure from which the conduit is supported. Installation shall not appear to be loose or non-linear with changes in temperature from night to day or from summer to winter. In no case shall a straight run of conduit be installed over 20’ without an expansion fitting. Furnish additional expansion fittings if required by the characteristics of the particular installation.

3.02 CONDUIT BODIES AND BOXES

A. Conduit bodies such as "LB", "T", "GUAT", etc., shall be installed in exposed runs of conduit wherever indicated and where required to overcome obstructions and to provide pulling access to wiring. Covers for such fittings shall be accessible and unobstructed by the adjacent construction. GUA series pulling bodies rather than LB fittings and the like, shall be used for splicing purposes as well as pulling access.

B. Covers for all conduit bodies shall be installed with gasketed cast metal type where located in damp or wet locations.

C. All conduit boxes installed whose inside volume is less than 100 cubic inches shall be cast metal type with gasketed cast metal cover, unless otherwise indicated.

D. All conduit boxes whose inside volume exceeds 100 cubic inches shall be sheet metal type except where gasketed cast metal type, stainless steel or fiberglass reinforced polyester are indicated.

E. Aluminum boxes and aluminum strut shall be supported ¼” off of concrete surfaces with insulating washers or similar material, or shall be coated with bitumastic.

F. Use mounting lugs. Drilling through back of boxes is prohibited.

3.03 RACEWAY SUPPORT

A. All raceway systems shall be adequately and safely supported. Loose, sloppy and inadequately supported raceways will not be acceptable. Supports shall be installed at

intervals not greater than those set forth by the NEC, unless shorter intervals are otherwise indicated, or unless conditions require shorter intervals of supports.

B. Multiple runs of surface mounted conduit on concrete or masonry surfaces shall be supported off the surface by means of aluminum or stainless steel channels. Attach each slotted channel support to concrete surface by means of two (2) 1/4" diameter stainless steel bolts into drilled expansion shields.

C. Single runs of surface mounted conduit on concrete or masonry surfaces shall be supported with hot-dipped malleable iron conduit clamps and nest-back spacers. Furnish plastic coated malleable iron conduit clamps and nest backs where corrosive areas are called out.

D. Conduit runs that are installed along metallic structures shall be supported by means of beam clamps as specified herein.

E. Where Aluminum is used, install neoprene spacers to prevent Aluminum from direct contact with CMU or concrete.

3.04 LABELING

A. In addition to labeling requirements as specified throughout this and other Sections, install wiring and raceway labeling as follows:

1. Apply identification labels as specified to empty conduits to identify each conduit as to terminus of other end and also to identify trade size of conduit.

2. Where active conduits terminate into bottoms of motor control centers, install label on each conduit terminus and show number and size of wiring and function of circuitry and trade size of conduit.

END OF SECTION

SECTION 26 01 20
Wire and Cable
Page 1 of 6

PART 1 - GENERAL

1.01 SCOPE

This section shall include 600 volt and less wire and cable, terminating devices, splice kits, labeling, and appurtenances.

1.02 STANDARDS

A. ASTM

B. UL 1277 Electrical Power and Control Tray Cables

C. UL 1685 Flame Exposure Test for Tray Cables

D. ICEA T-29-520 Vertical Cable Tray Flame Test

E. IEEE 1202 Flame Testing of Cables for use in Cable Tray

1.03 SUBMITTALS AND SHOP DRAWINGS

A. Process catalog submittals for the following:

1. Power and control cable
2. Instrument cable
3. Conductor Connectors
4. Tape Products
5. Labels

PART 2 - PRODUCTS

2.01 WIRE AND CABLE

A. All conductors shall be soft-drawn annealed copper, Class B stranding that meets ASTM B-8. Copper conductors shall be uncoated, except as otherwise specified.

B. Single conductor cable for power, control, and branch circuits shall have cross-linked polyethylene insulation, rated for 600 volts. Cable shall be NEC type XHHW-2. All such cable shall be rated for wet or dry use. Cable insulation shall be color coded with factory pigmented colors below size #6 awg. Color coding shall be as specified under Part 3 of this section. Cable shall be as manufactured by Southwire or equal.

C. Instrument cable for analog circuits, shall be # 16 awg, twisted shielded pairs or triads with PVC insulation and overall jacket. Cable assembly shall be rated for 600 volts, wet or dry locations. Furnish Okonite "Okoseal-N Type P-OS" or approved equal.

D. Single conductor cable for 24 volt dc control shall be minimum size #16. Furnish MTW type insulation for panel wiring and XHHW-2 insulation for field wiring in conduits.

E. Ground mat and associated upcomers and grounding conductors shall be tin-plated stranded copper.

F. Cable for RS485 applications shall be Belden #9841.

2.02 CONNECTORS

A. Mechanical connectors for 600V class wiring shall be tin-plated copper alloy bolted pressure type with bronze tin-plated hardware. Furnish connectors as follows:

TYPE	MANUFACTURER & TYPE
Single conductor to flat-plate connector	Blackburn LH
Multiple conductor to flat-plate connector	Blackburn L2H, L3H, L4H
Split-bolt connector	Blackburn HPS
Two-bolt parallel connector with spacer	Blackburn 2BPW
Cross Connector	Blackburn XT
Splice Connector	Blackburn S
Flush ground connector	OZ Type "VG"

B. Insulated spring wire connectors, "wire-nuts", for small building wire taps and splices shall be plated spring steel with thermoplastic jacket and pre-filled sealant. Connector shall be rated for 600 volts, 75 degrees C continuous. Furnish King Technology, or equal.

C. Connectors for control conductor connections to screw terminals shall be crimp-type with vinyl insulated barrel and tin-plated copper ring-tongue style connector. Furnish T&B "Sta-Kon", 3M "Scotchlok", or equal.

D. Terminal strips for miscellaneous field terminations of control and instrumentation circuits shall consist of 12 point box lug terminals with marking surface. Terminal assembly shall accept #18 to #12 awg and shall be rated 600 volts. Furnish Allen-Bradley #1492-HJ812 terminal blocks.

2.03 INSULATING PRODUCTS

A. Tape products shall be furnished as hereinafter specified and shall be Plymouth, Okonite, 3M, or equal.

B. General purpose electrical tape shall be 7 mil thick stretchable vinyl plastic, pressure adhesive type, "Slipknot Grey", 3M Scotch 33+, or equal.

C. Insulating void-filling tape and high voltage bedding tape shall be stretchable ethylene propylene rubber with high-tack and fast fusing surfaces. Tape shall be rated for 90 degrees C continuous, 130 degrees C overload, and shall be moisture-proof. Void filling tape shall be "Plysafe", 3M Scotch 23, or equal.

D. High temperature protective tape shall be rated 180^{o}C continuous indoor/outdoor, stretchable, self-bonding silicone rubber. High temperature tape shall be Plysil #3455, 3M Scotch 70, or equal.

E. Insulation putty filler-tape shall be Plymouth #32074, 3M Scotchfill, or equal.

F. Arc and fireproofing tape shall be Plymouth #3318, 3M Scotch #70 or equal.

2.04 LABELS

A. Colored banding tape shall be 5 mil stretchable vinyl with permanent solid color. Colors shall be as hereinafter specified. Tape shall be Plymouth "Slipknot 45", 3M Scotch #35, or equal.

B. Numbered wire marking labels shall be PVC sleeve-type markers, T&B, Brady or equal. Markers using adhesive are not acceptable.

C. Cable identification ties shall be weather resistant polyester with blank write-on space, T&B, Brady or equal.

2.05 MISCELLANEOUS MATERIAL

A. Cable grips shall be 316 SS grip-type wire mesh with machined metal support. Furnish Kellems, Appleton, or equal products.

B. Wire pulling compound shall be non-injurious to insulation and to conduit and shall be lubricating, non- crumbling, and non-combustible. Furnish Gedney "Wire- Quick", Ideal "Yellow" or equal.

PART 3 - EXECUTION

3.01 POWER AND CONTROL CABLE

A. Power and control conductors shall be sized as shown and where no size is indicated, the conductor size shall be #12 awg for power circuits #14 awg for 120 vac control circuits, and #16 awg for instrumentation circuits.

B. Equipment grounding conductors shall be installed with type XHHW insulated stranded copper conductors and the insulation color shall be green in sizes up to and including #10 awg.

C. Color coding shall be as follows. Non-factory color coded cables shall be marked with specified color tape. Use the following colors:

CONDUCTOR	120/208V SYSTEMS	480V SYSTEMS
Phase A or L1	Black	Brown
Phase B or L2	Red	Orange
Phase C	Blue	Yellow
Neutral	White	N/A
Ground	Green	Green

D. Branch circuits may be spliced for receptacle, lighting and small appliance load inside appropriate junction boxes. Feeders, branch circuit, power wiring, control wiring, and signal wiring shall be installed without splice.

E. Except as otherwise specified, taps and splices with #10 AWG and smaller, shall be made with insulated spring wire connectors. Such connectors in damp or wet locations shall be waterproofed by filling interstices around wires with silicone rubber and further insulating with an envelope of stretched piece of EPR tape around each wire. Then, apply one-half lapped layer of electrical tape over all.

F. Motor connections made with #10 AWG and smaller wire shall be made up with set-screwed copper lugs with threaded-on insulating jacket. After make-up of each connector, install two (2) layers half-lapped, of high temperature tape over connector barrel and down one (1") inch over wires.

G. Taps, splices, and connections in #8 AWG and larger wires shall be made with copper alloy bolted pressure connectors. Each such connector shall be insulated by means of applying insulation putty over sharp edges so as to present a smooth bonding surface. Next, apply at least four (4) layers, half-lapped each layer of EPR tape. Then, make final wrapping of at least three (3) layers, half-lapped each layer of electrical tape.

H. Control wiring connections to stud type and screw type terminals shall be made with ring-tongue type crimp connectors. Label each terminal jacket with wire marking label at each connection.

I. Each wire connection shall be made up tightly so that resistance of connection is as low as equivalent length of associated conductor resistance.

J. Numbered marking labels shall be installed to identify circuit numbers from panelboards. Install labels on each wire in each panelboard, junction, pullbox and device connection.

K. Label each wiring run with write-on waterproof labels inside motor control center. Install write-on label ties around wire group at conduit entrance and write-on label the wire size, conduit size and service.

L. Install PVC sleeve type numbered marking on each control wire termination at each terminal strip and at each device. Do this in motor control center, terminal cabinets, safety switches, remote controllers, pilot operators, and instrumentation equipment. Number selected shall correspond to number on terminal strip.

M. All wiring inside equipment enclosures shall be neatly trained and laced with nylon tie-wraps.

3.02 INSTRUMENTATION WIRING

A. All 4-20mA analog pairs shall have shields grounded at the instrumentation panel and insulated on the field end unless otherwise required by instrument supplier. Single point grounding shall be maintained.

3.03 GROUND WIRING

A. Each item of equipment shall be adequately and thoroughly grounded. Comply with Article 250 of N.E.C., except where higher standards of grounding have been specified. In addition to requirements as specified under Section 26 04 50, install grounding for general wiring systems as follows.

B. Equipment grounding conductors (EGC) shall be installed in each run of power and control conduits. These wires shall be green colored in sizes #6 AWG and smaller and green banded in larger sizes. Ground wires shall be type XHHW-2 insulated copper wires.

C. EGC runs into equipment shall be grounded to equipment bus where available, or to equipment ground lugs.

D. Where grounding type bushings are installed, bond EGC thereto, and furthermore, ground each bushing lug to equipment ground bus or ground lug, or ground rod.

E. In each motor terminal box, install equipment ground lug and connect EGC thereto. Bond pump frame to motor frame. Bond motor and pump to grounded electrode conductor.

3.04 LABELING

A. In addition to labeling requirements as specified throughout this Section, install wiring and raceway labeling as follows:

1. Apply numbered wire marking labels to control wiring terminations for each termination in each item of equipment. Use PVC sleeve type labels.

2. Apply numbered wire marking labels to power and control wiring terminations in motor control centers, panelboards, and at outlets, to identify circuit numbers. Use PVC sleeve type labels.

3. Apply numbered wire marking labels to each signal wire termination in each instrument junction box, and in each item of equipment served by instrumentation circuits. Use PVC sleeve type labels.

4. Apply write-on identification labels to wiring sets in each motor control center, and in each pullbox and junction box. Show wire size, conduit size, and line and load information. Use waterproof plastic write-on labels with nylon tie-wraps.

3.05 TESTING

A. Each run of 600V class power and control wiring shall be tested prior to connection of line and load. Make tests with 1000V dc hand-crank or motor driven ohmmeter. Each run of wiring shall be tested phase-to-phase and/or phase-to-neutral, and phase-to-ground. Test results for each test shall be equal to or greater than 25,000,000 ohms with 1000V dc applied. All tests shall be made in the presence of the Owners representative or Engineer.

B. Test all runs of signal wiring with 250V dc megger. Insulation values shall meet or exceed 1,000,000 ohms per 100 feet (cable to shield).

C. Should any cable or circuit fail to meet the above tests, replace wire and retest.

END OF SECTION

SECTION 26 01 25
15 kV Wire and Cable
Page 1 of 2

PART 1 - GENERAL

1.01 SCOPE

A. This section shall include wire and cable, terminating devices, splice kits, labeling, and appurtenances for furnishing and installation of 15 kV cable.

1.02 STANDARDS

A. UL 1072 - Medium Voltage Power Cables

B. ICEA S-93-639 (NEMA WC74)

C. UL 1685 - UL CT Flame Exposure Test

1.03 SUBMITTALS AND SHOP DRAWINGS

A. Process catalog submittals for the following:
   1. Power Cable
   2. Conductor Connectors
   3. Tape Products
   4. Termination kits
   5. Surge Arresters

PART 2 - PRODUCTS

2.01 WIRE AND CABLE

A. All conductors shall be soft-drawn annealed copper, Class B stranding that meets ASTM B-8. Copper conductors shall be uncoated, except as otherwise specified.

B. Cable for 15 kV volt applications shall be 15kV, EPR insulation, copper tape shield, PVC jacket, type MV-105. Southwire #15ET series or equal by Priority Wire and Cable.

2.02 Connectors and Surge Arresters

A. Copper lugs for use on 15 kV conductors shall be two hole with NEMA spacing, rated through 35kV, closed end construction to exclude moisture migration into cable conductor. Lugs shall be crimped type with UL listed die sets according to manufacturer, UL486A. Furnish 3M Scotchlock Copper compression lugs or approved equal.

B. Provide elbow connectors for 15 kv connections in the pad mounted switchgear. Elbow connectors shall be 200 amp load break and shall be suitable for the bushing in the equipment. Provide Cooper Power Systems 200 Amp 15 kV class T-OP II Deadbreak Connectors with 200 amp load break interface for elbow surge arrester.

C. Provide surge arresters on each phase of the new main incoming line connections. Surge arresters shall be elbow type and suitable for use on a 15 kV system voltage. Surge Arresters shall be Cooper Power Systems Metal Oxide Varistor Elbow (M.O.V.E.) Surge Arresters.

2.03 Insulating Products

A. Terminators for 15 kV cables (where elbow connectors are not used) shall be 35 kV rated, IEEE48, Class I, Cold Rubber Shrink, Non-Skirted, one piece. Furnish 3M #5650 series or equal.

2.04 Miscellaneous Material

A. Wire pulling compound shall be non-injurious to insulation and to conduit and shall be lubricating, non- crumbling, and non-combustible. Furnish Gedney "Wire- Quick", Ideal "Yellow" or equal.

PART 3 - EXECUTION

3.01 Power and Control Cable Installation

A. Cable terminations shall be made by qualified electricians. All arrester shall be grounded and the semi-conductor outer covering of the elbow connectors shall be grounded.

3.02 TESTING

A. All 15 kV cables shall be hi-pot tested at 80% of factory test voltage after all terminations are made. Test voltage shall be approved by the cable manufacturer. Testing shall be performed by independent qualified testing company, Real Power Technologies or approved equal. Testing company services will be paid for by the City. Coordinate with testing company. Testing shall be performed in the presence of Owners Representative or Engineer. Notify 10 days prior to testing. Submit test results for record.

B. Should any cable or circuit fail to meet the above tests, replace wire and retest.

END OF SECTION

SECTION 26 01 95
Panelboards
Page 1 of 2

PART 1 GENERAL

1.01 SCOPE

A. This specification covers the requirements for 480 volt, 240 volt and 208 volt lighting panelboards.

B. This specification defines minimum requirements, characteristic guidelines and features required.

1.02 STANDARDS

A. All panelboards shall be designed, manufactured and tested in accordance with the latest applicable standards of UL and NEMA. Panelboards shall be UL listed.

1.03 SUBMITTALS

A. Submit outline and dimensional drawings and catalog literature to Engineer for review.

PART 2 PRODUCTS

2.01 GENERAL

A Ratings shall be as indicated on the drawings.

B Circuit Breakers shall be bolt on and rated 10,000 amps rms symmetrical interrupting capacity for 240 volts and less. 480 volt panelboards shall have a rating of 35,000 amps rms symmetrical.

C Panelboards shall have integrated SPD rated for 120 kA. Provide alarm contacts, event counter, and indicator lights.

2.02 CONSTRUCTION

A. All buses shall be tin-plated copper.

B. Enclosures shall be painted steel.

C. NEMA 12 for installation indoors.

2.03 MANUFACTURER

A. Panelboards rated for 240 volts and less shall be Square D type NQ or equal product by Eaton, General Electric or equal.

B. Panelboards rated for 480 volts shall be Square D type NF or equal product by Eaton, General Electric or equal.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install panelboards as scheduled and in locations shown on the drawings. Provide grounding as specified per 26 04 50 and per NEC.

END OF SECTION

SECTION 26 01 96
Dry Type Transformers
Page 1 of 2

PART 1 GENERAL

1.01 SCOPE

A. This specification covers the requirements for dry-type ventilated transformers with 480 volt primary and ratings from 10 to 75 kVA.

B. This specification defines minimum requirements, characteristic guidelines and features required.

1.02 REFERENCES

A. NFPA 70 - National Electric Code

B. NEMA ST20

C. UL 1561

D. NEMA TP-1

E. NEMA TP-2

1.03 SUBMITTALS

A. Submit outline and dimensional drawings and catalog literature to Engineer for review.

1.04 STANDARDS

A. Transformers shall be listed by Underwriters Laboratories.

B. Transformers shall conform to the requirements of ANSI/NFPA 70.

C. Transformers are to be manufactured and tested in accordance with NEMA ST20.

PART 2 PRODUCTS

2.01 GENERAL

A Ratings shall be as indicated on the drawings.

B All insulating materials are to exceed NEMA ST20 standards and be rated for 180 deg C UL-component-recognized insulation system.

2.02 CONSTRUCTION

A. Transformers shall be 150 deg C temperature rise above 40 deg C ambient. Transformer shall be capable of carrying a 15% overload without exceeding 115 deg C in a 40 deg C ambient. Transformers shall have a minimum of two 2.5% full capacity

primary taps. The top of the transformer enclosure shall not exceed 50 deg C rise above a 40 deg C ambient.

B. The maximum temperature of the top of the enclosure shall not exceed a 65 deg C rise above a 40 deg C ambient.

C. NEMA 1 for installation indoors. The transformer enclosure shall be ventilated and be fabricated of heavy gauge, sheet steel construction. The entire enclosure shall be finished using a continuous process consisting of degreasing, cleaning, and phosphatizing by electrostatic deposition of polymer polyester powder coating, with a baking cycle to provide uniform coating of all edges and surfaces. The coating color shall be ANSI 49.

D. All cores shall be constructed of high-grade, non-aging silicon steel with high magnetic permeability and low hysteresis and eddy current losses. Magnetic flux densities shall be kept well below the saturation point.

E. Terminations shall consist of were leads with a minimum insulation rating of 125 deg C.

F. The sound levels shall not exceed 45 dB level as defined by NEMA ST20.

2.03 MANUFACTURER

A. Transformers shall be as manufactured by Square D or equal by Eaton, or General Electric.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install transformers in locations shown on the drawings. Provide grounding as specified per 26 04 50 and per NEC.

END OF SECTION

SECTION 26 02 10
Electric Utility Service
Page 1 of 1

PART 1 - GENERAL

1.01 SCOPE

A. The facility is served by TNMP. The service voltage is 12,470/7200 volt three phase 3 wire, solidly grounded.

PART 2 - PRODUCTS

[Not used]

PART 3 - EXECUTION

3.01 GENERAL

A. There are no modifications to the existing service. All work is after main service disconnect.

END OF SECTION

SECTION 16220
Emergency Generator

PART 1 – GENERAL

1.01 SCOPE

A. Furnish emergency generator as specified herein. Work shall include all necessary materials, equipment, freight to jobsite, and startup services.

B. Auxiliary and accessory devices necessary for system operation or performance, such as relays or terminals to interface with other Sections of these Specifications, shall be included.

C. Generator shall be 12,470Y/7200 volt three phase solidly grounded.

D. The generator and the paralleling switchgear shall be coordinated and supplied by the same supplier to achieve single point responsibility for the emergency power system.

1.02. RELATED SECTIONS

A. Section 26 02 30 Paralleling Switchgear

1.03 DESCRIPTION OF SYSTEM

A. Provide standby diesel fueled power systems to supply electrical power in event of failure of normal supply, consisting of a liquid cooled engine, an AC alternator and system controls with all necessary accessories for a complete operating system, including but not limited to the items as specified hereinafter.

1.04 REQUIREMENTS OF REGULATORY AGENCIES

A An electric generating system, consisting of a prime mover, generator, governor, coupling and all controls, must have been tested, as a complete unit, on a representative engineering prototype model of the equipment to be sold.

B. The generator set must conform to applicable National Electrical Code and applicable inspection authorities and the latest applicable Tier ratings.

C. The generator set must be available with the Underwriters Laboratories listing as a stationary engine generator assembly.

1.05 SUBMITTAL AND SHOP DRAWINGS

A. Process catalog data submittals for the following in accordance with the requirements set forth in the Standard General Conditions:

1. Engine
2. Generator
3. Control panel

4. Battery charger
5. Jacket water heater
6. Fuel tank
7. Enclosure
8. Breakers
9. Accessories

B. Process shop drawings for the generator skid showing sub base fuel tank, enclosure, service platform, and location of accessories.

C. Provide a motor starting sizing report and transient analysis with the specified load showing voltage and frequency dip and running kW.

PART 2 PRODUCTS

2.01 MANUFACTURERS QUALIFICATIONS

A. This system shall be Cummins Power Generation model 1500 DQGAB with configuration and options specified herein or equal product by Caterpillar Holt, Kohler represented by Lofton Equipment Company, or Stewart & Stephenson. Supplier shall have been regularly engaged in the production of engine-alternator sets, and associated controls for a minimum of ten years, thereby identifying one source of supply and responsibility. The supplier must be the parts and service supplier and warranty administrator of all equipment on the unit including the engine. The drawings and specifications are based on the first listed manufacturer. Allow in bid and pay for any changes due to the use of other than the first listed manufacturer.

B. To be classified as a manufacturer, the builder of the generator set must manufacture, at minimum the engine.

C. The manufacturer shall have printed literature and brochures describing the standard series specified. It shall not be a one of a kind fabricated machine.

2.02 ENGINE

A. The prime mover shall be a liquid cooled, diesel fueled, turbo charged engine of 4-cycle design. The engine shall be sized to provide a nominal generator output capacity of 1500 kW.

B. The engine is to be cooled with a unit mounted radiator, fan, water pump, and closed coolant recovery system providing visual diagnostic means to determine if the system is operating with a normal engine coolant level. The radiator shall be designed for operation in 122 degrees Fahrenheit, 50 degrees Celsius ambient temperature.

C. The intake air filter(s) with replaceable element must be mounted on the unit. Full pressure lubrication shall be supplied by a positive displacement lube oil pump. The

engine shall have a replaceable oil filter with internal bypass and replaceable elements. Engine coolant and oil drain extensions must be provided to outside of the mounting base for cleaner and more convenient engine servicing. A fan guard must be installed for personnel safety.

D. Remote 2-wire starting shall be by a solenoid shift, electric starter.

E. Engine speed shall be governed by electronic governor to maintain alternator frequency within 1% from no load to full load alternator output. Steady state regulation is to be 0.25%.

F. The engine fuel system shall be designed for operation on No. 2 diesel fuel. A secondary fuel filter, water separator, manual fuel priming pump, fuel shutoff solenoid and all fuel lines must be installed at the point of manufacture.

G. Sensing elements to be located on the engine for low oil pressure shutdown, high coolant temperature shutdown, low coolant level shutdown, over-speed shutdown and over-crank shutdown. These sensors are to be connected to the control panel using a wiring harness with the following features:

1. Wire number labeling on each end of the wire run for easy identification, a molded rubber boot to cover the electrical connection on each sensor to prevent corrosion and all wiring to be run in flexible conduit for protection from the environment and any moving objects.

H. The manufacturer shall supply its recommended stainless steel, flexible connector to couple the engine exhaust manifold to the exhaust system.

I. The engine shall have a unit mounted, thermostatically controlled water jacket heater to aid in quick starting. It will be of adequate wattage as recommended by the engine manufacturer. The jacket heater voltage shall be 480 volts single phase.

2.03 ALTERNATOR

A. The alternator shall be a 4-pole revolving field type, wired for 12,470/7,200 VAC, three phase, three wire, 60 Hz rated. Unit shall be brushless 4 pole with 2/3 pitch windings.

B. The generator shall meet temperature rise standards for Class "F" insulation. All leads must be extended into an AC connection panel.

C. One step load acceptance shall be 100% of engine-generator set nameplate rating and meet the requirements of NFPA 110 for Level 1 systems. The generator set and regulator must sustain at least 90% of rated voltage for 10 seconds with 300% of rated load at near zero power factor connected to its terminals when equipped with direct or brushless excitation.

D. A solid state voltage regulator designed and built by the engine-generator set manufacturer must be used to control output voltage by varying the exciter magnetic field to provide + or - 0.5% regulation during stable load conditions. Should an extremely heavy load drop the output frequency, the regulator shall have a voltage droop of 4 Volts/Hertz to maximize motor starting capability. The frequency at which this droop operation begins must be adjustable, allowing the generator set to be properly matched to the load characteristics insuring optimum system performance.

E. The voltage regulator must contain a limiting circuit to prevent output voltage surges in excess of 125% of rated voltage during generator set operation. On loss or near loss of the voltage sensing signal, the voltage regulator must be capable of shutting down to prevent an overvoltage condition from occurring. It must have a second mode of operation allowing 300% of rated current to flow through the electrical distribution circuit(s) for ten (10) seconds under the same conditions. Voltage regulators not capable of selecting either mode of operation are not acceptable. LED indication will be provided on the regulator to monitor the sensing (yellow), excitation (green), and output circuit (red).

F. A terminal box that is an integral part of the generator set shall be provided to allow the installer a convenient location in which to make electrical output connections. An isolated neutral lug must be included by the generator set manufacturer to insure proper sizing.

G. Alternator shall be Stamford AvK model HV804R WDG 87 or approved equal.

2.04 WEATHER ENCLOSURE & FUEL TANK

A. Weather protective sound attenuating enclosure:

1. The engine-generator set shall be factory enclosed in a steel enclosure constructed with corner posts, uprights and headers. The roof shall aid in the runoff of water and include a drip edge. The enclosure shall be coated with electrostatically applied powder paint, baked and finished to the manufacturers specifications. Color shall be Precision Tan or equal. Submit paint chip with submittals.

2. The enclosure shall have intake and exhaust sound baffles. This material must be of a self-extinguishing design. The rating of the completed assembly shall be 85 dba at 23 feet.

3. The enclosure is to have doors to allow access to the engine, alternator and control panel. Each door will have lockable hardware with identical keys. Padlocks do not meet this specification. The exhaust system shall be mounted within the enclosure to further reduce the unit sound level and provide a clean, smooth exterior design.

4. The enclosure shall have interior LED lights run off of the dc battery system. Lights shall have timer to turn off lights when not in use.

B. Enclosure shall have rodent barriers.

C. Enclosure shall ship assembled on fuel tank.

1. The fuel system shall include a double walled (with tank rupture alarm), UL 142 approved, stub up, base mounted fuel tank. The fuel tank shall be sized for 24 hour operation of the standby generator at 100% load. It shall have the structural integrity to support the engine-generator set. The fuel tank shall be in accordance with NFPA 37, NFPA 110 and Uniform Fire Code. Minimum features shall include all welded construction, a lockable fuel filler cap, fuel gauge, low fuel level alarm, fuel line check valve and fittings for fuel supply, return, fill and vent. Fuel tank shall have a leak sensor wired to generator controls and alarm. In addition fuel tank shall have low fuel level at 50%, internal spill containment, mechanical level fuel gauge, and mechanical fill limiter. This tank must be supplied by the engine-generator set manufacturer and be installed before shipment.

2. The manufacturer will supply its recommended flexible fuel line to connect the engine to the external fuel source. The fuel line shall match the fuel fitting on the unit base rail and have braided stainless steel covering with brass fittings.

2.05 CONTROLS

A. All engine alternator controls and instrumentation shall be designed, built, wired, tested and shock mounted in a NEMA 4 enclosure to the engine-generator set by the manufacturer. It shall contain panel lighting, a fused DC circuit to protect the controls and a +/-5% voltage adjusting control.

B. The engine-generator set shall contain a complete 2 wire automatic engine start-stop control which starts the engine on closing contacts and stops the engine on opening contacts. A cyclic cranking limiter shall be provided to open the starting circuit after eight attempts if the engine has not started within that time. Engine control modules must be solid state plug-in type for high reliability and easy service.

C. The panel shall include: analog meters to monitor AC voltage, AC current and AC frequency an emergency stop switch, an audible alarm, battery charger fuse, and an engine control and monitoring module.

D. The programmable-module shall include: a Off/manual/auto and run/stop switches with LEDs to indicate mode operation.

E. The module shall have a graphical data display that allows operator to view all engine and alternator data, perform operator adjustment for speed, voltage and time delays, view fault history, and setup and adjust the generator set. Display shall be controlled by sealed membrane switches. Display shall have up to 9 lines of data with 26 characters per line.

2.06 ACCESSORIES

A. The generator set(s) must be manufactured to the applicable specifications on file with Underwriters Laboratories and the UL 2200 mark must be affixed.

B. Provide an automatic, dual rate battery charger manufactured by the engine-generator set supplier. The automatic equalizer system shall monitor and limit the charge current. The output voltage is to be determined by the charge current rate. The charger must have a maximum open circuit voltage of 35 volts and be protected against a reverse polarity connection. The battery charger is to be factory installed on the generator set.

C. A heavy duty, lead acid battery shall be provided by the generator set manufacturer of adequate voltage and amperage capacity to start and operate the engine. Provide all connecting battery cables as required.

D. Exhaust silencer(s) shall be provided of the size as recommended by the manufacturer and shall be of grade necessary to meet the sound limit specifications of the sound attenuated enclosure. All components must be properly sized to assure operation without excessive back-pressure when installed. Exhaust silencer shall be located inside weatherproof enclosure.

E. Provide a 480-volt engine jacket water heater and thermostatic control.

F. Provide a neutral grounding pad for grounding the neutral at the neutral grounding resistor.

G. Provide a neutral grounding resistor rated 400 amps for 10 seconds at 760C temp rise. Provide a current transformer with junction box. The neutral grounding resistor shall be provided with an outdoor safety enclosure. The enclosure shall have a solid top, screened bottom, side covers, and top mounted eye-bolts for handling. The enclosure finish shall be mill galvanized. The enclosure shall have 4 inch legs. The resistor will consist of stainless steel stamped grid elements for higher currents or edge wound resistors for lower currents, double insulated. The resistor terminals must be stainless steel. All resistor end frames, hardware, and non-current carrying spacers must be zinc plated steel at a minimum. If more than one resistor frame is required, series connections must be tin-plated copper bus for grid resistors and Teflon coated wire for edge wound resistors. The resistor bank shall be mounted on porcelain standoff insulators with a rating equal to or greater than the line to neutral voltage. Neutral grounding resistors shall be delivered to the jobsite completely assembled and ready for installation. Provide a 120 volt condensation heater. The neutral grounding resistor shall be designed and factory-tested to IEEE Standard 32 and shall be UL listed. The neutral grounding resistor will be mounted on a concrete pad adjacent to the generator. Neutral grounding resistor shall be Post Glover or approved equal.

H. An OSHA approved service platform shall be provided on each side of the generator enclosure.

1. Platform shall be designed so that all doors can open approximately 180 degrees and platform shall extend past each service door.
2. Construction shall consist of A-36 structural frame members, stairs on one end and hand rails. Walk area shall have surface grating, with safety threads and shall consist of 1" by 1/8" type 19-W-4 hot dipped galvanized steel, which shall be fastened to the frame with galvanized steel clips and plated bolts.
3. Platform and grating shall be hot-dipped galvanized after fabrication.
4. Platforms shall ship completely assembled with lifting provisions.

PART 3 EXECUTION

3.01 FACTORY TESTING

A. Before shipment of the equipment, the engine-generator set shall be tested under rated load for performance and proper functioning of control and interfacing circuits. Tests shall include:

1. Verifying all safety shutdowns are functioning properly.
2. Single step load pick-up per NFPA 110 for Level 1 systems.
3. Transient and voltage dip responses and steady state voltage and speed (frequency) checks.
4. Test completed unit under full load for 4 hours before shipment.

3.02 OWNER'S MANUALS

A. Three (3) sets of OWNER’S manuals specific to the product supplied must accompany delivery of the equipment. The Owner's Manual shall be project specific. General operating instruction, preventive maintenance, wiring diagrams, schematics and parts exploded views specific to this model must be included. Furnish one electronic in pdf format.

3.03 TRAINING AND TESTING

A. Allow in bid for a factory-authorized service representative to train OWNER'S maintenance personnel to adjust, operate, and maintain packaged engine generators.

B. Allow in bid for a factory-authorized service representative to train OWNER'S maintenance personnel on procedures and schedules for starting and stopping, troubleshooting, servicing, and maintaining equipment.

3.04 INSTALLATION

A. Install generator in location shown on the drawings in accordance with the manufacturer's recommendations as reviewed by Engineer.

3.05 SERVICE

A. Supplier of the electric plant and associated items shall have permanent service facilities in this trade area. These facilities shall comprise a permanent force of factory trained service personnel on 24 hour call, experienced in servicing this type of equipment, providing warranty and routine maintenance service to afford the OWNER maximum protection. Delegation of this service responsibility for any of the equipment listed herein will not be considered fulfillment of these specifications. Service contracts shall also be available.

3.06 WARRANTY

A. The standby electric generating system components, complete engine-generator and instrumentation panel shall be warranted by the manufacturer against defective materials and factory workmanship for a period of 24 months. Such defective parts shall be repaired or replaced at the manufacturer's option, free of charge for travel and labor. The warranty period shall commence when the standby power system is first placed into service. Multiple warranties for individual components (engine, alternator, controls, etc.) will not be acceptable. Satisfactory warranty documents must be provided. Also, in the judgment of the specifying authority, the manufacturer supplying the warranty for the complete system must have the necessary financial strength and technical expertise with all components supplied to provide adequate warranty support.

3.07 STARTUP AND CHECKOUT

A. The supplier of the electric generating plant and associated items covered herein shall provide factory trained technicians to checkout the completed installation and to perform an initial startup inspection to include:

1. Ensuring the engine starts (both hot and cold) within the specified time.
2. Verification that all engine, alternator and control parameters are within the specifications.
3. Set no load frequency and voltage.
4. Test all automatic shutdowns of the engine-generator.

B. Perform a load test of the electric plant, ensuring full load frequency and voltage are within specification. Furnish load bank, test at ½ load for 1 hour and full load for two hours.

C. Fuel for testing will be furnished by others.

3.08 TRAINING SESSION

A. Provide a 2 hour training session for Owner's personnel. Training session shall include:

1. Safety

a. General safety precautions
b. Equipment safety code
c. Electric shock and arc flash

2. Equipment Operation

a. Engine/generator operation process
b. Fundamental operating principals of the engine/generator
c. Identify all components of equipment - mechanical, electrical, and electronic
d. Standard operating proceedures - start-up, monitoring, and shut-down.

3. Component Description

a. External components
b. Controls/Instruments
c. Settings
d. Identify each component's function - Engine/generator and Automatic Transfer Switch and their relationship to one another.

4. Operating Instructions

a. Auto/Manual modes
b. How to change settings
c. Settings
d. Description of operation in transition phases

5. Preventative Maintenance

a. Inspection procedures with equipment in operation
b. Potential trouble symptoms
c. Planned maintenance requirements and intervals
d. Procedures for testing equipment after maintenance has been preformed

6. Planned Maintenance Requirements

a. Procedures for testing equipment after maintenance has been performed.

7. Service Events

a. Alarms/Display Messages
b. Procedures including E-Stop reset
c. Symptom list

8. Troubleshooting

a. Probable cause and recommendation

9. Demonstration

a. The instructor will demonstrate the automatic transfer switchgear and generator by simulating a power outage. This will allow the engine to start and pick up the emergency load. The demonstration shall be scheduled with the Owner so as to not interrupt processes.

END OF SECTION

SECTION 26 02 30
Paralleling Switchgear
Page 1 of 18

PART 1 GENERAL

1.01 SCOPE

A. This specification section describes all labor, materials, equipment and services necessary for and incidental to furnishing the switchgear and auxiliary control panel required for the system specified herein and shown on the drawings.

B. The scope of work shall also include factory testing, comprehensive system start-up and site testing.

C. Wherever the terms “plans” or “drawings” are used in these specifications, they shall refer to the Bid Documents for this project. These drawings, together with this specification and other related documents, make up the Contract Documents. The equipment proposed under these specifications shall be compatible with the space provisions and wiring configurations shown on these drawings.

1.02 APPLICABLE CODES AND STANDARDS

A. The design, equipment, installation, and testing shall be in strict accordance with the applicable requirements set forth in ANSI, UL, IEEE and NEMA.

B. The metal-clad switchgear and all components shall be designed, manufactured and tested in accordance with the latest applicable standards of NEMA SG-4 and SG-5, and but not limited to, ANSI/IEEE 37.20.2.

C. Due to the critical nature of this facility and to provide for maximum reliability and responsibility, the entire Critical Power Switchgear System, including all controls, breakers, buswork and components, shall be completely manufactured and assembled by a single manufacturer and shall be UL listed and labeled under manufacturer’s name at the time of the bid opening.

D. All equipment and material supplied shall be in accordance with the latest edition and amendments of all applicable standards, codes, laws and regulations listed below:

1) ANSI/IEEE C12 – Code for Electric Metering
2) ANSI/IEEE C39.1 - Requirements for Electrical Analog Indicating.
3) ANSI C57.13 - Requirements for Instrument Transformers.
4) FS W-F-370 – Fuseholders (For Plug and Enclosed Cartridge Fuses).
5) NEMA AB 1 - Molded Case Circuit Breakers.
6) NEMA KS 1 - Enclosed Switches.
7) NEMA ICS 1 - General Standards for Industrial Control and Systems.
8) NEMA PB 2 - Dead Front Distribution Switchboards.
9) NFPA 70 - National Electric Code.
10) NFPA 110 - Emergency and Standby Systems.
11) Underwriters’ Laboratories, Inc. (UL1558)
12) Federal, State, and local codes

1.03 SWITCHGEAR MANUFACTURER QUALIFICATIONS

A. It is the intent of the owner to receive bids only from manufacturers who are adequately qualified to provide a highly reliable, fully integrated, state-of-the-art Critical Power Switchgear System that can be successfully supported over the lifetime of the system. Qualified bidders shall meet the following requirements and provide the necessary support documentation indicated. Failure to provide this support documentation will be considered a non-responsive bid and will result in bid disqualification.

B. The manufacturer shall be a well-established company regularly engaged in the application, engineering, manufacturing, integration and testing of critical electrical power control switchgear systems. The manufacturer shall have at least ten years experience in the design and manufacture of generator control power systems and automatic transfer switch gear.

C. Switchgear and Control Manufacturer shall be of adequate size and have necessary capital resources to demonstrate that it can fully support a project of this magnitude for the expected life of the equipment. The manufacturer must have a capitol net worth of at least 5 times the value of the proposed equipment. It is expected that this equipment will be supported over a 15 year period. Bidder upon request shall provide a complete copy of its most recent annual financial statement, prepared by an independent accounting firm, showing the net worth of the bidder as of that date.

D. The Manufacturer must have adequate factory employed, field service personnel on staff for installation support and start-up and to provide field support for the life of the system. Factory field service shall be readily available twenty-four hours a day, 365 days a year. The manufacturer may not subcontract field service personnel. A 24 hour, toll free “Hot-Line”, with a guaranteed call back response within 1 hour, from a qualified factory technician must be in place at the time of bid offering with a proven history of response.

E. As protection to the owner, any manufacturer wishing to limit themselves to a maximum number and type of field service visits for the start up of this equipment, must state so in their bid. Provide published field service rates, including overtime and holiday rates for additional visits. This information shall be provided for bid evaluation.

F. Subject to compliance with requirements specified herein, provide products by one of the following:

1) Cummins Power Generation, Inc.
2) Caterpillar Holt
3) Kohler Lofton Equipment, Inc.
4) Russelectric, Inc.

1.04 SUBMITTALS

A. Switchgear Manufacturer shall furnish a submittal with adequate information to fully define the system.

B. Information that shall be submitted by the Switchgear Manufacturer as itemized below:

1) A one-line diagram clearly indicating the functional relationship between equipment.

2) Outline drawings showing plan and elevation views of each piece of equipment, and containing the following information for each item:

   a) Size.
   b) Weight.
   c) Dimensions and weight of the equipment shipping splits.

3) Typical conduit entry areas
4) Equipment door detail drawings showing all meter and control device locations with nameplate legends.
5) Base plans for the location of the equipment floor channels, anchor bolts and conduit entrance spaces.
6) Time/current characteristic curves for all circuit breakers and protective devices.
7) Short-circuit rating of bus, and interrupting and withstand ratings of breakers.
8) Detailed bill of material indicating items to be released first, due to long lead time.
9) Detailed cubicle front view drawings with indication of each major component's device identification, description and manufacturer.
10) Detailed cubicle front view drawings with all required nameplate information.
11) Proposed protective relay diagrams also showing all major metering.
12) Proposed sequence of operation for entire system.
13) Make and manufacturer of all major components of the switchgear and control lineups.
14) Outline of service organization and ability to respond to emergencies.
15) Manufacturer's warranty statement.

B. Electronic pdf copy of the reviewed submittal and stamped by the consulting engineer will be returned to the Switchgear Manufacturer for production release.

1.05 OPERATING AND MAINTENANCE MANUALS

A. After final acceptance of the equipment or within 45 days after the conclusion of the equipment start-up, whichever occurs first, the Switchgear Manufacturer shall submit to the Owner complete, three bound copies of the installation, operation and maintenance instructions for each item of equipment to be furnished. All final instructions shall be certified by the Switchgear Manufacturer as applicable to the equipment furnished and shall be specifically identified, such as by serial number, etc.

B. Installation, maintenance and operating instruction manuals shall include, but not be limited to, the following items:

1) Detailed operating and maintenance instructions.
2) All approved "As-Built" shop drawing information shall be updated to "As-Installed" and include all field modifications.
3) Assembly splice-plate details for interconnection of shipping sections.
4) Wiring diagrams for each breaker, switch, etc., with all terminal markings and connections for other circuits.
5) Internal connection diagrams of relays, instruments and control switches.
6) Complete parts list with all principal parts identified as to manufacturer and type or model number.
7) Recommended spare parts list (with pricing) for one-year operation.
8) Hard copy of the equipment PLC program (bound separately).
9) Complete system interconnect diagrams.

C. Maintenance: The manufacturer shall provide an optional, comprehensive preventive maintenance program.

D. Prior to training owner personnel, a set of complete O & M manuals shall be delivered to the Owner.

E. O & M manuals shall contain 100% accurate system "As-Installed" drawings, interconnect diagrams, schematic diagrams, wiring diagrams, individual sub-system component manuals, operation procedures, system description with theory of operation, maintenance schedules and procedures, original programmed settings and parameters, and all other information necessary for the Owner to maintain, operate, test, and troubleshoot the system. O&M Manuals shall be project specific.

F. O & M manuals shall not solely rely on sub-component manuals. A thorough consolidation of operation and maintenance information shall be available in a system overview guide. All major components of the system such as breakers, synchronizers, generator cubicle control, genset controls, PLC, Operator Interface Panel, and Master Cubicle shall be included in this overview.

1.06 WARRANTY

A. The Manufacturer shall provide a complete two year warranty. Any failure to comply with the contract documents or any defects that appear within the two year period shall be corrected at no cost to the owner.

PART 2 PRODUCTS

2.01 SYSTEM OVERVIEW

A. The switchgear shall be arranged for fully automatic or manual operation at the discretion of the operator. Each Section shall be complete and include the necessary AC instrumentation, relaying, voltage regulator equipment, generator control equipment, engine governor controls, pilot lights, selector switches, etc., and accessories, as shown on the contract drawings and as specified hereinafter.

B. All control voltage for auxiliary relays, circuit breakers, synchronizing and other automatic equipment shall be obtained from the emergency generators and the engine starting batteries and the station battery system specified herein.

2.02 POWER SYSTEM COMPONENTS

A. Genset (G1)

B. Genset Breaker (52G1)

C. Generator Bus: This is the bus on which the generator start and parallel onto.

D. Load Bus: This is the bus that is normally fed by the utility source (U1) through the utility main breaker (52N1) and has connection for 15 kV loop distribution system.

H. Generator Control Module (GCM). This is the generator control system which monitors and performs all the control functions of each generator.

I. Digital Master Control Module (DMC). This is the auxiliary control panel which houses the Programmable Logic Controller (PLC) and the Operator or Human Machine Interface (HMI).

2.03 SYSTEM MODES

A. Normal Standby Conditions:

1. Generator Breakers are open and the Generators are not running.
2. 52G1 Breaker is open.
3. Utility Source UM is available and its respective utility main breaker 52N1 is closed powering the Load Bus.
4. Load bus is powering the plant 15 kV loop distribution.
5. The system is in Automatic Mode.

B. Closed Transition Failure Operation.

1. Loss of Normal Power - Failure of Utility Source UM

a. The PLC in the DMC receives a utility fail signal (start signal) from the SEL 351 protective relay in the paralleling gear which monitors the utility source UM on the utility main breaker 52N1.The PLC then issues a start signal to the Generator.
b. All loads assigned to shed level 0 immediately open.
c. The generator starts automatically and independently accelerate to rated voltage and frequency.
d. When the generator is at rated voltage and frequency and the Transfer Time Delay has expired, 52N1 opens. The Transfer Time Delay timer can be set or changed on the Time Delay Settings section in the System Control Screen on the HMI.
g. After 52N1 opens, the Program Transition Time Delay starts timing.
h. If the Utility Source UM returns before the Program Transition Time Delay Expires the load is returned to the utility source and the generator is stopped.
i. When the Program Transition Time Delay expires:
j. 52G1 closes and the entire plant is fed by the generator source.
k. The plant operators will bring the plant back up sequentially.
m. The Load Demand feature will operate if it is enabled.

2. Return of Normal Power - Return of Utility Source UM (Soft Close Transition)

a. The protective relay SEL 751 monitoring the Utility Source U1 on the utility main breaker 52N1 removes the start signal from the PLC in the DMC.
b. The Retransfer Time Delay starts timing. The Retransfer Time Delay timer can be set/changed on the Time Delay Settings section in the System Control Screen on the HMI.
c. If the utility source fails during the retransfer time delay, the timer resets and starts again when the utility returns.
d. Once the Retransfer Time Delay expires, the master synchronizer between the generator bus and the utility source is enabled to sync the generators to the utility source.
e. When the sync conditions in the utility monitoring protective relay, on 52N1 are met, that breaker closes and the generator ramps down load.
f. When the power across 52G1 approaches zero, 52G1 opens.
g. The generator circuit breaker opens and the generators run in cool down mode and then shutdown.
h. The system returns to normal standby conditions.

3. Close Transition Test Modes

    a. Test with Load On - Load Bus

        1. The operator initiates this sequence by selecting the Test with Load checkbox on the System Control Screen or via dry contact inputs located on the customer's interconnect terminal block. The On checkbox in the Remote Enable section on the System Control screen must be selected for the dry contacts to be active.
        2. When the System receives a "Test With Load" (Test Load Bus) signal, the generators start automatically, independently and accelerate to rated voltage and frequency.
        3. The system monitors the process and then closes the unit to the Generator Bus.
        4. When the generator is online, the master synchronizer between the Generator Bus and the utility source is enabled.
        6. When the sync conditions in the protective relay on 52G1 are met, that breaker closes, and the generator ramps up load.
        7. When power across 52N1 approaches zero, 52N1 opens.
        8. At this time the entire plant is fed by the generator source.

    b. Test with Load Off - Load Bus

        1. When the "Test With Load" signal is removed, the master synchronizer between the generator bus and the utility source is enabled to sync the generator to the utility.
        2. When the sync conditions in the utility monitoring protective relay on 52N1 are met, that breaker closes and the generator ramps down load.
        3. When the power across 52G1 approaches zero, 52G1 opens.
        4. The generator breaker open the generator runs in cool down mode and then shutdown.
        5. The system returns to a Standby mode of operation.

    c. Test Without Load On

        1. The operator initiates this sequence by selecting the Test without Load checkbox on the System Control screen.
        2. When the System receives a "Test Without Load" signal, the generators start automatically, independently and accelerate to rated voltage and frequency.
        3. 52G1 does not close in this mode of operation.

    d. Test Without Load Off

        1. When the "Test Without Load" signal is removed, the generator run in cool down mode and then shutdown.
        2. The system returns to a Standby mode of operation.

4. Open Transition Failure Operations

    a. Loss of Normal Power - Failure of Utility Source UM

        1. All loads not assigned to load shed level 0 immediately open.
        2. The Generator starts automatically and independently and accelerate to rated voltage and frequency.
        3. After the first unit closes to the bus, control of the remaining units switches to the synchronizer in each GCM. The GCM causes the generator to synchronize with the Generator Bus, and the close to it at the proper time.
        5. When the generators is online, and the Transfer Time Delay has expired, 52N1 opens.

6. After 52N1 opens, the Program Transition Time Delay starts timing.
7. When the Program Transition Time Delay expires, 52G1 closes and the entire plant is fed by the generator source.
8. The load shed loads close to the bus as described in X.1 Normal Load Control.
9. The Load Demand feature will operate if it is enabled.

b. Return of Normal Power - Return of Utility Source U1 (Open Transition)

1. The protective relay monitoring the utility source U1 on the utility main breaker 52N1 removes the start signal from the PLC in the DMC. The PLC then removes the start signal from the Generators.
2. The Retransfer Time Delay starts timing.
3. If the utility source fails during the retransfer time delay, the time resets and starts again when the utility returns.
4. When the retransfer time delay expires, 52G1 and all loads on the load bus not assigned to load shed level 0 open as the program transition timer starts.
5. When the program transition time expires, 52N1 closes and the open loads on the load bus cycle closed on a timed basis, based on the load add level to which they are assigned.
6. The generator breakers open, generators run in cool down mode and then shutdown.
7. The system returns to a Standby Mode of Operation.

5. Open Transition Test Modes

a. Test with Load On - Load Bus

1. The operator initiates this sequence by selecting the Test with Load checkbox on the System Control screen or via dry contact inputs located on the customer's interconnect terminal block. The On checkbox in the Remote Enable section on the System Control screen must be selected for the dry contacts to be active.
2. When the System receives a "Test With Load" (Test Load Bus) signal, the Generators start automatically, independently and accelerate to rated voltage and frequency.
3. When the generator is online, 52N1 and all loads on the load bus not assigned to the load shed level 0 open.
6. When the program transition time expires, 52G1 closes.
7. The Load Demand feature will operate if it is enabled.

b. Test with Load Off - Load Bus

1. When the "Test With Load" signal is removed, 52G1 and all loads on the load bus not assigned to load shed level 0 open as the program transition time starts.
2. When the program transition timer expires, 52N1 closes and the open loads on the load bus cycle closed on a timed basis, based on the load add level to which they are assigned.
3. The generator breakers open, and generators run in cool down mode and then shutdown.
4. The system returns to a Standby mode of operation.

2.04 SYSTEM FEATURES

A. Normal Load Control. The WWTP is currently not automated in regard to the Plant 2 Blowers listed in the load shed sequence below. After a power failure, the blowers must be restarted manually by an operator. The load shed feature described below shall be for future use when the blowers will be upgraded to VFDs and automatically started.

1. Load Add Sequence

    a. The Load Add feature allows the system to have each load assigned to a Load Add Level in the range from 1-8. The amount of load assigned to each load level should be less than the capacity of the generator. More than one load can be assigned to a load add level.
    b. When the Generator connects to the Load Bus, the 52G1 breaker closes and all load assigned to the load add level 1 will be commanded to add.
    c. When the Generator is online, the 52G1 Breaker closes and all loads assigned to the load add levels up to the rating of the generator. Additional load add levels will continue until all Generators have been added to the Load Bus.
    d. If there are more load add levels than Generator rating in the system, the DMC will continue to add load levels on a time delay basis until all load add levels in use in the system are added.
    e. DMC will only add load levels equal to the rating of the generator. Any further load add levels will need to be added using the manual commands from the Load Control screen.
    f. If during the manual adding of load levels, and overload condition occurs, the system will start the Load Shed sequence.

B. Load Shed Sequence

1. The Load Shed feature allows the system to have each load in the system assigned to a load shed level in the range 0 - 7. Load Shed level assignment can be automatically done by the DMC based upon the load add level assignments, or can be user defined. Load Shed level 0 will never shed and should be used for critical loads. Load Shed level 1 is the first load to shed when an overload condition has been detected.
2. The load shed feature is activated when the generator detects an overload condition.
3. An overload condition occurs when a GCM of the generator senses a frequency at or below 57 Hz for three seconds or at 105% of load for 60 seconds.
4. Upon receiving an overload condition from the Generator, the DMC starts an overload timer.
5. When this timer expires, all loads assigned to Load Shed level 1 open.
6. If the system is still in an overload condition, the DMC waits a time delay (2 seconds) and all loads assigned to the Load Shed level 2 open.
7. This sequence continues until the overload condition clears.
8. Once the overload condition is reset, Load Levels may be restored manually using the Restore pushbuttons on the Load Control Screen.
9. If during the manual restore of load levels, an overload condition occurs, the system will again start the Load Shed sequence.
10. Load Shed Levels:

    0 - Miscellaneous Plant Load - 300 kW
    1 - Plant 2 Blower No. 1 - 150 hp
    2 - Plant 2 Blower No. 2 - 150 hp
    3 - Plant 2 Blower No. 3 - 150 hp
    4 - Plant 2 Blower No. 4 - 150 hp
    5 - Plant 2 Blower No. 5 - 150 hp
    6 - Plant 2 Blower No. 6 - 150 hp
    7 - Spare

C. Load Demand

The Load Demand feature allows the Generator to operate closer to its rated capacities, decreasing fuel consumption and reducing wear on the system.

D. Load Demand Sequence

There are two time delays associated with the Load Demand feature.

- The Initial time delay is the time delay the DMC waits for the system loads to stabilize before monitoring the load to see if generators can be shutdown.
- The Shutdown time delay is the time delay the DMC waits before issuing a Load Demand Stop to a Generator while the load conditions are such that the next Generator in the Load Demand sequence should be shutdown.

There are two load set points associated with the Load Demand feature.

- The kW Dropout Percent is the value that determines when the generator in the load demand sequence is shutdown. Capacity is the kW rating of the Generator. The percent is the Load Bus kW divided by the above calculated capacity.

1. Load demand must be enabled from the System Control Screen.
2. Once the Load Demand feature is enabled, the initial time delay will begin timing.
3. When the initial time delay has expired, the DMC will begin calculating the kW values for which the Generator should be shutdown.
4. If the load conditions exist such that the Generator should be shutdown, the shutdown time delay relay will begin timing.
5. When the shtudown time delay expires, the Generator will shutdown.
6. The difference between the pickup and dropout values should not be less than twenty percent (20%).
9. The operator has to ensure that the dropout settings selected does not lead to unnecessary load shedding. Note that if there is overload during load demand, all Generators in load demand shutdown restarts immediately.

G. Grid Tie Protective Relay

1. A Grid Tie protective relay will be installed on the utility source. The Grid Tie protective relay will be active during closed transition and paralleling modes.
2. The Grid Tie protective relay will pickup with voltage and frequency is outside of limits agreed to by the utility. In addition, reverse power and directional ground overcurrent functions will be programmed into the protective settings.
3. The Grid Tie relay will open the Generator breaker 52G1 in the event the Grid Tie protective relay picks up.

I. Generator Manual Operation

1. Manual Operation from the HMI

   a. The operator initiates this sequence by selecting manual mode from the Generator Control Screen of the HMI.
   b. This mode allows the operator to start/stop each Generator and open/close each Generator Breaker from the HMI.
   c. The operator discontinues the sequence by selecting the Auto Mode from the Generator Control Screen of the HMI, or the sequence can be also discontinued by opening each Generator Breaker and stopping each Generator manually from the same screen. The operator then has to uncheck the manual check box.

J. Manual Operation from the GCM.

This mode can be used if the PLC fails and it becomes necessary to start the Generator and connect to the Load Bus.

1. Place the Generator in manual from the Generator Control Panel.

2. Start each Generator manually and close its Generator Breaker to a dead or live bus from the Generator Control Panel. Refer to the specific Generator manual to perform this function.
3. Control the 52N1 and 52G1 breakers with their mode control switch and their individual breaker control switches on the front of the switchgear.
4. 52N1 and 52G1 breakers are electrically interlocked to prevent any closed transition operation.
5. When the Generators are connected to the Load Bus, follow your facility safety procedures to manually and add additional loads if sufficient capacity exists.
6. Return the Generators to the standby mode by disconnecting facility loads per facility procedures. Open each Generator Breaker and shutdown each Generator from the respective GCM.
7. Switch each Generator Control Switch from Manual to Auto Mode.
8. 52N1 and 52G1 breakers can be returned to their normal mode by putting their mode control switch in manual mode and then using their individual breaker control switches to control them.
9. The mode control switch of the transfer pair should be returned to Auto Mode after 52N1 and 52G1 breakers are set to their normal standby conditions.

K. Generator Bus Overload

1. The Generator Bus overload condition occurs when an operational Generator is either at or below 57 Hz for three seconds or at 105% of load for 60 seconds.
2. If Generator Bus overload condition occurs, a bus overload alarm initiates on the DMC.
3. A Generator shuts down on overload based on the overload protection settings in the GCM.

2.05 FAILURE MODES

A. Fail to Start

1. If a unit fails to start after the overcrank time delay (time set in the GCM) expires, the unit shuts down and an alarm sounds on the DMC.
2. The operator needs to check and rectify the problem at the Generator at this stage.

B. Failure to Synchronize

1. If a unit fails to synchronize after a preset time delay, and alarm sounds and the unit continues attempting to synchronize until signaled to stop by an operator either on the GCM or on the Generator Control Screen of the HMI on the DMC.

2.06 CONTROL AND SAFETY DEVICES

A. Alarm Horn: A station alarm horn and silencing circuit with indicating lamp shall be provided to sound an audible should a malfunction occur. Should the alarm be silenced after a malfunction, receipt of another signal shall cause the horn to sound again (Annunciator Ring Back). When the failed circuit has been corrected, the alarm horn shall be automatically reset. Horn shall be rated for 88 to 90 decibels at 10 feet.

B. Annunciator Alarm Ring-Back: All alarms shall be of the “Ring-Back” type. Any time the alarm horn is silenced, the next alarm shall re-energize the station alarm horn.

C. Automatic DC Control Voltage Sensor System: An automatic DC control sensor system shall be provided in the master control section to provide DC control voltage. DC control power shall be obtained from any one of the engine starting batteries. The sensor shall automatically select the best control voltage from the available batteries. The DC control

voltage sensor shall insure a stable system control voltage, as long as any of the battery sources are available. In each generator control cubicle a DC overvoltage protection circuit and supply shall be provided to protect the system from an excessive overvoltage (110 %) and undervoltage (50%) conditions, particularly during engine cranking. The protection shall extend to all circuits connected to the best battery selector.

D. Current Transformers: 0-5 ampere output, wound type, molded construction, with single secondary winding and primary/secondary ratio as required, burden and accuracy consistent with connected metering and relay devices. Rated 50-400 Hertz, 600 volts at 10 kV BIL full wave and built to ANSI/IEEE C57.1.3 and UL in accordance with IEC 44-1.

E. DMC Operator Interface Panel: The master operator interface panel shall communicate with the master control PLC and provide operator access to set points, engine sequence, and various switchgear functions. Any of the set points and the engine sequence will be viewed at any time, but changes shall be password protected to prevent tampering. Each set point shall have preprogrammed high and low limits to ensure that a chosen value is within an acceptable range. Additionally the DMC shall have the following features:

1) Password Screen: This screen will allow the operator must enter a password to change control set points. The system contains up to eight levels of password protection.
2) Date and Time Screen: The Date and Time screen will allow an operator to change the system's date and time. The operator will enter a password and then access
3) Date/Time screen by pressing the key.
4) Main Menu Screen: This screen will index of all the pages used in the system.
5) System One Line Screen with system metering of for both sources.
6) Generator Breaker Status Screen: The generator breaker status screen will display actual generator power in kW, rated kW and circuit breaker open/closed status for each generator in the system.
7) Main Breaker Status Screen: The Main Breaker Status screen will display the status for each feeder breaker in the system.
8) Engine Sequence Screen: The Engine Sequence screen will display the engine sequence, locked out or future for each engine in the system. The operator will program the engine sequence at any time through this screen to change the starting and stopping sequence of the engines for load demand operation.
9) Load Demand Set Points Screen: The load demand set points screen will display the load demand timer, decrease set point, decrease timer, increase set point and increase timer
10) Load Control Set Points Screen: The load control set points screen will display the under frequency load shed timer set point, overload kW set point, overload timer set point, auto/man load control, current load step and load shed activated.
11) Load Control Priority Screens: The Load Control Priority screens will allow the operator to define the set priorities of the breakers. These screen displays the start signal, priority, load add, load shed, auto/man load control, current load step and load shed activated for each breaker in the system.
12) Real time and historical trending, 90 days storage before overwrite.
13) Scheduler.
14) Generator reports.
15) System settings and diagnostics.
16) Security/login.
17) Help screens.

18) Control Functions: The operator interface panel will enable certain master control functions including but not limited to (a) Load Control (b) Demand Control (c) System Control.
19) Alarm acknowledge and silence from touchscreen.
20) Modicon M340 PLC programmed using Unity Pro Software.
21) Digital Transducers as needed for system control and monitoring.
22) Distributed I/O with Ethernet ring communications network.
23) Master synchronizer as needed for utility paralleling and synchronizing.
24) NFPA 110 compliant Reports for generator and paralleling switchgear.
25) Four levels of security.
26) External door mounted service port.
27) ANSI 61 grey cabinet, UL 891 Listed.
28) Key lockable cabinet.

F. Generator protection relay with metering, protective relaying, event capture, communications and monitoring including contacts to trip breaker. Protective functions shall include, as a minimum, the following:

1) 27 / 59 Overvoltage and Undervoltage
2) 32 Reverse Power
3) 46 Negative Sequence Overcurrent
4) 51V Voltage Restrained Phase Overcurrent
5) 50 Instantaneous and Definite Overcurrent for Ground
6) 50/51 Ground Overcurrent
7) 24 Over Excitation
8) 87 Phase Differential
9) 40 Loss of Field
10) 67 Directional Ground
11) 50 BF Breaker Failure
12) 47 Voltage Phase Reversal
13) 81O/U Over/Under Frequency

G. Metering functions shall include current, voltage, kW, kVAR, kVA, kWh, power factor, and frequency.

H. Grit tie Relay including contacts to trip breaker. Protective functions shall include, as a minimum, the following:

1) 27 Undervoltage
2) 32 Reverse Power
3) 46 Negative Sequence
4) 50 Instantaneous Phase Overcurrent
5) 50 Instantaneous Ground Overcurrent
6) 50/51 Phase Overcurrent
7) 50/51 Ground Overcurrent
8) 59 Overvoltage
9) 67R Directional Ground Overcurrent
10) 81O/U Over/Under Frequency

I. System Programmable Controllers: The system shall be controlled by Modicon M340 programmable controller with power supply, chassis, and input/output cards, and

communications cards. All PLC programming for system operation shall be the responsibility of the switchgear manufacturer. Each programmable controller shall be password protected.

J. Over and Under Voltage \ Frequency Relay An overvoltage (100 to 125%), undervoltage (75% to 100%), overfrequency (60 to 70 HZ) and underfrequency (50 to 60 HZ) relay shall be supplied to monitor the bus voltage and provide alarms and initiate load shedding, if required, for abnormal conditions. Red failure lights, auxiliary contacts, and an alarm in the engine generator master control section will be energized to indicate an abnormal voltage or frequency condition. Each setpoint has an independent time delay setting (adj. 1 to 30 seconds). Upon detecting a bus under frequency condition all available engines will be started. Under frequency load shedding operates the load control contacts similar to overload except at a more rapid shedding rate. This feature ensures the greatest continuity of service to the priority one loads. Automatic restoration of load occurs after the bus returns to normal frequency and the under frequency alarm has been reset using the failure reset push button.

2.07 SWITCHGEAR

A. Switchgear breakers, structure, and protective relays shall be per section 26 03 53. The switchgear described in this specification shall be designed for operation on a 12,470 VAC, 3-phase, 3 wire, grounded 60-hertz utility system.

2.08 STATION BATTERY AND BATTERY CHARGER

A. Station Battery and Battery Charger shall be furnished for the Paralleling Switchgear System.

1) The station battery and charger shall be installed in a freestanding, console with the batteries at the bottom and the charger at the top.

a) Operation shall be completely automatic with the charger maintaining the battery fully charged under all normal service conditions. Cooling shall be by convection. The console mounted battery charger enclosure shall be equipped with the following:

1) A DC voltmeter, DC ammeter, float-charged indicator and high-rate charge indicator shall be mounted on the front of the panel.
2) The enclosure shall contain a potentiometer for adjusting float charge voltage and a potentiometer for adjusting the high-rate voltage. These controls shall be equipped with AC and DC fuses and an AC and DC failure alarm relay.
3) An automatic, 24-hour timer shall be installed within the console cabinet.

b) Following an AC power failure longer than 8 to 12 seconds, the timer shall automatically switch the charger to the high-rate mode. After the preset interval, the timer shall return the battery to float charge.

2) The storage batteries shall be a 24 volt pocket plate nickel cadmium battery, manufactured by ALCAD. Capacity shall be 110 ah @ 8 hour rate to 1.14VPC @ 77F.

3) The battery shall be designed for nominal 125 volt DC switchgear service and shall be capable of delivering 110-ampere-hour capacity at the 8-hour rate.

4) The battery charger shall be microprocessor controlled, self diagnostic SCR type battery charger, Alcad model AT10-024-025-01130000. Input shall be 120 volts, 60 Hertz, single phase, AC. Nominal output shall be 20 amperes and 125 volts DC. Provide alarm assembly with local LED's and relay contacts for AC failure, DC failure, high Vdc, low vdc, positive and negative ground fault. Provide MOV surge suppressors.

2.09 SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) INTERFACE

A. Furnish information for Owner's plant SCADA system as described below.

B. Provide Modbus TCP/IP Ethernet port in switchgear PLC and all register maps and documentations for the generator control switchgear and ancillary equipment as described herein. Protocol shall be Modbus TCP.

C. Display data from generator control cubicle the engine monitoring to include but not be limited to:

a) all pre-alarm.
b) alarm.
c) engine status.
d) engine selector switch status.
e) generator circuit breaker position.
f) generator volts, amps, kilowatts, and frequency.
g) load shed outputs

D. Display data from the master control cubicle PLC to include, but not limited to:

a) system annunciation.
b) generator bus voltage .
c) generator bus kilowatts.
d) generator bus kilovars.
e) power factor
f) generator bus frequency.
g) load demand setpoint and timer settings.
h) manual/auto selector switch position and all remaining master control settings
i) utility bus voltage.
j) utility bus kilowatts.
k) utility bus kilovars.
l) utility bus frequency.

E. All data shall be real-time and monitor only.

F. Provide three control inputs to PLC via Modbus Ethernet:

1) Initiate exercise mode, test with load.
2) Initiate exercise mode, test without load.
3) Hold return to utility power. (To be utilized after power failure).

G. The Owners PLC shall communicate with the switchgear using dedicated Cat 5 Ethernet wiring. Communication protocol shall be Modbus Ethernet.

H. The integration of the data into the City's SCADA system will be paid for separately by City and is not in this contract, however, the integration will occur during commissioning, therefore allow in bid for coordination with City's SCADA integrator.

PART 3 EXECUTION

3.01 COORDINATION

A. The Switchgear Manufacturer shall be responsible for providing the coordinating interconnect diagrams showing the electrical connections between all related equipment specified in this section of the specifications. The interconnect diagrams are for use by the Electrical Contractor and switchgear service personnel during installation and checkout of the equipment.

B. The Engine Generator Vendor will supply the Switchgear Manufacturer with any required engine interface hardware, electronic governor, and voltage regulator system components. Along with this equipment, the Engine Generator Vendor will furnish detailed drawings outlining proper interconnection and physical mounting data. The equipment shall be mounted and wired by the Switchgear Manufacturer.

C. The Switchgear Manufacturer shall verify the completion of all start-up commissioning and site testing of the Critical Power Switchgear System. The Switchgear Manufacturer shall also assist the Engine-Generator Vendor as necessary in the performance of site start-up and testing of the engine-generators.

3.02 FACTORY TESTING

A. At the factory, the Switchgear Manufacturer shall perform tests on the switchgear and generator controls as required verifying the proper operation of each component and demonstrating full compliance with the requirements of this specification. The factory test reports will be available upon request.

B. The equipment shall be completely assembled, wired, adjusted, and tested at the factory. Rigid inspections before and after assembly shall assure correctness of design and workmanship. After assembly, each switchgear assembly shall be tested for operation under simulated conditions.

C. After a visual inspection, the following operational tests shall be performed:
Operate all circuit breakers in connected as well as in test positions. Check the operation of all interlocks by attempting to close breaker into interlocked configurations.

D. Check racking mechanisms by removing and reinstalling each circuit breaker.

1) Check stored energy mechanism of each breaker by tripping, and closing and tripping each breaker after the removal of control power.
2) Dielectric tests.
3) Test all protective relay devices by simulation tests.

E. The Manufacturer shall supply all equipment, devices, and circuitry required to simulate all synchronizing and paralleling functions, digital and analog signal inputs, outputs and confirmation signals, diesel generator control and operation. Automatic and manual operation of the paralleling circuit breakers and protective and indicating devices shall be included.

3.03 PACKING AND SHIPPING

A. The Switchgear Manufacturer shall prepare all equipment covered by this specification in such a manner as to protect it against damage in transit.

B. The Switchgear Manufacturer shall perform the following steps to prepare the equipment for shipping and final assembly at the site:

1) All equipment shall be adequately packed to prevent damage from handling, weather, shock, vibration and corrosion during shipment by common carrier.

2) All metering and equipment shall be protected to ensure cleanliness during shipment, storage and erection.

3) Each item of equipment shall be clearly marked. All boxes, crates and shipments shall be numbered and identified with the following information:

a) Owner's purchase order number.
b) Owner's name and delivery location.
c) Manufacturer's name and address.
d) Contents.

4) All equipment shall have provisions for lifting and skidding. All lifting points shall be clearly marked.

5) Each shipping unit shall be braced adequately and rigidly both internally and externally to prevent damage during transit or in the process of erection.

6) When assemblies are supplied that require disassembly for installation or are shipped disassembled, each piece of the subassembly so affected shall be uniquely identified as to its assembly position. All loose peripheral equipment shall be boxed, crated or otherwise completely enclosed and protected during storage, handling and shipment.

C. All equipment and material shall be shipped to the job site unless otherwise instructed.

D. All equipment shall be adequately protected, braced and secured to prevent physical and environmental damage during transit and handling. All material not mounted or installed on the major equipment during shipping shall be properly crated and shipped with the associated equipment.

E. Drawout circuit breakers shall be crated and shipped separately if recommended by the breaker vendor otherwise breakers will be shipped within the system.

F. The manufacturer shall coordinate shipping of all equipment and material with the successful Contractor.

G. Shipping sections shall be arranged to permit transport through limited access as required.

H. The equipment shall be equipped for handling by crane, pallet jack and rollers.

3.04 INSTALLATION

A. The Electrical Contractor shall provide labor for the installation of the Critical Power Switchgear System plus all associated external wiring for power and controls. All rigging required for unloading and installation shall be the responsibility of the Electrical Contractor.

B. The Switchgear shall be installed following the procedures set forth by the Switchgear Manufacturer. The Switchgear Manufacturer shall assist the Electrical Contractor as required in interpreting the installation instructions. The Electrical Contractor shall certify to the Switchgear Manufacturer and Owner that the installation has been performed per the latest documents and instructions.

C. Following installation, the Switchgear Manufacturer shall inspect and verify the correct installation of the switchgear, including all individual components.

3.05 FIELD SERVICE STARTUP AND TRAINING REQUIREMENTS

A. The Switchgear Manufacturer shall provide the services of a field service engineer for a pre-installation coordination meeting with the Engine Generator Vendor and Electrical Contractor to coordinate the installation and interconnection of the Critical Power Switchgear System and generators.

B. The Switchgear Manufacturer shall provide a field engineer for an initial visit to checkout the installation of the switchgear to allow the energization of the utility main service breaker if required.

C. The Switchgear Manufacturer shall provide a field engineer for post installation start-up and testing assistance, prior to system turnover and initial instruction and training for the facility's operating personnel. This trip shall include all service required to checkout the Critical Power Switchgear System and demonstrate the complete operation for final acceptance by the owner.

D. Grid-tie relay commissioning. Protective relay settings provided by Engineer. Allow in bid for loading setpoint file and third party testing and commissioning of grid tie relay. Provide test equipment, Doble 6150 or equal. Using Doble 6510 simulate current and voltage injection and verify trip function. Allow two separate trips, one full day each trip. Testing shall be performed by National Switchgear or approved equal. Engineer shall witness test. Provide 10 days notice. Provide documentation of all testing.

E. At the time of start-up of the system equipment, the Switchgear Manufacturer shall furnish (2) preliminary sets of installation, operating and maintenance manuals. At the conclusion of the site testing, the field engineer shall leave (1) manual at the site.

F. This manual shall include any and all changes that have occurred during the equipment start-up. The amended manual shall serve as a reference tool until the final sets of O&M manuals are supplied.

G. The instructions shall include recommended field test procedures as defined in the Standards. A schedule listing the frequency prescribed for performing the field tests shall be provided.

H. Approximately six months after the complete system turnover, a visit shall be made to provide instruction for operating personnel on the complete operation and maintenance program for the Critical Power Switchgear System.

I. The bid shall include the cost for the services of a factory authorized service representative to train the Owner's personnel on procedures and schedules for programming, setting of relay, startup, shutdown, troubleshooting, servicing and preventive maintenance of all equipment, Including the below:

1) The instruction shall be dedicated and intensive and shall be provided by competent instructors fully familiar with the equipment.

2) The instructions shall be presented in an eight hour session. The Field Service engineer will provide Instructions on the operation and maintenance of the switchgear, circuit breaker, protective relays and PLC equipment.

3) The Owner will provide a suitable classroom environment on site for the instruction session.

4) When Field Service provides the instruction procedures, the training session can be recorded by the owner on VHS videocassettes.

5) Schedule training with the Owner through the Architect/Engineer with at least seven working days advance notice.

6) Provide both classroom training and hands-on equipment operation covering the following:

a) Safety precautions.
b) Features and construction of switchgear and accessories.
c) Routine inspection, test and maintenance procedures.
d) Routine cleaning.
e) Features, operation and maintenance of protective devices.
f) Interpretation of readings of indicating and alarm devices.
g) Review operating and maintenance manuals.
h) Review troubleshooting operations.

END OF SECTION

SECTION 26 03 53
15 kV Switchgear
Page 1 of 4

PART 1 – GENERAL

1.01 SCOPE

A. Furnish and install 15 kV Switchgear as shown on the drawings and as specified herein. Furnish all labor, materials, tools, cable, equipment, and related items required for the complete installation of the switchgear.

B Voltage characteristics will be 12,470Y/7200 volts, grounded wye, 60 hertz.

1.02 RELATED WORK

A. Section 26 02 30 Paralleling Switchgear

1.03 SUBMITTALS AND SHOP DRAWINGS

A. Submittals and shop drawings shall comply with General Conditions.

B. Process submittals for the following:

1. Switchgear

2. Circuit breakers with time current curves

3. Metering

C. Process shop drawings for the switchgear. Shop drawings shall include but not be limited to the following:

1. Dimensional outline drawings with weights. Conduit entry areas into top and bottom shall be clearly scaled and dimensioned. Shipping splits shall be indicated.

2. Elementary diagrams. Elementary diagrams shall include all wire numbers, color codes, and device terminal numbers.

3. Wiring diagrams. Wiring diagrams shall show physical location of devices used in the elementary diagrams and shall show color code and terminal number of wires terminated on device.

1.04 STANDARDS

A. The Switchgear shall be designed, tested, and assembled in accordance with the following standards:

IEEE C37.20.2 Draw out Breakers and Auxiliary Drawers

IEEE C37.20.3 Metal Enclosed Switchgear

IEEE C37.04, C37.06, and C37.09

PART 2 – PRODUCTS

2.01 SWITCHGEAR CONSTRUCTION

A. The distribution switchgear shall be indoor, metal clad type suitable for 12,470/7200 volt, three phase, grounded, 60 Hz system. The switchgear shall be front access only and shall not require rear access.

B. Buss ampacity shall be 1200 amps continuous.

C. Short circuit rating shall be a minimum of 25,000 amps rms symmetrical at 480 volts AC.

D. The switchgear shall be enclosed in a NEMA 1, indoor, enclosure.

E. Main incoming cable compartments shall have cable supports.

F. The main bus shall be insulated and constructed of tin plated copper.

G. Switchgear shall have third party certification by UL.

2.02 CIRCUIT BREAKERS

A. Circuit breakers shall be vacuum type and shall be draw out. Main and generator bus tie breakers shall be electrically operated and shall have features as required by Section 26 02 30.

B. Circuit breakers shall be 100 percent rated breakers rated for 600 amps. Breakers shall have two step stored energy closing, solid state trip devices, trip indicators, and plug-in ampere rating unit. Solid state tripping system shall have the following time-current characteristics:

1. Ampere setting (over current pickup)

2. Long time delay

3. Short time pickup

4. Short time pickup

5. Ground fault pickup

6. Ground fault delay

7. Instantaneous with provisions for settings to reduce arc flashing when equipment is being worked on. The instantaneous shall also have the ability to being turned off without affecting arc flash mitigation function.

C. Electrically operated breakers shall have 125 vdc motor drive for open/close operation and 125 vdc shunt trip coil. Closing time shall not exceed 70 msec. Trip time shall not

exceed 60 msec. Transition time for the feedback signal shall not exceed 30 msec. Breaker shall have two sets of a and b auxiliary contacts.

2.03 METERING AND RELAYS

A. For metering and relays provide PTs and CTs in main gear as shown on One Line Diagram. Manufacturer of Paralleling Switchgear shall provide metering and relay units in Paralleling Gear.

2.04 WIRING

A. Wiring shall be switchgear type SIS in accordance with the applicable NEMA Standard as well as local and NEC requirements. No wire shall be less than #12 AWG for controls, and not less than #10 AWG for current transformers. Wiring between the hinged door and the terminals blocks in the housing shall have an extra slack, and shall be bundled together in a neat workmanlike manner.

B. A control wiring trough shall be provided for the interconnecting wires between the units. Terminal blocks with numbers shall be provided for termination of external connections. All device interconnection wires shall be numbered and tagged as such.

C. CT wiring shall have shorting type terminal blocks.

2.05 NAMEPLATES

A. Nameplates shall be provided on all hinged doors for unit description and for each control or indicating device. Nameplates shall be of a suitable size and shall be engraved as specified or directed, using lettering approximately 3/4 - inch high for section identity nameplates and 1/4 - inch high elsewhere. The nameplates shall be black and white laminated phenolic material. The engraving shall extend through the black exterior lamination to the white core.

B. Each switchgear shall be furnished with a sign marked "DANGER - 480 VOLTS". Letters shall be not less than 1 inch high, 1/4 inch stroke. Signs shall be laminated plastic, red letters on a white background, approximately 3 inches x 5 inches.

2.06 PAINTING AND FINISHES

A. After fabrication and before the installation of the components, all metal surfaces shall be thoroughly cleaned of all grease, weld splatter or any foreign matter and treated to provide a bond between the primer, paint and the metal surface to prevent the entrance of moisture and the formation of rust under the paint film.

B. All surfaces shall be painted with a rust-resisting epoxy primer coat applied with a cathodic electrodeposition or equal process and then the exterior surfaces covered with two finish coats.

C. The finishing paint coat color for the entire unit substation shall be ANSI No.61 Light Grey. Interior finish shall be of light color.

D. The paint as well as the application process shall have special heat and oil resisting properties and shall provide a corrosion resistant, uniform and thorough paint coverage.

E. Furnish touch-up paint in the amount of one gallon each of interior and exterior paint.

F. All hardware shall be furnished with a suitable protective finish.

2.07 SURGE PROTECTION

A. The utility main section shall have a station class arrester with a nominal rating of 10 kV and a MCOV rating of 8.4 kV.

2.08 MANUFACTURER

A. Switchgear shall be Eaton type MEF metal enclosed front access switchgear, or approved equal.

PART 3 – EXECUTION

3.01 FACTORY TESTS

A. All equipment shall be carefully inspected after assembly and all wiring shall be checked to ensure correctness of connections and operation.

B. The switchgear, accessories and wiring shall be tested in accordance with latest revision of U.L. and NEMA standards.

C. Five copies of certified test reports shall be furnished.

D. In the event of failure of any equipment to meet the test requirements, the Owner's permission before any repairs or modifications are carried out shall be obtained. If these repairs and modifications are, in the Owner's opinion, likely to affect the results of any test previously carried out, the appropriate retesting shall be performed at no extra cost.

3.02 INSTALLATION

A. Make the following minimum tests and checks before the manufacturer's representative is called in for testing.

1. Remove all current transformer shunts completing secondary circuit.
2. Check all mechanical interlocks for proper operation.
3. Vacuum clean all interior equipment.
4. Make all breaker settings as directed by Engineer.
5. Program and make all metering settings.

END OF SECTION

SECTION 26 04 10
Underground Electrical
Page 1 of 3

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish and install a system of underground raceways and wiring as shown on the drawings.

1.02 APPLICATIONS

A. Except as otherwise shown on the Drawings, or otherwise specified, all underground and in-slab conduit raceways shall be of the following type:

1. For small diameter conduits for instrumentation and feeder circuits, conduit runs shall be made with schedule 40 PVC. Bends to grade shall be made with plastic coated rigid aluminum conduit. All conduit coming out of the ground in grass areas shall have concrete mow protection as detailed on the drawings. Plastic coated conduit in all cases shall extend 3” above the concrete.

2. All instrumentation underground conduit runs shall be made with schedule 40 PVC conduit with plastic coated rigid metallic conduit upturns. A 24” separation shall be maintained from power conduit ductbanks or if in the same ductbank, it shall be plastic coated rigid steel conduit the whole way.

1.03 SUBMITTALS

A. Process submittals for the following:

1. Non Metallic conduit
2. Metallic conduit
3. Grounding Bushings
4. Buried conduit marker tape
5. Conduit supporting saddles

1.04 RELATED WORK SPECIFIED UNDER OTHER SECTIONS

A. Refer to Section 26 01 10 for raceways.

B. Refer to Section 26 01 20 for wiring.

C. Refer to Section 26 04 50 for grounding.

D. Refer to Division 3 for concrete.

PART 2 - PRODUCTS

2.01 RACEWAYS

A. Raceways shall be as specified in Section 26 01 10.

2.02 MISCELLANEOUS

A. Gravel for underbedding of conduits shall be washed type pea gravel.

B. Plastic saddles (where allowed) for spacing and supporting conduits shall be interlocking types as manufactured by Cantex.

C. Plastic marker label tape for buried conduits shall be yellow background with black letters with repetitive marking "ELECTRIC LINE" on yellow background, continuous along its length. Furnish T&B # NA-0608, or equal tape.

PART 3 - EXECUTION

3.01 EXCAVATION AND BACKFILLING

A. Do all excavating and backfilling necessary for the installation of the work. This shall include shoring and pumping in ditches to keep them dry until the work has been installed.

B. All excavations shall be made to proper depth, with allowances made for floors, forms, beams, piping, finished grades, etc. Ground under conduits shall be undisturbed earth or if disturbed, mechanically compacted to a density ratio of 95% before conduits are installed.

C. All backfilling shall be made with selected soil, free of rocks and debris, and shall be pneumatically tamped in six (6") inch layers to secure a field density ratio of 95%.

D. Field check and verify the locations of all underground utilities prior to any excavating. Avoid disturbing these as far as possible. In the event existing utilities are broken into or damaged, they shall be repaired so as to make their operation equal to that before the trenching was started.

E. All concrete ductbanks shall have a red dye in to indicate electrical ductbank. All ductbanks shall be concrete encased.

F. All concrete encased ductbanks shall be tied into structure with doweled rebar, on each corner, four places minimum.

G. Where conduits turn up provide 6” rise of concrete encasement to protect conduit from mowing.

3.02 RACEWAYS

A. All underground conduits shall be PVC schedule 40 unless otherwise noted. All bends to grade shall be made with plastic coated rigid metallic conduits and shall extend to 6" above grade. Conduits shall be watertight over the entire length of the underground run.

B. Install all power, control, and signal wiring. Label each single conductor wire at each connection with PVC sleeve type wire labels. Label each signal cable at each end with plastic waterproof write-on type label to identify terminal connection and function and device served.

C. Where empty conduits terminate into equipment install blank "disc" under grounding bushing and bring specified foot-marked pull tape through disc. Label each end of each pull tape with waterproof plastic label to identify terminus of other end and also show conduit size.

3.03 WIRING

A. All underground wiring runs shall be installed from line to load without splice.

END OF SECTION

SECTION 16450
Grounding Systems

PART 1 - GENERAL

1.01 SCOPE

A. Furnish and install complete grounding systems in accordance with Article 250 of the National Electrical Code as shown on the Drawings and as specified herein.

B. Provide ground mat grounding electrode system as shown on the drawings and as specified herein.

1.02 SUBMITTALS

A. Submit manufacturers' catalog sheets with catalog numbers marked for the items furnished, which shall include:

1. Ground well casings
2. Ground rods
3. Terminal lugs and clamps
4. Exothermal welding materials
5. Ground cable
6. Ground connection hardware

PART 2 - PRODUCTS

2.01 GROUNDING ELECTRODES

A. All ground mat grounding electrodes and grounding electrode conductors shall consist of tin plated stranded copper.

B. All ground rods shall be copper clad steel products, 3/4" diameter x 10 foot long, unless otherwise indicated. Ground rods shall be Blackburn #6258, or equal. Provide heavy duty ground rod clamps, exothermic welds where concealed or below grade. Equal to Blackburn #GG58 where vertical connections are installed and #GUV where U-bolt connectors are installed to serve horizontal connections.

2.02 GROUNDING DEVICES

A. Connectors shall be furnished as specified under Section 16120.

B. Conduit grounding bushings shall be furnished as specified under Section 16110.

C. Equipment grounding conductors shall be furnished as specified under Section 16120.

D. Flush cast metal grounding plates shall consist of bronze body with flat plate on top and bolted clamp connector on bottom. Furnish OZ type "VG", or equal flush connectors. Each such connector shall be furnished with silicon bronze connector bolts for installation of top-mounted grounding connectors.

E. Exothermal welding kits shall be "Cadweld" products as manufactured by Erico. Molds, cartridges, powder, and accessories shall be as recommended by the manufacturer.

2.03 GROUND TEST WELLS

A. Ground test wells shall be furnished each ground rod for the purpose of field testing the ground mat system.

B. Ground test wells shall each consist of ground rod with connector attached to a #4 upcomer from the ground mat and contained within an access well with labeled top.

C. Ground test well enclosures shall be Brooks product #3RT series, or equal. Enclosures shall be 10 1/4" diameter and shall include cast iron cover with integrally cut "GROUND TEST WELL" in top of cover.

PART 3 - EXECUTION

3.01 GROUND MATS AND GROUND WELLS

A. Install ground mat around the perimeter and under the new foundations as shown. Use #4/0 AWG tin-plated copper stranded conductor for the ground mat. Install upcomer with indicated wire sizes of tin plated copper conductors. Exothermally weld all connections.

B. Unless other larger sizes are indicated on the drawings, install #2 upcomers from ground mat to PLC, and other equipment indicated on the drawings. Install "VG" flush floor connector to serve each upcomers and run #2 stingers from top side of each "VG" to ground bus in equipment. Bond VG to rebar in concrete.

C. Install ground rods in test wells where indicated on the drawings.

D. Install chemical grounding kits where called for. Drill holes as required and install kit per manufacturer’s instructions. Exothermic weld all concealed, imbedded in concrete or buried connections.

3.02 TRANSFORMER

A. Bond transformer neutral to cabinet.

B. Install grounding electrode conductor from each transformer neutral to system ground and to local electrodes as shown. Run #2 ground wire to ground mat.

3.03 WIRING SYSTEMS GROUNDING

A. All equipment enclosures, motor and transformer frames, metallic conduit systems and exposed structural steel systems shall be grounded.

B. Equipment grounding conductors shall be run with all wiring. Sizes of equipment grounding conductors shall be based on Article 250 of the N.E.C. except where larger sizes may be shown. Bond each equipment grounding conductor to the equipment grounds at each end of each run. Run 4/0 ground full length of tray, bond to each section and every enclosure where conductors originate or terminate. Protect grounded equipment conductor in conduit where it leaves the tray.

C. Liquid tight flexible metal conduit in sizes 1" and larger shall be equipped with external bonding jumpers. Use liquid tight connectors integrally equipped with suitable grounding lugs.

D. Where conduits enter into equipment free of the metal enclosure, install grounding bushing on each conduit and bond bushing lug to equipment ground bus.

E. Where conduits enter equipment enclosures, equip each penetration inside with grounding bushing. Install bonding jumper from each grounding bushing to ground bus.

F. Equipment enclosures that do not come furnished with a ground bus, install ground lug in each enclosure that shall be bonded to the metal cabinet or backpan of the enclosure.

G. Separately derived systems shall be each grounded as shown and shall comply with Article 250 of the NEC except where higher standards are shown.

3.04 TESTING

A. All exothermic weld connections shall successfully resist moderate hammer blows. Any connection which fails such test or if upon inspection, weld indicates a porous or deformed connection, the weld shall be remade.

B. All exothermic welds shall encompass 100 percent of the ends of the materials being welded. Welds which do not meet this requirement shall be remade.

C. Test the ground resistance of the system. All test equipment shall be furnished by Contractor and be approved by Engineer. Test equipment shall be as manufactured by Biddle or approved equal. Dry season resistance of the system shall not exceed five ohms. If such resistance cannot be obtained with the system as shown, provide additional grounding as directed by Engineer.

END OF SECTION

SECTION 16455
Lightning Protection
Page 1 of 2

PART 1 - GENERAL

1.01 SCOPE

A. Furnish and install complete lighting protection system for the new pre-cast switchgear building.

1.02 STANDARDS

A. The following specifications and standards of the latest issue form a part of the specification:

1. Lightning Protection Institute (LPI) Installation Code, LPI 175 and clamps
2. National Fire Protection Association Lightning Protection Code, NFPA 78
3. Underwriter Laboratories, Inc. Installation Code, UL96A

1.03 SYSTEM DESIGN

A. The work covered by this section of the specifications consists of system design and furnishing all labor, materials, and items of service required for the completion of a functional lightning protection system as approved by the engineer, and in strict accordance with this section of the specifications.

1.04 SUBMITTALS

A. Complete design and drawings showing the type, size, and locations of all grounding, down conductors, roof conductors, and air terminals shall be submitted to the engineer for approval.

B. Submit shop drawings for all roof penetration details.

1.05 QUALITY ASSURANCE

A. Upon completion of the installation, the lightning protection installer shall submit the Underwriters Laboratories, Inc. Master Label certification and the Lightning Protection Institute Certified System certification. The system will not be accepted without the UL Master Label. Submit record drawings with the LPI forms LPI-C1-01, -02, and -03.

1.06 STANDARDS

A. The system to be furnished under this specification shall be the standard product of manufacturers regularly engaged in the production of lightning protection equipment and shall be the manufacturer's latest approved design. The equipment shall be UL listed and properly UL labeled. All equipment shall be new, and of a design and construction to suit the application where it is used in accordance with accepted industry standards and LPI, UL, NFPA, and NEC code requirements.

PART 2 - PRODUCTS

2.01 GENERAL

A. All materials shall be copper and bronze and of the size, weight, and construction to suit the application. Bolt type connectors and splicers shall be suitable for use on Class I structures. Pressure squeeze clamps are not acceptable. All mounting hardware shall be stainless steel to prevent corrosion.

B. The system shall consist of a complete system and shall include connectors, splicers, bonds, copper down leads, and proper ground terminals.

2.02 LIGHTNING PROTECTION DEVICES

A. All equipment shall be Thompson Lightning Protection products or equal. Structural steel may be utilized as permitted by UL, NFPA, and LPI.

B. Down conductors shall be Thompson Lightning Protection #32 STRANDED, ground rods #TL3510. Ground rod connections shall be cadwelded. Provide cable holders #186X and #166 as necessary to support all downlead, and bonding cables at 3 feet on center maximum. Verify compatibility of any proposed adhesive with roofing system in use. Furnish all fittments and appurtenances as required for a complete installation.

PART 3 - EXECUTION

3.01 INSTALLATION

A. All equipment shall be installed in a neat, workmanlike manner. Work with other trades to insure a correct, neat and unobtrusive installation.

B. Installation shall comply in all respects to LPI Code 175. Installation shall be made by or under supervision of an LPI Certified Master Installer. Completed installation to receive system certification including submittal of Forms LIP-C1-01, LPI-C1-02, and LPI-C1-03.

C. Ground electrodes shall be installed and in no instance shall they be less than 1 foot below grade and 2 feet from foundation wall. Driven rods shall penetrate earth at least 10 feet.

END OF SECTION

DIVISION 31

EARTHWORK

SECTION 31 10 00
Site Clearing
Page 1 of 5

PART 1 - GENERAL

1.01 Section Includes

A. Work included in this Section, while not inclusive but listed as a guide, shall include:

1. Furnishing of all labor, tools, equipment and incidentals required to complete the work.
2. Layout of work.
3. Protection of existing trees.
4. Removal of trees and other vegetation.
5. Topsoil stripping.
6. Clearing and grubbing.
7. General site excavation.
8. Removing below-grade improvements.

1.02 Related Sections

A. Coordinate the work of this Section with the Work of other Sections as required to properly execute the Work and as necessary to maintain satisfactory progress of the work of other Sections. Other Sections containing related work include but are not limited to the following:

B. Testing Laboratory Services – Independent testing laboratory hired by the City per, Contract Documents

C. Temporary Storm Water Pollution Control - Section 01 57 23

1.03 References

Meet requirements and recommendations of applicable portions of Standard listed.

A. ASTM D698 - Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 lb/ft;).

B. ASTM D4318 - Liquid Limit, Plastic Limit and Plasticity Index of Soils.

C. Texas Department of Transportation Standard Specifications for Construction of Highways, Streets, and Bridges, 2004, TxDOT.

1.04 Submittals

A. Samples:

1. Provide adequate samples for determination of moisture density relationships and Plasticity Index (P.I.) of on-site materials, imported fill material and drainage aggregate.

B. Tests Reports: Submit complete laboratory analysis of soil material proposed for fill material.

1. Establish moisture density relationship of in-place sub-grade in accordance with ASTM D-698.
2. Establish moisture density relationship of proposed select fill(s) material in accordance with ASTM D-698.

3. Perform PI test on proposed select fill material to confirm conformance with the project specifications in accordance with ASTM D-4318.
4. Gradation of drainage aggregate in accordance with ASTM C-136.

1.05 Job Conditions

A. Traffic: Conduct site clearing operations to ensure minimum interference with roads, streets, walk, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from the Owner.

B. Protection of Existing Improvements: Provide protections necessary to prevent damage to existing improvements indicated to remain in place.

C. Protect improvements on adjoining properties and on Owner's property.

1.06 Notification of Owners of Utility Lines and Equipment

A. Notify any corporation, company, individual or local authority owning conduits, wires, pipes or equipment on site that is affected by demolition work.

B. Arrange for removal or relocation of indicated items and pay any fees or costs in conjunction with removal or relocation, except as otherwise noted.

C. Cap lines in accordance with instructions of governing authorities or Owners.

1.07 Protections

A. Prior to starting demolition or clearing operations, provide necessary protections as specified in Division 1 and Section 31 50 00, including necessary barricades.

1.08 Explosives

Use of explosives is strictly prohibited.

PART 2 - PRODUCTS

2.01 Soil Materials

A. Top Soil: Shall be rich, friable, sandy loam, free of lumps, debris, wood, roots, Nutgrass, Dallisgrass and reasonably free of other weeds and foreign grasses. Existing topsoil obtained by stripping and meeting the above requirements shall be stockpiled on site.

B. Select Fill: Shall be select non-expansive sandy clay or clayey sand fill with a Plasticity Index (P.I.) of 4 to 12 and a Liquid Limit of 30% or less.

C. Sand: Sand for wall backfill shall be pit run, free of organic matter, clays or other binders (concrete sand) with less than 10% passing the #200 mesh sieve.

D. Non-select Fill: On-site clay material free of debris and vegetation processed so that clods or particles are a maximum of 2" in diameter.

PART 3 - EXECUTION

3.01 Preparation

A. Verify that abandoned utilities have been properly disconnected and capped.

B. Verify that required barricades and other protective measures are in place.

3.02 Demolition Operations

A. Execute demolition of designated existing site items.

B. Materials, equipment and debris resulting from demolition operations shall become property of Contractor, unless otherwise noted. Immediately remove demolition debris from site and legally dispose.

3.03 Salvage

A. Salvage designated site items for relocation and reinstallation.

B. Store and protect items until ready for installation.

3.04 Clearing and Grubbing

A. The designated area shall be cleared of all trees, brush, shrubbery, plants, etc., not indicated on the plans to be preserved. Pavement shall be removed where indicated. Trees and brush designated to be left in place shall be carefully trimmed as directed and shall be protected from scarring, barking or other injuries during construction operations. Pruned limbs over two inches in diameter shall be treated by painting the exposed ends with an approved asphaltic material. Unless otherwise indicated on the plans, trees and stumps shall be cut off or otherwise removed as close to the natural ground as practicable on areas which are to be covered by at least three feet of embankment. On areas required for borrow sites and materials sources, stumps, roots, etc., shall be removed to the complete extent necessary to prevent such objectionable matter becoming mixed with the material to be used in construction.

B. Refer to Section 01 57 23 for tree protection and maintenance requirements

3.05 General Site Excavation

A. The term Building area shall mean the area generally within line 5 feet from all exterior building wall lines and includes walks abutting the building or walks within the building area.

B. The entire building and paving site shall be cleaned of all debris, vegetation, organic matter, concrete and asphalt paving to a depth of 4" minimum before excavation is begun.

C. Perform the necessary cutting of the site to establish the grade indicated on the Grading Plan. Cutting shall be sufficiently deep to allow for fill materials to be placed on top of cut area with the finish top soil or paving material to attain the final finish grades.

D. After acceptance of exposed cut surfaces by the Testing Laboratory, the exposed surface shall be proof-rolled. Soft, loose areas shall be removed to a level of stiff or dense soil.

Backfill with acceptable select fill, moisture condition and compact as required by these specifications and the plans.

E. Areas designated for planting or within the limit of construction not covered by building or pavements shall be held down 6" below finish grade for topsoil placement.

F. General Demolition: Shall consist of removal and disposal of pavements and other obstructions visible at the ground surface, underground structures and utilities indicated to be demolished and removed. Remove all such excavated materials from site.

G. Unauthorized Excavation: Consists of removal of materials beyond indicated subgrade elevations or dimensions without prior approval by engineer. Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending the indicated bottom elevation of the footing or base to the excavation bottom, without altering required top elevation. Backfill and compact unauthorized excavations as specified for authorized excavations of same classification.

3.06 Backfill and Fill - General

A. Surface Preparation for Fill: Scarify soil to a depth of 6", moisture condition the soil at optimum moisture. Compact to 95% of Standard Proctor at moisture contents at or +4% above the Proctor optimum.

B. Backfill and Fill: Place backfill and Select Fill materials in 8" loose lift. Before compaction, bring soil to optimum moisture. Compact each layer to required percentage of maximum density for each area of classification. Do not place backfill material on surfaces that are muddy or frozen.

3.07 Grading

Uniformly grade all areas including adjacent transition areas and at all miscellaneous ground structures, curbs and walks, grade surrounding area uniformly to top of curb, walk or structure unless shown otherwise.

A. Finish Grading: Grade area adjacent to building lines to drain away from structures and to prevent ponding. Finish surfaces to be free from irregular surface changes.

B. Topsoil: Where areas are designated as planting, hold down subgrade 6". Fill with topsoil to required finish grade or to top of surrounding ground structure. Top soil shall be placed to a depth of 6", spread and hand raked to required finish grades. Top soil be placed over all fill areas, areas designated as planting and all areas not covered by building or pavement included in this contract. Coordinate topsoil placement and requirements with landscape work.

3.08 Maintenance

A. Protect newly graded areas from traffic and erosion and keep free of trash and debris.

B. Repair and re-establish grades in settled, eroded and rutted areas to required finish elevations.

C. When completed, compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, reshape and compact to the required density prior to further construction.

3.09 Disposal of Spoilage and Cleanout

A. All materials excavated or scheduled to be removed from the site, including, but not limited to concrete paving, asphalt paving, natural soils, abandoned utilities, rock, etc. shall be legally disposed off the site by the Contractor.

B. During construction, the site shall be maintained free of excavated materials, spoilage, etc. and shall be kept clean and neat at all times.

END OF SECTION

SECTION 31 20 00
Earth Moving
Page 1 of 5

PART 1 - GENERAL

1.01 Section Includes:

A. Work included in this Section, while not at all inclusive but listed as a guide, shall include:
   1. Furnishing of all labor, tools, equipment and incidentals to complete the work.
   2. Layout of the work.
   3. All required excavation within the limits of the site.
   4. Removal, proper utilization or disposal of all excavated material.
   5. Shaping and finishing of all earthwork in conformity to the lines and grades as shown on the plans.
   6. Placement and compaction of all suitable material obtained from excavation, or other excavation on the site.
   7. Backfill for structures.

1.02 Related Section

A. Coordinate the work of this Section with the Work of other Sections as required to properly exe cute the Work and as necessary to maintain satisfactory progress of the work of other Sections. Other Sections containing related work include but are not limited to the following:
   1. Temporary Storm Water Pollution Control - Section 01 57 23
   2. Subgrade Preparation - Section 31 23 13

1.03 References

Meet requirements and recommendations of applicable portions of Standard listed.

A. ASTM D698 - Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 lb/ft;).

B. ASTM D4318 - Liquid Limit, Plastic Limit and Plasticity Index of Soils.

C. Texas Department of Transportation Standard Specifications for Construction of Highways, Streets, and Bridges, 2004, TxDOT.

1.04 Submittal

A. Samples: Provide adequate samples for determination of moisture density relationships and Plasticity Index (P.I.) of on-site materials, imported fill material and drainage aggregate.

B. Safety Plan: When trench excavation exceeds a depth of five feet (5'), submit detailed plans and specifications for trench safety systems to meet the OSHA requirements necessary to satisfy federal and state laws and regulations. The trench safety plan shall be designed and sealed by a Registered Professional Engineer, licensed in the State Texas.

C. Storm Water Pollution Prevention Plan: Prior to beginning the Earthwork, the Contractor shall develop, submit for approval, and implement a Storm Water Pollution Prevention Plan in accordance with the latest TCEQ and City (MS4) Stormwater regulations, if the disturbed area of the project (or common plan of development) is one (1) acre or greater.

D. Test Reports by City Independent Testing Laboratory: Submit complete laboratory analysis of soil material proposed for fill material.
   1. Establish moisture density relationship of in-place sub-grade in accordance with ASTM D-698.
   2. Establish moisture density relationship of proposed select fill(s) material in accordance with ASTM D-698.
   3. Perform PI test on proposed select fill material to confirm conformance with the project specifications in accordance with ASTM D-4318.
   4. Gradation of Aggregate in accordance with ASTM C-136.

PART 2 - PRODUCTS

2.01 Soil Materials

A. Top Soil: Shall be rich, friable, sandy loam, free of lumps, debris, wood, roots, Nutgrass, Dallisgrass and reasonably free of other weeds and foreign grasses. Existing topsoil obtained by stripping and meeting the above requirements shall be stockpiled on site.

B. Select Fill: Shall be select non-expansive sandy clay or clayey sand fill with a Plasticity Index (P.I.) of 4 to 12 and a Liquid Limit of 30% of less.

C. Sand: Sand for wall backfill shall be pit run, free of organic matter, clays or other binders (concrete sand) with less than 10% passing the #200 mesh sieve.

D. Non-select Fill: On-site clay material free of debris and vegetation processed so that clods or particles are a maximum of 2" in diameter.

2.02 Accessories

Drainage Fabric:
1. Mirafi Filter Fabric, ASTM D4491.

2.03 On Site Rock

A. Rock Excavated on-site may be utilized as embankment, backfill, subgrade and base material provided it meets the following usage requirements.
   1. Embankment: The maximum dimension of any rock, clod or lump shall be less than the depth of the embankment layer, and in no case shall any rock over two (2) feet in its maximum dimension be placed in an embankment. Any over-sized rock, which is otherwise acceptable material, may be broken to the required dimension and utilized in embankment construction.
   2. Not Used.

2.04 Borrow

This material shall consist of suitable earth material, other than rock, such as loam clay, or other such materials approved by engineer or Geotech that will form a stable embankment.

PART 3 - EXECUTION

3.01 Excavation

A. Construction Methods: The Contractor shall abide by all applicable federal, state and/or local laws governing excavation work. All excavation shall be in accordance with the lines, grades and typical sections as shown on the plans. Unless otherwise shown on the plans, excavation shall be made to the subgrade. Where excavation terminates in unstable soil, the Contractor shall remove the unstable soil and backfill to the required grade.

   Where excavation terminates in loose or solid rock, the Contractor may be required to extend the depth of excavation six inches and to backfill with select material compacted as required.

B. Provisions for Drainage: If it is necessary in the execution of the work to interrupt the natural drainage of the surface, or the flow of artificial drains, the Contractor shall provide temporary drainage facilities that shall prevent damage to public or private interest and shall restore the original drains as soon as the work shall permit. The Contractor shall be held liable for all damages which may result from neglect to provide for either natural or artificial drainage which his work may have interrupted.

C. Excess Excavation: Excavation in excess of that needed for construction shall be disposed of by the Contractor at no additional cost to the Owner. In general, excess excavation shall be used in widening of embankments, flattening of slopes, etc. but, if it becomes necessary to waste any material, it shall be disposed of in such a manner as to present a neat appearance and to not obstruct proper drainage or cause injury to any improvements or abutting property.

3.02 Embankment

A. Construction Methods: Prior to the placing of any embankment, all clearing and grubbing, and site preparation shall have been completed. Stump holes or other small excavations within the limits of the embankment shall have been backfilled before commencing the subgrade construction. The surface of the ground, including plowed or loosened ground or small ditches or washers, shall be restored to approximately its original slope.
   1. The surface of hillsides shall be loosened by the scarifying or plowing to a depth of not less than four inches or cut into steps before embankment materials are placed. The embankment shall then be placed in layers as hereinafter specified, beginning at the low side in part widths as the embankment is raised. The material which has been loosened shall be re-compacted simultaneously with embankment material placed at the same elevation. Where embankment is to be placed over or adjacent to existing embankments, the slopes shall be plowed or scarified to a depth not less than four inches and the embankment built up in successive players, as hereinafter specified, to the level of the old embankment before its height is increased. Then, the old embankment shall be scarified and re-compacted with the next layer of embankment. The total depth of the scarified and added materials shall not exceed the permissible depth of the layer.
   2. All embankments for road beds or pavements shall be constructed in layers approximately parallel to the finished grade of the street and shall be so constructed as nearly as possible to conform to the cross section of the subgrade section. Embankments shall be constructed to the established grade and to the shape of the typical section shown on the plans, and each section shall conform to the detailed sections of slopes. After completion of the embankment, it shall be continuously maintained to its finished section and grade until the project is accepted.

3. Earth embankments shall be constructed in successive layers, for the full width of specified depth or cross sections; and in such length as are suitable for the sprinkling and compaction methods to be used. Each layer of earth embankment shall be uniform as to material, density, and moisture content before beginning compaction. Prior to compaction, the layers shall not exceed six inches in depth for pneumatic tire rolling or eight inches in depth for rolling with other types of rollers.
4. Earth embankment placed adjacent to and over pipes, culverts, and other structures shall be of suitable material and shall be placed in successive layers approximately horizontal. Layers of embankment shall be brought up uniformly on each side of the structure, and special care shall be taken to prevent any wedging action against the structure. For such distances along embankments adjacent to structures where it is impracticable to obtain compaction by rolling, the embankment material shall be placed in layers not exceeding six inches in depth of loose material wetted uniformly to the moisture content just above optimum; and shall then be compacted by mechanical hand compactors or other approved methods, maintaining the required moisture content by additional sprinkling, if necessary, supplemented by such hand work as is necessary to secure a uniform and thoroughly compacted fill, until each layer has been uniformly compacted.
5. All earth, cuts, full of part width in the side of a hill, which are not required to be excavated below subgrade elevation for base or backfill, shall be scarified to a uniform depth of not less than six inches below grade shown on the plans; and the materials shall be mixed and reshaped by blading and then sprinkled and rolled in accordance with the hereinabove outlined requirements for earth embankments.

B. Density Testing: For each layer of earth embankment and select material, the relative compaction of the embankment shall be as shown on the plans. After each section of earth embankment or select material is completed, moisture-density tests shall be made as follows:

Paved Areas/Structural Foundations - minimum of one test per 2000 sf.
Sidewalk and grassed areas - minimum of one test per 3000 sf.

3.03 Backfill for Structures

A. Preparation:
1. Prior to backfilling below grade walls, verify that preceding work has been satisfactory completed, including membrane waterproofing and sub-soil drainage system.
2. Verify that forms, trash, debris and any temporary shoring has been removed.
3. Verify that basements walls or other earth retaining walls shown on the plans are supported as required on the structural drawings.

B. Grade Beams: Backfill with select fill. Place backfill in layers not exceeding 8" loose depth, compact to density specified elsewhere.

C. Basement Walls: Backfill with select fill and as noted in sections and details on the drawings. Extend backfill to within 2 feet of established rough grade. Place backfill in layers not exceeding 8" loose depth and compact to 95% Standard Proctor. Backfill final one foot with approved clay material.
1. When planting is scheduled adjacent to building, hold top of clay fill down to depth required for placement of top soil.
2. When pavement is scheduled adjacent to wall, backfill with select fill and carry it to the required sub-grade elevation required for pavements.

3.04 Subgrade Preparation for Pavements

A. Scarify existing soil prior to placing any fill material or providing soil stabilization. Compact in-place material to a minimum of 95% Standard Proctor density.

B. Place fill material in non-planting areas (or stabilized soil) in 8" loose lifts, compact each lift to 95% Standard Proctor density.

C. When subgrade is scheduled to receive soil stabilization, provide as required and specified.

3.05 Grading

A. Uniformly grade all areas including adjacent transition areas and at all miscellaneous ground structures, curbs and walks, grade surrounding area uniformly to top of curb, walk or structure unless shown otherwise.

B. Finish Grading: Grade area adjacent to building lines to drain away from structures and to prevent ponding. Finish surfaces to be free from irregular surface changes.

C. Topsoil: Where areas are designated as planting, hold down subgrade 6". Fill with topsoil required finish grade or to top of surrounding ground structures. Top soil shall be placed to a depth of 6", spread and hand raked to required finish grades. Top soil shall be placed over all fill areas, areas designated as planting and all areas not covered by building or pavement included in this contract. Coordinate topsoil placement and requirements with landscape work.

END OF SECTION

PART 1 - GENERAL

1.01 Section Includes

A. Work included in this Section, while not all inclusive but listed as a guide shall include.
   1. Furnishing of all labor, tools, equipment and incidentals to complete the work.
   2. Layout of the work.
   3. All required excavation within the limits of the work area.
   4. Removal, proper utilization or disposal of all excavated material.
   5. Compacting, shaping and finishing of all subgrade in conformity to the alignment, cross section, and elevation shown on the plans.
   6. Sprinkling for dust control.

B. Submit complete laboratory analysis of soil material proposed for fill material. Testing by City's independent lab.
   1. Establish moisture density relationship of in-place sub-grade in accordance with ASTM D-698.
   2. Establish moisture density relationship of proposed select fill(s) material in accordance with ASTM D-698.
   3. Perform PI test on proposed select fill material to confirm conformance with the project specifications in accordance with ASTM D-4318.

1.02 Related Sections

A. Coordinate the work of this Section with the Work of other Sections as required to properly execute the Work and as necessary to maintain satisfactory progress of the work of other Sections. Other Sections containing related work include but are not limited to the following:
   1. Site Clearing – Section 31 10 00
   2. Earth Moving - Section 31 20 00

1.03 References

Meet requirements and recommendations of applicable portions of Standards listed.

A. ASTM D698 - Laboratory Compaction Characteristic of Soil Using Standard Effort (12,400 lb/ft;).

B. ASTM D4318 - Liquid Limit, Plastic Limit and Plasticity Index of Soils.

C. Texas Department of Transportation Standard Specifications for Construction of Highways, Streets, and Bridges, 2004, TxDOT.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 General

After the excavation or embankment has been substantially completed, the subgrade shall be brought to the proper alignment, cross-section and elevation, so that after rolling and subsequent finishing operations, it shall conform to the correct configuration and dimensions as indicated on plans.

3.02 Equipment

All equipment necessary for the construction of this item shall be suitable for the work considering the confined work area and shall be approved by the Owner's Representative as to condition before the contractor shall be permitted to begin construction operations on which the equipment is to be used. Hand operated mechanical tampers may be used.

3.03 Compaction

Compaction shall consist of the equipment operation, as herein specified discretion.

A. Compaction Methods: The method of compaction shall be left to the discretion of the contractor. Each layer of fill, if dry, shall be wetted uniformly to the moisture content required to obtain the desired density and shall be compacted by means of tamps or rammers.

3.04 Finished Subgrade

After completion of the compaction and immediately ahead of the application of pavement, the subgrade shall then be tested with templates or string lines by the Contractor. All irregularities which develop in excess of one-half inch in a length of 16 feet (12.5 mm in 5M) measured longitudinally shall be corrected by loosening, adding or removing material; reshaping; and recompacting by sprinkling and rolling. The completed subgrade shall have a uniform density of not less than of the maximum density, as shown on the plans, determined by ASTM D 698. Moisture content shall be within minus -2 to plus +4 of optimum.

The subgrade shall be maintained in a smooth, compacted condition, in conformity with the required pavement section and established grade, until the pavement is placed, and shall be kept wetted down sufficiently in advance of placing any pavement to ensure its being in a firm and moist condition for at least two inches below surface of the prepared subgrade. Only such subgrade as is necessary for the satisfactory prosecution of the work shall be completed ahead of the placement of pavement. Complete drainage of the subgrade shall be provided at all times.

3.05 Sprinkling for Dust Control

Sprinkling for dust control shall consist of the authorized application of water on those portions of the projects as shown on the plans or as directed and herein specified.

The Contractor shall operate a sprinkler which shall insure the distribution of water in a uniform and controllable rate of application. It shall be the Contractor's continuous responsibility at all times including nights, holidays, weekends, etc., until acceptance of the project by the Owner's Representative, to maintain the project free of dust in a manner which shall cause the least inconvenience to the public.

3.06 Compaction Tests

The completed subgrade shall be tested for compaction and moisture content at the rate of one test per 2,000 square foot. Testing by City's independent lab. Contractor to notify City Supervision three (3) days prior to set up.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes construction dewatering.

1.02 PERFORMANCE REQUIREMENTS

A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control ground-water flow into excavations and permit construction to proceed on dry, stable subgrades.

1.03 SUBMITTALS

A. Shop Drawings for Information: For dewatering system. Show arrangement, locations, and details of wells and well points; locations of headers and discharge lines; and means of discharge and disposal of water.

1. Include Shop Drawings signed and sealed by the qualified professional engineer responsible for their preparation.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with water disposal requirements of authorities having jurisdiction.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.

1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site and surrounding area.
2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

3.02 INSTALLATION

A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.

B. Before excavating below ground-water level, place system into operation to lower water to specified levels. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed, or until dewatering is no longer required.

C. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.

1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.

D. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.

1. Maintain piezometric water level a minimum of 24 inches below surface of excavation.

E. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water in a manner that avoids inconvenience to others. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction (City).

F. Provide standby equipment on-site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to Owner.

1. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches (900 mm) below overlying construction.

G. Damages: Promptly repair damages to adjacent facilities caused by dewatering operations.

END OF SECTION

SECTION 31 63 29
Drilled Piers
Page 1 of 4

PART 1 - GENERAL

1.1 SUMMARY

A. Description of Work: Furnish all labor, materials, services, equipment and appliances required in conjunction with drilled pier foundations complete, including, but not limited to the following:
   1. Layout of drilled piers.
   2. Excavation of drilled piers.
   3. Temporary steel casings – if required.
   4. Furnishing and placing reinforcing steel.
   5. Furnishing and placing concrete.
   6. Placing anchor bolts for steel columns.
   7. Removal of spoil (excavated material) resulting from drilled pier excavations.

B. The extent of drilled piers is shown on the drawings, including locations, diameters of shafts, elevation of top bearing stratum for bidding purposes, top of pier elevations, reinforcement, and details of construction.

C. Related work specified in other sections:
   1. Testing Laboratory Services: Section 01 41 00.
   2. Soil Investigation Data: Section 02 20 00.
   3. Concrete Reinforcement: Section 03 20 00.
   4. Cast-in-Place Concrete: Section 03 30 00.

1.2 QUALITY ASSURANCE

A. Pier drilling contractor shall be required to submit proof of qualifications requirements including:
   1. Minimum of 5 previous projects of similar scope and nature or larger.
   2. Verify having been in business for a minimum of three years.

B. Testing laboratory services:
   1. Refer to section 01 41 00 for additional information concerning laboratory services in conjunction with drilled pier work.
   2. The contractor shall pay for the services of an independent testing agency to design the concrete mix in conjunction with drilled piers and to perform continuous pier drilling observations.
   3. Contractor shall give a minimum of 2 days notice to geotechnical consultant for services in conjunction with drilled piers.

C. Drilling Log:
   Geotechnical Representative shall keep an exact log of each pier, regardless of soil conditions, indicating:
   1. Pier number.
   2. Pier location.
   3. Depth drilled through overburden.
   4. Depth drilled in bearing stratum.

5. Elevation of ground surface.
6. Top elevation of concrete.
7. Top elevation and length of casing.
8. Diameter of shaft.
9. Diameter and type of bell (if bells are required).
10. Estimated inflow of water, source, and depth in bottom of hole when concrete is placed.
11. Description of bearing stratum.
12. Pumping required.

1.3 JOB CONDITIONS

A. Scheduling:
   . Schedule pier drilling so that piers will be filled with concrete within 8 hours after drilling.
   . Fill each pier with concrete not later than the same day it is drilled.

PART 2 – PRODUCTS

2.1 DRILLING EQUIPMENT

A. The equipment used shall be adequate to drill the sizes indicated to depths necessary for a stable foundation, giving consideration to subsurface conditions reported by the Geotechnical Investigation.

2.2 MATERIALS

A. Concrete Reinforcement: As specified in Section 03 20 00.

B. Cement, Aggregates and Admixtures: As specified in Section 03 30 00.

2.3 MIXES

A. As specified in Section 03 30 00.

PART 3 – EXECUTION

3.1 CONSTRUCTION

A. Drilling
   1. Drill piers with power auger foundation drilling rig designed for that purpose. Drill piers vertically, to diameters shown on drawings.
   2. If caving or substantial amounts of ground water are encountered, use casings, if required, to prevent caving and exclude water.

B. Casings
   1. Protective steel casing, at least as large in inside diameter as the nominal shaft size and of sufficient wall thickness to resist crushing by hydrostatic and earth pressures, shall be

installed in each pier hole when needed, in the judgement of the Foundation Inspector (s), to prevent caving or fall-in.

C. Casing Removal
   1. An initial jerk of “2” to “4” shall be allowed to start the lift; thereafter, while being removed from the pier hole, the casing must be kept plumb and must be pulled with a smooth, vertical motion (no rotation permitted), without jerks. Vibration of the casing during pulling is not approved. Maintain sufficient head of concrete to prevent reduction in diameter of pier shaft by earth pressure and to prevent extraneous material from mixing with fresh concrete. Coordinate withdrawal of temporary casings with concrete placement to maintain a sufficient need of concrete above casing bottom.
   2. Where cutoff elevation is below ground level, maintain protective casing to the ground surface if necessary to prevent detrimental caving or intrusion of shallow soils into the shaft.
   3. Dowels shall be placed and positioned after the casing has been pulled and the surface of the concrete has been established.

D. Removal of Groundwater Seepage
   1. Water above an average depth of 2” above the bottom of the excavation shall be pumped or removed before placement of concrete. If water cannot be held below this level long enough for concrete to be placed in the normal manner, place concrete by one of the following methods:
      a. Use of a submersible pump in the bottom of a straight hole or in a sump excavated in the bottom of a bell, with concrete being placed to cover the intake pipe before the pump is lifted.
      b. Use of a Tremie pipe or “elephant’s truck”.
      c. Use of pumped-in concrete discharging through a pipe below the water and below the surface of the concrete in the hole.

E. Allowable Tolerances:
   1. The piers shall be installed as indicated on the Drawings and in accordance with these Specifications. No pier shall be off center from its design locations more than 1/24 of the shaft diameter or 3”, whichever is less measured at the top of the pier. No vertical pier shall be out of plumb more than 1% of its length. All piers and shafts shall be at least as large in diameter as indicated on the Drawings. Deviations from underream configurations (if required) may be made only with prior written approval of the Structural Engineer.
   2. If any of the above tolerances are exceeded, additional construction (including costs of engineering and redesign) as required by the Structural Engineer, shall be paid for by the Contractor.

3.2 PLACING REINFORCING STEEL AND CONCRETE

A. Do not place steel or concrete until pier holes have been inspected, logged and approved by the Testing Laboratory.

B. Reinforcing steel shall be installed as indicated on the Drawings. All steel shall be free from excessive rust, mud or any foreign material which would hinder bonding of concrete and

steel. Reinforcement cages shall be straight and shall conform to the design dimensions. Adequate provision shall be made to ensure that the reinforcement steel will remain in place throughout placement of concrete and that specified concrete cover for the reinforcement steel is attained and maintained. The use of precast concrete spacer blocks or “Centraligner” pier sleds by Pieresearch, Arlington, TX (or equal) is recommended for this purpose.

C. After approval of the excavated pier hole by the Testing Laboratory, concrete shall be placed, if necessary, with the use of a drop chute or tremie, limiting free fall to 25’ maximum, such that will not cause segregation of the particles or permit infiltration of water or any other occurrence which would tend to decrease the strength of the concrete or the capacity of the finished pier. All concrete shall be placed in the presence of the Testing Laboratory.

D. Maintain a minimum 3” clearance between bottom of excavation and reinforcement.

3.3 DISPOSAL OF SOIL

Remove spoil from the ground around the excavation before concrete placement is started, and dispose off the site in a legal manner.

END OF SECTION

DIVISION 31

EARTHWORK

SECTION 32 13 13
Portland Cement Concrete Paving

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Work included in this Section, while not at all inclusive but listed as a guide, shall include:

1. Furnish all labor, tools, equipment and incidentals to complete the work.
2. Concrete paving, integral curbs, and miscellaneous other uses.
3. Sawed joints.
4. Sealing of Joints.
5. Expansion joint fillers

1.02 RELATED SECTIONS

A. Coordinate the work of this Section with the Work of other Sections as required to properly execute the Work and as necessary to maintain satisfactory progress of the work of other Sections. Other Sections containing related work include but are not limited to the following:

1. Testing and Inspection Services and Quality Control, as specified.
2. Temporary Storm Water Pollution Control – Section 01 57 23
3. Site Clearing- Section 31 10 00
3. Subgrade Preparation - Section 31 23 13
4. Sidewalks - Section 32 20 00

1.03 QUALITY ASSURANCE

A. Source Quality Control: Testing and Inspection of Concrete as specified.

B. Grade Control: Establish and maintain required lines and grades.

C. Concrete Mix Design Criteria:

1. Contractor shall provide and pay for design of concrete mixes. Design of concrete mixes shall be performed by a testing laboratory selected by Contractor and approved by A/E. Design methods shall be in accordance with ACI 211.
2. For each concrete mix design, make three trial mixes using proposed aggregate, in accordance with ACI 211. Experience Method is acceptable.
3. Check mix designs and revise if necessary wherever changes are made in aggregates or in surface water content of aggregate or workability of concrete.
4. Source Quality Control: Periodically inspect and control concrete mixing and loading of transit mix trucks at batch plant at intervals as agreed to and by Laboratory personnel.
5. Concrete mix designs which are currently being used on TxDOT projects, certified by the concrete supplier are generally acceptable.

1.04 REFERENCE STANDARDS

A. American Concrete Institute (ACI)

1. ACI 211.1-77 - Recommended Practice for Selecting Proportions for Normal and Heavyweight Concrete.
2. ACI 305-77 - Recommended Practice for Hot Weather Concreting.
3. ACI 306-72 - Recommended Practice for Cold Weather Concreting

4. ACI 315-74, Manual of Standard Practice for Detailing Reinforced Concrete Structures.

B. American Society for Testing and Materials (ASTM) (latest edition)

1. ASTM A184 - Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.
2. ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement
3. ASTM A615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
4. ASTM C33 - Concrete Aggregates
5. ASTM C94 - Ready-Mix Concrete
6. ASTM C150 - Portland Cement
7. ASTM C171 - Sheet Materials for Curing Concrete
8. ASTM C260 - Air-Entraining Admixtures for Concrete
9. ASTM C309 - Liquid Membrane - Forming Compound for Curing Concrete
10. ASTM C494 - Chemical Admixtures for Concrete
11. ASTM C618 - Fly Ash and Raw or Calcined Natural Pozzolan for use as a Mineral Admixture in Portland Cement Concrete.
12. ASTM C1549 - C1549-02 Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer
13. ASTM D1190 - Concrete Joint Sealer, Hot-Poured Elastic Type,
14. ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (non-extruding and resilient bituminous types).
15. ASTM D1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

C. Texas Department of Transportation (TxDOT) 2004 Standard Specification for Construction of Highways, Streets and Bridges.

1.05 SUBMITTALS

A. General: Submit in accordance with Division One.

B. Mix Designs: Submit copies of each laboratory trial mix design. Record of previous satisfactory performance for the proposed mix design may be submitted in lieu of above.

C. Product Data: Submit Manufacturer's descriptive literature and installation instructions for specified products.

D. Certificates: Submit Manufacturer's certification that materials meet specification requirements.

1.06 JOB CONDITIONS

A. Environmental Conditions: Except by written authorization of Owner’s Representative, no concrete shall be placed when the air temperature is less than 40ºF (4ºC) and falling but may be placed when the temperature is above 35ºF (2ºC) and rising, temperature taken in shade away from artificial heat. No concrete shall be placed in rain, sleet, snow or on a frozen subgrade.

B. Allowable Concrete Temperatures:

1. Cold Weather: Maximum and Minimum, ASTM C94, conform to ACI 306.
2. Hot Weather: Conform to ACI 305.

C. For Pavement Located in City or Highway Right-of-Way: In the event that any item in these specifications contradicts City or TxDOT construction or material standards and specifications, City or TxDOT standards and specifications shall control, as appropriate.

D. Traffic Control

1. Maintain vehicular and pedestrian traffic as required for other construction activities.
2. Provide barricades, warning signs, and warning lights as required to control traffic, maintain safety, and cause least interruption of work.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Portland Cement: ASTM C150, Type 1.

B. Fly Ash: The use of fly ash will be permitted when the amount and type has been established by laboratory data. The maximum amount allowed shall not exceed 20 percent of absolute volume of the specified cement content.

C. Aggregates: ASTM C33

1. Coarse aggregate: Coarse aggregate shall be washed and shall consist of durable particles of gravel, crushed blast furnace slag, crushed stone or combinations thereof and shall be free from frozen material or injurious amounts of salt, alkali, vegetable matter or other objectionable material either free or as an adherent coating. When white Portland cement is specified, the coarse aggregates used in the concrete shall be light colored. Quality shall be reasonably uniform throughout. Coarse aggregate shall not contain more than 0.25 percent by weight of clay lumps, nor more than five (5.0) percent by weight of laminated and/or friable particles when tested in accordance with Test Method Tex-413-A. Coarse aggregate from each source shall have a wear of not more than 40 percent when tested in accordance with Test Method Tx-410 A.

   Unless otherwise shown on the plans, coarse aggregate from each source will be subjected to five (5) cycles of both the sodium sulfate and the magnesium sulfate soundness test in accordance with Test Method Tex-411-A. When the loss is greater than 12 percent with sodium sulfate and/or 18 percent with magnesium sulfate, further testing will be required prior to acceptance or rejection of the material. A satisfactory record under similar conditions of service and exposure will be considered in the evaluation of material failing to meet these requirements.

   When tested in accordance with Test Method Tex-401-A, the coarse aggregate, including combinations of aggregates when used, shall conform to the gradation requirements shown in Table 1.

TABLE 1
COARSE AGGREGATE GRADATION CHART

		Percent Retained on Each Sieve								
Aggregate Grade No.	Nominal Size In.	2-1/2 in.	2 in.	1-1/2 in	1 in.	3/4 in.	2 in.	3/8 in.	No. 4	No. 8
1	2	0	0-20	15-50		60-80			95-100	
2 (467)*	1-1/2		0	0-5		30-65		70-90	95-100	
3	1-1/2		0	0-5		10-40	40-75		95-100	
4 (57)*	1			0	0-5		40-75		90-100	95-100
5 (67)*	3/4				0	0-10		45-80	90-100	95=100
6 (7) *	2					0	0-10	30-60	85-100	95-100
7	3/8						0	5-30	75-100	
8	3/8						0	0-5	35-80	90-100

Numbers in parenthesis indicate that these gradations conform to corresponding ASTM gradation in ASTM C33

The loss of decantation in accordance with Test Method Tex-406-A plus the allowable weight of clay lumps shall not exceed one (1) percent, or the value shown on the plans, whichever is smaller. In the case of aggregates made primarily from the crushing of stone, if the material is finer than the 200 sieve is definitely established to be the dust of fracture, essentially free from clay or shale, as established by Part III of Test Method Tex-406-A, the percent may be increased to 1.5.

2. Fine aggregate: Fine aggregate shall be washed and consist of clean, hard, durable and uncoated particles of natural or manufactured sand or a combination thereof, with or without a mineral filler. When white Portland cement is specified the fine aggregate used in the concrete shall be light colored. It shall be free from frozen material or injurious amounts of salt, alkali, vegetable matter or other objectionable material and it shall not contain more than 0.5 percent of weight of clay lumps. When the aggregate is subjected to the color test for organic impurities in accordance with Test Method Tex-408-A, the test result shall not show a color darker than standard.

   Unless otherwise shown on the plans, the acid insoluble residue of fine aggregate used in concrete subject to direct traffic shall not be less than 60 percent by weight when tested in accordance with Test Method Tex-612-J.

   When tested in accordance with Test Method Tex-401-A, the fine aggregate or combinations of aggregates, including mineral filler, shall conform to the gradation requirements shown on Table 2.

TABLE 2
FINE AGGREGATE GRADATION CHART

	Percent Retained on Each Sieve							
Aggregate Grade No.	3/8 in.	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
1	0	0 to 5	0 to 20	15 to 50	35 to 75	65 to 90	90 to 100	97 to 100

Where manufactured sand is used in lieu of natural sand, the percent retained on the No. 200 sieve shall be 94 to 100.

Where the sand equivalent value is greater than 85, the retainage on the No. 50 sieve may be 65 to 94 percent.

Fine aggregates will be subjected to the Sand Equivalent Test (Test Method Tex-203-F). The sand equivalent shall not be less than 80 unless otherwise shown on the plans.

For all classes of concrete the fineness modulus shall be between 2.30 and 3.10 as determined by Test Method Tex-402-A.

C. NOT USED

D. Mortar and Grout: Mortar and grout shall consist of one (1) part Portland cement, two (2) parts finely graded sand and sufficient water to provide the desired consistency. Mortar may contain admixtures. Mortar shall have a consistency such that the mortar can be easily handled and spread by trowel. Grout shall have a consistency such that the grout will flow into and completely fill all voids.

When required to prevent color difference, white cement shall be added to produce the color required. When shown on the plans or in the specifications, or when required by the architect, latex adhesive conforming to the requirements of Departmental Material Specification D-9-8110 shall be added to the mortar.

E. Storage of Materials:

1. Cement, Fly Ash and Mineral Filler: All cement, fly ash and mineral filler shall be stored in well ventilated weatherproof buildings or approved bins, which will protect them from dampness or absorption of moisture. Each shipment of packaged cement shall be kept separated to provide easy access for identification and inspection.

2. Aggregates: The method of handling and storing concrete aggregates shall prevent contamination with foreign materials. If the aggregates are stored on the ground, the sites for the stockpiles shall be clear of all vegetation and shall be level. The bottom six (6) inch layer of aggregate shall not be disturbed or used without recleaning.

When conditions require the use of two (2) or more sizes of aggregates, the aggregates shall be separated to prevent intermixing. Where space is limited, stockpiles shall be separated by physical barriers. Aggregates from different sources shall be stored in different stockpiles unless the aggregates are pre-blended.

Methods of handling aggregates during stockpiling and their subsequent use shall be such that segregation will be minimized.

All aggregate shall be stockpiled at least 24 hours to reduce the free moisture content. In order to control absorption, stockpiles shall be sprinkled.

To assure uniform concrete, aggregate stockpiles shall be maintained at reasonable uniform moisture content.

3. Admixtures. Admixtures shall be stored in accordance with TxDOT Item 437, Concrete Admixtures.

F. Measurement of Materials:

Except as noted below, the measurements of materials used in batches of concrete shall be by weight.

Water may be measured by volume or weight.

Cement and fly ash shall be weighed separately from other materials. Weighing of sacked cement will not be required. When sacked cement is used, the quantity of cement per batch shall be based upon using full bags of cement. Batches involving use of fractional bags will not be permitted.

G. Admixtures:

1. Air entraining agents: ASTM C260.
2. Cement dispersing agents: ASTM C494.

H. Water: Clean and potable.

I. Reinforcing Steel:

1. Bar mats: ASTM A184, Grade 60.
2. Deformed billet steel: ASTM A615, Grade 60.

J. Welded wire fabric: ASTM A185.

K. Dowels and Sleeves: Plain round bar dowels, sized as detailed, conforming to reinforcing steel requirements, coated with bituminous paint on one-half or length. Provide sleeves as detailed, closed at one end, and allowing one-inch movement at closed end.

L. Supports: Provide chair spacers and other required supports in accordance with requirements of ACI 315.

M. Joint Assemblies: Metal positioning and supporting devices for expansion and contraction joint assemblies (such as welded wire bar chairs, bar stakes, etc.) Shall be as shown on the plans or may be approved similar devices of equivalent greater strength. The support devices shall secure the joint assembly and dowels within the allowable tolerances while providing no restraint against joint movement. Dowels used in joint assemblies shall be secured in parallel position by a transverse metal brace or may be secured by approved other devices. The devices shall provide positive mechanical connection between the brace and each unit (other than by wire tie) and prevent transverse movement of each load transmission device.

N. Joint fillers, conforming with ASTM D1751.

O. Wood Form: Good grade lumber, sound and free of warp, minimum 2-inch nominal thickness, except where extremely short radio of curves require thinner forms.

P. Curing compound: Liquid membrane, ASTM C309, Type 2 white pigmented.

Q. Curing sheets: ASTM C171.

R. Joint Sealing Compound: Hot rubber compound or silicone sealing compound, as per General Notes or as approved.

2.02 CONCRETE MIX

A. Concrete Quality: In accordance with approved mix design and following requirements:

1. Slump: 5" maximum for flatwork, 6" maximum for catch basins, etc. or as specified by City or TxDOT Items 360 & 421, for concrete located in R-O-W.
2. Compressive strength: Not less than 3,000 psi at 28 days or as otherwise noted or specified in the Contract Documents.
3. Entrained air: Concrete mix shall contain 5% entrained air plus or minus 1%.
4. Admixture: Introduce in quantities and according to methods recommended by admixture manufacturer.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that earthwork is completed to correct line and grade.

B. Check that subgrade is smooth, compacted and free of frost or excessive moisture.

C. Do not commence work until conditions are satisfactory.

3.02 MAINTAINING SUBGRADE PRIOR TO PLACING CONCRETE

A. Provide complete drainage of subgrade during entire construction period. On elevated grades, direct surface water to gutters, paved ditches or drains by proper grading of subgrade.

B. Maintain subgrade in a smooth, compacted condition at required section and grade until concrete pavement is ready to be placed. Keep subgrade thoroughly wetted down sufficiently in advance of placing concrete to insure a firm moist subgrade condition for at least 2 inches below prepared surface.

C. Prepare only a sufficient amount of subgrade in advance of placing of concrete to enable work to proceed smoothly and effectively. Avoid placing of equipment or hauling equipment over completed subgrade until placement of concrete has been completed.

D. The use of sand cushion for subgrade leveling purposes is prohibited.

3.03 INSTALLATION

A. Forms:

1. Set forms accurately to required grades and alignment
2. Adequately brace to withstand loads applied during concrete placement.
3. Install flexible or curved forms of wood or metal for curves with radius of 300 feet or less.
4. Leave forms in place for a minimum of 12 hours after completion of the finishing operation.

B. Joint Fillers:

1. At driveway to street connections, accurately shape joint filler to concrete section per Paving Details.
2. Securely fasten filler in place and in contact with subgrade for its entire length. Provide holes for dowel bars not more than 1/8" larger than bar diameter.
3. Where joint sealant or sealing compound is scheduled, provide removable tacked-on strips to provide a recess for sealant or compound.

C. Reinforcement:

1. Install reinforcing steel in middle of the pavement thickness.
2. Steel shall be free of rust or mill scale, dirt or oil.
3. Reinforcing shall be supported by chairs. Pulling-up reinforcing that is laying on the subgrade while the pour is under way will not be permitted.

D. Placing and Finishing:

1. Placing: Deposit concrete so that specified slab thickness will be obtained after vibrating and finishing operations. Minimize handling to prevent segregation. Consolidate concrete by suitable means to prevent formation of voids or honeycombs. Exercise care to prevent disturbance of forms.
2. Finishing: After consolidation and screeding, float concrete level to within specified tolerances. Use a straight edge to level and test surface in longitudinal direction to required grade. Finish surface to a heavy broomed finish. Finish edges to provide a smooth dense surface with 1/8" radius.

3.04 JOINTS

A. Intentional stoppage of concrete placing shall be at planned location of either an expansion joint or construction joint.

B. When stoppage occurs at an expansion joint, install joint assembly as shown on drawings for an expansion joint, with a bulkhead of sufficient section drilled to accommodate required dowels.

C. When stoppage occurs at a construction joint, install joint assembly as detailed on drawings for a construction joint.

1. Provide a bulkhead of sufficient section to prevent deflection, or loss of shape of concrete section. Drill bulkhead to permit continuation of longitudinal reinforcing steel through construction joint.

2. Immediately upon unintended stoppage of concrete placing, place available concrete to a line and install bulkhead perpendicular to surface of pavement and at a required elevation. Place and finish concrete to this bulkhead. Remove and dispose of concrete remaining on subgrade ahead of bulkhead.
3. When placing of concrete is resumed before concrete has set to extent that concrete will stand on removal of bulkhead, new concrete shall be rodded with the first; otherwise, carefully preserve joint face.
4. An edge created by a construction joint of this type shall have a joint steel seal space as detailed on drawings.
5. Install standard concrete street header as per City standards when joining old pavement to new pavement, unless otherwise required on the drawings.

D. Provide sawed dummy joints spaced apart as indicated on the drawings (approximately 15 ft on center maximum).

1. Saw joints after completion of finishing operations as soon as concrete has hardened to extent necessary to prevent raveling of joint or damage to adjacent concrete surfaces.
2. Saw joints same day that concrete is placed except that sawing of joints in concrete placed late in day may be delayed until morning of following day.
3. In any event, saw joints within 18 hours after placing concrete.
4. Use a power-driven concrete saw made especially for sawing concrete and maintain in good operating condition.
5. Saw blades shall make a clean, smooth cut, producing a groove 1/8" to 3/16" wide and depth equal to 1/4 of slab thickness, minimum one-inch depth.
6. Do not cut existing reinforcement.
7. Joints should be continuous across the slab unless interrupted by full-depth, pre-molded joint filler, and should extend completely through curb.
8. Joint openings wider than one-fourth inch shall be cleaned and sealed before opening area to traffic.

E. Expansion joints or isolation joints shall be used to isolate fixed objects abutting or within the paved area. They shall contain pre-molded joint filler for the full depth of the slab and shall be sealed prior to opening to traffic.

3.05 CURING

A. Apply membrane curing compound at a uniform rate of approximately 200 square foot per gallon, or as recommended by manufacturer, as soon as finishing operation has been completed and concrete has lost its water sheen.

B. At contractor's option, curing sheets may be used, held in place with moist sand.

C. Curing procedure shall protect concrete, including concrete edges and curbs, against loss of moisture and rapid temperature change for a period of not less than 4 days from beginning of curing operation, without damage or marking of finished concrete surface.

D. Do not allow traffic on concrete for a minimum period of 7 days after placing.

3.06 COLD WEATHER PROTECTION

A. When concrete is placed in cold weather and the temperature may be expected to drop below 35ºF, provide cold weather protection in accordance with ACI 306.

B. When ambient temperature is expected to fall below 32ºF during day or night, cover concrete with protective material to a sufficient depth to prevent freezing of concrete.

C. Protect concrete from freezing temperatures for a minimum of 5 days after placing.

D. Remove and replace concrete damaged by frost action.

3.07 SEALING JOINTS

A. Cleaning joints: Prior to applying joint sealing compound, clean joints with compressed air to obtain a clean and dry surface on face of joints so that sealing material will adhere.

B. When hot rubber compound is called for in the General Notes:

1. Melt joint sealing compound to proper consistency for pouring using continuous agitator type kettle with calibrated thermometer. Do not heat above 450□F.
2. Continuously apply joint sealing compound full depth of joint recesses and flush with concrete surface, in accordance with manufacturer's directions. Do not apply when ambient temperature is below 35ºF.

C. When silicone sealing compound is called for in the General Notes:

1. Apply sealing compound as per manufacturer's instructions.

3.08 PAVEMENT STRENGTH TEST – Testing by City's Independent Lab

A. During the progress of the work, the cast test cylinders to maintain a check on the compressive strengths of the concrete being placed.

B. Four test cylinders shall be taken from a representative portion of the concrete being placed for every 100 cubic yards of concrete pavement placed, but in no case, shall less than one set of cylinders be taken from any day's placement.

After the cylinders have been cast, they shall remain on the job site undisturbed for 24 hours and then transported, moist cured, and tested by the Testing Laboratory designated or approved by the Owner's Rep.

One of the cylinders in each set shall be tested in seven days; and two cylinders in each set tested in 28 days. Fourth cylinder to be held and tested in 56 days if 28-day breaks are low.

If the 28-day test results indicate deficient strength, the Contractor may, at his option and expense, core the pavement in question and have the cores tested by an approved laboratory to override the results of the cylinder tests.

END OF SECTION

SECTION 32 17 23
Pavement Markings

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Work included in this Section, while not all inclusive but listed as a guide, shall include:

1. Furnish all labor, materials, services, equipment and appliances required in conjunction with painted pavement markings.
2. Layout all markings.
3. Four inches (4") white or yellow color stripping for parking spaces in parking lots as indicated on site plan or other that matches existing striping.

1.02 RELATED SECTIONS

A. Coordinate the work of this Section with the Work of other Sections as required to properly execute the Work and as necessary to maintain satisfactory progress of the work of other Sections. Other Sections containing related work include but are not limited to the following:

1. Portland Cement Concrete Paving - Section 32 13 13

1.03 REFERENCES

A. American Society for Testing and Materials, ASTM.

B. Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges, 2004, TxDOT.

C. City Standards and Details as applicable.

1.04 QUALITY ASSURANCE

A. Subcontractor for work of this section shall be of firm specializing in application of pavement markings.

B. Contractor shall submit all products/materials along with the warranty terms available for Owner review and approval prior to construction.

1.05 PROJECT CONDITIONS

A. Concrete paving and curbs shall have been in place a minimum of 14 days prior to application of pavement markings.

B. Do not apply marking paint when weather is foggy or rainy, or ambient or pavement temperature are below 40 F, nor when such conditions are anticipated during eight hours after application.

C. Hot-applied thermoplastic striping and prefabricated markings shall only be used where required by the local governing authorities, where specified on the Plans or other project documents, or where specifically approved by the Owner. Under other circumstances, paint shall be the default marking material.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Paint for markings: Equal to Standard Paints, Inc., 1007 W. Commerce Street, Dallas, Texas or Sherwin Williams Traffic Marking Paint, conforming to Fed. Spec. TT-P-115E, Type III, or approved equal.

B. Hot-applied thermoplastic striping: Furnish in accordance with TxDOT DMS-8220, “Hot Applied Thermoplastic”, most recent edition.

C. Prefabricated pavement markings: Furnish prefabricated pavement marking materials meeting the requirements of TxDOT DMS-8240, “Permanent Prefabricated Pavement Markings,” most recent edition. Store all materials in a weatherproof enclosure and prevent damage during storage.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine surface on which pavement markings are to be applied and report any unsatisfactory conditions which will prevent the proper application of markings to the Contractor.

3.02 PREPARATION:

A. Thoroughly clean surfaces to receive pavement markings. Layout markings in conformance with drawings. Surfaces to receive markings shall be dry.

B. When applying markings to recently-poured concrete pavement, check compatibility of marking material(s) with any concrete admixtures and surface treatments used and ensure that appropriate steps are taken per the manufacturer’s recommendations to ensure thorough and complete bonding of the markings to the treated concrete.

3.03 APPLICATION – Apply products per recommendations of Manufacturer.

A. Equipment: Hand operated push-type machines of a type commonly used for application of paint to pavement surfaces. Use hand-operated spray guns in areas where the push-type machines cannot be used.

B. Application of Paint: Apply paint in one coat evenly to clean, dry surfaces. Apply marking paint at not less than rate of one gallon per 100 Sq. Ft. (equivalent to approximately one gallon for 300 lineal feet of 4" wide strip), to result in uniform complete coverage of surfaces to be painted. Apply paint only when air and surfaces temperatures are above 40 F. Provide guide lines and template necessary to control paint application. Edges of markings shall be sharply outlined.

C. Application of Thermoplastic or Prefabricated Markings: Application shall conform to TxDOT Standard Specifications, Item 666 “REFLECTORIZED PAVEMENT MARKINGS” or Item 668 “PREFABRICATED PAVEMENT MARKINGS”, as appropriate.

D. Protection: Protect newly painted surfaces from damage by vehicles during time required for paint to harden sufficiently to withstand traffic. During period of high wind, discontinue painting operations. Protect thermoplastic or prefabricated markings as prescribed by the appropriate TxDOT specifications or manufacturer's directions.

3.04 CLEANING

A. Cleanup all debris caused by the work of this section, keeping the premises clean and neat at all times.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Work included in this Section, while not all inclusive but listed as a guide, shall include:

1. Furnishing of all labor, tools, materials, equipment and incidentals required to complete the work.
2. Concrete sidewalks, concrete for planters and steps, and barrier free ramps.
3. Expansion joint fillers.
4. Sawed joints.
5. Sealing of joints.

1.02 RELATED SECTIONS

A. Coordinate the work for this Section with the Work of other Sections as required to properly execute the Work and as necessary to maintain satisfactory progress of the work of other Sections. Other Sections containing related work include but are not limited to the following:

1. Testing and Inspection Services – As Specified in Contract Documents
2. Subgrade Preparation - Section 31 23 13
3. Portland Cement Concrete Paving - Section 32 13 13

1.03 REFERENCES STANDARDS

A. American Concrete Institute (ACI)

1. ACI 305-77 - Recommended Practice for Hot Weather Concreting.
2. ACI 306-72 - Recommended Practice for Cold Weather Concreting.

B. American Society for Testing and Materials (ASTM) (latest edition).

C. Texas Department of Transportation Standard Specifications for Construction of Highways, Streets, and Bridges, 2004, TxDOT.

1.04 QUALITY ASSURANCE

A. Source Quality Control: Testing and Inspection as specified.

B. General: Concrete sidewalks shall have a minimum thickness of four inches or as specified on plans; except that sidewalks constructed in driveways approach sections shall have a minimum thickness equal to that of driveway approach or as called by plans and specifications within the limits of the driveway approach. The construction of the driveway approach shall include the variable height radius curb in accordance with the plans and details.

C. Concrete Mix Design Criteria:

1. Contractor shall provide and pay for design of concrete mixes. Design of concrete mixes shall be performed by a testing laboratory selected by Contractor and approved by the A/E. Design methods shall be in accordance with ACI 211.
2. For each concrete mix design, make three trial mixes using proposed aggregate, in accordance with ACI 211. Experience Method is acceptable.
3. Check mix designs and revise if necessary wherever changes are made in aggregates or in surface water content of aggregate or workability of concrete.

1.05 JOB CONDITION

A. Environmental Conditions: See Section 32 13 13

B. Allowable Concrete Temperature: See Section 32 13 13

PART 2 PRODUCTS

2.01 MATERIALS

A. Portland Cement: ASTM C150, Type 1.

B. Aggregates: ASTM C33. Refer to Portland Cement Concrete Paving 32 13 13

C. Admixtures: See Section 32 13 13

D. Fly Ash: See Section 32 13 13

E. Water: Clean and potable.

F. Reinforcing Steel:

1. Bar mats: ASTM A184, Grade 60.
2. Deformed billet steel: ASTM A615, Grade 60.

G. Welded wire fabric: ASTM A185.

H. Dowels and Sleeves: Plain round bar dowels, sized as detailed, conforming to reinforcing steel requirements, coated with bituminous paint on one-half or length. Provide sleeves as detailed, closed at one end, and allowing one-inch movement at closed end.

I. Supports: Provide chair spacers and other required supports in accordance with requirements of ACI 315.

J. All expansion joints shall be 1/2-inch redwood or as approved.

K. Wood Form: Good grade lumber, sound and free of warp, minimum 2-inch nominal thickness, except where extremely short radius of curves require thinner forms.

L. Curing Compound: Liquid membrane, ASTM C309, Type 2 white pigmented.

M. Curing Sheets: ASTM C171.

N. Joint Sealing Compound: Hot rubber compound or silicone sealing compound.

2.02 CONCRETE MIX

A. Concrete Quality: In accordance with approved mix design and following requirements:

1. Slump: 5" maximum for flatwork.
2. Compressive strength: Not less than 3,000 psi at 28 days, OR AS NOTED ON PLANS.
3. Entrained air: Concrete mix shall contain 5% entrained air plus or minus 1%.
4. Admixture: Introduce in quantities and according to methods recommended by admixture manufacturer.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that earthwork is completed to correct line and grade.

B. Check that subgrade is smooth, compacted and free of frost or excessive moisture.

C. Do not commence work until conditions are satisfactory.

3.02 MAINTAINING SUBGRADE PRIOR TO PLACING CONCRETE

A. Provide complete drainage of subgrade during entire construction period. On elevated grades, direct surface water to gutters, pave ditches or drains by proper grading of subgrade.

B. Maintain subgrade in a smooth, compacted condition at required section and grade until concrete pavement is ready to be placed. Keep subgrade thoroughly wetted down sufficiently in advance of placing concrete to insure a firm moist subgrade condition for at least 2 inches below prepared surface.

C. Prepare only a sufficient amount of subgrade in advance of placing of concrete to enable work to proceed smoothly and effectively. Avoid placing of equipment or hauling equipment over completed subgrade until placement of concrete has been completed.

D. The use of sand cushion for subgrade leveling purposes is prohibited.

3.03 INSTALLATION

A. Forms:

1. Set forms accurately to required grades and alignment.
2. Adequately brace to withstand loads applied during concrete placement.
3. Install flexible or curved forms of wood or metal for curves with radius of 300 feet or less.
4. Leave forms in place for a minimum of 12 hours after completion of the finishing operation.

B. Joint Fillers:

1. At driveways to street connections, accurately shape joint filler to concrete section.
2. Securely fasten filler in place and in contact with subgrade for its entire length. Provide holes for dowel bars not more than 1/8" larger than bar diameter.
3. Where joint sealant or sealing compound is scheduled, provide removable tacked-on strips to provide a recess for sealant or compound.

C. Reinforcement:

1. Install reinforcing steel in middle of the pavement thickness.
2. Steel shall be free of rust or mill scale, dirt or oil.

D. Placing and Finishing:

1. Placing: Deposit concrete so that specified thickness will be obtained after vibrating and finishing operations. Minimize handling to prevent segregation. Consolidate concrete by suitable means to prevent formation of voids or honeycombs. Exercise care to prevent disturbance of forms.
2. Finishing: After consolidation and screening, float concrete level to within specified tolerances. Use a straight edge to level and test surface in longitudinal direction to required grade. They shall be troweled and then brushed transversely to obtain a smooth uniform brush finish. Joint and sides shall be edged with suitable tools. Finish edges to provide a smooth dense surface with 2" radius.

3.04 JOINTS

A. Intentional stoppage of concrete placing shall be at planned location of either an expansion joint or construction joint.

B. When stoppage occurs at an expansion joint, install joint assembly as shown on drawings for an expansion joint, with a bulkhead of sufficient section drilled to accommodate required dowels.

C. When stoppage occurs at a construction joint, install joint assembly as detailed on drawings for a construction joint.

1. Provide a bulkhead of sufficient section to prevent deflection, or loss of shape of concrete section. Drill bulkhead to permit continuation of longitudinal reinforcing steel through construction joint.
2. Immediately upon unintended stoppage of concrete placing, place available concrete to a line and install bulkhead perpendicular to surface of pavement and at a required elevation. Place and finish concrete to the bulkhead. Remove and dispose of concrete remaining on subgrade ahead of bulkhead.
3. When placing of concrete is resumed before concrete has set to extent that concrete will stand on removal of bulkhead, new concrete shall be rodded with the first: otherwise, carefully preserve joint face.
4. An edge created by a construction joint of this type shall have a joint steel seal space as detailed on drawings.

D. Provide tooled dummy joints spaced as indicated on the drawings, generally the width of the sidewalk.

1. Tool joints after completion of finishing operations as soon as concrete has hardened to extent necessary to prevent raveling of joint or damaged to adjacent concrete surfaces.
2. Joints shall be continuous across the slab.

E. Expansion joints or isolation joints shall be used to isolate fixed objects abutting or within the paved area. They shall contain pre-molded joint filler for the full depth of the slab and shall be sealed prior to opening to traffic. Expansion joints for sidewalks and driveways shall be formed, using expansion joint material of an approved type and shaped to the section. Expansion joints shall be placed in the sidewalks at 40-foot (12M) intervals, unless otherwise shown on the drawings.

F. Where a driveway approach is to be constructed at a location where there exists a separate curb and gutter, said curb and gutter shall be removed for the full width of the gutter to the nearest joint of to a sawed point at the point of radius. On concrete pavement with monolithic curb, the breakout line shall be 12 inches from the face of the curb line and shall be parallel to it and form a right angle with the concrete surface. The breakout line shall be a sawed groove.

3.05 CURING

A. Apply membrane curing compound at a uniform rate of approximately 200 sq. ft. per gallon, or as recommended by manufacturer, as soon as finishing operation has been completed and concrete has lost its water sheen.

B. At Contractor’s option, curing sheets may be used, held in place with moist sand.

C. Curing procedure shall protect concrete, including concrete edges and curbs, against loss of moisture and rapid temperature change for a period of not less than 4 days from beginning of curing operation, without damage or making of finished concrete surface.

D. Do not allow pedestrians on concrete for minimum period of 4 days after placing.

3.06 COLD WEATHER PROTECTION - See Section 32 13 13

3.07 SEALING JOINTS - See Section 32 13 13

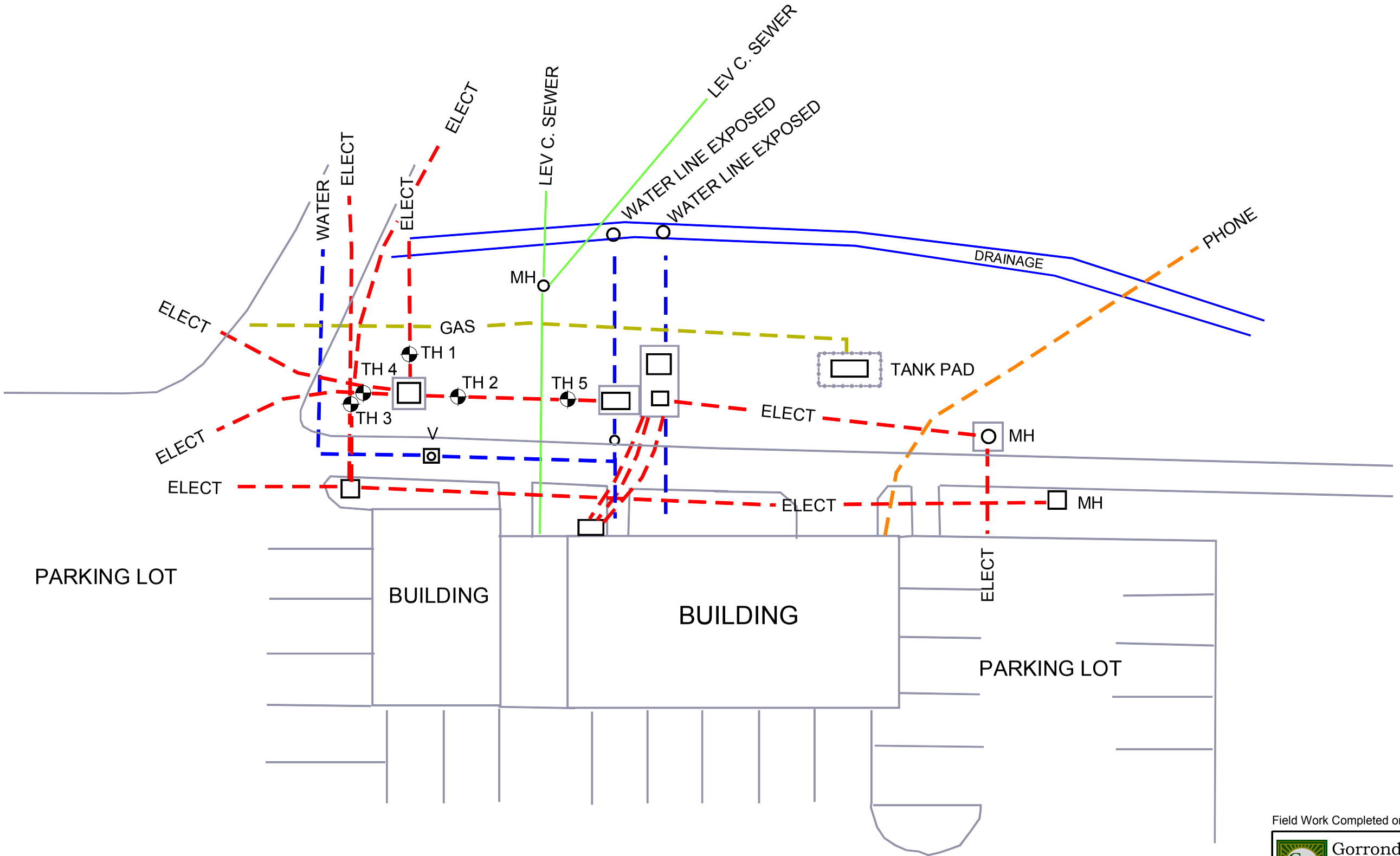
3.08 FIELD QUALITY CONTROL - See Section 32 13 13

A. Inspection and testing as specified.

END OF SECTION

APPENDIX

SUBSURFACE SURVEY



Legend of Utility Color Codes

- RED - Electric, Power, Illumination, Signal
- YELLOW - Gas, Oil, Petroleum, Steam
- ORANGE - Communication, Fiber, Phone Duct
- BLUE - Potable Water, Irrigation
- PURPLE - Fiber Optic
- DARK GREEN - Storm Drain
- LIGHT GREEN - Sanitary Sewer
- CYAN - Cable TV

Notes:

1. This is a field sketch and is therefore not drawn to scale.
2. The locations of utilities depicted herein are approximate only.
3. Any dimensions shown are approximate only and are intended solely to portray the position of utilities relative to other site features.

Field Work Completed on: 3-30-2012 TBPE Firm #F-7933

Gorrondona & Associates, Inc.
Land Surveying
Subsurface Utility Engineering / UC
Geotechnical Engineering / CMT
7524 Jack Newell Blvd South
Fort Worth, TX 76118
817-496-1424

WWTP Switchgear

S.U.E. Field Sketch

Lewisville, TX

DRAWN BY:		G&AI PM:
TH		CH
G&AI PROJECT NO.:	SUE SHEET NO.:	DATE:
COLV1201.00	1 of 1	2012-03-30

Gorrondona & Associates, Inc.
7524 Jack Newell Blvd South
Fort Worth, TX 76118
(817) 496-1424

SUMMARY OF TEST HOLE INFORMATION

Project Name:	LEWISVILLE WWTP SWITCHGEAR	**General Location:** LEWISVILLE	**Field Manager:** Ron, Josh, Adam
Client Name:	CITY OF LEWISVILLE		**Technicians:**
Client Proj. No.:		**City/Town:** LEWISVILLE	**Vacuum Excavation Truck/Trailer:**
G&AI Proj. No.:	COLV1201.00	**County:** DENTON **State:** TX	**Designating Truck:**

Test Hole No.	Utility Size, O.D. (inches)	Utility Material (refer to legend)	Utility Type (refer to legend)	Depth to Top of Utility (feet)	Cross Sectional View	General Utility Direction	Surface Type & Thickness (inches) C - Concrete A - Asphalt NG - Nat. Grd.	ID'd By: 1 - 5/8" iron rod w/cap 2 - Nail/Disk 3 - "X" in Concrete 4 - 5 -	Completion Date	General Test Hole Location BOC - Back of Curb EOP - Edge of Pavement ROW - Right of Way CL - Centerline BL - Baseline N -North S - South E- East W- West FR - Frontage Road
1	17	CONC	E	2.54	⌐	↕	NG - Nat. Grd.	5/8" IR w/cap	3/30/2012	
2	15	CONC	E	2.72	⌐	↔	NG - Nat. Grd.	5/8" IR w/cap	3/30/2012	
3	6	CONC	E	1.96	⌐	↕	NG - Nat. Grd.	5/8" IR w/cap	3/30/2012	
4	14	CONC	E	2.88	⌐	↔	NG - Nat. Grd.	5/8" IR w/cap	3/30/2012	
5	16	CONC	E	3.18	⌐	↔	NG - Nat. Grd.	5/8" IR w/cap	3/30/2012	
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

Notes: Utility Sizes shown are Top of Duct Width

Utility Types:

E - Electric	**BT** - Buried Telephone	**TS** - Traffic Signal
G - Gas	**FOC** - Fiber Optic Cable	**FM** - Force Main
W - Water	**SAN** - Sanitary Sewer	-
PL - Product Line	**STM** - Storm Sewer	-
FL - Fuel Line	**CTV** - Cable Television	-

Utility Materials:

STL - Steel	**PVC** - Polyvinyl Chloride	**CSC** - Concrete/Steel Cylinder
PE - Polyethylene	**DBC** - Direct Buried Cable	**CMP** - Corrugated Metal Pipe
AC - Transite	**RCP** - Reinforced Concrete Pipe	-
CI - Cast Iron	**VC** - Vitrified Clay	-
DI - Ductile Iron	**FG** - Fiberglass	-

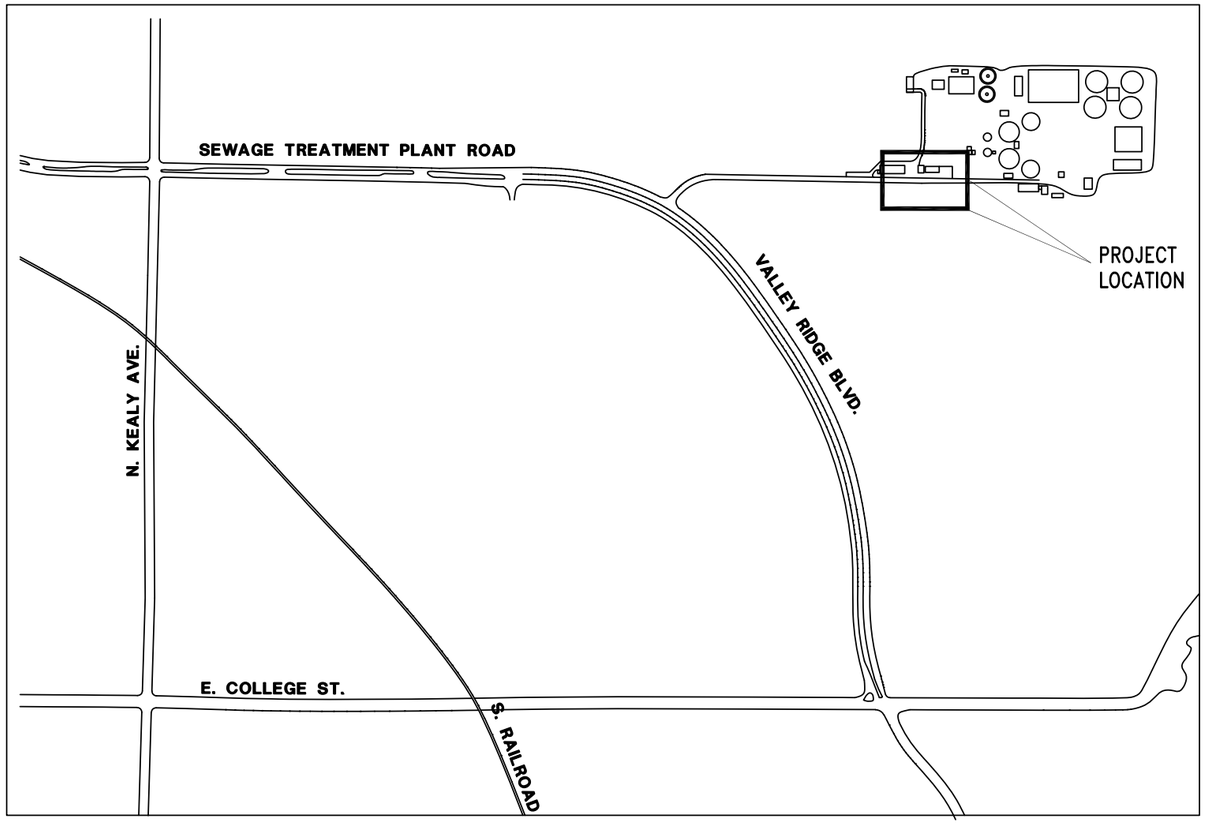
Prepared By: TH Date: 4/3/2012 Checked By: CH Date: CH

CITY OF LEWISVILLE

WASTEWATER TREATMENT PLANT
EMERGENCY GENERATOR

BID DOCUMENT No. 18-23-I
PROJECT No. U1501
AUGUST 2018

SHEET INDEX



LOCATION MAP
SCALE: 1"=600'-0"

0 600 1200
SCALE IN FEET

NORTH

PREPARED BY:

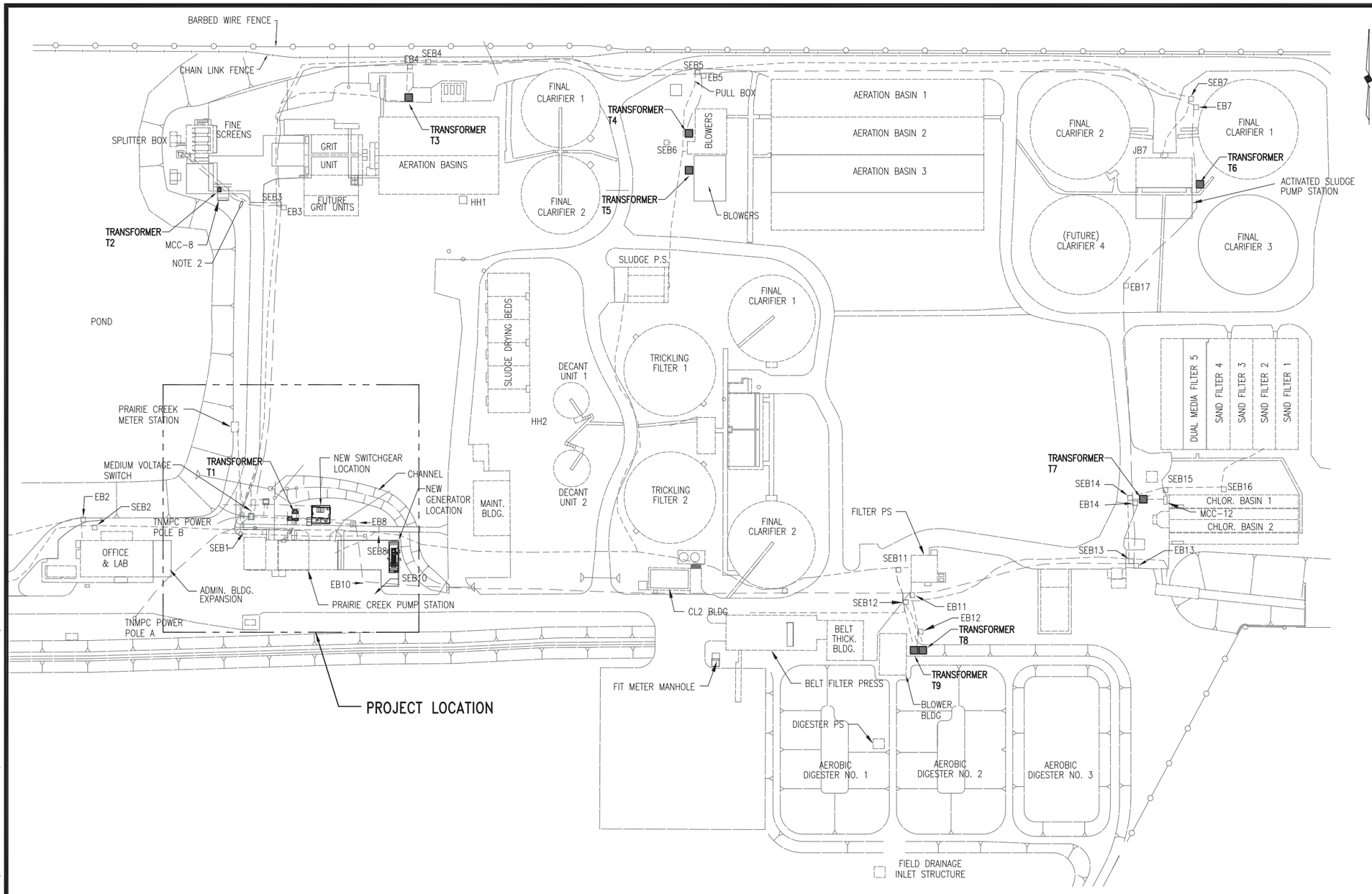
McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240
TEXAS FIRM REGISTRATION No. F-338

IN ASSOCIATION WITH

Charles Gojer and Associates, Inc.
Consulting Engineers
Texas Firm Registration No. F-697
11615 Forest Central Dr. Suite 303
Dallas, Texas 75243 (214) 340-1199

STATE OF TEXAS JOSEPH A. KOTRLA 56351 REGISTERED PROFESSIONAL ENGINEER
8-22-2018
FIRM NO F-338

STATE OF TEXAS CHARLES GOJER 33348 REGISTERED PROFESSIONAL ENGINEER
8-22-18



NOTES:

1. THIS DRAWING WAS EXECUTED BASED UPON THE MOST CURRENT INFORMATION GATHERED IN THE FIELD.

0 60 120

SCALE IN FEET

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

THESE DOCUMENTS ARE FOR BIDDING, CONSTRUCTION, AND PERMIT PURPOSES.
DATE: 7-16-2018
McCREARY & ASSOCIATES, INC.
Consulting Engineers
Dallas, Texas FIRM No. F-338

LEWISVILLE

ENGINEERING DIVISION
CITY OF LEWISVILLE

WASTEWATER TREATMENT PLANT EMERGENCY GENERATOR

PLANT LAYOUT

STATE OF TEXAS
JOSEPH J. KOTRLA
56361
REGISTERED PROFESSIONAL ENGINEER

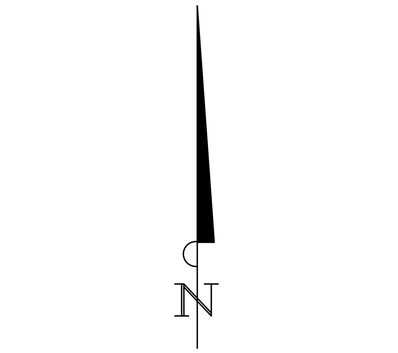
JULY 2018
date

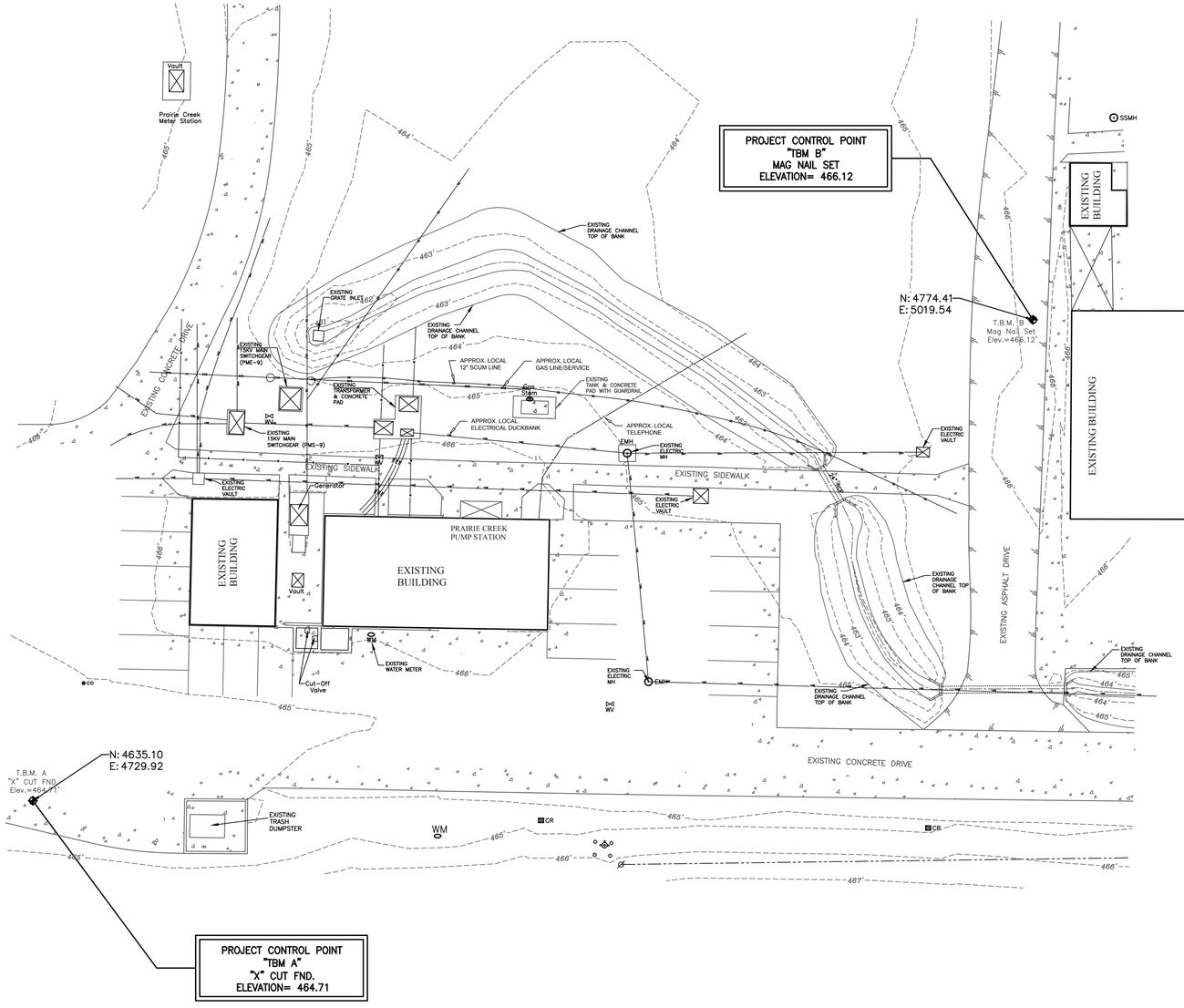
Sheet G2 of 2

BID 18-22PI

REVISED: 7/16/18 – Richard Z:\12.051\Dwg\Electrical\G02 Plant Layout.dwg PLOT SCALE: 1:120 PLOT STYLE: 4V_BHC.ctb PLOTTED BY: Richard ON 7/16/2018

City of Lewisville, Texas





LEGEND

Wire Fence		WV	Water Valve
Wood Fence		WM	Water Meter
Chain Link Fence			Fire Hyrdrant
Concrete		ICV	Irrigation Control Valve
Asphalt		CO	Sanitary Sewer Cleanout
Light Standard		SSMH	Sanitary Sewer Manhole
Guy Wire/Anchor		STMH	Storm Drain Manhole
Utility Pole		GM	Gas Meter
Overhead Wires		GV	Gas Valve

CGA Topo Survey Plan Notes:

1. ALL UNDERGROUND UTILITY INFORMATION DEPICTED ON THIS SURVEY PLAN IS BASED ON FIELD RESEARCH, AVAILABLE INFORMATION FROM THE CITY AS-BUILT RECORDS, AND FIELD DATA COLLECTED BY THE SURVEYOR OF RECORD. ALL UTILITITY LINES SHOWN ARE APPROXIMATE. CHARLES GOJER AND ASSOCIATES, INC. (CGA) CANNOT GUARANTEE THE ACCURACY OR COMPLETENESS OF THESE RECORDS.

2. THIS SURVEY PLAN DOES NOT PROVIDE A DETERMINATION OR OPINION CONCERNING THE LOCATION OR EXISTENCE OF WETLANDS, FAULTLINES, TOXIC OR HAZARDOUS WASTE AREAS, SUBSIDENCE, SUBSURFACE AND ENVIRONMENTAL CONDITIONS OR GEOLOGICAL ISSUES.

3. THIS SURVEY PLAN DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE, EXPRESSED OR IMPLIED.

4. EXCEPT AS SPECIFICALLY STATED OR SHOWN, THIS SURVEY PLAN DOES NOT PURPORT TO REFLECT ANY OF THE FOLLOWING WHICH MAY BE APPLICABLE TO THE SUBJECT TRACT: BUILDING SETBACK LINES; RESTRICTIVE COVENANTS; SUBDIVISION RESTRICTIONS; ZONING OR OTHER LAND-USE REGULATIONS; AGREEMENTS; LEASE AGREEMENTS; AND OWNERSHIP TITLE EVIDENCE.

5. THIS SURVEY PLAN IS BEING INCLUDED IN THE CIVIL CONSTRUCTION DOCUMENT SET FOR INFORMATIONAL PURPOSES ONLY TO AID IN CONSTRUCTION. THE ORIGINAL TOPO SURVEY, WAS USED AS THE FOUNDATION FOR THE ESTABLISHMENT OF DIMENSION CONTROL (BOTH VERTICAL AND HORIZONTAL) AND EXISTING SITE FEATURES (SURFACE AND UNDERGROUND), FROM WHICH CGA'S CIVIL DESIGN DOCUMENTS WERE CREATED. CGA ACCEPTS NO RESPONSIBILITY FOR OMITTIONS OR ERRORS RESULTING FROM INFORMATION PROVIDED BY THE SURVEYOR OF RECORD.

6. REFER TO SHEET C2 FOR ADDITIONAL GENERAL NOTES.

S.U.E. Field Sketch Note:

1. SOME UTILITY INFORMATION DEPICTED ON THIS SURVEY PLAN WAS BASED ON THE S.U.E. FIELD SKETCH PROVIDED BY GORRONDONA & ASSOCIATES, INC. FOR THE WWTP SWITCHGEAR PROJECT DATED 03/30/2012 (G&AI PROJ # COLV1201.00) SEE FULL REPORT FOR ADDITIONAL INFORMATION.

Surveyor's Notes:

1. No boundary survey was performed for this Topographic Survey.

2. No Easements are shown on this Topographic Survey.

3. Elevations shown are based on the TBM #2 and #3, as shown on the Topographic Survey by Jaster-Quitanilla, LLP, dated 12-04-13, Checked by ESB, Field Book 126, Page 70.

Surveyor's Certification:

This survey was completed without the benefit of a current title commitment.
I, Michael B. Arthur, Registered Professional Land Surveyor in and for the State of Texas, hereby certify that the plat hereon represents an actual survey made on the ground and that all lines and dimensions shown are correct to the best of my knowledge. There were no visible conflicts found during the time of this survey, except as shown.

DATE:	SCALE:	DRAWN BY:	CHK'D. BY:	JOB NO.:
04/01/2016	1" = 20'	C.S.H.	M.B.A.	2016-0035

CONTROL POINTS			
I.D.	NORTHING	EASTING	DESCRIPTION
TBM A	N= 4635.10	E= 4729.92	"X" CUT FND. ELEV= 464.71
TBM B	N= 4774.41	E= 5019.54	MAG NAIL SET ELEV= 466.12

BENCH MARKS

BENCHMARK BASE CONTROL POINT
ELEVATIONS SHOWN ARE BASED ON THE TBM #2 AND #3, AS SHOWN ON THE TOPOGRAPHIC SURVEY BY JASTER-QUITANILLA, LLP, DATED 12-04-13, CHECKED BY ESB, FIELD BOOK 126, PAGE 70.

TBM# 1
FND "X" CUT
ELEV=485.06
N 5103.21, E 4950.81

TBM#2
FND "X" CUT
ELEV=485.06
N 5176.31, E 4943.06

TOPOGRAPHIC SURVEY
Part of Lot 4, Block A
LEWISVILLE
SERVICE CENTER
City of Lewisville,
Denton County, Texas

North Texas
Surveying, L.L.C.
Registered Professional Land Surveyors
1515 South McDonald St., Suite 110,
McKinney, Tx. 75069
Ph. (469) 424-2074 Fax: (469) 424-1997
www.northtexassurveying.com
Firm Registration No. 10074200

LEWISVILLE
Deep Roots. Broad Wings. Bright Future.

ENGINEERING DIVISION
CITY OF LEWISVILLE

WASTEWATER TREATMENT PLANT EMERGENCY GENERATOR

TOPOGRAPHIC SURVEY

AUG 21, 2018
date

Sheet
C-1
of 8

PLOT DATE/TIME: 8/21/2018 - 6:24pm
PRINTED BY: JENNIFER
CAD FILE: P:\2015\15-182\CIVIL\DWG\15-182_C1-TOPO.dwg

General Notes:

1. ANY CONTRACTOR/SUBCONTRACTOR PERFORMING WORK ON THIS PROJECT SHALL FAMILIARIZE HIMSELF WITH THE SITE AND SHALL BE SOLELY RESPONSIBLE FOR ANY DAMAGE TO EXISTING FACILITIES RESULTING DIRECTLY OR INDIRECTLY FROM HIS OPERATIONS. SAID EXISTING IMPROVEMENTS SHALL INCLUDE BUT NOT BE LIMITED TO STRUCTURES, BERMS, DITCHES, FENCES, AND PLANTS. ANY REMOVAL OR DAMAGE TO EXISTING IMPROVEMENTS SHALL BE REPLACED OR REPAIRED BY THE CONTRACTOR AT HIS EXPENSE AND SHALL BE APPROVED BY THE OWNER.
2. ALL CONSTRUCTION, TESTING, AND MATERIALS SHALL MEET OR EXCEED ALL REQUIREMENTS OF THE CITY AND PROJECT SPECIFICATIONS. ALL SUBMITTALS MUST BE ORIGINALS WITH SIGNATURES WHERE APPLICABLE.
3. ALL REQUIRED ACCEPTANCE TESTING SHALL BE DONE BY AN APPROVED LABORATORY AT THE EXPENSE OF THE CONTRACTOR. CONTRACTOR'S QUALITY CONTROL PROGRAM TESTING IS SEPARATE AND ALL ASSOCIATED COSTS TO BE THE BURDEN OF THE CONTRACTOR. ADDITIONAL TESTING, BEYOND SPECIFICATION'S, MAYBE REQUESTED BY THE OWNER AND SHALL BE PAID FOR BY THE OWNER. THE OWNER MAY ALSO REQUEST AN INDEPENDENT TESTING LABORATORY TO PERFORM TESTING AT THE OWNER'S EXPENSE. THE CONTRACTOR IS ULTIMATELY RESPONSIBLE FOR PROVIDING LABORATORY TESTING DOCUMENTATION SHOWING THAT CONSTRUCTION WORK PERFORMED ON THIS PROJECT MEETS SPECIFICATIONS WHEN IN QUESTION. THIS COST IS THE RESPONSIBILITY OF THE CONTRACTOR'S UNLESS OTHERWISE DIRECTED.
4. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE CONTRACT DOCUMENTS AND SPECIFICATIONS, AND ANY OTHER APPLICABLE STANDARDS OR SPECIFICATIONS RELEVANT TO THE PROPER COMPLETION OF THE WORK SPECIFIED. FAILURE ON THE PART OF THE CONTRACTOR TO FAMILIARIZE HIMSELF WITH ALL STANDARDS OR SPECIFICATIONS PERTAINING TO THIS WORK SHALL IN NO WAY RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR PERFORMING THE WORK IN ACCORDANCE WITH ALL SUCH APPLICABLE STANDARDS AND SPECIFICATIONS.
5. CONSTRUCTION INSPECTION WILL BE PERFORMED BY THE CONTRACTOR TO ENSURE WORK MEETS CONTRACT REQUIREMENTS PRIOR TO NOTIFYING THE CONSTRUCTION MANAGER THAT THE WORK IS READY FOR THE OWNERS INSPECTION, AND INDEPENDENT TESTING AND FINAL ACCEPTANCE.
6. CONSTRUCTION INSPECTION/OBSERVATION WILL BE PERFORMED BY REPRESENTATIVES OF THE OWNER, ENGINEER, GEOTECHNICAL ENGINEER, REVIEWING GOVERNMENT AUTHORITIES AND AGENCIES. UNRESTRICTED ACCESS SHALL BE PROVIDED TO THEM AT ALL TIMES FOR THEIR INSPECTIONS/REVIEW AND ANY DESIRED INDEPENDENT TESTING COMPANY, IN ORDER TO VERIFY WORK COMPLETED MEETS CONTRACT REQUIREMENTS. CONTRACTOR IS RESPONSIBLE FOR UNDERSTANDING AND SCHEDULING REQUIRED INSPECTIONS AND REQUIRED TESTING. TESTING SAMPLES SHALL BE COLLECTED AND PROCESSED BY CERTIFIED TECHNICIANS APPROVED BY THE OWNER'S REPRESENTATIVE. TESTING AND INSPECTION FEES SHALL BE PAID BY CONTRACTOR UNLESS OTHERWISE DIRECTED.
7. ALL CONTRACTORS MUST CONFINE THEIR ACTIVITIES TO THE WORK AREA. NO ENCROACHMENTS OUT OF PROJECT LIMITS WILL BE ALLOWED. ANY DAMAGE RESULTING THEREFROM SHALL BE CONTRACTOR'S RESPONSIBILITY TO REPAIR.
8. IT WILL BE THE RESPONSIBILITY OF EACH CONTRACTOR TO PROTECT ALL EXISTING PUBLIC AND PRIVATE UTILITIES THOUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONTRACTOR SHALL CONTACT THE APPROPRIATE UTILITY COMPANIES FOR LINE LOCATIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION AND SHALL ASSUME FULL LIABILITY TO THOSE COMPANIES FOR ANY DAMAGES CAUSED TO THEIR FACILITIES.
9. 4" TOPSOIL SHALL BE ADDED TO ANY AREAS DISTURBED BY CONSTRUCTION NOT BEING PAVED.
10. ALL UNDERGROUND UTILITIES SHALL BE INSTALLED BY LICENSED PERSONNEL. ANY UTILITY INSTALLED OUTSIDE OF AN EASEMENT SHALL BE INSTALLED BY A LICENSED PLUMBER AND INSPECTED BY CODE ENFORCEMENT.
11. EMBEDMENT SHALL BE AS SPECIFIED AND MEET CITY STANDARDS.
12. EXISTING FEATURES BASED ON TOPOGRAPHIC SURVEY PROVIDED BY NTS AND ASBUILT DRAWINGS. LOCATIONS AND/OR DEPTHS OF EXISTING UTILITIES SHOWN ON PLANS ARE ASSUMED FROM INFORMATION AVAILABLE AND ARE NOT GUARANTEED TO BE COMPLETE AND ACCURATE. THE CONTRACTOR IS RESPONSIBLE FOR CERTIFYING THE LOCATION OF EXISTNG UTILITIES WITHIN THE CONSTRUCTION LIMITS. THE CONTRACTOR SHALL MAKE THE NECESSARY ARRANGEMENTS AND COMPLY WITH REQUIREMENTS AND SPECIFICATIONS OF THE RESPECTIVE UTILITY TO BE ABONDONED, CUT, MOVED, RELOCATED, OR RECONNECTED TO AN EXISTING FACILITY. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY FOR THE UTILITIES NOT SHOWN OR NOT IN THE LOCATION SHOWN. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES ON THE PROJECT SITE.
13. THERE ARE MONITORING WELLS KNOWN TO EXIST AROUND THE PERIMETER OF THE SLUDGE FIELD.
14. THE USE OF TEMPORARY FUEL STORAGE WILL NOT BE ALLOWED ON THE PROJECT SITE UNLESS APPROVED BY OWNERS REP. CONSTRUCTION EQUIPMENT SHALL BE FUELED BY OFF-SITE BASED SERVICE TRUCKS ON AN AS-NEEDED BASIS.
15. CONTRACTOR SHALL NOT PLACE ASPHALT PRODUCTS ON THE GROUND WITHIN 48 HOURS OF FORECASTED RAIN. AFTER PLACEMENT OF ASPHALT, EMULSION OR COATINGS, THE CONTRACTOR SHALL MAINTAIN, FOR THE DURATION OF THE ASPHALT PRODUCT CURING TIME, STAND-BY EMERGENCY PERSONNEL AND EQUIPMENT TO CONTAIN ANY ASPHALT WASH OFF, SHOULD AN UNEXPECTED RAIN OCCUR.
16. THERE WILL BE NO ROUTINE VEHICLE MAINTENANCE OR SERVICING, SUCH AS OIL CHANGES, ON THE PROJECT SITE UNLESS APPROVED BY THE OWNER'S REP.
17. PURPOSEFUL RELEASE OF VEHICLE OR EQUIPMENT FLUIDS ONTO THE GROUND WILL NOT BE ALLOWED. CONTAMINATED SOIL, RESULTING FROM ACCIDENTAL SPILLS, WILL BE REMOVED IMMEDIATELY AND DISPOSED OF PROPERLY. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE PLANT SUPERVISOR IF A SPILL OCCURS ON SITE.
18. THE AREAS FOR TEMPORARY FIELD OFFICES, CONSTRUCTION EQUIPMENT AND CONSTRUCTION MATERIALS ARE INDICATED AS "STAGING AREA" ON THE "EROSION/SEDIMENT CONTROL PLAN". FINAL LOCATION TO BE APPROVED BY OWNER.
19. ALL CONSTRUCTION MATERIAL/DEBRIS SHALL BE PLACED IN AN ON-SITE CONTAINER AND DISPOSED OF PROPERLY AT AN AUTHORIZED LANDFILL BY THE CONTRACTOR.
20. INGRESS AND EGRESS FOR THIS PROJECT SHALL BE LIMITED TO THE ENTRANCE/EXIT AS INDICATED ON THE PLANS.
21. HEAVY CONSTRUCTION EQUIPMENT IS LIMITED TO TRAVELING WITHIN THE LIMITS OF THE PROJECT SITE.
22. TRUCK RINSE-OUT PITS WILL BE LOCATED IN THE CONSTRUCTION STAGING AREA AND/OR AT CONSTRUCTION STABILIZED EXITS WHICH ARE NOT SUBJECT TO FLOODING. TRUCK RINSE-OUT WILL NOT BE ALLOWED OUTSIDE THE PROJECT CONSTRUCTION LIMITS. INSTALL SEDIMENT TRAP AS REQUIRED AND DIRECTED.
23. DURING CONSTRUCTION, PORTABLE TOILET SERVICE SHALL BE PROVIDED BY THE CONTRACTOR FOR CONSTRUCTION WORKERS. TOILETS SHALL BE LOCATED IN THE CONSTRUCTION STAGING AREA AND NOT WITHIN THE 100-YEAR FLOODPLAIN.
24. ALL SOIL, SAND, GRAVEL AND EXCAVATED MATERIALS STOCKPILED ON-SITE, SHALL HAVE APPROPRIATELY SIZED SILT FENCES PLACED UPGRADIENT AND DOWNGRADIENT.
25. TEMPORARY STOCKPILE AREAS SHALL BE DESIGNATED ON THE "EROSION/SEDIMENTATION CONTROL PLAN" BY THE CONTRACTOR. THE CONTRACTOR SHALL PROVIDE ALL TRAFFIC CONTROL DEVICES NECESSARY TO PROTECT AND SAFEGUARD.
26. THE CONTRACTOR SHALL PROVIDE ALL TRAFFIC CONTROL DEVICES NECESSARY TO PROTECT AND SAFEGUARD THE PUBLIC AND WORKERS AGAINST INJURY AND PROTECT THE WORK AGAINST DAMAGE. ALL TEMPORARY TRAFFIC CONTROL SIGNING AND DEVICES SHALL BE IN PLACE PRIOR TO BEGINNING WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REQUIRED TRAFFIC CONTROL AS FIELD CONDITIONS WARRANT. CONTRACTOR SHALL COMPLY WITH STATE REGULATIONS AND THE CITY'S PUBLIC WORKS DEPT. STANDARDS AND REQUIREMENTS.
27. ANY DISTURBED GROUND, DUE TO CONSTRUCTION ACTIVITIES, THAT IS NOT TO BE PAVED, SHALL BE SEEDED OR SODDED PER SPECIFICATION AND EROSION CONTROL PLAN.
28. THE CONTRACTOR SHALL HAVE IN HIS POSSESSION, PRIOR TO CONSTRUCTION, ALL NECESSARY PERMITS, LICENSES, BONDS, ETC., REQUIRED TO COMPLETE THE PROJECT. THE CONTRACTOR SHALL HAVE AT LEAST ONE SET OF APPROVED ENGINEERING PLANS AND SPECIFICATIONS ON-SITE AT ALL TIMES.
29. CONSTRUCTION AREA LIMITS - THE LIMITS OF CONSTRUCTION, MATERIAL STORAGE AREAS, EQUIPMENT STORAGE AREA, PARKING AREA AND OTHER AREAS REQUIRED FOR THE CONTRACTOR'S EXCLUSIVE USE DURING CONSTRUCTION SHALL BE MARKED BY THE CONTRACTOR AND APPROVED BY THE OWNER'S AUTHORIZED REPRESENTATIVE. THE CONTRACTOR SHALL ERECT AND MAINTAIN FENCING, SIGNAGE AND WARNING DEVICES VISIBLE FOR BOTH DAY/NIGHT USE TO DELINEATE THE PERIMETER OF ALL SUCH AREAS AS NEEDED. ALL MARKINGS AND BARRICADES SHALL CONFORM TO ALL STATE REGULATIONS AND THE CITY STANDARDS.
30. CONTRACTOR SHALL BE RESPONSIBLE FOR TRENCH SAFETY REQUIREMENTS IN ACCORANCE WITH CITY STANDARDS, TEXAS STATE LAW, AND O.S.H.A. STANDARDS FOR ALL EXCAVATIONS IN EXCESS OF FIVE FEET IN DEPTH. TRENCH SAFETY DESIGN WILLL BE THE RESPONSIBILITY OF THE UTILITY CONTRACTOR. CONTRACTOR SHALL OBTAIN A TRENCH SAFETY DESIGN SEALED BY A PROFESSIONAL ENGINEER.
31. THE CONTRACTOR SHALL NOT OPEN OR CLOSE ANY PUBLIC UTILITY VALVES UNLESS AUTHORIZED BY THE CITY.
32. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING ALL DAMAGED PAVEMENT MARKINGS DUE TO CONSTRUCTION ACTIVITIES. (FIRE LANES, ACCESSIBLE PARKING, CROSS WALKS AND RAMPS, ETC.)
33. BACKFILL FOR UTILITY LINES SHALL BE 95% DENSITY STANDARD PROCTOR UNDER PAVEMENT AND 90% DENSITY IN LANDSCAPE AREAS OUTSIDE OF PAVEMENT.
34. IN THE EVENT AN ITEM IS NOT COVERED IN THE CONTRACT DOCUMENTS OR BY THE CITY'S STANDARD CONSTRUCTION SPECIFICATIONS AND DETAILS, THE MOST RECENT ADDITION OF THE NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS (NCTCOG) STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION SHALL APPLY UNLESS SUPERCEDED BY SPECIFICATIONS DESIGNATED BY CITY PERMIT OR BY OTHER CRITERIA NOTED ON THESE PLANS & SPECIFICATIONS. THE CITY ENGINEER SHALL HAVE THE FINAL DECISION ON ALL CONSTRUCTION MATERIALS, METHODS, AND PROCEDURES IN PUBLIC ROW AND EASEMENTS.

General Security/ Safety Notes

1. HAUL ROUTES – LOCATION OF HAUL ROUTES ON THE SITE SHALL BE AS APPROVED BY THE OWNER AT THE PRE-CONSTRUCTION MEETING. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE OFF-SITE HAUL ROUTES (STATE HIGHWAYS, COUNTY ROADS, OR CITY STREETS) WITH THE APPROPRIATE OWNER WHO HAS JURISDICTION OVER THE AFFECTED ROUTE. THE CONTRACTOR SHALL NOTIFY THE CITY AND OBTAIN THEIR APPROVAL OF ROUTES TO BE TAKEN BY HAULING EQUIPMENT. THE CONTRACTOR WILL NOTIFY THE POLICE DEPARTMENT AND MAKE ALL NECESSARY ARRANGEMENTS AND OBTAIN ANY REQUIRED PERMITS FOR TRAFFIC CONTROL DURING HAULING OPERATIONS. ON-SITE HAUL ROUTES SHALL BE MAINTAINED BY THE CONTRACTOR AND SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER, UPON PROJECT COMPLETION. A CONDITION REPORT OF THE BEFORE AND AFTER CONDITIONS OF ON-SITE HAUL ROUTES SHALL BE PREPARED JOINTLY BY THE CONTRACTOR AND THE OWNER OR THE OWNER'S AUTHORIZED REPRESENTATIVE. FENCING, DRAINAGE, GRADING AND TEMPORARY HAUL ROUTES OR ACCESS POINTS ON THE SITE SHALL BE THE CONTRACTOR'S TOTAL RESPONSIBILITY AND SHALL BE APPROVED BY THE OWNER OR THE OWNER'S AUTHORIZED REPRESENTATIVE PRIOR TO THE WORK.
2. STAGING AREA – THE CONTRACTOR'S STAGING AREA IS SHOWN ON THE EROSION/SEDIMENT CONTROL PLAN SHEET. THE CONTRACTOR SHALL MAKE PROVISIONS FOR ANY REQUIRED UTILITIES TO FIELD OFFICE ETC., AS SPECIFIED.
3. SAFETY AND SECURITY – THE CONTRACTOR AND EMPLOYEES SHALL CONDUCT HIS/HER ACTIVITIES IN A SAFE AND SECURE MANNER AT ALL TIMES.
4. PROTECTION AND REPAIR OF DAMAGE TO EXISTING CABLES.– ALL UNDERGROUND CABLES SHALL BE PROTECTED AND ANY DAMAGES REPAIRED.
5. CONSTRUCTION LIMITS – ALL CONTRACTOR VEHICLES AND TRAFFIC SHALL REMAIN WITHIN THE LIMITS OF CONSTRUCTION AREAS, STAGING AREAS, OR HAUL ROUTES AS SHOWN ON THE PLANS, OR AS APPROVED BY THE OWNER OR THE OWNER'S AUTHORIZED REPRESENTATIVE.
6. TESTING – UNLESS OTHERWISE SPECIFIED, ALL INITIAL TESTS REQUIRED BY PLANS OR SPECIFICATIONS FOR ACCEPTANCE OF WORKMANSHIP AND/OR MATERIALS SHALL BE INITIATED BY THE CONTRACTOR OR THE AUTHORIZED REPRESENTATIVE AND PAID FOR BY THE CONTRACTOR. RETESTING OF FAILED INITIAL TESTS, ARE TO BE PAID BY THE CONTRACTOR. ADDITIONAL TESTING, BEYOND SPECIFICATIONS, MAYBE REQUESTED BY THE OWNER AND SHALL BE PAID FOR BY THE OWNER. THE OWNER MAY ALSO REQUEST AN INDEPENDENT TESTING LABORATORY TO PERFORM TESTING AT THE OWNER'S EXPENSE. THE CONTRACTOR IS ULTIMATELY RESPONSIBLE FOR PROVIDING LABORATORY TESTING DOCUMENTATION SHOWING THAT CONSTRUCTION WORK PERFORMED ON THIS PROJECT MEETS SPECIFICATIONS WHEN IN QUESTION. THIS COST IS THE RESPONSIBILITY OF THE CONTRACTOR'S UNLESS DIRECTED OTHERWISE.
7. ALL BARRICADES SHALL BE SECURED IN PLACE AGAINST MOVEMENT.
8. IF REQUIRED, ALL BARRICADE LIGHTING SHALL BE VERIFIED BY THE CONTRACTOR FOR PROPER OPERATION ONE HOUR PRIOR TO SUNSET EACH DAY.
9. CONTRACTOR SHALL NOTIFY THE LOCAL UTILITY STAKEOUT SERVICE FOR SITE UTILITY STAKEOUT PRIOR TO BEGINNING WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING UTILITY COMPANIES TO IDENTIFY ALL EXISTING UNDERGROUND UTILITIES AND/OR CABLES WITHIN THE PROJECT LIMITS AND/OR STAGING AREAS. CONTRACTOR WILL ASSIST UTILITY COMPANIES IN EFFORTS TO FIELD VERIFY UNDERGROUND UTILITIES.
10. CONTRACTOR SHALL BE REQUIRED TO ATTEND CONSTRUCTION COORDINATION MEETINGS. TIME AND LOCATION OF MEETING TO BE DETERMINED PRIOR TO START OF CONSTRUCTION, AS APPROVED BY THE OWNER AND A/E.
11. CONTRACTOR SHALL COMPLY WITH ALL AIR, STORMWATER, AND WATER QUALITY REGULATIONS WHICH PERTAIN TO CONSTRUCTION ACTIVITIES AND/OR PLANT OPERATIONS ON THIS PROJECT. CONTRACTOR MUST PREPARE A SWPPP FOR THE PROJECT. THE SWPPP MAY BE SUBMITTED AT THE PRE-CONSTRUCTION MEETING FOR APPROVAL BY THE CITY OF LEWISVILLE'S STORMWATER DIVISION. THE CONTRACTOR MUST FILE ALL PERMITS, ETC. AND FOLLOW CITY'S AND STATE STORMWATER REGULATIONS.
12. EROSION CONTROL MEASURES MAY ONLY BE PLACED IN FRONT OF INLETS, OR IN CHANNELS, DRAINAGEWAY OR BORROW DITCHES AT RISK OF CONTRACTOR. CONTRACTOR SHALL REMAIN LIABLE FOR ANY DAMAGE CAUSED BY THE MEASURES, INCLUDING FLOODING DAMAGE, WHICH MAY OCCUR DUE TO BLOCKED DRAINAGE. AT THE CONCLUSION OF ANY PROJECT, ALL CHANNELS, DRAINAGEWAYS, AND BORROW DITCHES IN THE WORK ZONE SHALL BE DREDGED OF ANY SEDIMENT GENERATED BY THE PROJECT OR DEPOSITED AS A RESULT OF EROSION CONTROL MEASURES.

NOTICE:

ALL EXISTING UTILITIES SHOWN ON THESE CONSTRUCTION DOCUMENTS, WERE BASED OFF OF FIELD SURVEY DATA AND AS-BUILT RECORD INFORMATION AND ARE TO BE CONSIDERED APPROXIMATE IN LOCATION. EXACT LOCATIONS ARE UNKNOWN TO CHARLES GOJER AND ASSOCIATES, INC. (CGA) AND THE SURVEYOR OF RECORD ON THIS PROJECT. REFER TO THE TOPOGRAPHIC SURVEY PLAN AND NOTES, SHEET C1, FOR ADDITONAL INFORMATION. CONTRACTOR(S) MUST USE EXTREME CAUTION WHILE EXCAVATING WITHIN THE PROJECT CONSTRUCTION LIMITS DUE TO THE POSSIBILITY THAT THERE COULD BE EXISTING UTILITY LINES IN AREAS SHOWN TO BE VACANT ON THESE CONSTRUCTION DOCUMENTS. THE CONTRACTOR(S) IS SOLELY RESPONSIBLE FOR VERIFYING THE EXACT LOCATION OF UTILITIES AND NOTIFYING THE ENGINEER OF RECORD WHEN DISCREPANCIES ARE FOUND. PRIOR TO ANY EXCAVATION, THE CONTRACTOR(S) SHALL KNOW WHERE ALL SHUT-OFF WATER VALVES ARE TO THE PROJECT SITE IN CASE OF A WATER LINE BREAK/LEAK RESULTING DIRECTLY OR INDIRECTLY FROM CONSTRUCTION OPERATIONS. THE CONTRACTOR(S) MUST KEEP ACCURATE AS-BUILT INFORMATION, NOTING ANY DIFFERENCES IN THE ACTUAL FIELD MEASUREMENTS COMPARED TO THESE CONSTRUCTION DOCUMENTS PROVIDED, FOR BOTH NEW AND EXISTING UTILITIES. CGA IS NOT LIABLE FOR ANY DAMAGES TO EXISTING SITE FEATURES AND/OR UTILITIES RESULTING DIRECTLY OR INDIRECTLY FROM CONSTRUCTION OPERATIONS. REPAIRING ANY AND ALL DAMAGES TO UTILITIES AND/OR SITE FEATURES, WILL BE THE FINANCIAL RESPONSIBILITY OF THE CONTRACTOR(S) CAUSING THE DAMAGE. CGA SHALL BE HELD HARMLESS BY THE CONTRACTOR(S).

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

Abbreviations

ADDITIONAL	– ADDN'L	MANUFACTURER	– MFR.
APPROXIMATE	– APPROX.	MAXIMUM	– MAX.
		MINIMUM	– MIN.
BEARING	– BRG.		
BETWEEN	– BTWN.	NEAR SIDE	– N.S.
BLOCK	– BLK.	NOMINAL	– NOM.
BLOCKING	– BLKG.	NOT TO SCALE	– N.T.S.
BOTTOM	– BOT.	NUMBER	– NO. OR #
CENTER LINE	– C.L. OR ℄	ON CENTER	– O.C.
CLEAR	– CLR.	OPENING(S)	– OPNG(S).
CONCRETE	– CONC.	OPPOSITE HAND	– O.H.
CONSTRUCTION JOINT	– C.J.	OUTSIDE FACE	– O.F.
CURB RETURN	– CR	OUTSIDE DIAMETER	– O.D.
DETAIL	– DET.	PAVEMENT	– P
DIAGONAL	– DIAG.	PERPENDICULAR	– PERP.
DIAMETER	– DIA. OR ⌀	PIECE	– PC.
DRAWING(S)	– DWG(S).	POUNDS PER SQUARE FOOT	– P.S.F.
DOUBLE	– DBL.	POUNDS PER SQUARE INCH	– P.S.I.
DOWEL(S)	– DWL(S).	PRECAST CONCRETE	– P/C.
EACH	– EA.	RADIUS	– R
EACH FACE	– E.F.	REINFORCED CONCRETE PIPE	– RCP
EACH WAY	– E.W.	REINFORCE(ING) (ED) (MENT)	– REINF.
ELEVATION	– EL.	REQUIRED	– REQ'D.
EQUAL	– EQ.	SCHEDULE(D)	– SCHED.
EXPANSION JOINT	– E.J.	SECTION	– SECT.
EXISTING	– EXIST.	SHEET	– SHT.
FAR SIDE	– F.S.	SIMILAR	– SIM.
FIN. FLOOR ELEV.	– FFE	SPACE	– SP.
FLOW	– FL	SPECIFICATION(S)	– SPEC(S).
FOUNDATION	– FDN.	SQUARE FOOT (FEET)	– S.F.
		STANDARD	– STD.
GAGE OR GAUGE	– GA.	SANITARY SEWER	– SS
GALVANIZED	– GALV.	STEEL	– STL.
GENERAL CONTRACTOR	– G.C.	STIFFENER	– STIFF.
		STRAIGHT	– STR.
HEIGHT	– HT.	STIRRUPS	– STIR.
HORIZONTAL	– HORIZ.	STRUCTURAL	– STRUCT'L.
		SYMMETRICAL	– SYM.
INFORMATION	– INFO.	TOP OF CURB	– TC
INSIDE DIAMETER	– I.D.	THICK	– THK.
INSIDE FACE	– I.F.	TOP AND BOTTOM	– T & B
INTERIOR	– INT.	TOP OF STEEL	– T.O.S.
INTERMEDIATE	– INTERM.	TOP OF WALL	– T.O.W.
IRON ROD FOUND	– IRF	TYPICAL	– TYP.
JOINT	– JT.	UNLESS NOTED OTHERWISE	– U.N.O.
KIPS (1000 LBS)	– K	VERTICAL	– VERT.
LONGITUDINAL	– LONG.	WATER LINE	– W
		WELDED WIRE FABRIC	– W.W.F.
		WITH	– W/
		WORK POINT	– W.P.

Trench Safety Notes:

1. FEDERAL REGISTER, VOLUME 54, NO. 209 (OCTOBER 1989), THE UNITED STATES DEPARTMENT OF LABOR AND OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) "CONSTRUCTION STANDARDS FOR EXCAVATIONS, 29 CFR, PART 1926, SUBPART P", ALL TRENCHES OVER 5 FEET IN DEPTH IN EITHER HARD AND COMPACT OR SOFT AND UNSTABLE SOIL SHALL BE SLOPED, SHORED, BENCHED, SHEETED, BRACED OR OTHERWISE SUPPORTED. FURTHER MORE, ALL TRENCHES LESS THAN 5 FEET IN DEPTH SHALL ALSO BE EFFECTIVELY PROTECTED WHEN HAZARDOUS GROUND MOVEMENT MAY BE EXPECTED. TRENCH SAFETY SYSTEMS TO BE UTILIZED FOR THIS PROJECT SHALL BE PROVIDED BY THE CONTRACTOR, DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER.
2. IN ACCORDANCE WITH THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS, WHEN EMPLOYEES ARE REQUIRED TO BE IN THE TRENCHES 4-FEET DEEP OR MORE, ADEQUATE MEANS OF EXIT, SUCH AS A LADDER OR STEPS, MUST BE PROVIDED AND LOCATED SO AS TO REQUIRE NO MORE THAN 25 FEET OF LATERAL TRAVEL.
3. THE CONTRACTOR'S "RESPONSIBLE PERSON", AS DEFINED IN 29 CFR PART 1929, SHOULD EVALUATE THE SOIL EXPOSED IN THE EXCAVATIONS AS PART OF THE CONTRACTOR'S SAFETY PROCEDURES. IN NO CASE SHOULD SLOPE HEIGHT, SLOPE INCLINATION, OR EXCAVATION DEPTH, INCLUDING UTILITY TRENCH EXCAVATION DEPTH, EXCEED THOSE SPECIFIED IN LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS.

KEY NOTES:

1. CONTRACTOR SHALL EXCAVATE AT PROPOSED UTILITY CONNECTION POINTS, UNDERGROUND UTILITY CROSSING LOCATIONS AND CRITICAL BUILDING AREAS. CONTRACTOR SHALL VERIFY TYPE, SIZE, MATERIAL, HORIZONTAL AND VERTICAL POSITION OF ALL EXISTING UTILITIES WITHIN THE CONSTRUCTION LIMITS WHERE EXCAVATION IS OCCURING PRIOR TO CONSTRUCTION. CONTRACTOR SHALL ALLOW ENGINEER TIME TO MODIFY DESIGN IF CONFLICTS ARE FOUND. THIS SHALL BE DONE AT NO ADDITIONAL COST TO THE OWNER. AS-BUILT INFORMATION IS LIMITED AND CANNOT BE GUARANTEED TO BE ACCURATE.
2. SOME UTILITY INFORMATION DEPICTED ON THIS PLAN WAS BASED ON THE S.U.E. FIELD SKETCH PROVIDED BY GORRONDONA & ASSOCIATES, INC. FOR THE WWTP SWITCHGEAR PROJECT DATED 03/30/2012 (G&AI PROJ # COLV1201.00) SEE FULL REPORT FOR ADDITIONAL INFORMATION.

Charles Gojer and Associates, Inc.
Consulting Engineers
Texas Firm Registration No. F-697
11615 Forest Central Dr. Suite 303
Dallas, Texas 75243 (214) 340-1199

JOB NO. 15 – 182

LEWISVILLE
Great Rivers, Broad Vistas, Bright Futures

ENGINEERING DIVISION
CITY OF LEWISVILLE

WASTEWATER TREATMENT PLANT EMERGENCY GENERATOR

GENERAL NOTES AND ABBREVIATIONS

DAMON A. ANDREWS 100011 LICENSED PROFESSIONAL ENGINEER 8-21-18

AUG 21, 2018
date

Sheet C-2 of 8

PRINTED BY: JENNIFER
CAD FILE: P:\2015\15-182\CIVIL\DWG\15-182_C2-GEN NOTES.dwg
PLOT DATE/TIME: 8/21/2018 - 3:14pm

EXISTING TANK AND CONCRETE PAD TO BE REMOVED. REMOVE EX. GAS SERVICE CONNECTION/METER. REMOVE APPROX. 30 LIN. FT OF GAS LINE AND PERMANENTLY PLUG AND CAP AT LOCATION SHOWN. COORD WORK W/ GAS UTILITY AND OWNER AS REQU.

EXISTING GUARDRAIL AROUND TANK TO BE REMOVED.

EXISTING DRAINAGE CHANNEL TOP OF BANK

EXISTING GRATE INLET

EXISTING CONCRETE DRIVE

EXISTING 15KV MAIN SWITCHGEAR (PME-9)

EXISTING TRANSFORMER & CONCRETE PAD

APPROX. LOCAL GAS LINE/ SERVICE

APPROX. LOCAL 12" SCUM LINE

EXISTING TANK & CONCRETE PAD WITH GUARDRAIL

7.69'

3.77'

6.23'

12.26'

5'±

APPROX. LOCAL ELECTRICAL DUCKBANK

APPROX. LOCAL TELEPHONE

EMH

EXISTING ELECTRIC MH

EXISTING ELECTRIC VAULT

EXISTING 15KV MAIN SWITCHGEAR (PMS-9)

WV

EXISTING SIDEWALK

NEW SWITCHGEAR BLDG. LOCATION

Generator

PRAIRIE CREEK PUMP STATION

EXISTING BUILDING

Vault

4 - EXISTING PARKING STALLS TO HAVE STRIPING REMOVED IN THIS AREA.

WM

EXISTING WATER METER

Cut-Off Valve

EXISTING CONCETE PAVEMENT AREA TO BE REMOVED AS SHOWN.

37.16'

22.79'

N: 4715.82
E: 4923.64

46.40'

22.85'

N: 4669.43
E: 4922.74

1 - EXISTING PARKING STALL TO HAVE STRIPING PERMANENTLY REMOVED IN THIS AREA.

24" TCP

EXISTING DRAINAGE CHANNEL TOP OF BANK

EXISTING ASPHALT DRIVE

T.B.M. B
Mag Nail Set
Elev.=466.12'

EXISTING BUILDING

N

GRAPHIC SCALE
10 0 5 10
1 inch = 10 ft.

CAUTION!!!

Texas811 NOTIFICATION CENTER (Prev. DigTESS):
811 or 1-800-545-6005 or 1-800-DIG-TESS

LONESTAR 811 NOTIFICATION CENTER:
1-800-669-8344

All excavators must call one of the above notification centers prior to digging. Call not earlier than 14 days before or later than 2 working days (48-hours) before the date the excavation is to begin, excluding weekends and legal holidays.

One Call Notification Center covers all underground utilities except water, sewer and slurry. The Excavator shall notify these operators directly.

* THE CONTRACTOR IS SOLELY RESPONSIBLE FOR VERIFYING THE EXACT LOCATION OF ALL UTILITIES IN THE PROJECT SITE AND NOTIFYING THE OWNER AND A/E WHEN DISCREPANCIES ARE FOUND.

KEY NOTES:

1. CONTRACTOR SHALL EXCAVATE AT PROPOSED UTILITY CONNECTION POINTS, UNDERGROUND UTILITY CROSSING LOCATIONS AND CRITICAL BUILDING AREAS. CONTRACTOR SHALL VERIFY TYPE, SIZE, MATERIAL, HORIZONTAL AND VERTICAL POSITION OF ALL EXISTING UTILITIES WITHIN THE CONSTRUCTION LIMITS WHERE EXCAVATION IS OCCURING PRIOR TO CONSTRUCTION. CONTRACTOR SHALL ALLOW ENGINEER TIME TO MODIFY DESIGN IF CONFLICTS ARE FOUND. THIS SHALL BE DONE AT NO ADDITIONAL COST TO THE OWNER. AS-BUILT INFORMATION IS LIMITED AND CANNOT BE GUARANTEED TO BE ACCURATE.
2. SOME UTILITY INFORMATION DEPICTED ON THIS PLAN WAS BASED ON THE S.U.E. FIELD SKETCH PROVIDED BY GORRONDONA & ASSOCIATES, INC. FOR THE WWTP SWITCHGEAR PROJECT DATED 03/30/2012 (G&AI PROJ # COLV1201.00) SEE FULL REPORT FOR ADDITIONAL INFORMATION.

General Construction Notes:

1. REFER TO SHEET C2 FOR GENERAL CONSTRUCTION NOTES.

Demolition Notes:

1. BEFORE CONTRACTOR BEGINS ANY EXCAVATION, ALL EXISTING UTILITIES SHALL BE LOCATED BY AUTHORIZED PERSONNEL OF LOCAL UTILITY COMPANIES AND FACILITY MAINTENANCE PERSONNEL.
2. CONTRACTOR SHALL CONTACT & COORDINATE WITH APPROPRIATE PERSONNEL AT UTILITY FRANCHISE COMPANY(S) FOR LOCATION OF CURRENT AND ABANDONED UTILITIES, AND ANY NEW WORK IMPACTING UTILITY.
3. THE CONTRACTOR MAY REMOVE ALL OR PORTIONS OF EXISTING UTILITIES ABANDONED IN PLACE TO FACILITATE THE INSTALLATION OF NEW UTILITIES OR STRUCTURES. ABANDONED UTILITIES WHICH ARE CUT, SHALL BE PERMANTENTLY PLUGGED & CAPPED PER FRANCHISE UTILITY STANDARDS AND REQUIREMENTS.
4. ABANDONMENT/REMOVAL OF UTILITIES REQUIRED HEREON SHALL BE DONE AFTER COMPLETION, TESTING AND ACCEPTANCE OF NEW UTILITIES WHERE SERVICE CANNOT BE INTERUPTED. CONTRACTOR SHALL COORDINATE WITH OWNER PRIOR TO CONSTRUCTION.
5. CONTRACTOR SHALL REMOVE ABANDONED UTILITIES BENEATH NEW EQUIPMENT PADS OR BUILDING FOUNDATIONS. CUT AND PLUG ENDS OF PIPE. CONTRACTOR SHALL COORDINATE WITH ALL PROJECT DISCIPLINES.
6. CONTRACTOR SHALL INSTALL BMP MEASURES PRIOR TO EARTH DISTURBING ACTIVITIES. REFER TO EROSION CONTROL PLAN, SHEET C6, FOR MIN. REQUIRED.
7. CONTRACTOR SHALL REFER TO S.U.E. REPORT PREPARED IN FALL OF 2012 BY GORRONDONA & ASSOC. FOR ADDITIONAL INFORMATION ON UNDERGROUND UTILITIES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR VERIFYING THE EXACT LOCATION OF ALL UTILITIES IN PROJECT SITE AND NOTIFYING THE OWNER AND A/E WHEN DISCREPANCIES ARE FOUND.

EXISTING FEATURES LEGEND

X X	Wire Fence	WV	Water Valve
	Wood Fence	WM	Water Meter
	Chain Link Fence		Fire Hydrant
	Concrete	ICV	Irrigation Control Valve
	Asphalt	CO	Sanitary Sewer Cleanout
	Light Standard	SSMH	Sanitary Sewer Manhole
	Guy Wire/Anchor	STMH	Storm Drain Manhole
	Utility Pole	GM	Gas Meter
	Overhead Wires	GV	Gas Valve

Demolition Legend

LIMITS OF PAVEMENT DEMOLITION

CONSTRUCTION LIMITS

CONTROL POINTS				
I.D.	NORTHING	EASTING	DESCRIPTION	
TBM A	N= 4635.10	E= 4729.92	"X" CUT FND.	ELEV= 464.71
TBM B	N= 4774.41	E= 5019.54	MAG NAIL SET	ELEV= 466.12

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

Charles Gojer and Associates, Inc.
Consulting Engineers
Texas Firm Registration No. F-697
11615 Forest Central Dr. Suite 303
Dallas, Texas 75243 (214) 340-1199

JOB NO. 15 — 182

PLOT DATE/TIME: 9/21/2018 - 3:25pm

PRINTED BY: JENNIFER
CAD FILE: P:\2015\15-182\CIVIL\DWG\15-182_C3-DEMOLITION.dwg

LEWISVILLE
Deep Roots. Broad Wings. Bright Future.

ENGINEERING DIVISION
CITY OF LEWISVILLE

WASTEWATER TREATMENT PLANT EMERGENCY GENERATOR

SITE DEMOLITION PLAN

DARREN A. ANDREW 103007 LICENSED PROFESSIONAL ENGINEER 9-21-18

AUG 21, 2018
date

Sheet
C-3
of 8

Earthwork Requirements:

1. EXCAVATE AND DISPOSE OF WASTE VEGETATION AND OTHER DELETERIOUS MATERIALS ENCOUNTERED AT THE SURFACE. AFTER REMOVAL OF THE EXISTING PAVEMENT / VEGETATION AND RE-ESTABLISHING GRADE AND LANDSCAPE AREAS, THE SOIL MOISTURE CONTENT OF THE NEAR SURFACE CLAYS SHOULD BE MAINTAINED IN ACCORDANCE WITH THE RECOMMENDATIONS GIVEN BELOW UNTIL THESE AREAS RECEIVE FINAL PAVEMENT OR GRASS TURF. CONTRACTOR SHALL NOTIFY CITY SUPERVISOR WHEN TESTING IS REQUIRED, THREE (3) DAYS IN ADVANCE. INDEPENDENT TESTING COMPANY TO BE UNDER CITY CONTRACT.

2. SCARIFY SOILS EXPOSED IN FILL AREAS AND TRANSITIONAL AREAS (CUT TO FILL AND FILL TO CUT) TO A DEPTH OF APPROXIMATELY 6 INCHES, ADD MOISTURE IF REQUIRED, MIX AND RECOMPACT TO A DRY DENSITY BETWEEN 95 AN 100 PERCENT OF THE MAXIMUM DRY DENSITY DETERMINED BY A STANDARD PROCTOR COMPACTION TEST, ASTM D 698. THE MOISTURE CONTENT OF THE COMPACTED SOILS SHOULD BE MAINTAINED BETWEEN -2% to +3% OF THE OPTIMUM VALUE, DETERMINED FROM ASTM D 698, UNTIL COVERED BY FILL OR PAVEMENT.

3. PLACE FILL SOILS FOR PAVEMENTS IN LOOSE LIFTS NOT EXCEEDING 8" INCHES AND COMPACT TO THE MOISTURE/DENSITY VALUES SPECIFIED IN NO. 2 ABOVE. IMPORTED FILL SHALL HAVE A LL LESS THAN 35 & PI BETWEEN 5 & 15, AND APPROVED BY OWNERS REPRESENTATIVE. NO ROCKS OR FRAGMENTS >4"ø OR ROOTS, VEGETATION OR ANY OTHER UNDESIRABLE MATTER IN THE SOIL. INSTALL CLAY PLUG AT EDGES OF THE PAVEMENT.

4. FILL MATERIALS TO BE USED FOR GENERAL SITE FILL SHOULD CONSIST OF ON-SITE MATERIAL APPROVED BY THE SOILS ENGINEER. IMPORTED SOILS SHALL BE COMPATIBLE WITH THE EXISTING SOILS ON SITE, WITH A LIQUID LIMIT LESS THAN 50.

5. PAVEMENT SUBGRADE SHALL BE PROOFROLLED TO LOCATE AREAS OF SOFT SUBGRADE. IN AREAS TO BE CUT, THE PROOFROLL SHALL BE PERFORMED AFTER THE FINAL GRADE IS ESTABLISHED. IN AREAS TO BE FILLED, THE PROOFROLL SHALL BE PERFORMED PRIOR TO PLACEMENT OF ENGINEERED FILL AND AFTER THE FINAL SUBGRADE IS ESTABLISHED. AREAS OF LOOSE OR SOFT SUBGRADE ENCOUNTERED IN THE PROOFROLL SHOULD BE REMOVED AND REPLACED WITH ENGINEERED FILL, OR MOISTURE CONDITIONED AND RE-COMPACTED IN PLACE.

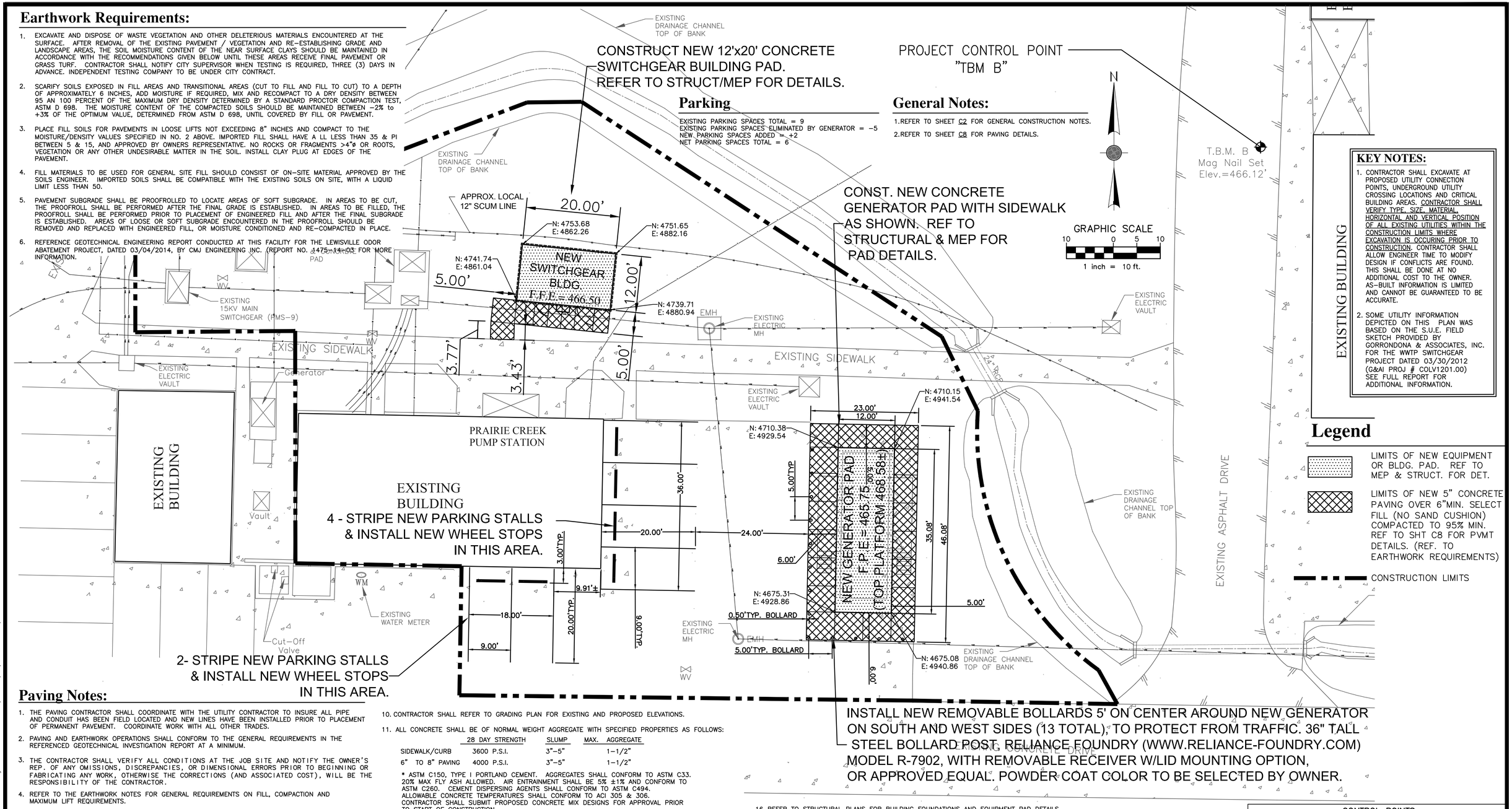
6. REFERENCE GEOTECHNICAL ENGINEERING REPORT CONDUCTED AT THIS FACILITY FOR THE LEWISVILLE ODOR ABATEMENT PROJECT, DATED 03/04/2014, BY CMJ ENGINEERING INC. (REPORT NO. 1475-14-03 FOR MORE INFORMATION.

Parking

EXISTING PARKING SPACES TOTAL = 9
EXISTING PARKING SPACES ELIMINATED BY GENERATOR = -5
NEW PARKING SPACES ADDED = +2
NET PARKING SPACES TOTAL = 6

General Notes:

1. REFER TO SHEET C2 FOR GENERAL CONSTRUCTION NOTES.
2. REFER TO SHEET C8 FOR PAVING DETAILS.



KEY NOTES:

1. CONTRACTOR SHALL EXCAVATE AT PROPOSED UTILITY CONNECTION POINTS, UNDERGROUND UTILITY CROSSING LOCATIONS AND CRITICAL BUILDING AREAS. CONTRACTOR SHALL VERIFY TYPE, SIZE, MATERIAL, HORIZONTAL AND VERTICAL POSITION OF ALL EXISTING UTILITIES WITHIN THE CONSTRUCTION LIMITS WHERE EXCAVATION IS OCCURING PRIOR TO CONSTRUCTION. CONTRACTOR SHALL ALLOW ENGINEER TIME TO MODIFY DESIGN IF CONFLICTS ARE FOUND. THIS SHALL BE DONE AT NO ADDITIONAL COST TO THE OWNER. AS-BUILT INFORMATION IS LIMITED AND CANNOT BE GUARANTEED TO BE ACCURATE.
2. SOME UTILITY INFORMATION DEPICTED ON THIS PLAN WAS BASED ON THE S.U.E. FIELD SKETCH PROVIDED BY GORRONDONA & ASSOCIATES, INC. FOR THE WWTP SWITCHGEAR PROJECT DATED 03/30/2012 (G&AI PROJ # COLV1201.00) SEE FULL REPORT FOR ADDITIONAL INFORMATION.

EXISTING BUILDING

Legend

- LIMITS OF NEW EQUIPMENT OR BLDG. PAD. REF TO MEP & STRUCT. FOR DET.
- LIMITS OF NEW 5" CONCRETE PAVING OVER 6"MIN. SELECT FILL (NO SAND CUSHION) COMPACTED TO 95% MIN. REF TO SHT C8 FOR PVMT DETAILS. (REF. TO EARTHWORK REQUIREMENTS)
- CONSTRUCTION LIMITS

Paving Notes:

1. THE PAVING CONTRACTOR SHALL COORDINATE WITH THE UTILITY CONTRACTOR TO INSURE ALL PIPE AND CONDUIT HAS BEEN FIELD LOCATED AND NEW LINES HAVE BEEN INSTALLED PRIOR TO PLACEMENT OF PERMANENT PAVEMENT. COORDINATE WORK WITH ALL OTHER TRADES.
2. PAVING AND EARTHWORK OPERATIONS SHALL CONFORM TO THE GENERAL REQUIREMENTS IN THE REFERENCED GEOTECHNICAL INVESTIGATION REPORT AT A MINIMUM.
3. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AT THE JOB SITE AND NOTIFY THE OWNER'S REP. OF ANY OMISSIONS, DISCREPANCIES, OR DIMENSIONAL ERRORS PRIOR TO BEGINNING OR FABRICATING ANY WORK, OTHERWISE THE CORRECTIONS (AND ASSOCIATED COST), WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
4. REFER TO THE EARTHWORK NOTES FOR GENERAL REQUIREMENTS ON FILL, COMPACTION AND MAXIMUM LIFT REQUIREMENTS.
5. THE CONTRACTOR SHALL PROVIDE, CONSTRUCT AND MAINTAIN BARRICADES AND SIGNS IN ACCORDANCE WITH THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AND THE CITY STANDARDS AND SPECIFICATIONS AS REQUIRED.
6. CONSTRUCTION JOINTS, COLD JOINTS (ISOLATION JOINTS) AND CURB RETURNS SHALL HAVE PRE-MOLDED JOINT FILLER INSTALLED TO ALLOW FOR EXPANSION.
7. CONTRACTOR TO MATCH EXISTING JOINT PATTERN WHERE APPLICABLE. PROVIDE SAW DUMMY JOINTS AT 15' MAX SPACING (5' WALKS) & EXPANSION JOINTS EVERY 60' MAX FOR 6-8" PAVING (25' WALKS).
8. TESTING LAB REPRESENTATIVE MUST BE PRESENT PRIOR TO AND DURING ALL CONCRETE POURS. CONTRACTOR SHALL NOTIFY CITY SUPERVISOR WHEN TESTING IS REQUIRED, THREE (3) DAYS IN ADVANCE. INDEPENDENT TESTING COMPANY TO BE UNDER CITY CONTRACT.
9. ALL DIMENSIONS AND RADII ARE TO FACE OF CURB OR EDGE OF PAVEMENT UNLESS OTHERWISE NOTED.
10. CONTRACTOR SHALL REFER TO GRADING PLAN FOR EXISTING AND PROPOSED ELEVATIONS.
11. ALL CONCRETE SHALL BE OF NORMAL WEIGHT AGGREGATE WITH SPECIFIED PROPERTIES AS FOLLOWS:

	28 DAY STRENGTH	SLUMP	MAX. AGGREGATE
SIDEWALK/CURB	3600 P.S.I.	3"-5"	1-1/2"
6" TO 8" PAVING	4000 P.S.I.	3"-5"	1-1/2"

* ASTM C150, TYPE I PORTLAND CEMENT. AGGREGATES SHALL CONFORM TO ASTM C33. 20% MAX FLY ASH ALLOWED. AIR ENTRAINMENT SHALL BE 5% ±1% AND CONFORM TO ASTM C260. CEMENT DISPERSING AGENTS SHALL CONFORM TO ASTM C494. ALLOWABLE CONCRETE TEMPERATURES SHALL CONFORM TO ACI 305 & 306. CONTRACTOR SHALL SUBMIT PROPOSED CONCRETE MIX DESIGNS FOR APPROVAL PRIOR TO START OF CONSTRUCTION.

12. REINFORCING STEEL SHALL CONFORM TO ASTM A-615, GRADE 60, U.N.O.
13. ALL REINFORCING SHALL LAP 36 BAR DIAMETERS AT SPLICES UNLESS NOTED OTHERWISE. HOOK CONTINUOUS BARS AT DISCONTINUOUS ENDS.
14. DETAILING, FABRICATION AND PLACEMENT OF CONCRETE REINFORCING AND ACCESSORIES SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF ACI PUBLICATION 315.
15. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE CITY OF LEWISVILLE STANDARDS AND SPECIFICATIONS, EXCEPT AS NOTED HEREIN AND APPROVED BY THE CITY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SUPPLY AND INSTALL ALL MATERIALS SO AS TO MEET OR EXCEED ALL APPLICABLE CITY CODES/REQUIREMENTS, ADA GUIDELINES, AND INDUSTRY STANDARDS.
16. REFER TO STRUCTURAL PLANS FOR BUILDING FOUNDATIONS AND EQUIPMENT PAD DETAILS.
17. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND PAYING FOR ALL INSURANCE, PERMITS, LICENSES AND BONDS & INSPECTIONS AS REQUIRED TO COMPLETE THE PROJECT.
18. RESTRIPE ANY REMOVED OR DAMAGED STRIPING DUE TO CONSTRUCTION, INCLUDING EXISTING FIRE LANES.
19. PROVIDE BROOM FINISH FOR NEW CONCRETE SURFACES. PAVEMENT JOINT SEALANT SHALL BE 888-SL SILICONE JOINT SEALANT AS MANUFACTURED BY THE DOW CORNING CO., OR APPROVED EQUAL. JOINT PRE-PARATION AND SEALANT INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

CONTROL POINTS

I.D.	NORTHING	EASTING	DESCRIPTION
TBM A	N= 4635.10	E= 4729.92	"X" CUT FND. ELEV= 464.71
TBM B	N= 4774.41	E= 5019.54	MAG NAIL SET ELEV= 466.12

Charles Gojer and Associates, Inc.
Consulting Engineers
Texas Firm Registration No. F-697
11615 Forest Central Dr. Suite 303
Dallas, Texas 75243 (214) 340-1199

JOB NO. 15 - 182

LEWISVILLE
Keep Texas Beautiful Bright Future

ENGINEERING DIVISION
CITY OF LEWISVILLE

WASTEWATER TREATMENT PLANT EMERGENCY GENERATOR

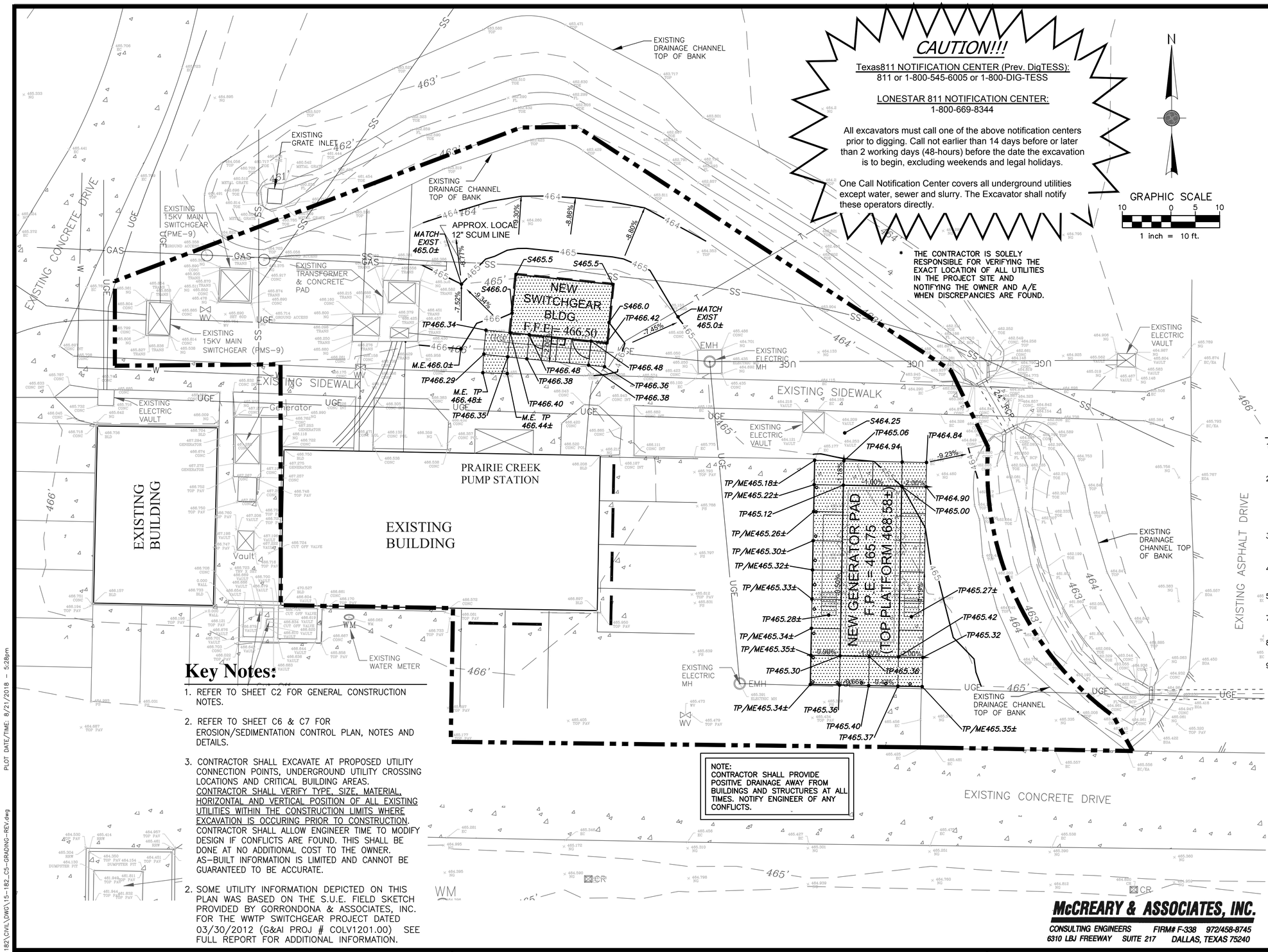
DIMENSION CONTROL AND PAVING PLAN

DARREN A. ANDREW 80061 LICENSED PROFESSIONAL ENGINEER 8-21-18

AUG 21, 2018
date

Sheet C-4 of 8

PRINTED BY: JENNIFER
CAD FILE: P:\2015\15-182\CIVIL\DWG\15-182_C4-DIM AND PAVING.dwg
PLOT DATE/TIME: 8/21/2018 - 4:17pm



CAUTION!!!

Texas811 NOTIFICATION CENTER (Prev. DigTESS):
811 or 1-800-545-6005 or 1-800-DIG-TESS

LONESTAR 811 NOTIFICATION CENTER:
1-800-669-8344

All excavators must call one of the above notification centers prior to digging. Call not earlier than 14 days before or later than 2 working days (48-hours) before the date the excavation is to begin, excluding weekends and legal holidays.

One Call Notification Center covers all underground utilities except water, sewer and slurry. The Excavator shall notify these operators directly.

* THE CONTRACTOR IS SOLELY RESPONSIBLE FOR VERIFYING THE EXACT LOCATION OF ALL UTILITIES IN THE PROJECT SITE AND NOTIFYING THE OWNER AND A/E WHEN DISCREPANCIES ARE FOUND.

N

GRAPHIC SCALE
10 0 5 10
1 inch = 10 ft.

Legend

	CONSTRUCTION LIMITS
700	PROPOSED CONTOURS
700	EXISTING CONTOURS
	EXIST. SWALE FL
	EX HEADWALL
	DIRECTION OF FLOW
	LIMITS OF NEW PAVEMENT/PAD
OR OR	EXISTING STORM INLET OR MANHOLE
428.60	SPOT ELEVATION
× 428.60	EXISTING SPOT ELEVATIONS
S	TOP SOIL/FINISHED GROUND
TP	TOP OF PAVEMENT
FL	FLOW LINE
EX OR E OR ME	EXISTING OR MATCH EXISTING
F.F.E	FINISHED FLOOR ELEVATION
F.P.E.	FINISHED PAD ELEVATION

Grading Notes:

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE CITY OF LEWISVILLE AND THE CONTRACT DOCUMENTS, EXCEPT AS NOTED HEREIN AND APPROVED BY THE OWNER, ENGINEER & GOVERNING AUTHORITY(S).
2. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT ALL UTILITIES IN THE CONSTRUCTION OF THIS PROJECT. ALL MANHOLES, CLEAN-OUTS, VALVE BOXES, FIRE HYDRANTS AND ETC., MUST BE ADJUSTED TO PROPER LINE AND GRADE BY THE CONTRACTOR PRIOR TO AND AFTER THE PLACING OF PERMANENT PAVING AS REQUIRED. UTILITIES MUST BE MAINTAINED TO PROPER LINE AND GRADE DURING CONSTRUCTION.
3. CONTRACTOR SHALL FIELD VERIFY ELEVATIONS OF EXISTING PAVEMENT AND LANDSCAPE AREAS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF DISCREPANCIES TO PLANS.
4. REFER TO EARTHWORK REQUIREMENTS NOTED ON SHEET C4, DIMENSION CONTROL AND PAVING PLAN.
5. IF ROCK IS ENCOUNTERED IN THE TRENCH, ROCK SPOIL SHALL NOT BE USED IN THE UPPER 1.5 FEET OF THE TRENCH.
7. UNSUITABLE AND EXCESS EXCAVATED MATERIALS SHALL BE LEGALLY DISPOSED OF OFFSITE BY THE CONTRACTOR.
8. INSTALL SOIL RETENTION BLANKETS ON ALL GRADED EARTH SLOPES 6:1 AND STEEPER.
9. ALL SPOT ELEVATIONS ARE TOP OF PAVEMENT UNLESS NOTED OTHERWISE.

Key Notes:

1. REFER TO SHEET C2 FOR GENERAL CONSTRUCTION NOTES.
2. REFER TO SHEET C6 & C7 FOR EROSION/SEDIMENTATION CONTROL PLAN, NOTES AND DETAILS.
3. CONTRACTOR SHALL EXCAVATE AT PROPOSED UTILITY CONNECTION POINTS, UNDERGROUND UTILITY CROSSING LOCATIONS AND CRITICAL BUILDING AREAS. CONTRACTOR SHALL VERIFY TYPE, SIZE, MATERIAL, HORIZONTAL AND VERTICAL POSITION OF ALL EXISTING UTILITIES WITHIN THE CONSTRUCTION LIMITS WHERE EXCAVATION IS OCCURING PRIOR TO CONSTRUCTION. CONTRACTOR SHALL ALLOW ENGINEER TIME TO MODIFY DESIGN IF CONFLICTS ARE FOUND. THIS SHALL BE DONE AT NO ADDITIONAL COST TO THE OWNER. AS-BUILT INFORMATION IS LIMITED AND CANNOT BE GUARANTEED TO BE ACCURATE.
2. SOME UTILITY INFORMATION DEPICTED ON THIS PLAN WAS BASED ON THE S.U.E. FIELD SKETCH PROVIDED BY GORRONDONA & ASSOCIATES, INC. FOR THE WWTP SWITCHGEAR PROJECT DATED 03/30/2012 (G&AI PROJ # COLV1201.00) SEE FULL REPORT FOR ADDITIONAL INFORMATION.

NOTE:
CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE AWAY FROM BUILDINGS AND STRUCTURES AT ALL TIMES. NOTIFY ENGINEER OF ANY CONFLICTS.

CONTROL POINTS			
I.D.	NORTHING	EASTING	DESCRIPTION
TBM A	N= 4635.10	E= 4729.92	"X" CUT FND. ELEV= 464.71
TBM B	N= 4774.41	E= 5019.54	MAG NAIL SET ELEV= 466.12

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

Charles Gojer and Associates, Inc.
Consulting Engineers
Texas Firm Registration No. F-697
11615 Forest Central Dr. Suite 303
Dallas, Texas 75243 (214) 340-1199

JOB NO. 15 — 182

PLOT DATE/TIME: 8/21/2018 - 5:26pm
PRINTED BY: JENNIFER
CAD FILE: P:\2015\15-182\CIVIL\DWG\15-182_C5-GRADING-REV.dwg

LEWISVILLE
Deep Roots. Broad Wings. Bright Future.

ENGINEERING DIVISION
CITY OF LEWISVILLE

WASTEWATER TREATMENT PLANT EMERGENCY GENERATOR

GRADING AND DRAINAGE PLAN

STATE OF TEXAS — DARREN A. ANDREW — 100007 — REGISTERED — PROFESSIONAL ENGINEER — 8-21-18

AUG 21, 2018
date

Sheet C-5 of 8

CAUTION!!!

Texas811 NOTIFICATION CENTER (Prev. DigTESS):
811 or 1-800-545-6005 or 1-800-DIG-TESS

LONESTAR 811 NOTIFICATION CENTER:
1-800-669-8344

All excavators must call one of the above notification centers prior to digging. Call not earlier than 14 days before or later than 2 working days (48-hours) before the date the excavation is to begin, excluding weekends and legal holidays.

One Call Notification Center covers all underground utilities except water, sewer and slurry. The Excavator shall notify these operators directly.

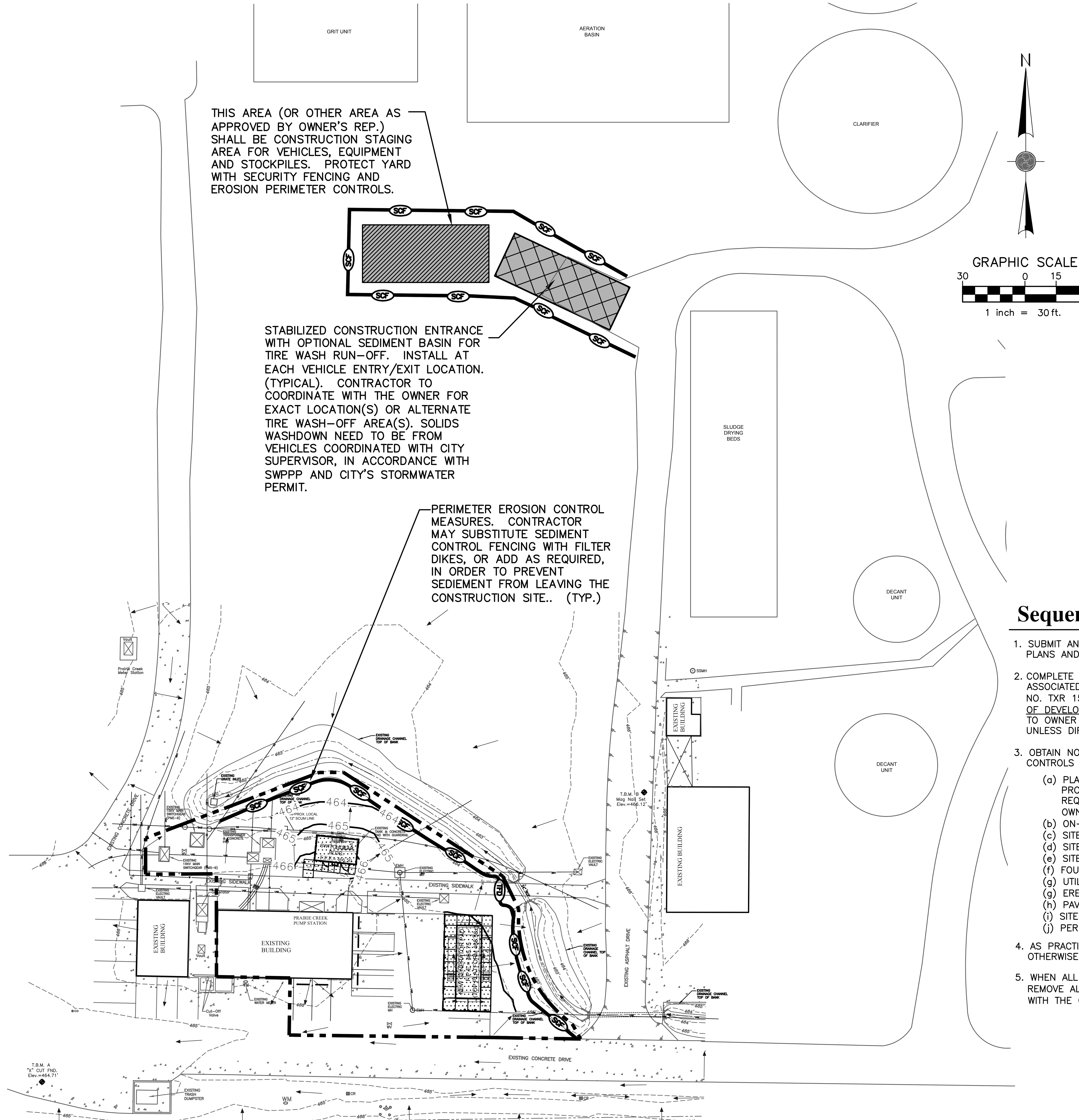
* THE CONTRACTOR IS SOLELY RESPONSIBLE FOR VERIFYING THE EXACT LOCATION OF ALL UTILITIES IN THE PROJECT SITE AND NOTIFYING THE OWNER AND A/E WHEN DISCREPANCIES ARE FOUND.

KEY NOTES:

1. CONTRACTOR SHALL EXCAVATE AT PROPOSED UTILITY CONNECTION POINTS, UNDERGROUND UTILITY CROSSING LOCATIONS AND CRITICAL BUILDING AREAS. CONTRACTOR SHALL VERIFY TYPE, SIZE, MATERIAL, HORIZONTAL AND VERTICAL POSITION OF ALL EXISTING UTILITIES WITHIN THE CONSTRUCTION LIMITS WHERE EXCAVATION IS OCCURING PRIOR TO CONSTRUCTION. CONTRACTOR SHALL ALLOW ENGINEER TIME TO MODIFY DESIGN IF CONFLICTS ARE FOUND. THIS SHALL BE DONE AT NO ADDITIONAL COST TO THE OWNER. AS-BUILT INFORMATION IS LIMITED AND CANNOT BE GUARANTEED TO BE ACCURATE.
2. SOME UTILITY INFORMATION DEPICTED ON THIS PLAN WAS BASED ON THE S.U.E. FIELD SKETCH PROVIDED BY GORRONDONA & ASSOCIATES, INC. FOR THE WWTP SWITCHGEAR PROJECT DATED 03/30/2012 (G&AI PROJ # COLV1201.00) SEE FULL REPORT FOR ADDITIONAL INFORMATION.

KEY NOTES:

1. REFER TO SHEET C2 FOR GENERAL CONSTRUCTION NOTES.
2. REFER TO SHEET C7 FOR ADDITIONAL EROSION/SEDIMENTATION CONTROL NOTES AND DETAILS.
3. THE CONTRACTOR MUST FOLLOW ALL CURRENT FEDERAL, STATE AND LOCAL AUTHORITY REGULATIONS. THE EROSION/SEDIMENTATION CONTROL PLAN, PROVIDED, SHOWS THE MINIMUM REQUIRED BMP MEASURES TO PROTECT THE SITE. ADDITIONAL TEMPORARY BMP MEASURES MAY BE REQUIRED, AT NO ADDITIONAL COST TO THE OWNER, DUE TO CONSTRUCTION MEANS AND METHODS UNDER THE CONTROL OF THE GENERAL CONTRACTOR. SEVERAL OF THESE SUCH ITEMS, BY NO MEANS ALL-INCLUSIVE, INCLUDE: SCHEDULING/PHASING OF WORK, LOCATION OF ON AND OFF-SITE STORAGE AREAS, STOCKPILE LOCATIONS, UNFORESEEN WORK OUTSIDE CONSTRUCTION LIMITS, TRUCK/HAUL ROUTES AND ETC. THE PLAN SHALL BE MODIFIED BY THE CONTRACTOR, WITH THE OWNER'S REPRESENTATIVE AND/OR GOVERNING AUTHORITY'S PERMISSION, IN ORDER TO PREVENT CONSTRUCTION DEBRIS AND RUN-OFF FROM LEAVING THE SITE AND VIOLATING THE GENERAL PERMIT.
4. EROSION CONTROL MEASURES MAY ONLY BE PLACED IN FRONT OF INLETS, OR IN CHANNELS, DRAINAGE WAYS OR BORROW DITCHES AT RISK OF CONTRACTOR. CONTRACTOR SHALL REMAIN LIABLE FOR ANY DAMAGE CAUSED BY THE MEASURES, INCLUDING FLOODING DAMAGE, WHICH MAY OCCUR DUE TO BLOCKED DRAINAGE. AT THE CONCLUSION OF THE PROJECT, ALL CHANNELS, DRAINAGE WAYS AND BORROW DITCHES IN THE WORK ZONE SHALL BE DREDGED OF ANY SEDIMENT GENERATED BY THE PROJECT OR DEPOSITED AS A RESULT OF EROSION CONTROL MEASURES.
5. CCONTRACTOR SHALL FURNISH AND INSTALL FILTER DIKES DURING CONSTRUCTION AS REQUIRED FOR ADDITIONAL PROTECTION, AND/OR INSTALL IN PAVED AREAS THAT DO NOT ALLOW THE INSTALLATION OF SEDIMENT SILT FENCING.



Legend

Symbol	Description
700 (solid)	PROPOSED CONTOURS
700 (dashed)	EXISTING CONTOURS
SCF	SEDIMENT CONTROL FENCE (SCF) —OR— TRIANGULAR FILTER DIKE (TFD)
	CONSTRUCTION LIMITS
	CONSTRUCTION ENTRANCE/EXIT (REFER TO DETAIL FOR CORRECT DIMENSIONS.)
	CONTRACTOR'S PARKING, EQUIPMENT AND MATERIAL STORAGE AREA
	EXIST. SWALE FL
	EX. FENCE
	EX HEADWALL
	FLOW ARROW
OR	EXISTING STORM INLET
	MANHOLE
	LIMITS OF NEW PAVEMENT/PADS

TOTAL ESTIMATED DISTURBED AREA: 0.25± ACRES

Sequence Of Earth Disturbing Activities

1. SUBMIT AND OBTAIN THE NECESSARY APPROVALS ON ALL OF THE REQUIRED PLANS AND PERMITS.
2. COMPLETE CONSTRUCTION SITE NOTICE (CSN) FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER TCEQ TPDES GENERAL PERMIT NO. TXR 150000, ONLY IF TOTAL DISTURBED AREA (INCLUDING COMMON PLAN OF DEVELOPMENT) IS 1.0 ACRE OR GREATER. THE CSN SHALL BE SUBMITTED TO OWNER FOR REVIEW AND APPROVAL. OWNER SHALL SUBMIT COPY TO MS4 UNLESS DIRECTED OTHERWISE BY OWNER.
3. OBTAIN NOTICE TO PROCEED AND BEGIN INSTALLATION OF EROSION/SEDIMENT CONTROLS PRIOR TO ON-SITE MOBILIZATION OF EQUIPMENT AND MATERIALS.
   (a) PLACE BMP'S CONTROLS, SIGNS AND BARRICADES. INSTALL INLET PROTECTION ON EXISTING INLETS, PERIMETER SILT FENCING AND OTHER REQUIRED SEDIMENT BARRIERS AS SHOWN ON PLAN OR AS DIRECTED BY OWNER'S REP OR ENGINEER.
   (b) ON-SITE MOBILIZATION OF EQUIPMENT AND MATERIALS.
   (c) SITE CLEARING. REMOVAL OF GROUND COVER AND SELECTED VEGITATION.
   (d) SITE DEMOLITION.
   (e) SITE GRADING. LEVEL AND CONTOUR SITE.
   (f) FOUNDATION/PAD EXCAVATION AND CONSTRUCTION
   (g) UTILITY CONSTRUCTION.
   (g) ERECT STRUCTURE(S) AND POUR BUILDING/EQUIP. PADS
   (h) PAVING ROADWAYS/DRIVEWAYS/SIDEWALKS AND MISCELLANEOUS AREAS.
   (i) SITE RESTORATION AND LANDSCAPING.
   (j) PERFORM DEMOBILIZATION OF REMAINING EQUIPMENT AND MATERIALS.
4. AS PRACTICABLE, ANY SOIL DISTURBED SHALL BE TEMPORARILY SEEDED OR OTHERWISE STABILIZED UNTIL FINAL STABILIZATION MEASURES ARE TAKEN.
5. WHEN ALL CONSTRUCTION IS COMPLETED AND THE SITE IS STABILIZED, REMOVE ALL TEMPORARY EROSION/SEDIMENTATION CONTROLS AND PROTECTION WITH THE OWNER'S APPROVAL.

CONTROL POINTS			
I.D.	NORTHING	EASTING	DESCRIPTION
TBM A	N= 4635.10	E= 4729.92	"X" CUT FND. ELEV= 464.71
TBM B	N= 4774.41	E= 5019.54	MAG NAIL SET ELEV= 466.12

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

Charles Gojer and Associates, Inc.
Consulting Engineers
Texas Firm Registration No. F-697
11615 Forest Central Dr. Suite 303
Dallas, Texas 75243 (214) 340-1199
JOB NO. 15 — 182

LEWISVILLE Deep Roots. Broad Wings. Bright Future.

ENGINEERING DIVISION CITY OF LEWISVILLE

WASTEWATER TREATMENT PLANT EMERGENCY GENERATOR

EROSION / SEDIMENT CONTROL PLAN

STATE OF TEXAS DARREN A. ANDREWS 90067 REGISTERED PROFESSIONAL ENGINEER 8-21-18

AUG 21, 2018
date

Sheet C-6 of 8

PLOT DATE/TIME: 8/21/2018 - 6:15pm
PRINTED BY: JENNIFER
CAD FILE: P:\2015\15-182\CIVIL\DWG\15-182_C6-Erosion Control.dwg

Erosion / Sedimentation Control Notes:

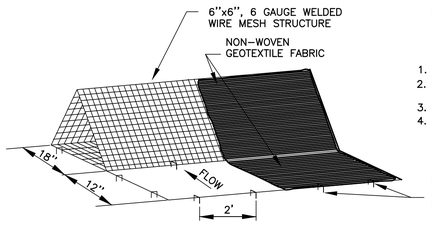
1. IF TOTAL DISTURBED AREA OF THE SITE (INCLUDING COMMON PLAN OF DEVELOPMENT) IS ONE (1) ACRE OR MORE, THE CONTRACTOR IS RESPONSIBLE FOR PREPARING, IMPLEMENTING AND MAINTAINING A STORM WATER POLLUTION PREVENTION PLAN FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER TPDES GENERAL PERMIT NO. TXR150000 THROUGH TCEQ. THE CONTRACTOR MUST FOLLOW ALL CURRENT FEDERAL, STATE AND LOCAL AUTHORITY REGULATIONS.
2. THE CONTRACTOR SHALL INSTALL EROSION/SEDIMENTATION CONTROLS AND TREE/NATURAL AREA PROTECTIVE FENCING PRIOR TO ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR EXCAVATION.) SWPPP SHALL BE APPROVED, ON FILE AND AVAILABLE, AND SITE SIGNAGE INSTALLED PRIOR TO INSTALLATION OF EROSION/SEDIMENTATION CONTROLS. INSPECTIONS OF SWPPP CONTROLS SHALL BE WEEKLY AND AFTER RAIN EVENTS.
3. THE PLACEMENT OF EROSION/SEDIMENTATION CONTROLS SHALL BE IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS FOR THE PROJECT AND SHALL BE CONSISTENT WITH REQUIREMENTS SPECIFIED IN APPLICABLE SEDIMENT AND EROSION SITE PLANS OR SITE PERMITS, OR STORM WATER MANAGEMENT SITE PLANS OR SITE PERMITS APPROVED BY THE FEDERAL, STATE, TRIBAL OR LOCAL OFFICIALS. CHANGES TO THE PLAN SHALL BE APPROVED BY THE ENGINEER, THE OWNER'S REPRESENTATIVE AND GOVERNING AUTHORITIES INSPECTING THE SITE.
4. IF OFF-SITE BORROW OF SPOIL SITES ARE USED IN CONJUNCTION WITH THIS PROJECT, THIS INFORMATION SHALL BE DISCLOSED AND THE EROSION CONTROL PLAN UPDATED BY THE CONTRACTOR TO SHOW LOCATION OF SUCH SITES. OFF-SITE BORROW AND SPOIL AREAS ARE TO BE CONSIDERED A PART OF THE PROJECT SITE AND THEREFORE SHALL COMPLY WITH REQUIREMENTS IN NOTE THREE ABOVE. THESE AREAS SHALL BE STABILIZED WITH PERMANENT GROUND COVER PRIOR TO FINAL APPROVAL OF THIS PROJECT.
5. THE PLACEMENT OF TREE/NATURAL AREA PROTECTIVE FENCING SHALL BE IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS FOR THE PROJECT AND THE LOCAL GOVERNING AUTHORITY'S (MS4) DESIGN GUIDE STANDARDS FOR TREE AND NATURAL AREA PROTECTION. REFER TO PLAN, NOTES, DETAILS AND SPECIFICATIONS.
6. AFTER SWPPP APPROVAL, PRIOR TO BEGINNING ANY SOIL DISTURBING ACTIVITIES ON SITE, A CONSTRUCTION CONFERENCE SHALL BE HELD AT THE SITE WITH THE CONTRACTOR, PERMIT APPLICANT(S)/OWNER'S REP., AND THE LOCAL GOVERNING AUTHORITY (MS4) IF APPLICABLE AFTER INSTALLATION OF THE EROSION/SEDIMENTATION CONTROLS AND TREE/NATURAL AREA PROTECTION MEASURES. THE CONTRACTOR SHALL NOTIFY THE ABOVE NOTED PARTIES AT LEAST THREE DAYS PRIOR TO THE MEETING DATE.
7. CONTRACTOR SHALL MAINTAIN ALL EROSION AND SEDIMENT CONTROLS FOR THE DURATION OF THE PROJECT OR AS DIRECTED BY THE OWNER'S REPRESENTATIVE, ENGINEER OR THE LOCAL GOV. AUTHORITY. SHOULD THE ENGINEER/OWNER NOT AGREE WITH THE LEVEL OF MAINTENANCE, THE ENGINEER/OWNER SHALL HAVE THE OPTION OF WITHHOLDING SCHEDULED PAYMENTS UNTIL SUCH TIME AS SATISFACTION IS REACHED.
8. ANY MAJOR VARIATION IN MATERIALS OR LOCATION OF CONTROLS OR FENCES FROM THOSE SHOWN ON THE PLANS WILL REQUIRE APPROVAL BY THE REVIEWING ENGINEER, OWNER'S REP., AN/OR THE GOV. AUTHORITY, AS APPROPRIATE. MINOR CHANGES BY THE CONTRACTOR MAY BE REQUIRED DURING THE COURSE OF CONSTRUCTION TO CORRECT CONTROL INADEQUACIES. THESE CHANGES MAY BE MADE AS FIELD REVISIONS TO THE EROSION AND SEDIMENTATION CONTROL PLAN. CONTRACTOR IS RESPONSIBLE FOR KEEPING PLAN CURRENT AND UPDATED WITH ALL CHANGES MADE IN THE FIELD.
9. ALL CONTROL MEASURES SHALL BE INSPECTED BY THE CONTRACTOR DURING CONSTRUCTION AT LEAST ONCE WEEKLY AND AFTER RAIN EVENTS, AND THE NECESSARY MODIFICATIONS COMPLETED. CONTRACTOR SHALL ALSO INSPECT ALL CONTROL MEASURES AFTER FINAL STABILIZATION (PRENNIAL VEGITATIVE COVER HAS BEEN ESTABLISHED ON THE SITE WITH A DENSITY OF 70% OF THE NATIVE BACKGROUND VEGETATIVE COVER.).
10. IF STOCKPILES ARE REQUIRED ON SITE, INSTALL SEDIMENT FENCING/BARRIER CONTROL AT TOE OF SLOPE. DURING WET WEATHER SEASON, STOCKPILES SHALL BE COVERED WITH POLYETHYLENE PLASTIC SHEETING 6 MIL. MIN. THICKNESS AND HELD TIGHTLY IN PLACE BY USING SANDBAGS ON ROPES OR OTHER APPROVED METHODS.
11. SOIL RETENTION BLANKETS SHALL BE INSTALLED ON ALL GRADED EARTH SLOPES 6:1 AND STEEPER.
12. ALL DISTURBED EARTH SHALL BE PERMANENTLY SODDED OR SEEDED WHEN THE PROJECT IS COMPLETED. THE SPECIFIC PLANT MATERIAL PROPOSED TO PROTECT FILL AND EXCAVATED SLOPES MUST BE SUITABLE FOR USE UNDER LOCAL CLIMATE AND SOIL CONDITIONS. IN GENERAL, SODDING BERMUDA GRASS IS ACCEPTABLE DURING THE SUMMER MONTHS (MAY 01 TO SEPTEMBER 30). WINTER RYE OR FESCUE GRASS MAY BE PLANTED DURING TIMES OTHER THAN THE SUMMER MONTHS AS A TEMPORARY MEASURE UNTIL SUCH TIME AS THE PERMANENT PLANTING CAN BE MADE. REFER TO LANDSCAPE PLAN FOR PLANTING INFORMATION IF ONE HAS BEEN PROVIDED FOR PROJECT.
13. PROTECT TREES AS INDICATED ON PLAN, BY PLACING FENCING AT THE TREE'S DRIP LINE AT A MINIMUM. ADDITIONAL PROTECTIVE MEASURES MAY BE NEEDED. REFER TO NOTES AND/OR DETAILS.
14. AS INLETS ARE CONSTRUCTED ON SITE, TEMPORARY SEDIMENT BARRIERS SHALL BE INSTALLED TO PROTECT AGAINST CONSTRUCTION RUN-OFF FROM ENTERING STORM SEWER SYSTEM.
15. CONTRACTOR SHALL NOT CLEAN VEHICLES ON SITE UNLESS A CLEANING/WASH STATION FOR SEDIMENT CONTROL IS CONSTRUCTED. SOLIDS WASHDOWN NEED TO BE FROM VEHICLES COORDINATED WITH CITY SUPERVISOR, IN ACCORDANCE WITH SWPPP AND CITY'S STORMWATER PERMIT.
16. CONTRACTOR SHALL USE APPROPRIATE SEDIMENT CONTROL WHILE DEWATERING ON SITE. A SEDIMENT TANK OR SUMP PIT DEWATERING STRUCTURE MAY BE USED. SUBMIT PLAN FOR APPROVAL BY OWNER.
17. CONTRACTOR SHALL HAVE ADDITIONAL FILTER DIKES AVAILABLE TO INSTALL ON SITE, AS REQUIRED FOR UNFORESEEN EMERGENCY USE DURING CONSTRUCTION, WHERE ADDITIONAL EROSION/SEDIMENTATION PROTECTION IS NEEDED.
18. PRIOR TO FINAL ACCEPTANCE BY THE OWNER/OWNER REP., ANY HAUL ROADS AND/OR WATERWAY CROSSINGS CONSTRUCTED FOR TEMPORARY CONTRACTOR ACCESS MUST BE REMOVED, ACCUMULATED SEDIMENT REMOVED FROM THE WATERWAY AND THE AREA RESTORED TO THE ORIGINAL GRADE AND RE-VEGETATED. ALL LAND CLEARING DEBRIS SHALL BE DISPOSED OF IN APPROVED SPOIL DISPOSAL SITES BY THE CONTRACTOR.
19. ALL WORK MUST STOP IF A VOID IN THE ROCK SUBSTRATE IS DISCOVERED WHICH IS; ONE SQUARE FOOT IN TOTAL AREA; BLOWS AIR FROM WITHIN THE SUBSTRATE AND/OR CONSISTENTLY RECEIVES WATER DURING ANY RAIN EVENT. THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE IMMEDIATELY FOR FURTHER INVESTIGATION.
20. IF THE EROSION CONTROL PLANS, AS APPROVED, CANNOT CONTROL EROSION AND OFF SITE SEDIMENTATION, IT IS REQUIRED, BY THE GENERAL TCEQ PERMIT, THAT THE PLAN BE REVISED AND ADDITIONAL EROSION CONTROL DEVICES BE INSTALLED. ADDITIONAL TEMPORARY BMP MEASURES SHALL BE INSTALLED BY THE CONTRACTOR.
21. THE ENGINEER/OWNER OR GOV. AUTHORITY HAS THE AUTHORITY TO DIRECT THE CONTRACTOR TO ADD AND/OR MODIFY EROSION/SEDIMENTATION CONTROLS ON SITE TO KEEP PROJECT IN COMPLIANCE WITH TCEQ RULES AND PERMIT REGULATIONS.
22. THE GENERAL CONTRACTOR SHALL COORDINATE SCHEDULES WITH SUBCONTRACTORS FOR INSTALLATION AND REMOVAL OF SEDIMENT CONTROLS WITH THE ENGINEER'S/OWNER'S AND GOV. AUTHORITY'S APPROVAL.

Tree and Natural Area Protection Notes:

1. ALL PRESERVED TREES AND NATURAL AREAS SHOWN ON PLAN, TO BE PRESERVED, SHALL BE PROTECTED DURING CONSTRUCTION WITH TEMPORARY FENCING. ALTERNATIVELY, NOTICES PROHIBITING DISTURBANCES MAY BE POSTED SO LONG AS ENFORCEMENT IS ADEQUATE.
2. PROTECTIVE FENCES SHALL BE ERECTED ACCORDING TO PLANS.
3. PROTECTIVE FENCES SHALL BE INSTALLED PRIOR TO THE START OF ANY SITE PREPARATION WORK (CLEARING, GRUBBING, OR GRADING), AND SHALL BE MAINTAINED THROUGHOUT ALL PHASES OF THE CONSTRUCTION PROJECT.
4. EROSION AND SEDIMENTATION CONTROL BARRIERS SHALL BE INSTALLED OR MAINTAINED IN A MANNER WHICH DOES NOT RESULT IN SOIL BUILD-UP WITHIN THE TREE DRIP LINES.
5. PROTECTIVE FENCES SHALL SURROUND THE TREES OR GROUP OF TREES, AND WILL BE LOCATED AT THE OUTERMOST LIMIT OF BRANCHES (DRIP LINE), FOR NATURAL AREAS, PROTECTIVE FENCES SHALL FOLLOW THE LIMIT OF CONSTRUCTION LINE, IN ORDER TO PREVENT THE FOLLOWING:
   A. SOIL COMPACTION IN THE ROOT ZONE AREA RESULTING FROM VEHICULAR TRAFFIC OR STORAGE OF EQUIPMENT OR MATERIALS.
   B. ROOT ZONE DISTURBANCES DUE TO GRADE CHANGES (GREATER THAN 6 INCHES CUT OR FILL), OR TRENCHING.
   C. WOUNDS TO EXPOSED ROOTS, TRUNK OR LIMBS BY MECHANICAL EQUIPMENT;
   D. OTHER ACTIVITIES DETRIMENTAL TO TREES SUCH AS CHEMICAL STORAGE, CEMENT TRUCK CLEANING AND FIRES.
6. EXCEPTIONS TO INSTALLING FENCES AT TREE DRIP LINES MAY BE PERMITTED IN THE FOLLOWING CASES:
   A. WHERE THERE IS TO BE AN APPROVED GRADE CHANGE, IMPERMEABLE PAVING SURFACE TREE WELL, OR OTHER SUCH SITE DEVELOPMENT, ERECT THE FENCE APPROXIMATELY 2 TO 4 FEET BEYOND THE AREA DISTURBED.
   B. WHERE PERMEABLE PAVING IS TO BE INSTALLED WITHIN A TREE'S DRIP LINE, ERECT THE FENCE AT THE OUTER LIMITS OF THE PERMEABLE PAVING AREA (PRIOR TO SITE GRADING SO THAT THIS AREA IS GRADED SEPARATELY PRIOR TO PAVING INSTALLATION TO MINIMIZED ROOT DAMAGE);
   C. WHERE TREES ARE CLOSE TO PROPOSED BUILDINGS, ERECT THE FENCE TO ALLOW 6 TO 10 FEET OF WORK SPACE BETWEEN THE FENCE AND THE BUILDING;
7. WHERE ANY OF THE ABOVE EXCEPTIONS RESULT IN A FENCE BEING CLOSER THAN 4 FEET TO A TREE TRUNK, PROTECT THE TRUNK WITH STRAPPED-ON PLANKING TO A HEIGHT OF 8 FEET (OR TO THE LIMITS OF LOWER BRANCHING) IN ADDITION TO THE REDUCED FENCING PROVIDED.
8. TREES APPROVED FOR REMOVAL SHALL BE REMOVED IN A MANNER WHICH DOES NOT IMPACT TREES TO BE PRESERVED.
9. ANY ROOTS EXPOSED BY CONSTRUCTION ACTIVITY SHALL BE PRUNED FLUSH WITH THE SOIL. BACKFILL ROOT AREAS WITH GOOD QUALITY TOP SOIL AS SOON AS POSSIBLE. IF EXPOSED ROOT AREAS ARE NOT BACKFILLED WITHIN 2 DAYS, COVER THEM WITH ORGANIC MATERIAL IN A MANNER WHICH REDUCES SOIL TEMPERATURE AND MINIMIZES WATER LOSS DUE TO EVAPORATION.
10. ANY TRENCHING REQUIRED FOR THE INSTALLATION OF LANDSCAPE IRRIGATION SHALL BE PLACED AS FAR FROM EXISTING TREE TRUNKS AS POSSIBLE.
11. NO LANDSCAPE TOPSOIL DRESSING GREATER THAN 4 INCHES SHALL BE PERMITTED WITHIN THE DRIP LINE OF TREES. NO SOIL IS PERMITTED ON THE ROOT FLARE OF ANY TREE.
12. PRUNING TO PROVIDE CLEARANCE FOR STRUCTURES, VEHICULAR TRAFFIC AND EQUIPMENT SHALL TAKE PLACE BEFORE DAMAGE OCCURS (RIPPING OF BRANCHES , ETC.)
13. ALL FINISHED PRUNING SHALL BE DONE ACCORDING TO RECOGNIZED, APPROVED STANDARDS OF THE INDUSTRY (REFERENCE THE NATIONAL ARBORIST ASSOCIATION PRUNING STANDARDS FOR SHADE TREES).
14. CONSTRUCTION ACTIVITY INCLUDING PARKING SHALL BE CONFINED TO THE PROJECT LIMITS SHOWN ON THESE PLANS.

Key Notes:

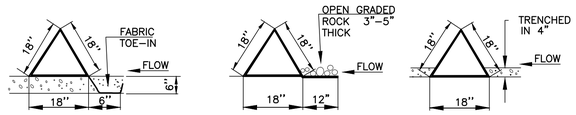
1. REFER TO SHEET C2 FOR CONSTRUCTION GENERAL NOTES.
2. REFER TO SHEET C6 FOR EROSION/SEDIMENT CONTROL PLAN.



NOTE:
FILTER FABRIC SHALL ENTIRELY COVER DIKE AND SKIRT.

INSTALLATION DETAIL OPTIONS:
1. TOE-IN 6" MINIMUM.
2. WEIGHTED WITH 3" – 5" OPEN GRADED ROCK.
3. TRENCHED IN 4".
4. CONTINUOUS BACKING/PLANKS ON IMPERVIOUS SURFACES.

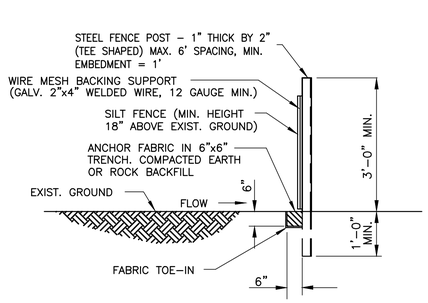
FOR OPTION (2) ABOVE, USE METAL STAPLE ANCHORS, 6"x1-½", EVERY 2' EXCEPT WHERE CROSSING PAVEMENT OR EXPOSED LIMESTONE.

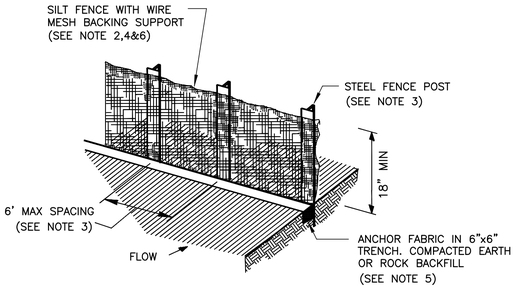


GENERAL NOTES:
1. TRIANGULAR SEDIMENT FILTER DIKES ARE USED IN AREAS WHERE THERE IS NO CONCENTRATION OF WATER IN A CHANNEL OR OTHER DRAINAGE WAY ABOVE THE BARRIER AND THE CONTRIBUTING DRAINAGE AREA IS LESS THAN ONE ACRE. THIS MEASURE IS EFFECTIVE ON PAVED AREAS WHERE INSTALLATION OF SILT FENCE IS NOT POSSIBLE OR WHERE VEHICLE ACCESS MUST BE MAINTAINED.
2. DIKES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT DIKE.
3. THE FABRIC COVER AND SKIRT SHALL BE A CONTINUOUS WRAPPING OF GEOTEXTILE. THE SKIRT SHALL BE A CONTINUOUS EXTENSION OF THE FABRIC ON THE UPSTREAM FACE.
4. THE SKIRT SHALL BE WEIGHTED WITH A CONTINUOUS LAYER OF 3-5 INCHES OF OPEN GRADED ROCK OR TOED-IN 6" WITH MECHANICALLY COMPACTED MATERIAL. OTHERWISE, THE ENTIRE STRUCTURE SHALL BE TRENCHED IN 4".
5. DIKES AND SKIRT SHALL BE SECURELY ANCHORED IN PLACE USING 6" WIRE STAPLES ON 2' CENTERS ON BOTH EDGES AND SKIRT, OR STAKE USING 3/8" DIAMETER REBAR WITH TEE ENDS. (UNLESS CROSSING PAVEMENT OR EXPOSED LIMESTONE.)
6. FILTER MATERIAL SHALL BE LAPPED OVER ENDS 6" TO COVER DIKE TO DIKE JOINTS. JOINTS SHALL BE FASTENED WITH GALVANIZED SHOAT RINGS.
7. THE DIKE STRUCTURE SHALL BE MW40-6 GA. 6"X6" WIRE MESH, 18" ON A SIDE.
8. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.
9. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6" AND DISPOSED OF IN A MANNER WHICH WILL NOT CAUSE ADDITIONAL SILTATION.
10. AFTER THE SITE IS COMPLETELY STABILIZED, THE DIKES AND ANY REMAINING SILT SHALL BE REMOVED WITH PERMISSION FROM OWNER. SILT SHALL BE PROPERLY DISPOSED OF.

03 Tri Dike Filter Dam

N.T.S.

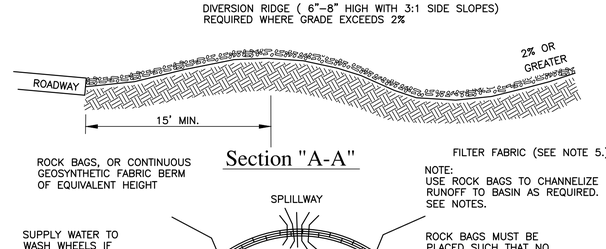




1. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POSTS MUST BE EMBEDDED A MINIMUM OF 12".
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF THE FLOW. WHERE FENCE CAN NOT BE TRENCHED INTO THE SURFACE (e.g. PAVEMENT) THE FABRIC SHALL BE WEIGHTED DOWN WITH ROCK OR 1"x4" LUMBER SECURELY FASTENED TO THE SURFACE, ON THE UPSTREAM SIDE TO PREVENT FLOW UNDER THE FENCE.
3. THE TRENCH MUST BE A MINIMUM OF 6" DEEP AND 6" WIDE TO ALLOW FOR THE FILTER FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
4. THE FILTER FABRIC SHALL BE SECURELY FASTENED TO THE WOVEN WIRE BACKING, WHICH IN TURN IS SECURELY FASTENED TO THE STEEL FENCE POST.
5. ACCUMLUTATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6". THE SILT SHALL BE DISPOSED OF ON AN APPROVED SITE AND IN SUCH A MANNER THAT WILL NOT CONTRIBUTE TO ADDITIONAL SILTRATION.
6. INSPECTION SHALL BE MADE WEEKLY AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY, IF NEEDED.
7. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED.

01 Silt Fence Detail

N.T.S.

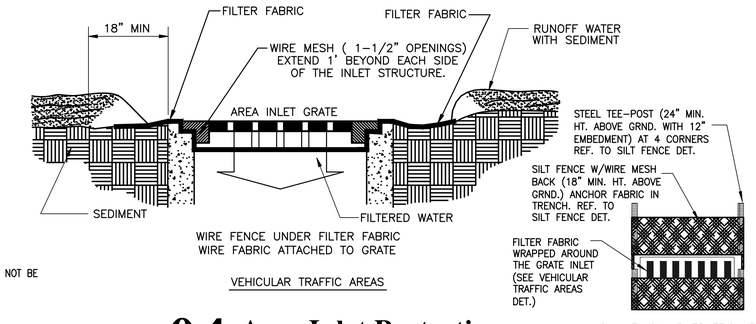


Plan

1. LOCATION FOR INSTALLATION IS IDENTIFIED ON THE PROJECT'S EROSION CONTROL PLAN. AN ALTERNATE LOCATION MUST BE APPROVED BY OWNER OR ENGINEER PRIOR TO INSTALLATION. AVOID CURVES ON PUBLIC ROADS AND STEEP SLOPES.
2. REMOVE VEGETATION AND OTHER OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA. GRADE CROWN FOUNDATION FOR POSITIVE DRAINAGE.
3. THE MIN. WIDTH OF THE ENTRANCE/EXIT SHOULD BE 20 FT. OR THE FULL WIDTH OF EXIT ROADWAY, WHICHEVER IS GREATER.
4. THE CONSTRUCTION ENTRANCE SHOULD BE AT LEAST 50 FT. LONG. EXTEND BEYOND THE 50 FT MIN., AS NECESSARY, IF THE PAD IS TOO SHORT FOR HEAVY CONSTRUCTION TRAFFIC.
5. PLACE GEOTEXTILE FABRIC AND GRADE FOUNDATION TO IMPROVE STABILITY. FABRIC SHALL BE DESIGNATED SPECIFICALLY FOR USE AS A SOIL FILTRATION MEDIA WITH AN APPROX. WEIGHT OF 6 oz/yd sq., A MULLEN BURST RATING OF 300 lb/in sq., AND AN EQUIVALENT OPENING SIZE GREATER THAN A NUMBER 50 SIEVE.
6. DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE STONE PAD TO A SEDIMENT TRAP OR BASIN. INSTALL PIPE UNDER PAD AS NEEDED TO MAINTAIN PROPER PUBLIC ROAD DRAINAGE.
7. ENTRANCE SHALL BE MAINTAINED IN A CONDITION, WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITITONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
8. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ON TO PUBLIC RIGHT-OF-WAY SHOULD BE REMOVED IMMEDIATELY BY CONTRATOR.
9. WHEN NECESSARY, WHEELS SHOULD BE CLEANED TO REMOVED SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY. WHEN WASHING IS REQUIRED, IT SHOULD BE DONE ON AN AREA STABILIZED WITH 4 INCH MIN. WASHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMNET BASIN. A COMMERCIAL WASH RACK MAY ALSO BE USED.
10. ALL SEDIMENT SHOULD BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATER COURSE BY USING APPROVED METHODS.

02 Stabilized Construction Entrance/Exit

N.T.S.



04 Area Inlet Protection

N.T.S.

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

Charles Gojer and Associates, Inc.
Consulting Engineers
Texas Firm Registration No. F-697
11615 Forest Central Dr. Suite 303
Dallas, Texas 75243 (214) 340-1199

JOB NO. 15 – 182

LEWISVILLE Deep Roots. Broad Wings. Bright Future.

ENGINEERING DIVISION
CITY OF LEWISVILLE

WASTEWATER TREATMENT PLANT
EMERGENCY GENERATOR

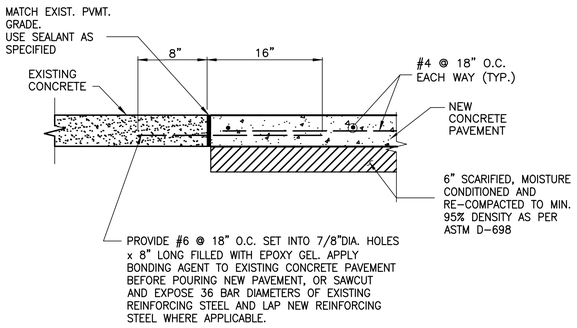
EROSION / SEDIMENT CONTROL NOTES & DETAILS

DARREN A. ANDREWS 90061 REGISTERED PROFESSIONAL ENGINEER 8-21-18

AUG 21, 2018
date

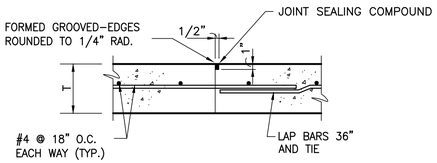
Sheet C-7 of 8

PRINTED BY: JENNIFER
CAD FILE: P:\2015\15-182\CIVIL\DWG\15-182_07-Erosion Control Notes and Details.dwg
PLOT DATE/TIME: 8/21/2018 – 6:11pm

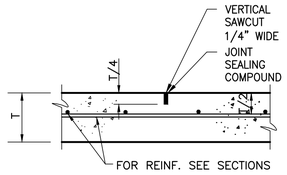


01 Existing Concrete To New Concrete Pavement

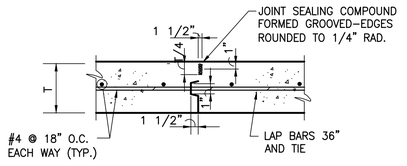
N.T.S.



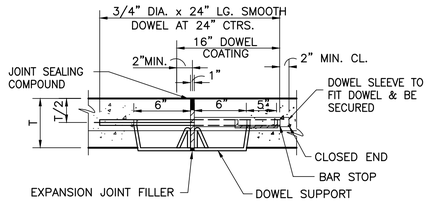
Construction Joint



Sawed Dummy Joint



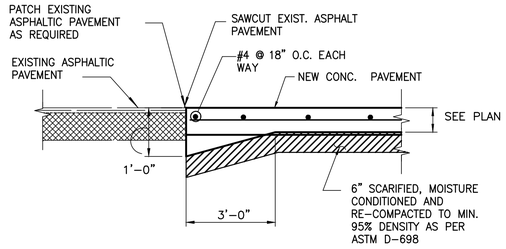
Keyway Joint



Expansion Joint

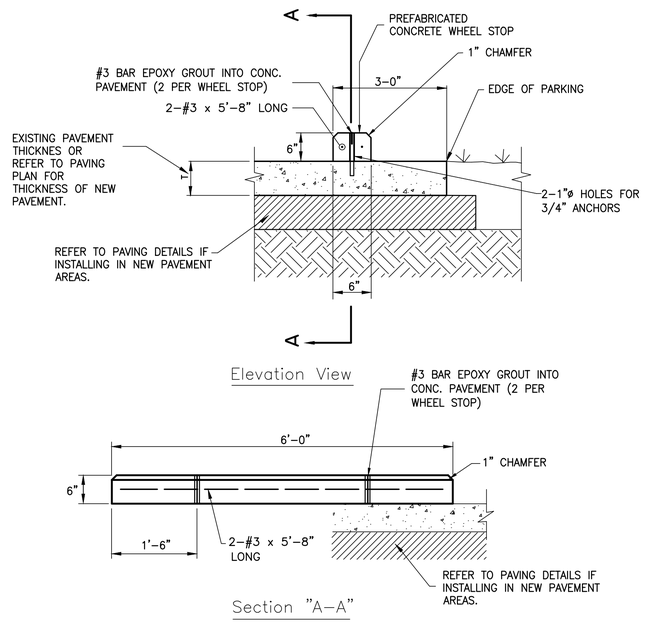
02 Typical Pavement Joint Details

N.T.S.



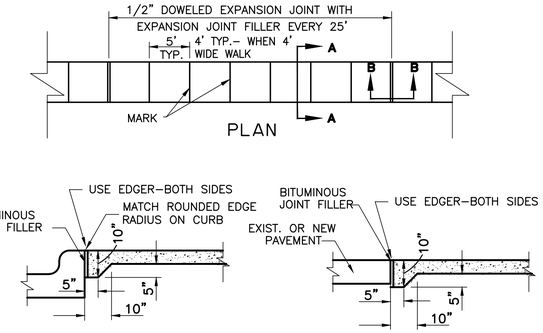
03 New Concrete Pavement to Existing Asphalt Pavement

N.T.S.

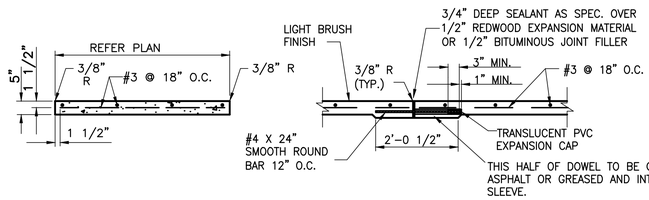


04 Wheel Stop Detail

N.T.S.



JOINT LUG DETAIL FOR MEDIAN PAVEMENT OR SIDEWALK ADJACENT TO CURB/PAVING



SECTION "A-A" SECTION "B-B"

NOTE:
1. CROSS SLOPE OF SIDEWALK SHALL BE 2% PER FT. MAX.
2. SIDEWALK WIDTHS SHALL BE AS SHOWN ON THE PAVING PLAN.
3. SIDEWALK STRENGTH SHALL BE AS NOTED ON PAVING PLAN.
4. ALL HONEYCOMB IN BACK OF CURB TO BE TROWEL-PLASTERED BEFORE POURING SIDEWALK.
5. LUG MAY BE FORMED BY SHAPING SUBGRADE TO APPROXIMATE DIMENSIONS SHOWN.
6. RAMPS AND SIDEWALK CONSTRUCTION SHALL MEET ALL CITY AND TAS REQUIREMENTS.
7. CONST. SIDEWALK OVER 6" MIN. 95% COMPACTED SELECT FILL MATERIAL (NO SAND PERMITTED) .

05 Reinforced Concrete Sidewalk Spacing Detail

N.T.S.

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

Charles Gojer and Associates, Inc.
Consulting Engineers
Texas Firm Registration No. F-697
11615 Forest Central Dr. Suite 303
Dallas, Texas 75243 (214) 340-1199

JOB NO. 15 - 182

LEWISVILLE Deep Roots. Broad Wings. Bright Future.

ENGINEERING DIVISION
CITY OF LEWISVILLE

WASTEWATER TREATMENT PLANT EMERGENCY GENERATOR

CIVIL DETAILS

DARRIS A. ANDREWS 80008 REGISTERED PROFESSIONAL ENGINEER 8-21-18

AUG 21, 2018
date

Sheet C-8 of 8

PRINTED BY: JENNIFER
CAD FILE: P:\2015\15-182\CIVIL\DWG\15-182_C8-CIVIL DETAILS.dwg
PLOT DATE/TIME: 8/21/2018 - 6:21pm

ABBREVIATIONS

A.B.	– ANCHOR BOLT
A/C	– AIR CONDITIONER
A/E	– ARCHITECT/ENGINEER
A.F.F.	– ABOVE FINISHED FLOOR
ADDN'L	– ADDITIONAL
ADJ.	– ADJACENT
AHU	– AIR HANDLING UNIT
ALT.	– ALTERNATE
ALUM.	– ALUMINIUM
APPROX.	– APPROXIMATE
ARCH.	– ARCHITECT
ARCH'L.	– ARCHITECTURAL
B.F.F.	– BELOW FINISHED FLOOR
B.L.	– BUILDING LINE
B.P.	– BASE PLATE
BAL.	– BALANCE
BLDG.	– BUILDING
BLK.	– BLOCK
BLKG.	– BLOCKING
BM.	– BEAM
BOT.	– BOTTOM
BRDG.	– BRIDGING
BRG.	– BEARING
BRKT.	– BRACKET
BSMT.	– BASEMENT
BTWN.	– BETWEEN
COMP.	– COMPRESSION
C.I.P.	– CAST–IN–PLACE
C.J.	– CONSTRUCTION JOINT
C.L.	– CENTER LINE
CANT'L	– CANTILEVER
CLG.	– CEILING
CLR.	– CLEAR
COL.	– COLUMN
CMU	– CONCRETE MASONRY UNIT
CONC.	– CONCRETE
CONN(S).	– CONNECTION(S)
CONSTR.	– CONSTRUCTION
CONT.	– CONTINUOUS
CONTR.	– CONTRACTOR
CTR.	– CENTER
D.L.	– DEAD LOAD
DBL.	– DOUBLE
DEG.(S)	– DEGREE(S)
DET.	– DETAIL
DIA.	– DIAMETER
DIAG.	– DIAGONAL
DIM(S).	– DIMENSION(S)
DN.	– DOWN
DWG(S).	– DRAWING(S)
DWL(S).	– DOWEL(S)
E.E.	– EACH END
E.F.	– EACH FACE
E.J.	– EXPANSION JOINT
E.S.	– EACH SIDE
E.W.	– EACH WAY
E.W.B.	– EACH WAY BOTTOM
E.W.T.	– EACH WAY TOP
E.W.T.B.	– EACH WAY TOP AND BOTTOM
EA.	– EACH
EL.	– ELEVATION
ELEC.	– ELECTRIC(AL)
EMBED.	– EMBED(DED)(MENT)
EQ.	– EQUAL
EQUIP.	– EQUIPMENT
EXIST.	– EXISTING
EXP.	– EXPANSION
EXT.	– EXTERIOR
F.TO F.	– FACE TO FACE
F.D.	– FLOOR DRAIN
F.P.	– FULL PENETRAION
F.S.	– FAR SIDE
FDN.	– FOUNDATION
FIN. FL.	– FINISHED FLOOR
FL.	– FLOOR
FLG.	– FLANGE
FT.	– FOOT (FEET)
FTG.	– FOOTING
G.C.	– GENERAL CONTRACTOR
GA.	– GAGE OR GAUGE
GALV.	– GALVANIZED
GEN.	– GENERAL
GB.	– GRADE BEAM
H.P.	– HIGH POINT
H.S.	– HEADED STUD(S)
HK.	– HOOK
H.I.F.	– HORIZONTAL INSIDE FACE
H.O.F.	– HORIZONTAL OUTSIDE FACE
HT.	– HEIGHT
HVAC	– HEATING,VENTILATION AND AIR CONDITIONING
I.D.	– INSIDE DIAMETER
I.F.	– INSIDE FACE
IN.	– INCHES
INFO.	– INFORMATION
INSUL.	– INSULATION
INT.	– INTERIOR
INTERM.	– INTERMEDIATE
JST(S).	– JOIST(S)
JT.	– JOINT
K	– KIPS (1000 LBS)
K.L.F.	– KIP PER LINEAR FOOT
K.S.F.	– KIP PER SQUARE FOOT
L.L.	– LIVE LOAD
LLH	– LONG LEG HORIZONTAL
LLV	– LONG LEG VERTICAL
L.P.	– LOW POINT
L.W.	– LONG WAY
L.W.B.	– LONG WAY BOTTOM
L.W.T.	– LONG WAY TOP
L.W.T.B.	– LONG WAY TOP AND BOTTOM
LB., #	– POUND
LG.	– LONG
M.C.	– MOMENT CONNECTION
M.O.	– MASONRY OPENING
MAS'Y	– MASONRY
MAT'L	– MATERIAL
MAX.	– MAXIMUM
MECH.	– MECHANICAL
MEZZ.	– MEZZANINE
MFR.	– MANUFACTURER
MIN.	– MINIMUM
MISC.	– MISCELLANEOUS
MK.	– MARK
MTL.	– METAL
N/A	– NOT APPLICABLE
N.I.C.	– NOT IN CONTRACT
N.S.	– NEAR SIDE
N.T.S.	– NOT TO SCALE
NO. OR #	– NUMBER
NOM.	– NOMINAL
O.A.	– OVERALL
OC	– ON CENTER
O.D.	– OUTSIDE DIAMETER
O.F.	– OUTSIDE FACE
O.G.L.	– ON GAGE LINE
O.H.	– OPPOSITE HAND
O.S.L.	– OUTSTANDING LEG
OPNG(S).	– OPENING(S)
OPP.	– OPPOSITE
OZ.	– OUNCE
P/C.	– PRECAST CONCRETE
P–T.	– POST–TENSION(ED)(ING)
P.E.	– PROFESSIONAL ENGINEER
P.S.F.	– POUNDS PER SQUARE FOOT
P.S.I.	– POUNDS PER SQUARE INCH
PAR.	– PARALLEL
PC.	– PIECE
PERIM.	– PERIMETER
PERP.	– PERPENDICULAR
PL.,	– PLATE
PREFAB.	– PREFABRICATED
PTFE.	– POLYTETRAFLUOROETHYLENE
QTY.	– QUANTITY
R	– RADIUS
R.D.	– ROOF DRAIN
RCP	– REINFORCED CONCRETE PIPE
REBAR	– REINFORCING BAR(S)
REF.	– REFERENCE
REINF.	– REINFORCE(ING)(ED)(MENT)
REQ'D.	– REQUIRED
S.F.	– SQUARE FOOT (FEET)
S.O.G.	– SLAB ON GRADE
S.W.	– SHORT WAY
S.W.B.	– SHORT WAY BOTTOM
S.W.T.	– SHORT WAY TOP
S.W.T.B.	– SHORT WAY TOP AND BOTTOM
SCHED.	– SCHEDULE(D)
SECT.	– SECTION
SHT.	– SHEET
SIM.	– SIMILAR
SL.	– SLAB
SLV.	– SLEEVE
SP.	– SPACE
SPEC(S).	– SPECIFICATION(S)
SQ.	– SQUARE
SS.	– STAINLESS STEEL
STD.	– STANDARD
STL.	– STEEL
STIFF.	– STIFFENER(S)
STIR.	– STIRRUP(S)
STR.	– STRAIGHT
STRUCT'L.	– STRUCTURAL
SYM.	– SYMMETRICAL
T & G	– TONGUE AND GROOVE
T & B	– TOP AND BOTTOM
T.O.B.	– TOP OF BEAM
T.O.F.	– TOP OF FOOTING
T.O.J.	– TOP OF JOIST
T.O.P.	– TOP OF PIER
T.O.P.C.	– TOP OF PIER CAP
T.O.S.	– TOP OF STEEL
T.O.S.C.	– TOP OF STRUCTURAL CONCRETE
T.O.W.	– TOP OF WALL
TEMP.	– TEMPERATURE
TEN.	– TENSION
THK.	– THICK
THK'N(D)	– THICKEN(ED)
TYP.	– TYPICAL
U.N.O.	– UNLESS NOTED OTHERWISE
W/	– WITH

GENERAL NOTES

DESIGN LOADS

1. GRAVITY LOADS:

   A. DESIGN UNIFORM LIVE LOADS ARE AS LISTED BELOW. LIVE LOAD REDUCTIONS ARE CALCULATED IN ACCORDANCE WITH THE IBC 2015 BUILDING CODE.

   B. DESIGN UNIFORM SUPERIMPOSED DEAD LOADS ARE IN ADDITION TO THE WEIGHT OF THE BUILDING STRUCTURE.

   C. DESIGN CONCENTRATED LIVE LOADS ARE NOT COMBINED WITH UNIFORM LIVE LOADS.

   E. UNIFORM LIVE LOADS

      ROOF = 20 PSF

   F. UNIFORM SUPERIMPOSED DEAD LOADS

      ROOF = 10 PSF MECH'L. + 6 PSF ROOFING

   G. CONCENTRATED LIVE LOADS

      ROOF = 200 LB.

      CONCENTRATED FLOOR LOAD APPLIED OVER AREA OF 2'–6" x 2'–6".

2. SNOW LOAD

   A. GROUND SNOW LOAD – CITY OF LEWISVILLE = 5 PSF

3. WIND LOADS

   A. IN ACCORDANCE WITH THE 2015 INSERNATIONAL BUILDING CODE

   B. WIND COEFFICIENTS AND CATEGORIES – CITY OF TEMPLE

      3 SEC GUST ..... 90 MPH
      EXPOSURE CLASS C
      OCCUPANCY CATEGORY II
      WIND IMPORTANCE FACTOR, Iw 1.00
      INTERNAL PRESSURE COEFFICIENT 0.18

   C. NET ROOF UPLIFT (10 PSF DL ROOFING ASSUMED)
      = –10 PSF TYPICAL.
      = –15 PSF WITHIN 10'–0" OF EDGE OR STEP IN ROOF.
      = –27 PSF IN CORNER ZONES AS DEFINED IN BUILDING CODE

   D. EXTERIOR WALL DESIGN PRESSURES:
      = 18 PSF(+), ALL ZONES
      = 22 PSF(–), EDGE ZONES

4. SEISMIC LOADS

   A. IN ACCORDANCE WITH INTERNATIONAL BUILDING CODE (IBC 2015)

   B. SEISMIC COEFFICIENTS AND CATEGORIES – CITY OF LEWISVILLE

FOUNDATION

1. THESE NOTES APPLY TO ALL FOUNDATIONS AND SLABS ON GRADE DETAILED ON THE STRUCTURAL DRAWINGS, UNLESS NOTED OTHERWISE.

2. FOUNDATION DESIGN IS BASED ON THE SOILS BORINGS SHOWN ON A PAST PROJECT DRAWING ENTITLED "WASTE WATER PLANT EXPANSION" DATED SEPT. 2004, FURNISHED BY THE OWNER.

3. ALLOWABLE BEARING PRESSURE ASSUMED AT 5 KSF FOR DRILLED AND UNDER REAMED PIERS FOUNDED ON THE SHALE FIRM, DARK GRAY STRATUM, WHICH IS ASSUMED TO BE FOUND AT APPROXIMATELY 20 FEET FROM EXISTING SURFACE.

4. SUB–GRADE PREPARATION UNDER BUILDING SLABS ON GROUND:

   A. REMOVE THE UPPERMOST 6" OF SOIL AND STOCKPILE FOR USE ONLY AS TOP SOIL FOR FINAL GRADING.

   B. EXCAVATE AS REQUIRED FOR PLACEMENT OF FOOTINGS AND SELECT FILL. PROVIDE 1% SLOPE AT BOTTOM ELEVATION TO PREVENT PONDING.

   C. BACKFILL BENEATH THE BUILDING WITH A MINIMUM OF 2 FEET OF SELECT FILL. PLACE IN LAYERS OF 8 INCH MAXIMUM LOOSE THICKNESS AND COMPACT TO A DRY DENSITY OF NOT LESS THAN 95% OF STANDARD PROCTOR (ASTM D–698) MAXIMUM DRY DENSITY. THE SOIL MOISTURE AT TIME OF COMPACTION SHALL BE WITHIN 3% OF THE MATERIAL'S OPTIMUM MOISTURE CONTENT. PLACE SELECT FILL AS SOON AS POSSIBLE OVER SUBGRADE TO LIMIT MOISTURE LOSS WITHIN THE UNDERLYING SOILS.

   D. SELECT FILL SHALL BE A UNIFORMLY BLENDED CLAYEY SAND HAVING A LIQUID LIMIT LESS THAN 30 AND A PLASTICITY INDEX BETWEEN 4 AND 15.

5. UNLESS SPECIFIED OTHERWISE, VAPOR BARRIER SHALL CONSIST OF 10 MIL POLYETHYLENE SHEET. LAP AND SEAL AT ALL JOINTS AND AROUND ALL STUB–OUTS. PATCH ALL TEARS PRIOR TO PLACING CONCRETE.

6. PROVIDE 6" DEEP TRAPEZOIDAL CARTON VOID FORMS UNDER ALL GRADE BEAMS.

CAST IN PLACE REINFORCED CONCRETE

1. ALL STRUCTURAL CONCRETE SHALL BE OF NORMAL WEIGHT AGGREGATE WITH SPECIFIED PROPERTIES AS FOLLOWS:

	28 DAY STRENGTH	SLUMP	MAX.AGGREGATE
GRADE BEAMS	– 4000 P.S.I.	3"–5"	1"
PIERS	– 3000 P.S.I.	6"–7"	1"
SLAB ON GRADE	– 3000 P.S.I.	3"–5"	1"
OTHER CONCRETE	– 3000 P.S.I.	3"–5"	1"

2. REINFORCING STEEL SHALL CONFORM TO ASTM A–615, GRADE 60.

3. REINFORCING STEEL SPECIFICALLY NOTED TO BE SHOP OR FIELD WELDED SHALL CONFORM TO ASTM A–706, GRADE 60. WELDING OF OTHER REINFORCING STEEL IS NOT PERMITTED.

4. ALL REINFORCING SHALL LAP 48 BAR DIAMETERS AT SPLICES UNLESS NOTED OTHERWISE. HOOK CONTINUOUS BARS AT DISCONTINUOUS ENDS.

5. DETAILING OF CONCRETE REINFORCING AND ACCESSORIES SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF ACI PUBLICATION 315.

6. UNLESS NOTED OTHERWISE, CONCRETE PROTECTION FOR REINFORCING SHALL BE AS FOLLOWS:

SLABS ON GRADE	1–1/2" TOP
GRADE BEAMS	2" SIDES AND TOP, 3" BOT. TO MAIN STEEL
BEAMS CAST AGAINST EARTH	2" SIDES AND TOP, 3" BOT. TO MAIN STEEL

7. NO HORIZONTAL JOINTS WILL BE PERMITTED IN CONCRETE, EXCEPT WHERE NOTED. VERTICAL JOINTS SHALL OCCUR AT OR NEAR THE CENTER OF SPANS, OR AS APPROVED BY THE STRUCTURAL ENGINEER.

8. PROVIDE 5% (+/– 1.5%) AIR ENTRAINMENT IN CONCRETE PERMANENTLY EXPOSED TO WEATHER. USE OF AIR ENTRAINMENT, & CORRESPONDING REDUCTION OF WATER/CEMENT, MUST BE NOTED ON MIX DESIGNS.

GENERAL

1. ALL MEMBERS AND MATERIALS COVERED UNDER THESE GENERAL NOTES AND THE CONSTRUCTION DOCUMENTS SHALL AS A MINIMUM BE INSPECTED IN ACCORDANCE WITH THE IBC 2015 CODE CHAPTER 17 : STRUCTURAL TESTS AND SPECIAL INSPECTIONS

2. SEE ELECTRICAL DRAWINGS FOR EXACT LOCATION AND SIZES OF SMALL MECHANICAL OPENINGS, SLEEVES, ETC. NOT SHOWN ON THE STRUCTURAL DRAWINGS.

3. REFER TO ARCHITECTURAL DRAWINGS FOR ALL FINISHES, DIMENSIONS OF SLAB DROPS, CHAMFERS, ETC.

4. THE USE OF REPRODUCTIONS OF THE DESIGN STRUCTURAL DRAWINGS FOR SHOP DRAWING PURPOSES IS NOT ACCEPTABLE.

5. THE CONTRACTOR SHALL VERIFY, PRIOR TO CONSTRUCTION, THAT THE NEW STRUCTURE WILL NOT CONFLICT WITH ANY EXISTING UTILITIES. IF CONFLICTS ARISE, THE CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER, AND SHALL STOP THE WORK UNTIL AN APPROPRIATE SOLUTION TO THE CONFLICTS ARE FOUND, AND THE CONTRACTOR IS GIVEN WRITTEN AUTHORIZATION TO PROCEED WITH THE WORK.

Charles Gojer and Associates, Inc.
Consulting Engineers
Texas Firm Registration No. F–697
11615 Forest Central Dr. Suite 303
Dallas, Texas 75243 (214) 340–1199
JOB NO. 15 – 182

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-238 972/458-8745
4216 L&J FREEWAY SUITE 217 DALLAS, TEXAS 75244

ENGINEERING DIVISION
CITY OF LEWISVILLE

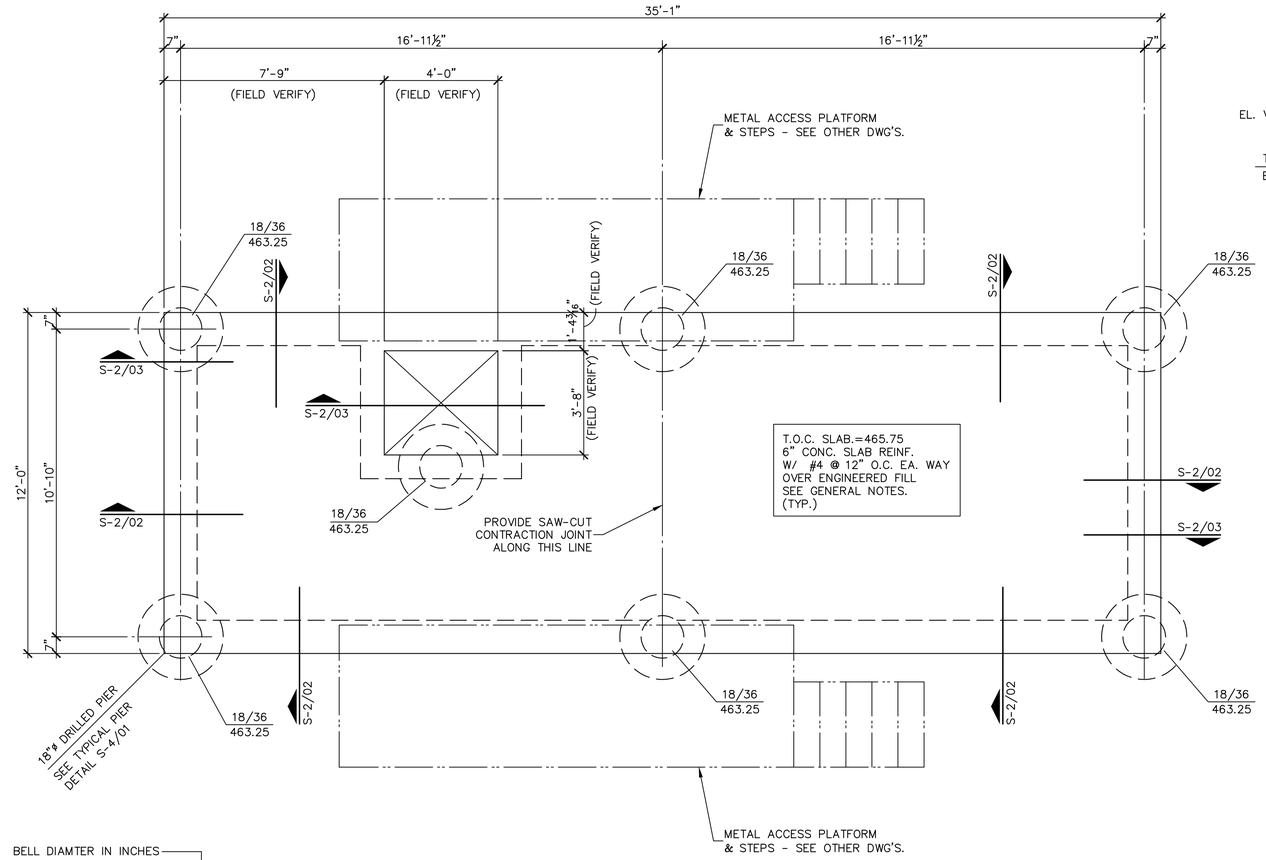
WASTEWATER TREATMENT PLANT EMERGENCY GENERATOR

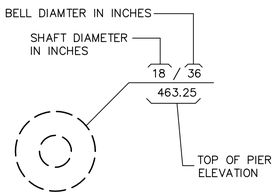
GENERAL NOTES AND ABBREVIATIONS

STATE OF TEXAS
CHARLES GOJER
93348
REGISTERED
PROFESSIONAL
ENGINEER
7-12-18

July 12, 2018
date

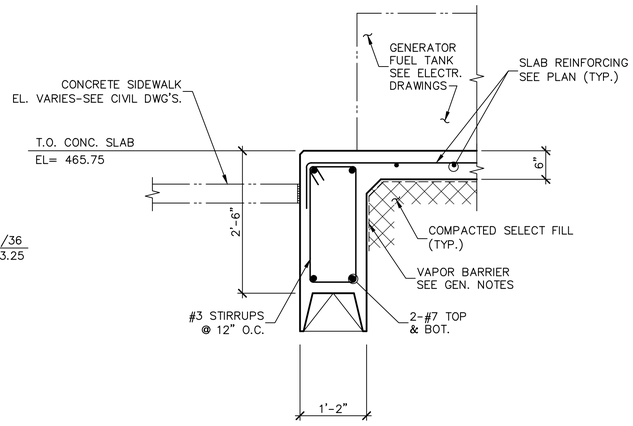
Sheet
S-1
of 4



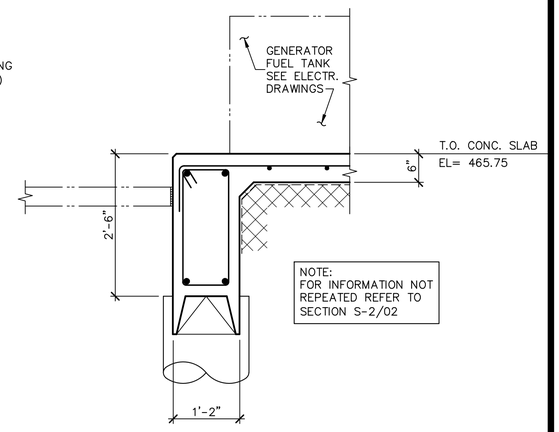


PLAN
NORTH

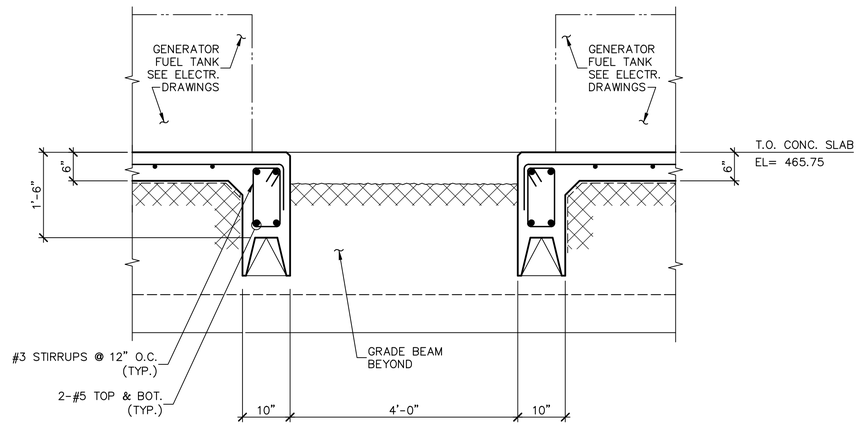
01 GENERATOR FOUNDATION PAD PLAN
SCALE: ⅜"=1'-0"



02 SECTION
SCALE: ¾"=1'-0"



03 SECTION
SCALE: ¾"=1'-0"



04 SECTION
SCALE: ¾"=1'-0"

Charles Gojer
and Associates, Inc.
Consulting Engineers
Texas Firm Registration No. F-697
11615 Forest Central Dr. Suite 303
Dallas, Texas 75243 (214) 340-1199
JOB NO. 15 — 182

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM # 538 972/438-8740
6310 L&J FREEWAY SUITE 217 DALLAS, TEXAS 75240

ENGINEERING DIVISION
CITY OF LEWISVILLE

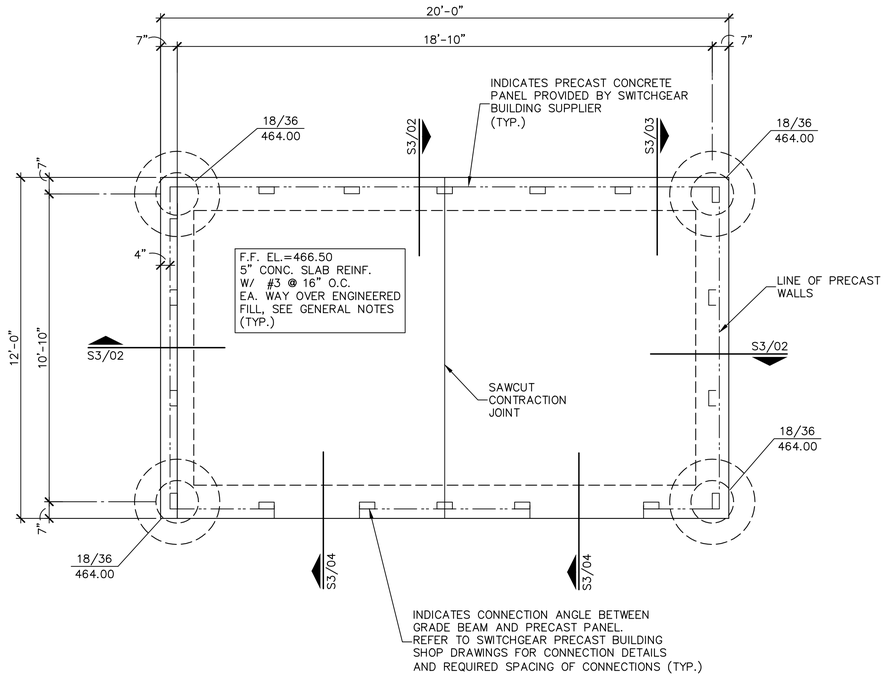
WASTEWATER TREATMENT PLANT
EMERGENCY GENERATOR

GENERATOR FOUNDATION
PAD PLAN & DETAILS

STATE OF TEXAS
CHARLES GOJER
33348
REGISTERED
PROFESSIONAL ENGINEER
7-12-18

July 12, 2018
date

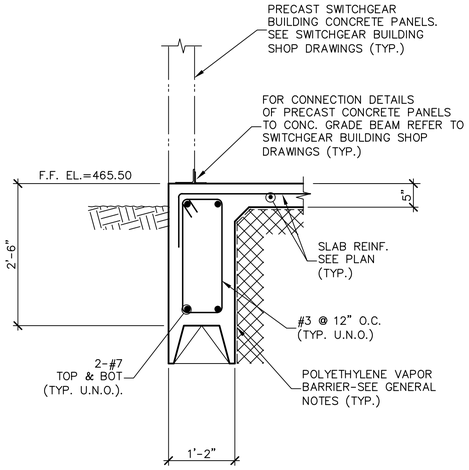
Sheet
S-2
of 4



PLAN NORTH

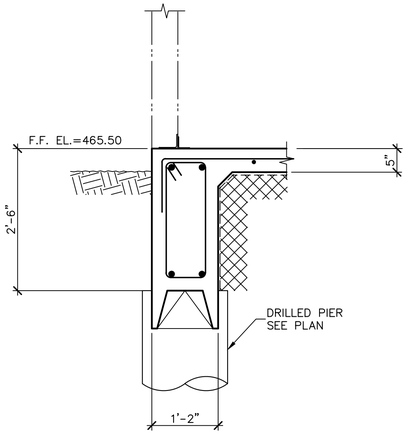
01 SWITCHGEAR BUILDING FOUNDATION PLAN

SCALE: 3/8"=1'-0"



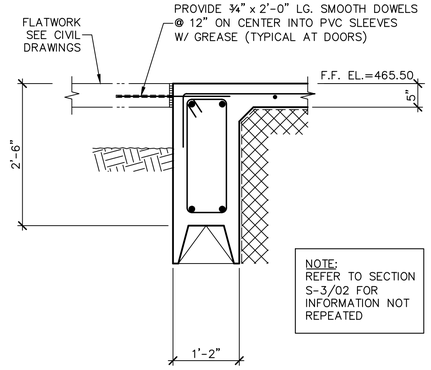
02 SECTION

SCALE: 3/4"=1'-0"



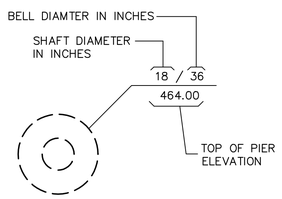
03 SECTION

SCALE: 3/4"=1'-0"



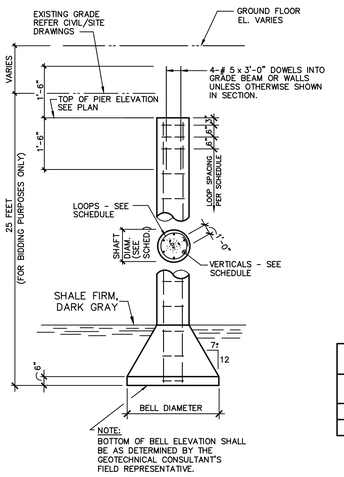
03 SECTION

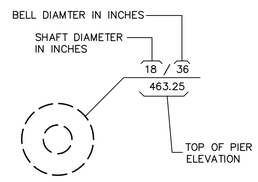
SCALE: 3/4"=1'-0"



Charles Gojer and Associates, Inc.
Consulting Engineers
Texas Firm Registration No. F-697
11615 Forest Central Dr. Suite 303
Dallas, Texas 75243 (214) 340-1199
JOB NO. 15 — 182

McCREARY & ASSOCIATES, INC. CONSULTING ENGINEERS FIRM # 1256 TBPE#001470 6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240	ENGINEERING DIVISION CITY OF LEWISVILLE	WASTEWATER TREATMENT PLANT EMERGENCY GENERATOR	SWITCHGEAR BUILDING FOUNDATION PLAN & DETAILS	STATE OF TEXAS CHARLES GOJER 53340 REGISTERED PROFESSIONAL ENGINEER 7-12-18	July 12, 2018 date	Sheet S-3 of 4



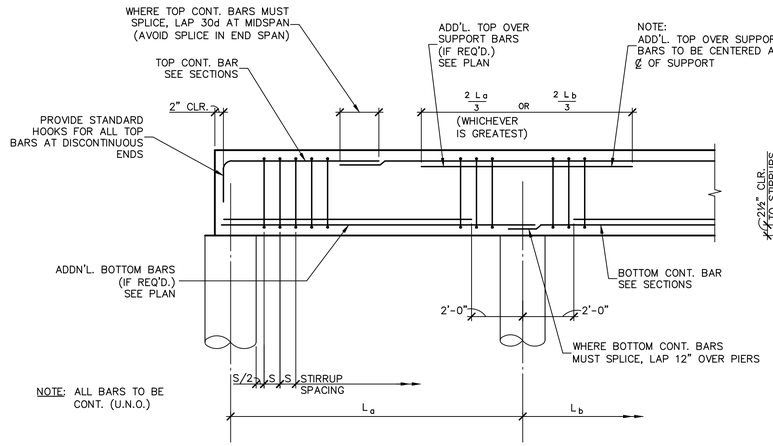


KEY TO PIER DESIGNATION

UNDER REAMED PIER REINFORCING SCHEDULE		
SHAFT DIAMETER	VERT. REINF.	LOOPS
18"	6-#6	#3 @ 12

01 TYPICAL STRAIGHT SHAFT DRILLED PIER

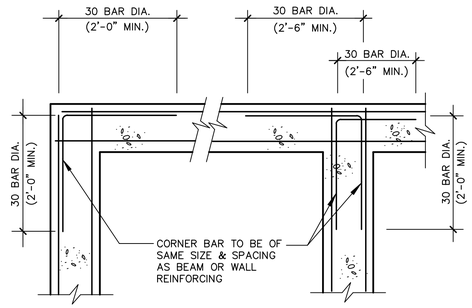
NO SCALE



BAR BENDING DIAGRAM

02 TYPICAL GRADE BEAM DETAIL

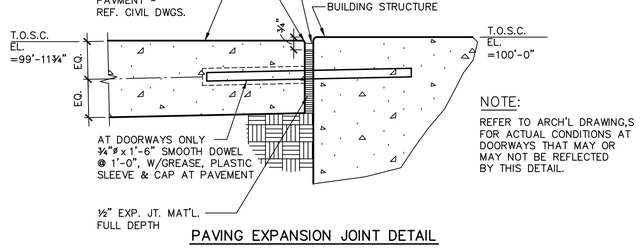
SCALE: NO SCALE



CORNER BARS AT WALLS AND BEAMS

03 TYPICAL DETAIL

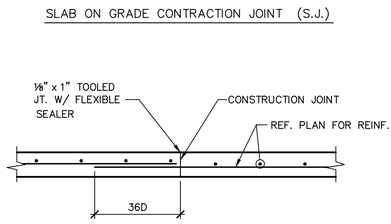
SCALE: NO SCALE



PAVING EXPANSION JOINT DETAIL

04 TYPICAL DETAIL

SCALE: NO SCALE

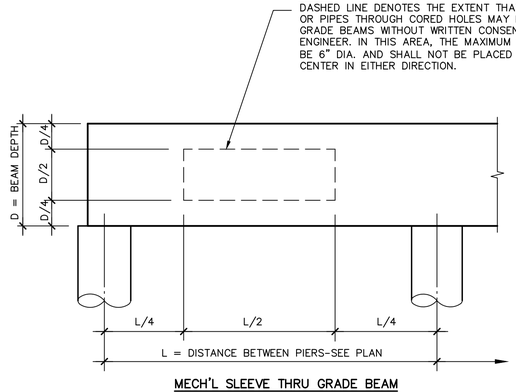


SLAB ON GRADE CONTRACTION JOINT (S.J.)

SLAB ON GRADE CONSTRUCTION JOINT DETAIL (C.J.)

05 TYPICAL DETAIL

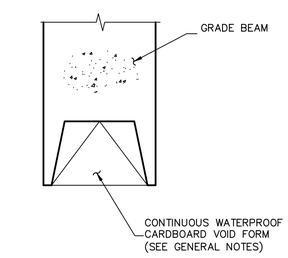
SCALE: NO SCALE



MECH'L SLEEVE THRU GRADE BEAM

06 TYPICAL DETAIL

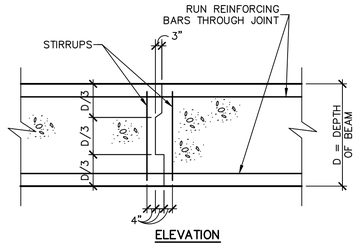
SCALE: NO SCALE



CARBOARD VOID FORM

07 TYPICAL DETAIL

SCALE: NO SCALE



ELEVATION

CONSTRUCTION JOINT DETAIL FOR CONCRETE BEAM

08 TYPICAL DETAIL

SCALE: NO SCALE

Charles Gojer and Associates, Inc.
Consulting Engineers
Texas Firm Registration No. F-697
11615 Forest Central Dr. Suite 303
Dallas, Texas 75243 (214) 340-1199
JOB NO. 15 – 182

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS TEXAS F-326 STONEY-0747
6010 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

ENGINEERING DIVISION
CITY OF LEWISVILLE

WASTEWATER TREATMENT PLANT EMERGENCY GENERATOR

TYPICAL STRUCTURAL DETAILS

STATE OF TEXAS — CHARLES GOJER — 33349 — REGISTERED — PROFESSIONAL ENGINEER — 7-12-18

July 12, 2018
date

Sheet
S-4
of 4

ABBREVIATIONS

AI	ANALOG INPUT
AFF	ABOVE FINISHED FLOOR
AL	ALUMINUM
ANN	ANNUNCIATOR
AO	ANALOG OUTPUT
ATS	AUTOMATIC TRANSFER SWITCH
BRG	BEARING
BRKT	BRACKET
CKT	CIRCUIT
CL2	CHLORINE
CONC	CONCRETE
C	CONDUIT
CR	CONTROL RELAY
CPT	CONTROL POWER TRANSFORMER
CT	CURRENT TRANSFORMER
CU	COPPER
DES	DRILLED EXPANSION SHIELD
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
EC	EMPTY CONDUIT
EF	EXHAUST FAN
EGC	EQUIPMENT GROUNDING CONDUCTOR
EOEH	ELECTRICALLY OPERATED ELECTRICALLY HELD
EOMH	ELECTRICALLY OPERATED MECHANICALLY HELD
ETM	ELAPSED TIME METER
EXOW	EXOTHERMIC WELD
FDR	FEEDER
FVNR	FULL VOLTAGE NON-REVERSING
G	GROUND
GND	GROUND, GROUNDED, GROUNDING
GFP	GROUND FAULT PROTECTION
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GRS	GALVANIZED RIGID STEEL
HDG	HOT DIPPED GALVANIZED
HDW	HARDWARE
HH	HANDHOLE
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC SELECTOR SWITCH
HOR	HAND-OFF-REMOTE SELECTOR SWITCH
HPS	HIGH PRESSURE SODIUM
HS	HAND SWITCH
HTR	HEATER
ICTO	INSTANT CLOSE, TIMED OPEN
IOTC	INSTANT OPEN, TIMED CLOSE
J-BOX	JUNCTION BOX
LA	LIGHTNING ARRESTOR
LLCO	LOW LEVEL CUT OFF
LOR	LOCAL-OFF-REMOTE
LOS	LOCKOUT STOP
LS	LIMIT SWITCH
LT	LIGHT
LTG	LIGHTING
LTF	LIQUID TIGHT FLEXIBLE CONDUIT
MB	MAIN BREAKER
MBD	MOTORIZED BACKDRAFT DAMPER
MCP	MOTOR CIRCUIT PROTECTOR
MCC	MOTOR CONTROL CENTER
MFR	MANUFACTURER
MH	METAL HALIDE
MLO	MAIN LUGS ONLY
MPD	MOTOR PROTECTIVE DEVICE
MPU	MOTOR PROTECTIVE UNIT
MSP	MAIN SERVICE PANEL
MTD	MOUNTED
MTR	MOTOR
MV	MERCURY VAPOR
N/P	NAMEPLATE
NOTC	NORMALLY OPEN, TIMED CLOSED
NO	NORMALLY OPEN
NC	NORMALLY CLOSED
OC	ON CENTER
OLS	OVERLOADS
OSC	OPEN-STOP-CLOSE
PB	PUSHBUTTON
PCC	PLASTIC COATED CONDUIT
PCV	PRESSURE CONTROL VALVE
PH	HYDROGEN ION CONCENTRATION
PNL	PANEL
PMT	PAD MOUNTED TRANSFORMER
PP	POWER POLE
PQM	POWER QUALITY METER
PVC	POLYVINYL CHLORIDE
PT	POTENTIAL TRANSFORMER
RECEP	RECEPTACLE
RGI	RIGID GALVANIZED IRON
RTD	REMOTE TEMPERATURE DETECTOR
RTU	REMOTE TELEMETRY UNIT
RVNR	REDUCED VOLTAGE, NON-REVERSING
S	SPST SWITCH
S2	DPST SWITCH
S3	SPDT SWITCH
S4	DPDT SWITCH
SP	SWITCH W/ PILOT LIGHT
SM	MANUAL MOTOR STARTER
SC	SURGE CAPACITOR
SF	SUPPLY FAN
SPD	SURGE PROTECTIVE DEVICE (TVSS)
S/N	SOLID NEUTRAL
S/S	SAFETY SWITCH
SS	START-STOP
STN/STL	STAINLESS STEEL
SW	SWITCH
SWGR	SWITCHGEAR
SWBD	SWITCHBOARD
SZ	SIZE
TYP	TYPICAL
TR	TIME DELAY RELAY
UG	UNDERGROUND
UH	UNIT HEATER
VIB	VIBRATION
WP	WEATHER PROOF
XFER	TRANSFER
XFMR	TRANSFORMER
XMTR	TRANSMITTER

ELECTRICAL SITE & PLAN SYMBOL LEGEND

SYMBOL	DESCRIPTION
A	LIGHT FIXTURE – LETTER DENOTES FIXTURE TYPE
HA	HID WALL MOUNTED FIXTURE – LETTER DENOTES FIXTURE TYPE
A	FLUORESCENT FIXTURE – RECESSED, SURFACE OR WALL MOUNTED
	EMERGENCY POWER PACK FIXTURE – WALL MOUNTED
	EXPOSED CONDUIT RUN
	CONCEALED OR UNDERGROUND CONDUIT RUN
	CIRCUIT HOME RUN TO PANELBOARD
S	WALL SWITCH, SPST
S2	WALL SWITCH, 2 POLE
S3	WALL SWITCH, 3-WAY
SM	MOTOR RATED SWITCH WITH OVERLOADS
GFCI WP	DUPLEX RCPT & GFCI DEVICE MOUNTED IN WEATHERPROOF BOX & COVERS
	RCPT-20A 125V 2P 3W GND. DUPLEX-12" UP OR AS NOTED
J OR J	JUNCTION BOX – WALL OR CEILING MOUNTED
	MOTOR LOCATION
	COMBINATION FUSED DISCONNECT SW./ MAGNETIC MOTOR STARTER
	MAGNETIC MOTOR STARTER
	DISCONNECT SWITCH – HEAVY DUTY TYPE
C	CONTACTOR
S	EXPLOSION-PROOF CONDUIT SEAL
HH	HAND HOLE
CS	CONTROL STATION. REF CONTROL SCHEMATICS FOR TYPE.
	FLEXIBLE CONDUIT
	CONDUIT TEE FITTING
	CONDUIT FITTING LB, LR, ETC.
	CROSS CONDUIT FITTING
T	WALL MOUNTED THERMOSTAT
OHE	OVERHEAD ELECTRICAL LINES
WP	WEATHERPROOF
GFI	GROUND FAULT INTERRUPTER
+48"	MOUNTING HEIGHT ABOVE FLOOR
E.C.	EMPTY CONDUIT
T122	CONDUIT AND CABLE TAG NUMBER. REF SCHEDULE
	480/277V PANELBOARD
	208/120V PANELBOARD
PC	PHOTOCELL
	EXIT SIGN, SOLID PORTION INDICATES DIRECTION OF SIGN
T	TELEPHONE OUTLET
E	ETHERNET OUTLET

ONE LINE DIAGRAM LEGEND

SYMBOL	DESCRIPTION
	POWER TRANSFORMER
	CURRENT TRANSFORMER
	CONTROL POWER (CPT) OR POTENTIAL (PT) TRANSFORMER
20AT 100AF	THERMAL MAGNETIC CIRCUIT BREAKER; AF=FRAME SIZE, AT=AMP TRIP
3 MCP	MAGNETIC ONLY CIRCUIT BREAKER; NUMBER INDICATES CONTINUOUS CURRENT RATING
5	STAB-IN CONNECTION, NUMBER INDICATES MCC UNIT DESIGNATION
	FUSE
	FUSED SWITCH
SZ3	FULL VOLTAGE, NON-REVERSING STARTER, WITH OVERLOAD RELAY, NUMBER INDICATES NEMA SIZE
	CONNECTION TO GROUND
	SPACE HEATER
S/N	SOLID NEUTRAL
	DELTA CONNECTED TRANSFORMER WINDINGS
	WYE CONNECTED TRANSFORMER WINDINGS
LA	LIGHTNING ARRESTER
SC	SURGE CAPACITOR
VS	VOLTMETER SWITCH
V	VOLTMETER
AS	AMMETER SWITCH
A	AMMETER
SPD	SURGE PROTECTION DEVICE
K	KIRK KEY INTERLOCK
SS	SOLID STATE SOFT STARTER
VFD	VARIABLE FREQUENCY DRIVE

CONTROL DIAGRAM LEGEND

SYMBOL	DESCRIPTION
●	DOOR MOUNTED DEVICE
▲	DEVICE MOUNTED REMOTE FROM MOTOR CONTROL
■	DEVICE MOUNTED REMOTE FROM STARTER UNIT BUT IN MCC
⌀	TERMINAL FOR CONNECTION OF EXTERNAL CIRCUITS
	NORMALLY CLOSED CONTACTS
	NORMALLY OPEN CONTACTS
CPT	CONTROL POWER TRANSFORMER
HAND OFF AUTO	3 POSITION SELECTOR SWITCH
	MOTOR SPACE HEATER
M	MOTOR CONTACTOR
CR	CONTROL RELAY
TR	TIMING RELAY
	FUSE
STOP	"STOP" PUSH BUTTON
START	"START" PUSH BUTTON
STOP	EMERGENCY "STOP" MUSHROOM BUTTON
TR1	TIMED CONTACTS
T'STAT	THERMOSTAT
LS	LIMIT SWITCH
FS	FLOAT SWITCH
PS	PRESSURE SWITCH
ETM	ELAPSED TIME METER
	AUDIBLE ALARM
G	PUSH-TO-TEST PILOT LIGHT LETTER INDICATES COLOR

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

THESE DOCUMENTS ARE FOR BIDDING, CONSTRUCTION, AND PERMIT PURPOSES.
DATE: 7-16-2018
McCREARY & ASSOCIATES, INC.
Consulting Engineers
Dallas, Texas FIRM No. F-338

PLOT DATE/TIME: 7/16/2018 - 3:17pm
PRINTED BY: RICHARD
CAD FILE: Z:\12.051\Dwg\Electrical\E01 Legends & Abbreviations.dwg

LEWISVILLE

ENGINEERING DIVISION
CITY OF LEWISVILLE

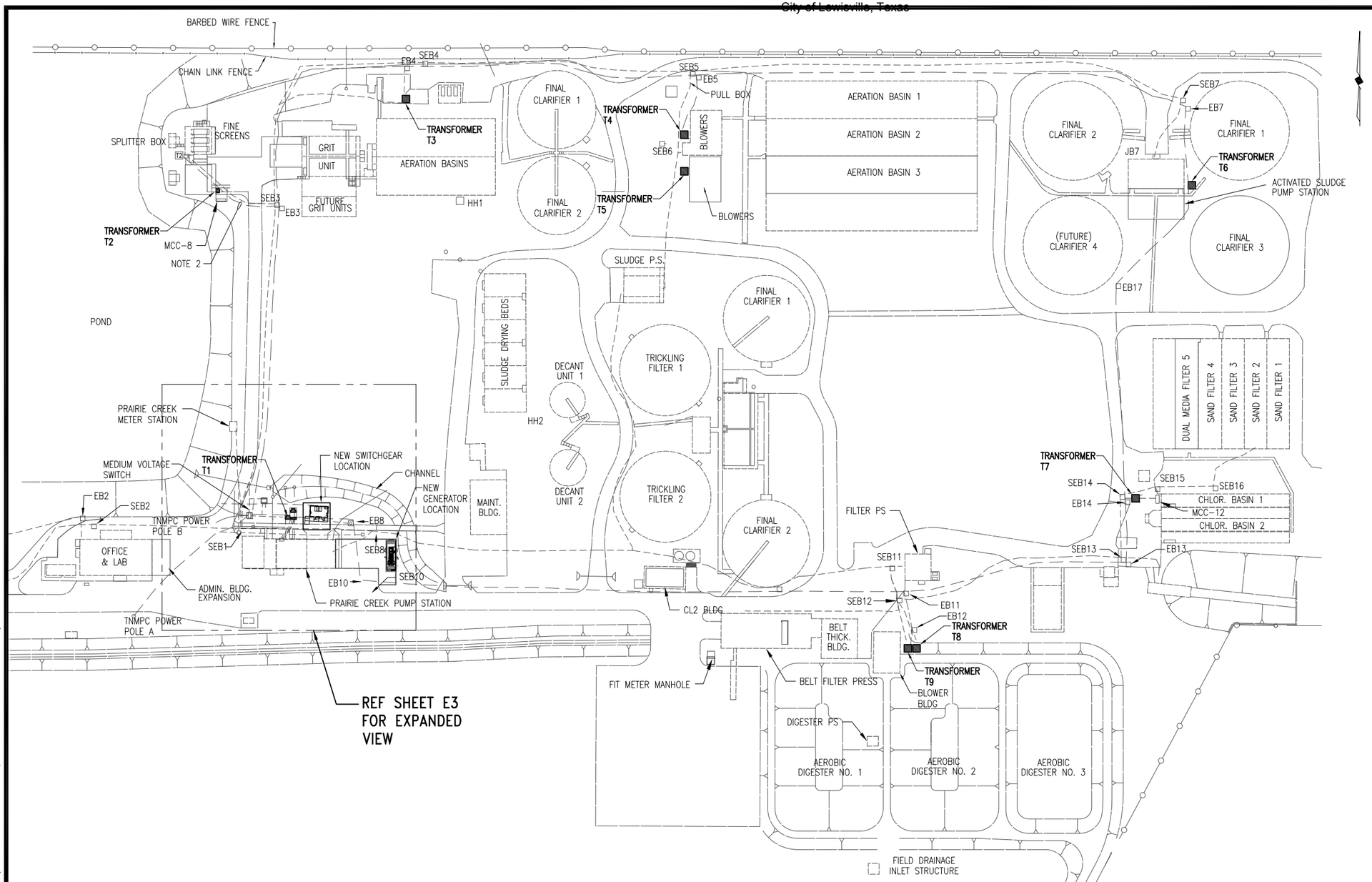
WASTEWATER TREATMENT PLANT EMERGENCY GENERATOR

LEGENDS & ABBREVIATIONS

STATE OF TEXAS 56361 REGISTERED PROFESSIONAL ENGINEER

JULY 2018
date

Sheet E1 of 12



NOTES:

1. THIS DRAWING WAS EXECUTED BASED UPON THE MOST CURRENT INFORMATION GATHERED IN THE FIELD.

0 60 120

SCALE IN FEET

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

THESE DOCUMENTS ARE FOR BIDDING, CONSTRUCTION, AND PERMIT PURPOSES.
DATE: 7-16-2018
McCREARY & ASSOCIATES, INC.
Consulting Engineers
Dallas, Texas FIRM No. F-338

LEWISVILLE

ENGINEERING DIVISION
CITY OF LEWISVILLE

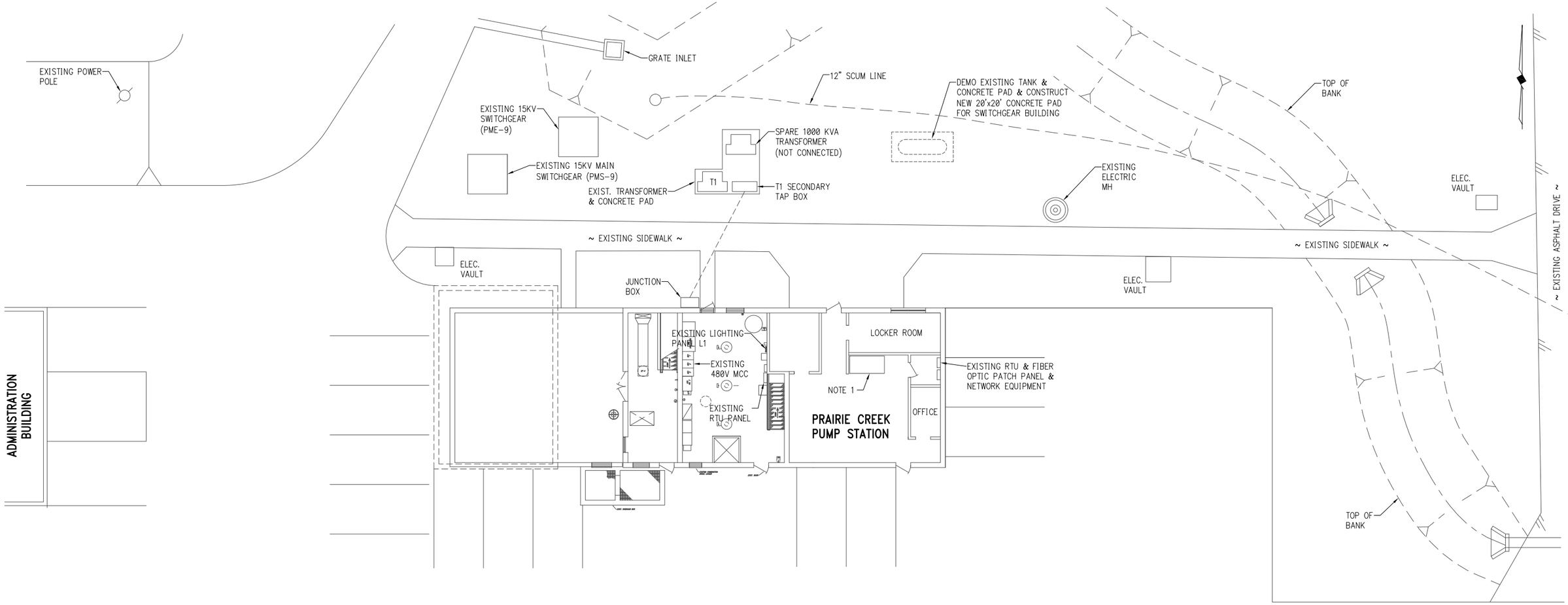
WASTEWATER TREATMENT PLANT EMERGENCY GENERATOR

WWTP SITE PLAN

STATE OF TEXAS JOSEPH J. KOTRLA 56361 REGISTERED PROFESSIONAL ENGINEER

JULY 2018
date

Sheet E2 of 12



NOTES:

1. EXISTING COMPUTER DESK WITH HMI COMPUTER TOWER UNDER DESK AND LARGE FLAT PANEL ON WALL OVER DESK

ELECTRICAL SITE PLAN

HALF SIZE SCALE: 1"=20'-0"
FULL SIZE SCALE: 1"=10'-0"

0 10 20
SCALE IN FEET

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

THESE DOCUMENTS ARE FOR BIDDING, CONSTRUCTION, AND PERMIT PURPOSES.
DATE: 7-16-2018
McCREARY & ASSOCIATES, INC.
Consulting Engineers
Dallas, Texas FIRM No. F-338

LEWISVILLE

ENGINEERING DIVISION
CITY OF LEWISVILLE

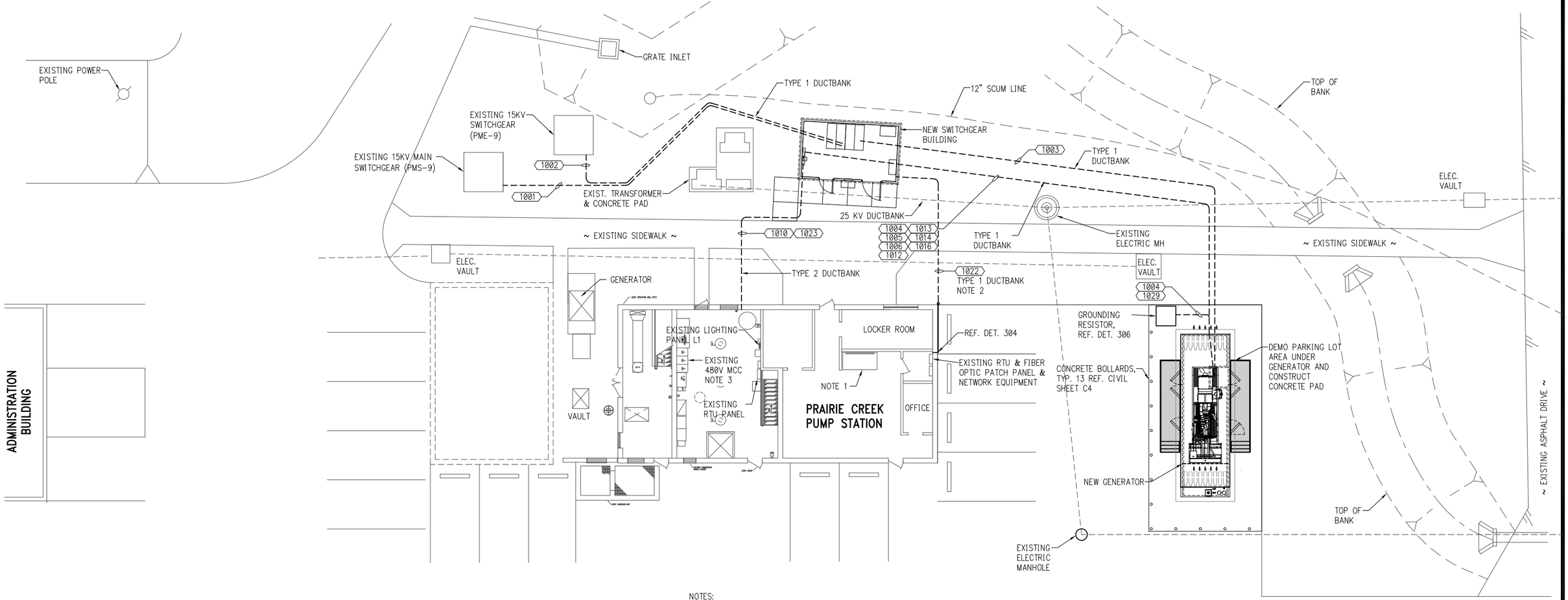
WASTEWATER TREATMENT PLANT EMERGENCY GENERATOR

PARTIAL SITE PLAN EXISTING

STATE OF TEXAS JOSEPH J. KOTRLA 94581 REGISTERED PROFESSIONAL ENGINEER

JULY 2018
date

Sheet E3 of 12



NOTES:

1. EXISTING COMPUTER DESK WITH HMI COMPUTER TOWER UNDER DESK AND LARGE FLAT PANEL ON WALL OVER DESK
2. STUB-UP CONDUIT AT BUILDING AND RUN EXPOSED TO CORE DRILL.
3. PROVIDE A 480 VOLT, 100 AMP, 3P FEEDER UNIT IN EXISTING MCC IN PRAIRIE CREEK LIFT STATION TO FEED NEW 480 VOLT PANELBOARD IN NEW SWITCHGEAR BUILDING.

ELECTRICAL SITE PLAN

HALF SIZE SCALE: 1"=20'-0"
FULL SIZE SCALE: 1"=10'-0"

0 10 20
SCALE IN FEET

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

THESE DOCUMENTS ARE FOR BIDDING, CONSTRUCTION, AND PERMIT PURPOSES.
DATE: 7-16-2018
McCREARY & ASSOCIATES, INC.
Consulting Engineers
Dallas, Texas FIRM No. F-338

ENGINEERING DIVISION
CITY OF LEWISVILLE

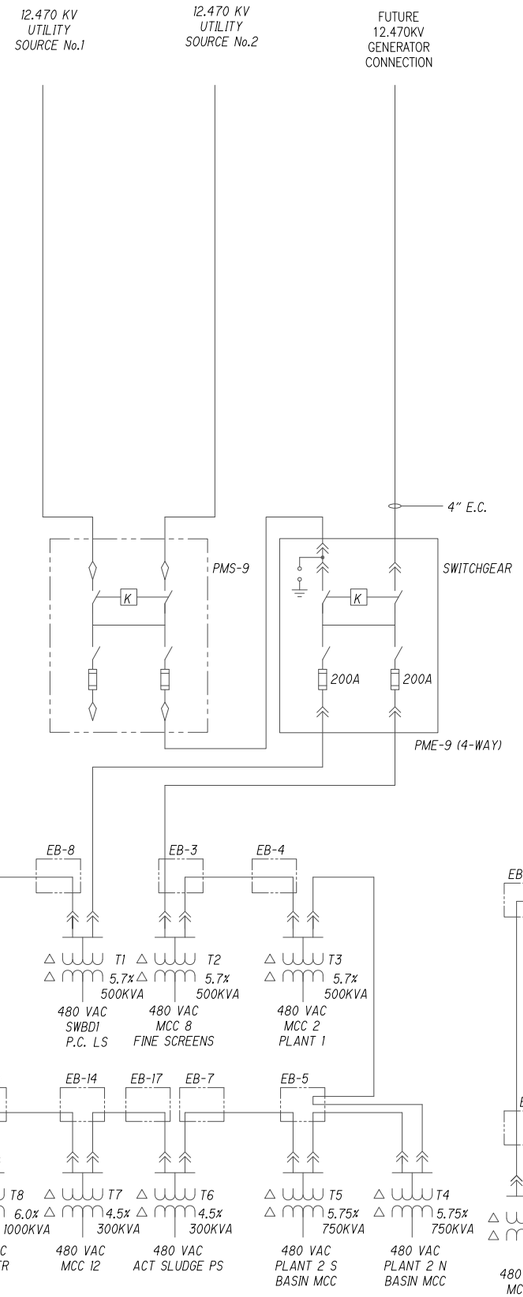
WASTEWATER TREATMENT PLANT
EMERGENCY GENERATOR

PARTIAL SITE PLAN
MODIFIED

STATE OF TEXAS JOSEPH J. KOTALA 56361 REGISTERED PROFESSIONAL ENGINEER

JULY 2018
date

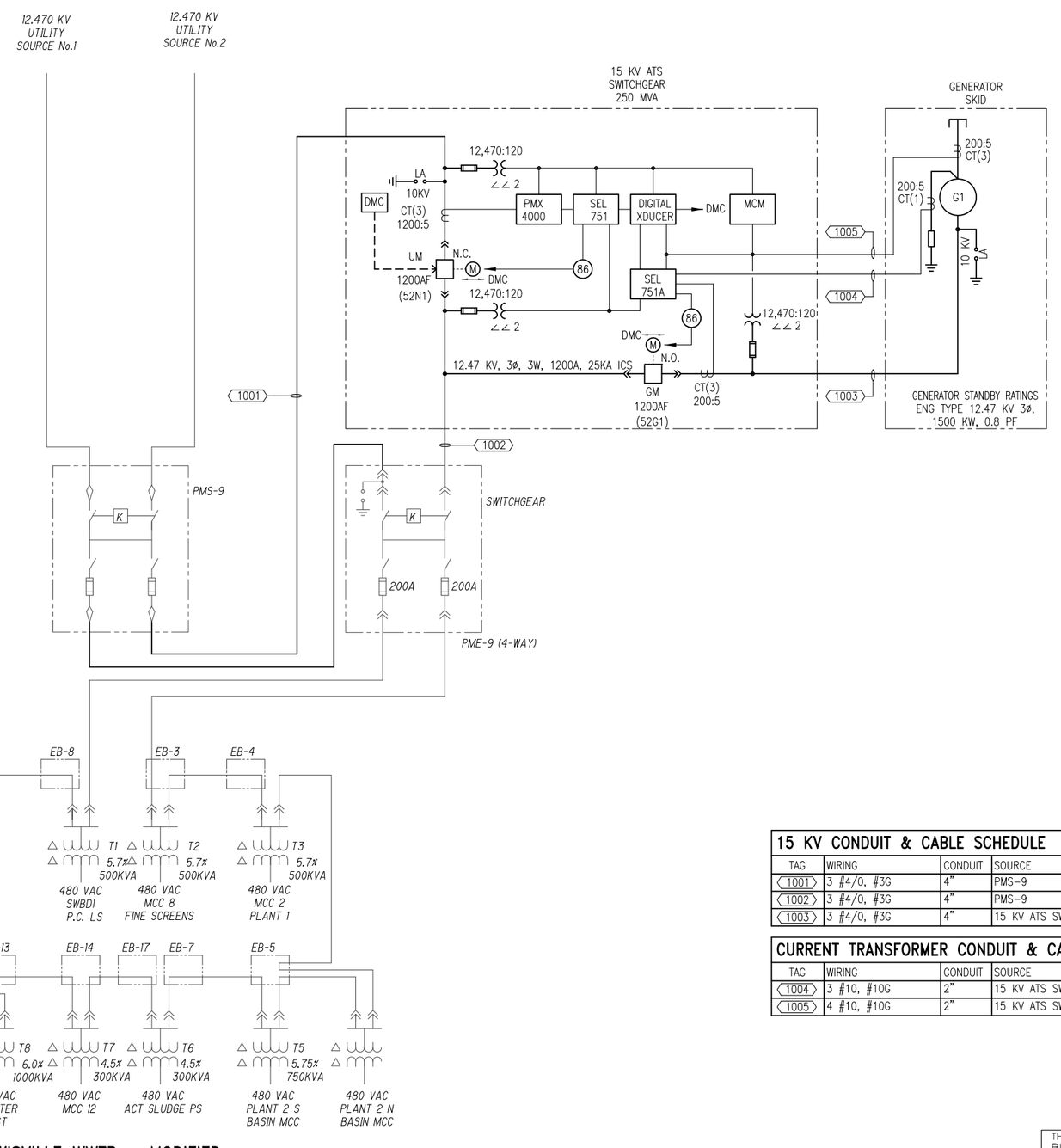
Sheet E4 of 12



NOTES:

1. LOOP IS OPEN (PARKED) AT TRANSFORMER T9.

LEWISVILLE WWTP – EXISTING



NOTES:

1. LOOP IS OPEN (PARKED) AT TRANSFORMER T9.

LEWISVILLE WWTP – MODIFIED

FUNCTION	ANSI DEVICE ID#
27	UNDERVOLTAGE
32	REVERSE POWER
38	TEMPERTURE, BEARING
46	CURRENT UNBALLANCE
47	PHASE REVERSAL
49	MOTOR THERMAL OVERLOAD
49R	TEMPERATURE, ALARM, TRIP
50N	NEUTRAL OVERCURRENT
50 PAF	ARCFLASH OVERCURRENT
50 P,G	OVERCURRENT, PHASE GROUND
51N	NEUTRAL TIME OVERCURRENT
51 P,G	TIME OVERCURRENT, PHASE, GROUND
59	OVER VOLTAGE
59N	OVERVOLTAGE GROUND FAULT
63	FAULT PRESSURE RELAY
66	STARTS PER HOUR
81U	OVER/UNDER FREQUENCY
87	DIFFERENTIAL CURRENT

* COMPLETE MODEL NUMBER IS BE1-11-15A1M2P2N0E000. REFERENCE SHEET E1 FOR ONE LINE DIAGRAM SYMBOLS

ABBREVIATIONS:

DMC	DIGITAL MASTER CONTROLLER
ICS	INTERRUPTING CAPACITY SYMMETRICAL
UM	ATS SWITCHGEAR UTILITY MAIN BREAKER
GM	ATS SWITCHGEAR GENERATOR BUS MAIN BREAKER
G1	GENERATOR No.1 BREAKER
G2	GENERATOR No.2 BREAKER
F1	ATS SWITCHGEAR FEEDER BREAKER TO HS PS
F2	ATS SWITCHGEAR LOAD BANK FEEDER BREAKER
LA	LIGHTNING ARRESTOR
PMX	POWER METER (EATON)
NC	NORMALLY CLOSED
M	MOTORIZED
CT	CURRENT TRANSFORMER
K	KIRK KEY
PME	PAD MOUNTED EQUIPMENT (S&C)
EB	ELECTRIC BOX (MANHOLE)
PMS	PAD MOUNTED SWITCHGEAR (S&C)
SEL	SCHWEITZER ENGINEERING LABORATORIES

NOTES:

1. SWITCHGEAR TRANSFER MODE IS PARALLELING, SOFT LOADING, NO EXPORT.
2. SEL 751 SHALL FUNCTION AS GRID TIE PROTECTION RELAY.

15 KV CONDUIT & CABLE SCHEDULE

TAG	WIRING	CONDUIT	SOURCE	DESTINATION	COMMENT
1001	3 #4/0, #3G	4"	PMS-9	15 KV ATS SWITCHGEAR	
1002	3 #4/0, #3G	4"	PMS-9	PME-9 (4-WAY)	
1003	3 #4/0, #3G	4"	15 KV ATS SWITCHGEAR	GENERATOR	

CURRENT TRANSFORMER CONDUIT & CABLE SCHEDULE

TAG	WIRING	CONDUIT	SOURCE	DESTINATION	COMMENT
1004	3 #10, #10G	2"	15 KV ATS SWITCHGEAR	15 KV ATS SWITCHGEAR	
1005	4 #10, #10G	2"	15 KV ATS SWITCHGEAR	GENERATOR	

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

THESE DOCUMENTS ARE FOR BIDDING, CONSTRUCTION, AND PERMIT PURPOSES.
DATE: 7-16-2018
McCREARY & ASSOCIATES, INC.
Consulting Engineers
Dallas, Texas FIRM No. F-338

LEWISVILLE

ENGINEERING DIVISION
CITY OF LEWISVILLE

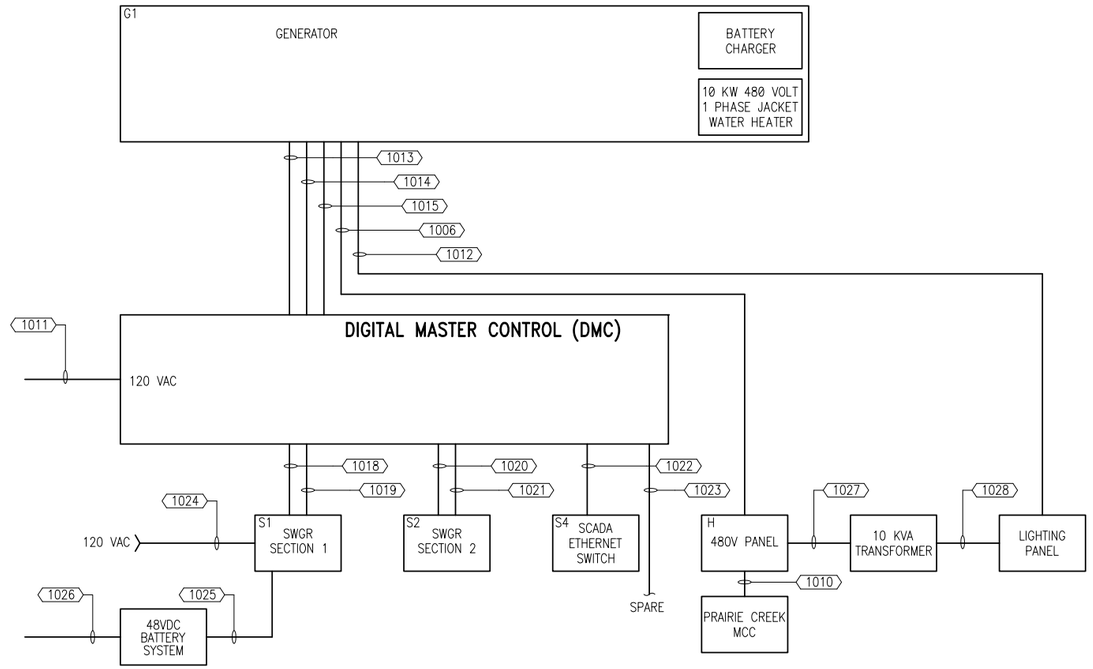
WASTEWATER TREATMENT PLANT EMERGENCY GENERATOR

ONE LINE DIAGRAM

STATE OF TEXAS JOSEPH J. KOTHLA 56361 REGISTERED PROFESSIONAL ENGINEER

JULY 2018
date

Sheet E5 of 12



TAG	WIRING	CONDUIT	SOURCE	DESTINATION	COMMENT
1010	8 #14, #14G	2"	MCC PRAIRIE CREEK	480V PANEL "H"	
1011	2 #14, #14G	2"	LIGHTING PANEL	DIGITAL MASTER CONTROL (DMC)	120 VAC
1012	2 #10, #10G	2"	GENERATOR	LIGHTING PANEL "L"	
1013	20 #14, #14G	2"	DIGITAL MASTER CONTROL (DMC)	GENERATOR PANEL	
1014	1-NEMA IV UTP CABLE 1-4C/S#16, 1-2C/S#16	2"	DIGITAL MASTER CONTROL (DMC)	GENERATOR PANEL	
1015	4 #14, #14G	2"	DIGITAL MASTER CONTROL (DMC)	GENERATOR PANEL	
1016	2-1C #	3/4"	GENERATOR PANEL	BATTERY CHARGER	
1017	2 #14, #14G	2"	BATTERY CHARGER	120 VAC PANEL	
1018	2 #14, #14G	3/4"	DIGITAL MASTER CONTROL (DMC)	SWGR SECTION 1	120 VAC
1019	2 #14, #14G	3/4"	DIGITAL MASTER CONTROL (DMC)	SWGR SECTION 1	DC CONTROL POWER
1020	15 #14, #14G	1"	DIGITAL MASTER CONTROL (DMC)	SWGR SECTION 2	GENSET BREAKER STATUS & CONTROL
1021	4 #14, #14G	3/4"	DIGITAL MASTER CONTROL (DMC)	SWGR SECTION 2	120 VAC
1022	1-ETHERNET CABLE	1"	DIGITAL MASTER CONTROL (DMC)	SCADA ETHERNET SWITCH	
1023	PULL CORD	1"	DIGITAL MASTER CONTROL (DMC)	PRAIRIE CREEK ELECTRIC ROOM	SPARE
1024	2 #14, #14G	3/4"	120 VAC PANEL	SWGR SECTION 1	
1025	2 #10, #10G	3/4"	SWGR SECTION 1	480V BATTERY SYSTEM	
1026	2 #10, #10G	3/4"	120 VAC PANEL	480V BATTERY SYSTEM	
1027	2 #10, #10N, #10G	3/4"	480V PANEL "H"	10 KVA TRANSFORMER	
1028	2 #8, #8N, #8G	1"	10 KVA TRANSFORMER	LIGHTING PANEL "L"	
1029	2 #10, #10G	2"	LIGHTING PANEL "L"	NEUTRAL GROUNDING RESISTOR	CONDENSATION HEATER

PANEL SCHEDULE

NUMBER H — VOLTS 480Y/277V 3ø, 4 WIRE
LOCATION SWITCHGEAR BUILDING — SIZE 100A
FED FROM MCC — MAIN BREAKER
NEMA 12 (SURFACE MOUNT)

CIRCUIT DESCRIPTION	CKT BKR	CKT #	CKT #	CKT BKR	CIRCUIT DESCRIPTION
LIGHTING TRANSFORMER	30/2	1	2	15/3	A/C UNIT
		3	4		
GENERATOR JACKET WATER HEATER	30/2	5	6		
		7	8	20/1	SPARE
SPARE	20/2	9	10	20/1	SPARE
		11	12	20/1	SPARE
SPARE	20/1	13	14	20/1	SPARE
SPARE	20/1	15	16	20/1	SPARE
SPARE	20/1	17	18	20/1	SPARE
SPARE	20/1	19	20	20/1	SPARE

SQUARE D NQOD OR EQUAL
PROVIDE INTEGRAL SPD UNIT WITH 120 KA SURGE RATING SURGE COUNTER AND ALARM CONTACTS
NEUTRAL GROUND

PANEL SCHEDULE

NUMBER L — VOLTS 240/120V 1ø, 3 WIRE
LOCATION SWITCHGEAR BUILDING — SIZE 50A
FED FROM MCC — MAIN BREAKER
NEMA 12 (SURFACE MOUNT)

CIRCUIT DESCRIPTION	CKT BKR	CKT #	CKT #	CKT BKR	CIRCUIT DESCRIPTION
SWITCHGEAR BUILDING LIGHTING	20/1	1	2	20/1	SWITCHGEAR BUILDING RECEPTACLES
GENERATOR BATTERY CHARGER	20/1	3	4	20/1	GENERATOR LIGHTS & RECEPTACLES
SWITCHGEAR BATTERY CHARGER	20/1	5	6	20/1	SPARE
NEUTRAL GROUNDING RESISTOR CONDENSATION HEATER	20/1	7	8	20/1	SPARE
SPARE	20/1	9	10	20/1	SPARE
SPARE	20/1	11	12	20/1	SPARE
SPARE	20/1	13	14	20/1	SPARE
SPARE	20/1	15	16	20/1	SPARE
SPARE	20/1	17	18	20/1	SPARE
SPARE	20/1	19	20	20/1	SPARE

SQUARE D NQOD OR EQUAL
PROVIDE INTEGRAL SPD UNIT WITH 120 KA SURGE RATING SURGE COUNTER AND ALARM CONTACTS
NEUTRAL GROUND

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

THESE DOCUMENTS ARE FOR BIDDING, CONSTRUCTION, AND PERMIT PURPOSES.
DATE: 7-16-2018
McCREARY & ASSOCIATES, INC.
Consulting Engineers
Dallas, Texas FIRM No. F-338

LEWISVILLE

ENGINEERING DIVISION
CITY OF LEWISVILLE

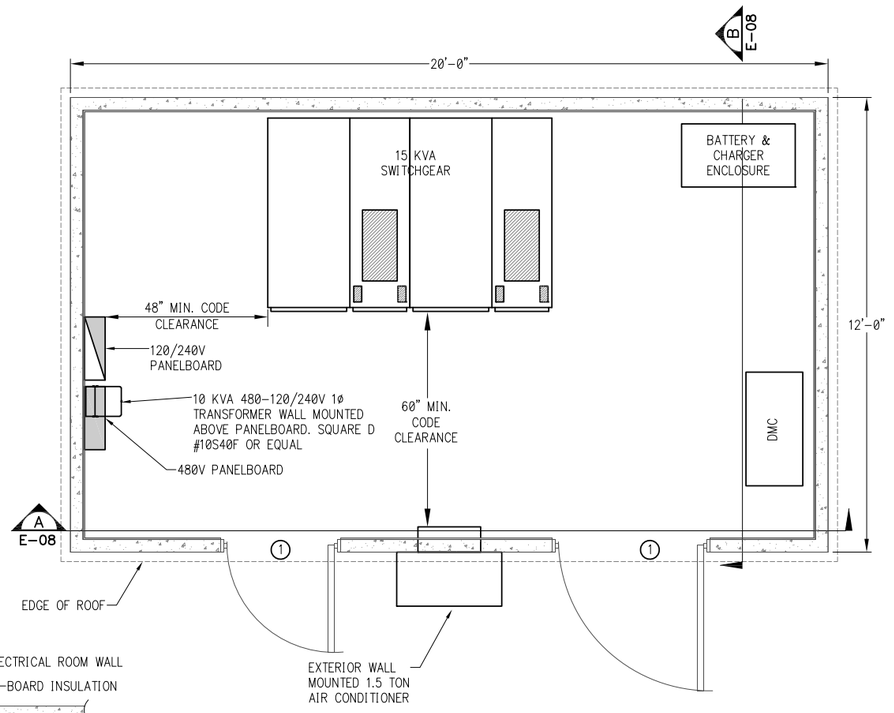
WASTEWATER TREATMENT PLANT EMERGENCY GENERATOR

SCHEDULES AND BLOCK DIAGRAMS

STATE OF TEXAS JOSEPH J. KOTRLA 56361 REGISTERED PROFESSIONAL ENGINEER

JULY 2018
date

Sheet E6 of 12

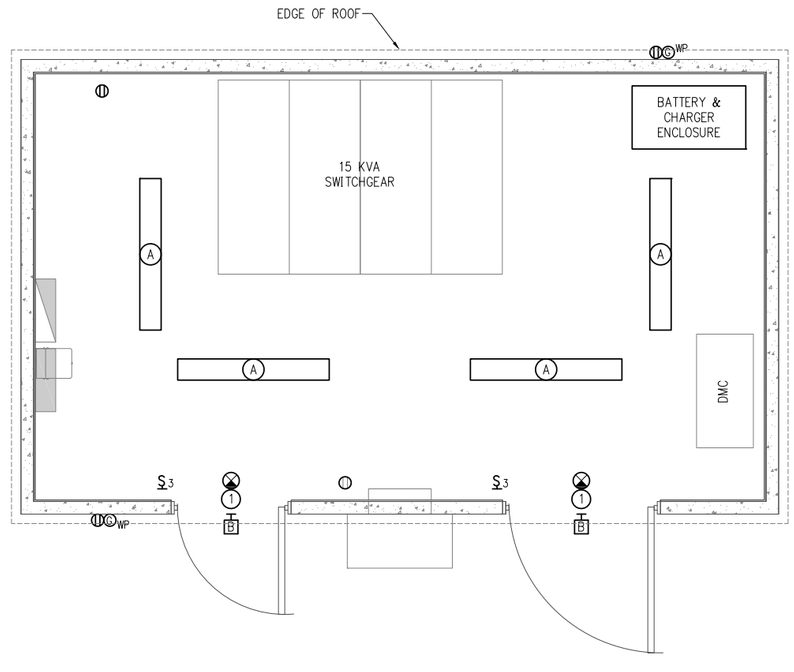


SWITCHGEAR BUILDING

SCALE: 1/2"=1'-0" **ECTRICAL PLAN**

0 2 4

SCALE IN FEET

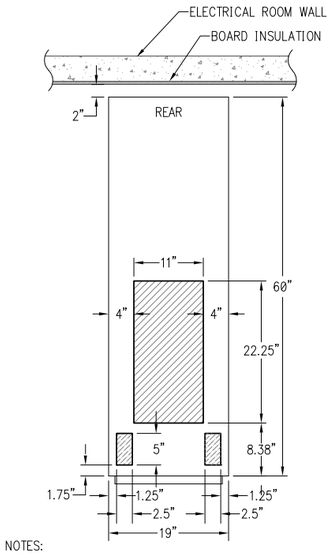


NOTES:
1. A NUMBER BESIDE A LIGHT FIXTURE, CIRCUIT OUTLET OR OTHER DEVICES INDICATES A PANEL BOARD BRANCH CIRCUIT CONNECTION. WHERE CONDUIT AND WIRE HAVE NOT BEEN SHOWN, FURNISH AND INSTALL CONDUIT AND WIRE TO PANEL BOARD. MATERIALS AND INSTALLATION SHALL BE PER THE SPECIFICATIONS. CONDUIT SHALL BE PER THE NEC, 3/4" MINIMUM. WIRE SHALL BE CODE SIZED PER THE BREAKER THAT THE BRANCH CIRCUIT IS TO BE CONNECTED TO ON THE PANEL BOARD SCHEDULE.
2. PROVIDE A PHOTOCELL MOUNTED 10'AFF FLUSH WITH WALL. THE PHOTOCELL SHALL BE CROUSE-HINDS #D2520 MOUNTED IN A FLUSH MOUNTED MASONRY BOX.
3. ALL RECEPTACLES SHALL BE MOUNTED 24"AFF. SWITCHES & T'STATS MOUNTED AT 4'-0" AFF.

SWITCHGEAR BUILDING

SCALE: 1/X"=1'-0" **LIGHTING PLAN**

SCALE IN FEET



NOTES:
1. FINISHED FOUNDATIONS SURFACE SHALL BE LEVEL WITHIN 0.0125 INCH IN 36 INCHES LEFT TO RIGHT, FRONT TO BACK & DIAGONALLY, AS MEASURED BY A LASER LEVEL.
2. PRIMARY CABLE ENTRANCE SPACE (TOP OR BOTTOM ENTRY) PRIMARY CONDUIT PROJECTION MUST NOT EXCEED 3 INCHES.
3. SECONDARY CONTROL WIRING CONDUIT OPENINGS (TOP OR BOTTOM) CONDUIT PROJECTION MUST NOT EXCEED 3 INCHES.

SWITCHGEAR DIMENSIONS

SCALE: 1"=1'-0"

0 1 2

SCALE IN FEET

LIGHT FIXTURE SCHEDULE

MARK	DESCRIPTION	LAMPS	VOLTS	MANUFACTURER	CATALOG NUMBER	COMMENTS
A	LED WRAPAROUND	LED	120	LITHONIA	LBL43000LM80CRI40KMIN1ZTMVOLTEL7CL80	
B	PERIMETER LIGHT	LED	120	LITHONIA	WST LED P1 40K VW MVOLT BBW PE DDBXD	
E	EXIT/EMGCY LIGHT	LED	120	LITHONIA	LHQM LED R HO	

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

THESE DOCUMENTS ARE FOR BIDDING, CONSTRUCTION, AND PERMIT PURPOSES.
DATE: 7-16-2018
McCREARY & ASSOCIATES, INC.
Consulting Engineers
Dallas, Texas FIRM No. F-338

LEWISVILLE

ENGINEERING DIVISION
CITY OF LEWISVILLE

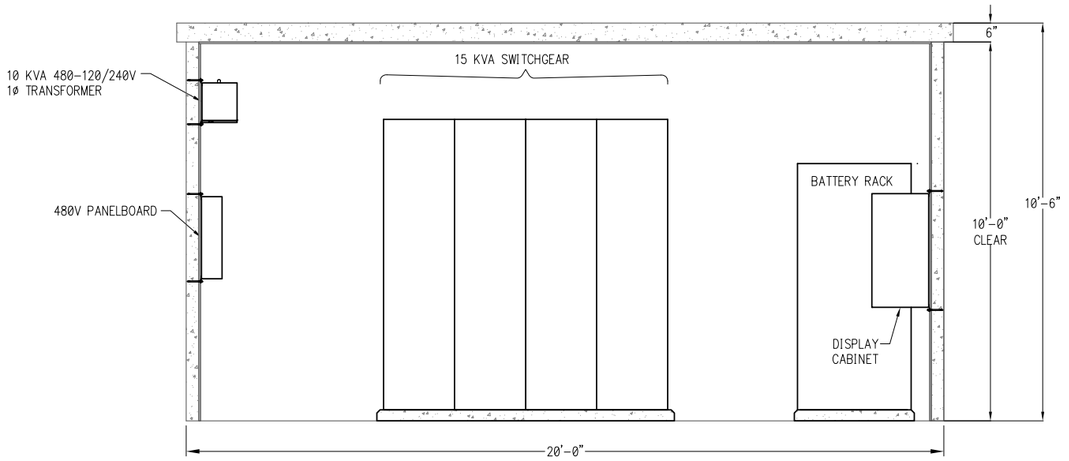
WASTEWATER TREATMENT PLANT
EMERGENCY GENERATOR

SWITCHGEAR BUILDING
ELECTRICAL FLOOR PLANS

STATE OF TEXAS JOSEPH Y. KOTECKI 56361 REGISTERED PROFESSIONAL ENGINEER

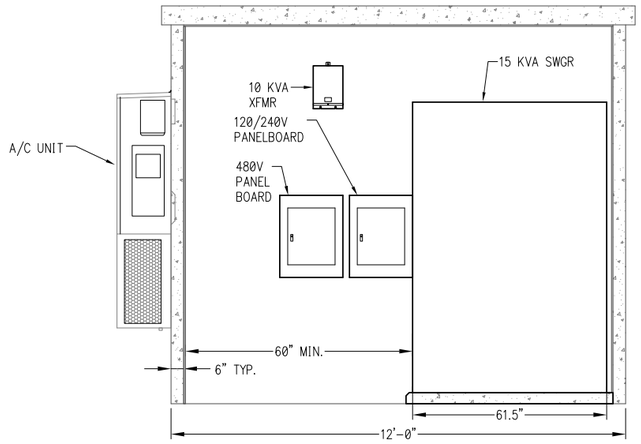
JULY 2018
date

Sheet E7 of 12



A E-07 SWITCHGEAR BUILDING

0 2 4
SCALE IN FEET



B E-07 SWITCHGEAR BUILDING

0 2 4
SCALE IN FEET

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

THESE DOCUMENTS ARE FOR BIDDING, CONSTRUCTION, AND PERMIT PURPOSES.
DATE: 7-16-2018
McCREARY & ASSOCIATES, INC.
Consulting Engineers
Dallas, Texas FIRM No. F-338

LEWISVILLE

ENGINEERING DIVISION
CITY OF LEWISVILLE

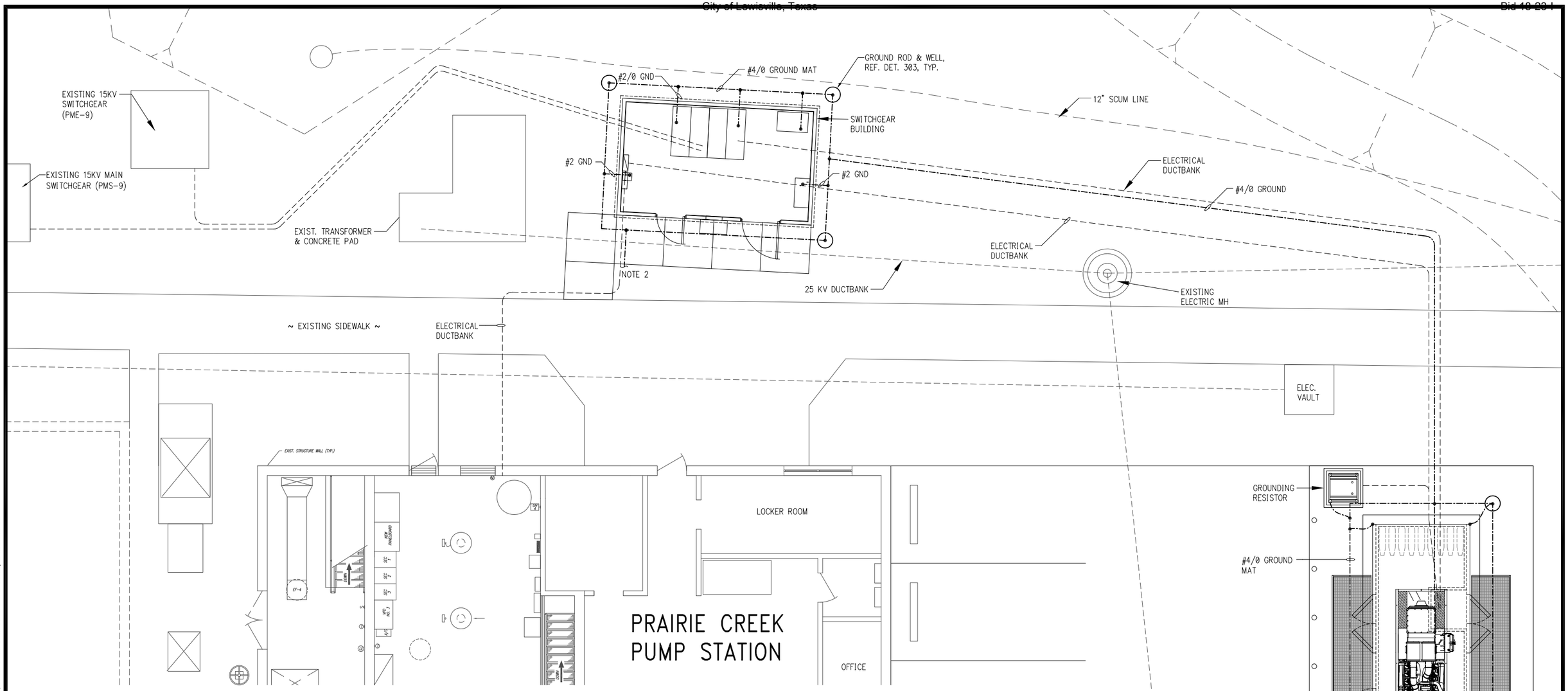
WASTEWATER TREATMENT PLANT
EMERGENCY GENERATOR

SWITCHGEAR BUILDING
ELECTRICAL ELEVATIONS

STATE OF TEXAS
JOSEPH V. KOTRLA
96361
REGISTERED
PROFESSIONAL ENGINEER

JULY 2018
date

Sheet
E8
of 12



NOTES:

1. GROUND MAT SHALL BE #4/0 TIN PLATE COPPER. CONNECTIONS FROM GROUND MAT TO EQUIPMENT SHALL BE #2 AWG.
2. LOCATE EXISTING PUMP STATION GROUND MAT AND BOND TO NEW SWITCHGEAR BUILDING GROUND MAT.
3. BOND GROUND FROM EACH DUCT BANK TO BUILDING GROUND.

GROUNDING PLAN

HALF SIZE SCALE: 1"=10'-0"
FULL SIZE SCALE: 1"=5'-0"

0 5 10
SCALE IN FEET

THESE DOCUMENTS ARE FOR BIDDING, CONSTRUCTION, AND PERMIT PURPOSES.
DATE: 7-16-2018
McCREARY & ASSOCIATES, INC.
Consulting Engineers
Dallas, Texas FIRM No. F-338

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

LEWISVILLE

ENGINEERING DIVISION
CITY OF LEWISVILLE

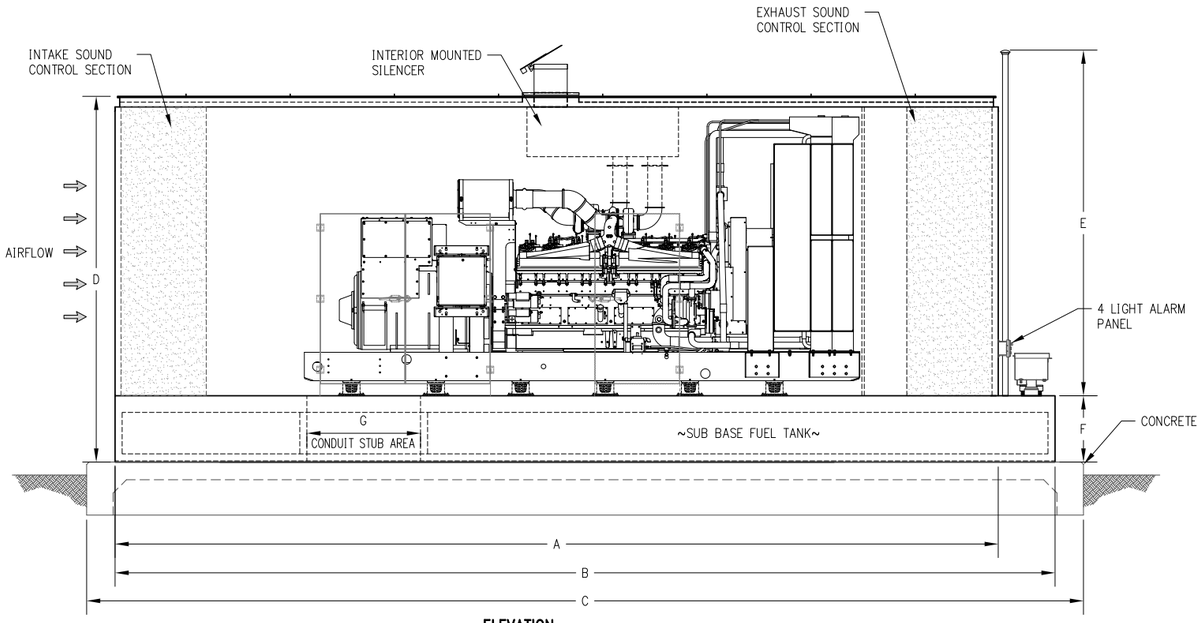
WASTEWATER TREATMENT PLANT EMERGENCY GENERATOR

PARTIAL SITE PLAN MODIFIED

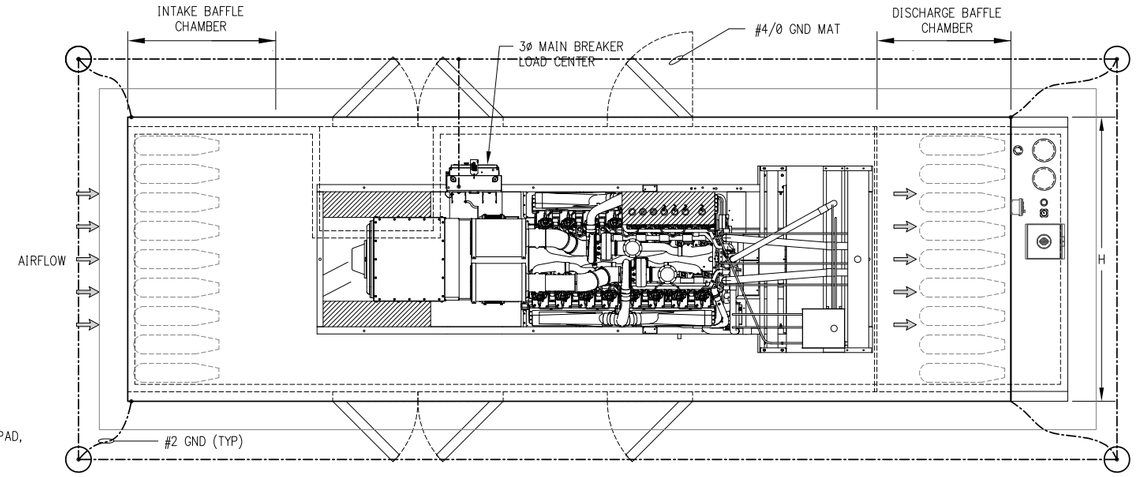
STATE OF TEXAS JOSEPH Y. KOTICH 56361 REGISTERED PROFESSIONAL ENGINEER

JULY 2018
date

Sheet E9 of 12



ELEVATION



PLAN

GENERAL DESCRIPTION:

SUB BASE FUEL SUPPLY TANK
- UL 142 LISTED DOUBLE WALL
- NORMAL VENT EXTENDED 24" ABOVE GRADE
- EMERGENCY VENTS
- LOW LEVEL, HIGH LEVEL, CRITICAL HIGH LEVEL & LEAK DETECTION FLOAT SWITCHES
- MECHANICAL OVERFILL PREVENTION VALVE SET @ 95% WITH 7 GALLON SPILL CONTAINER
- ROCHESTER 6540 FUEL LEVEL GAUGE
- LAMINATED DEPTH CHART & FILLING INSTRUCTIONS
- 4-LIGHT ALARM PANEL

SOUND ENCLOSURE PERFORMANCE
- SOUND LEVEL TO BE 85 dB(A) @ 23 FEET MIN.
- 14GA GALVANEAL CONSTRUCTION
- INTAKE & EXHAUST SOUND CONTROL SECTIONS
- ACCESS DOOR OPENINGS:
  - 72" X 36" TYP. SINGLE DOOR
  - 72" X 72" TYP. DOUBLE DOOR

ACCESSORIES
- INTERIOR MOUNTED SILENCER, FLEX CONNECTION, TAILPIPE WITH RAIN LID & RAIN CAP ASSEMBLY
- INSTALL CSP SUPPLIED SPRING ISOLATORS
- INSTALL CSP SUPPLIED FUEL FILTER ASSEMBLY

** INTERIOR & EXTERIOR EQUIPMENT MOUNTING MAY VARY IN LOCATION DUE TO MANUFACTURING DESIGN REQUIREMENTS

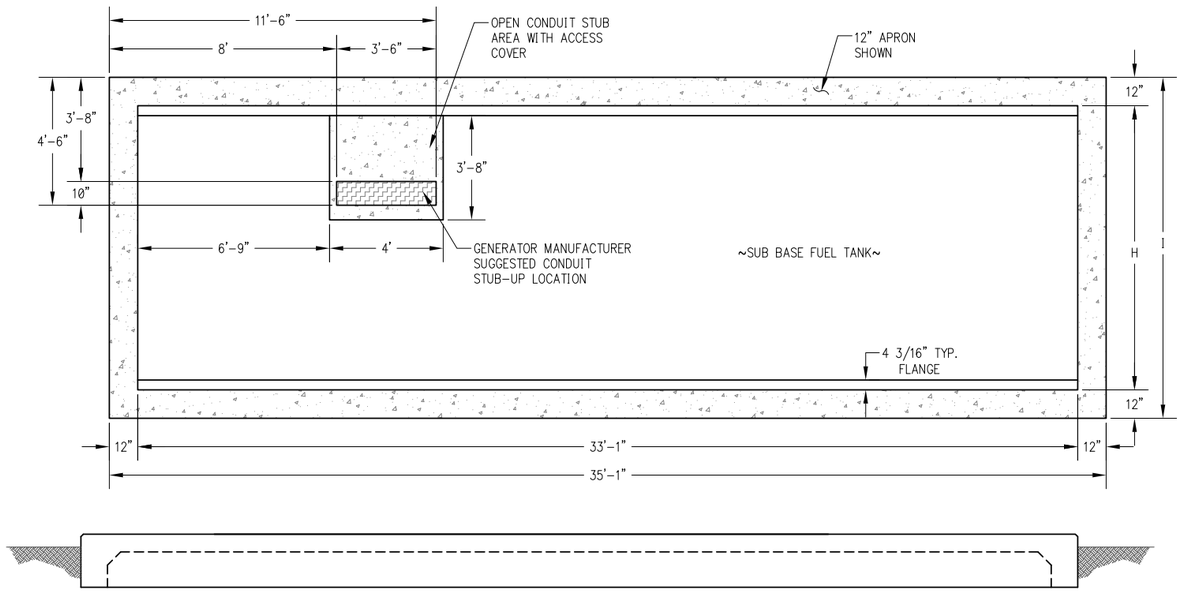
GENERATOR DATA					
MODEL	GEN. WEIGHT (WET)	ENCLOSURE WEIGHT	TOTAL SYSTEM WEIGHT	FUEL CONSUMPTION GPH @ 100% LOAD	COOLING CFM
1500 DQGAB	25,330 LBS.	16,001 LBS.	74,163	109.4	65,045

TANK DATA					
CAPACITY GALLONS	GALLONS PER IN. OF DEPTH	RUN TIME (HRS) @ FULL LOAD	TANK WEIGHT (LBS) DRY	TANK WEIGHT (LBS) WET	COMMENTS
2,750	176.9	25.1	12,279	32,832	GEE GENERAL DESCRIPTION NOTES

DIMENSIONS									
GEN. SIZE	A	B	C	D	E	F	G	H	I
1500 KW	31'-1"	33-1"	35'-0"	10'-7"	13'-0"	2'-4"	4'-0"	10-0"	12'-0"

101 DETAIL – GENERATOR

NOT TO SCALE



NOTES:
1. REFER TO TABLE, DETAIL 101 THIS SHEET FOR DIMENSIONS.

102 DETAIL – GENERATOR PAD

NOT TO SCALE

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

THESE DOCUMENTS ARE FOR BIDDING, CONSTRUCTION, AND PERMIT PURPOSES.
DATE: 7-16-2018
McCREARY & ASSOCIATES, INC.
Consulting Engineers
Dallas, Texas FIRM No. F-338

LEWISVILLE

ENGINEERING DIVISION
CITY OF LEWISVILLE

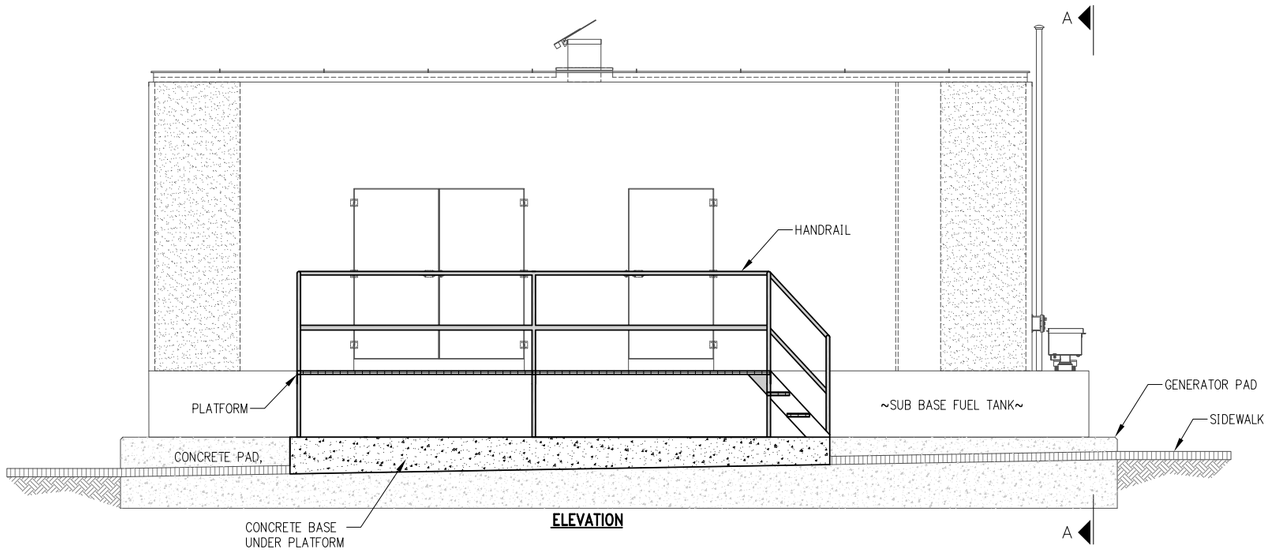
WASTEWATER TREATMENT PLANT
EMERGENCY GENERATOR

GENERATOR DETAILS
SHEET I

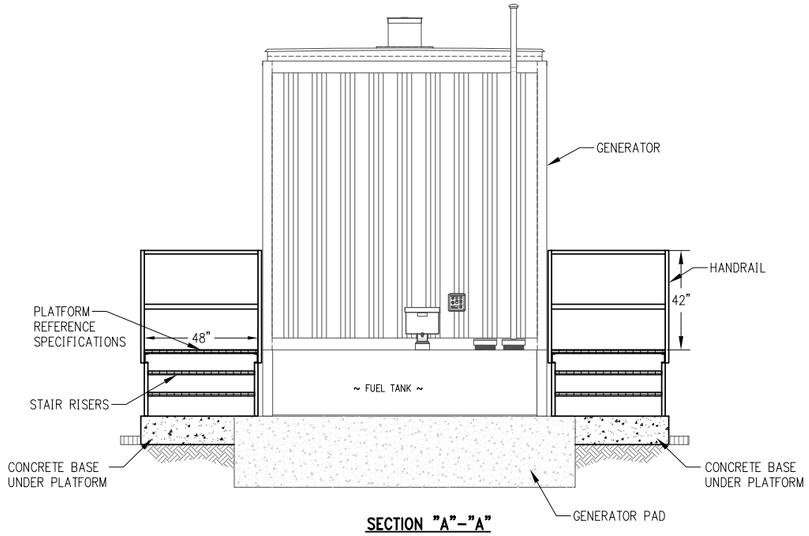
STATE OF TEXAS JOSEPH J. KOTRA 56361 REGISTERED PROFESSIONAL ENGINEER

JULY 2018
date

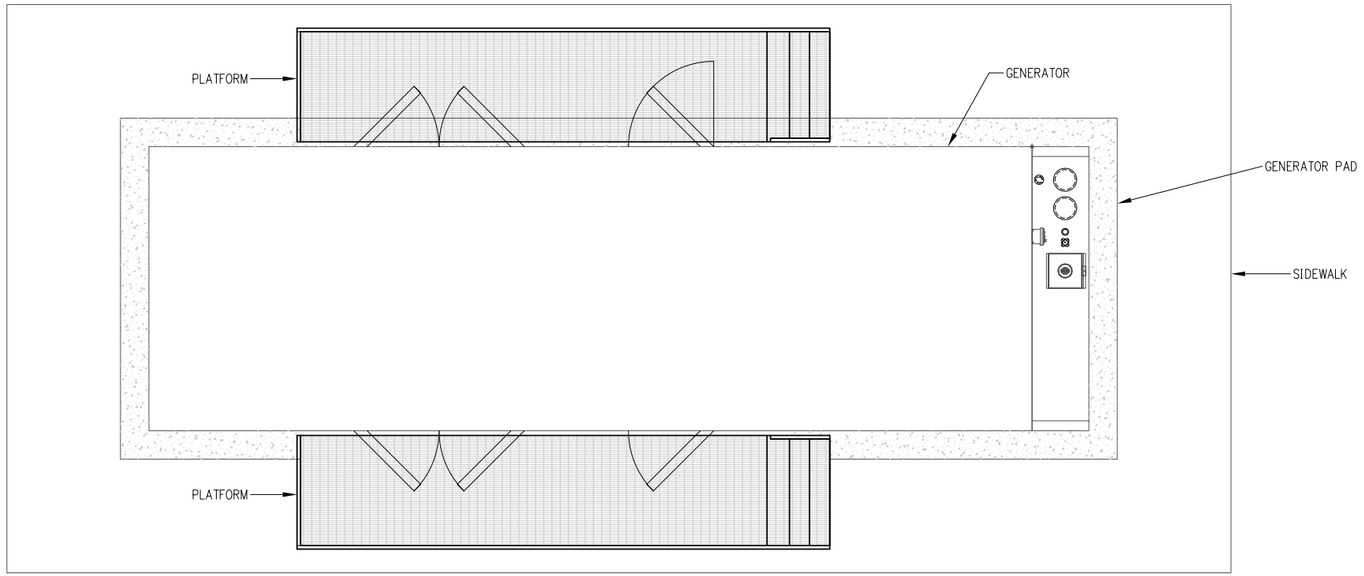
Sheet E10 of 12



ELEVATION



SECTION "A"-"A"



PLAN

201 DETAIL – ELEVATED PLATFORM

NOT TO SCALE

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

THESE DOCUMENTS ARE FOR BIDDING, CONSTRUCTION, AND PERMIT PURPOSES.
DATE: 7-16-2018
McCREARY & ASSOCIATES, INC.
Consulting Engineers
Dallas, Texas FIRM No. F-338

ENGINEERING DIVISION
CITY OF LEWISVILLE

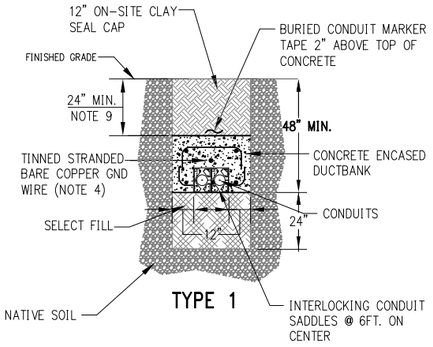
WASTEWATER TREATMENT PLANT
EMERGENCY GENERATOR

GENERATOR DETAILS
SHEET II

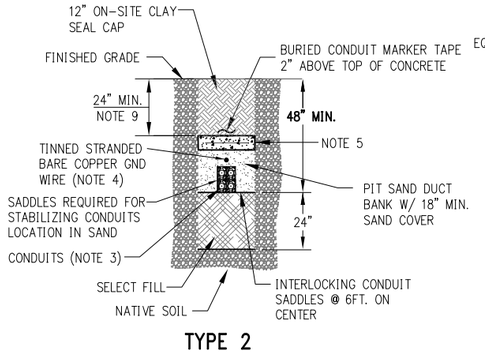
STATE OF TEXAS JOSEPH J. KOTAK 56361 REGISTERED PROFESSIONAL ENGINEER

JULY 2018
date

Sheet
E11
of 12



TYPE 1



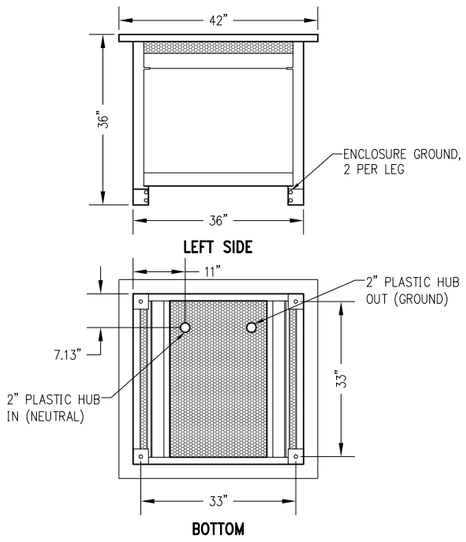
TYPE 2

NOTES:

1. ALL INSTALLATION OF UNDERGROUND DUCT BANK SHALL MEET THE SITE PREP., EXCAVATION, BACKFILL, AND CONCRETE REQUIREMENTS OF THE SPECIFICATIONS.
2. DUCT BANK SPACERS, RACEWAY IDENTIFIERS AND MARKERS SHALL BE PER SPECIFICATION.
3. CONDUITS FOR INSTRUMENTATION CABLES SHALL BE PLASTIC COATED.
4. GROUND WIRE SHALL BE SAME SIZE AS GROUND RING OR AS DESIGNATED.
5. 6" CONCRETE CAP REINFORCED W/ 6X6-W2.9/W2.9 WELDED WIRE FABRIC. SPRAY TOP OF CONCRETE W/ RED DYE AFTER POUR.
6. SELECT FILL SHALL CONSIST OF SANDY CLAY OR CLAYEY SAND WITH A PLASTICITY INDEX (P.I.) BETWEEN 6 AND 15, AND A LIQUID LIMIT OF 35 OR LESS.
7. THE SELECT FILL SHALL BE COMPACTED IN 8" MAXIMUM LAYERS TO A MINIMUM DENSITY OF 95% OF STANDARD PROCTOR DRY DENSITY AT +/- 2 PERCENT OF OPTIMUM MOISTURE CONTENT.
8. 480 VOLT DUCTBANK BETWEEN THE PAD MOUNTED TRANSFORMER AND MAIN/ATS SHALL BE TYPE 1. ALL OTHER DUCTBANKS SHALL BE TYPE 2 UNLESS OTHERWISE NOTED.
9. COVER DEPTH SHALL BE 24" MINIMUM EXCEPT WHERE DUCTBANK CROSSES AN EXISTING DUCTBANK. WHERE CROSSING AN EXISTING DUCTBANK, TYPE 1 DUCTBANKS SHALL MAINTAIN 6" MINIMUM COVER, TYPE 2 DUCTBANKS SHALL MAINTAIN 12" MINIMUM COVER.

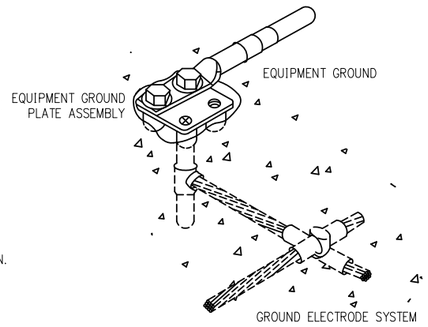
301 DETAIL – UNDERGROUND CONDUIT DUCT BANK

NOT TO SCALE TYPES 1 & 2



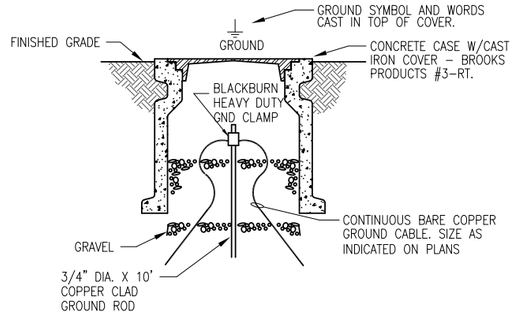
306 DETAIL – NEUTRAL GROUNDING RESISTOR

NOT TO SCALE



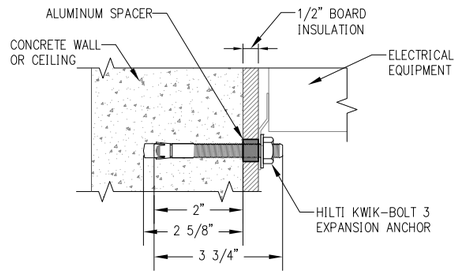
302 IN-SLAB GROUNDING CONNECTOR

NOT TO SCALE



303 GROUND ROD & WELL

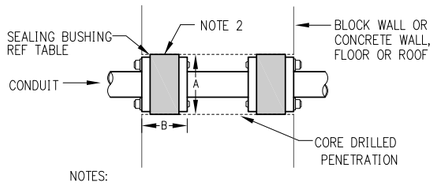
NOT TO SCALE



NOMINAL DIAMETER	HILTI KWIK BOLT 3					
	HOLE DIAMETER	EMBEDMENT	HOLE DEPTH	TOTAL LENGTH	THREAD LENGTH	INSTALLATION TORQUE
IN	IN	IN	IN	IN	IN	FT-LB (N-M)
3/8	3/8	2	2-5/8	3-3/4	2-1/4	20 (27)

307 DETAIL – EQUIPMENT MOUNTING

NOT TO SCALE



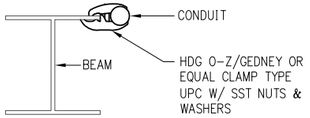
NOTES:

1. TYPICAL FOR NEW PENETRATIONS OF EXISTING WALLS, ROOFS & FLOORS.
2. CAULK ALL AROUND WITH SILICONE SEALANT PRIOR TO INSTALLING BUSHING
3. REPAIR ALL DAMAGE DONE BY CORE DRILL.

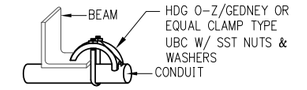
CONDUIT NOM. I.D.	CORE DRILLED HOLE DIA. "A"	"B"	O-Z GEDNEY CATALOG #
3/4"	2"	1 5/8"	CSMI-200P
1"	2 1/2"	1 5/8"	CSMI-250P
1 ¼"-1 ½"	3"	1 5/8"	CSMI-300P
2"	4"	1 7/8"	CSMI-400P
2 ½"-3"	5"	1 7/8"	CSMI-500P
3 ½"-4"	6"	1 7/8"	CSMI-600P

304 WATERTIGHT CONDUIT PENETRATION

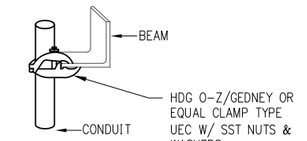
NOT TO SCALE



PARALLEL



RIGHT ANGLE



EDGE TYPE

305 TYPICAL CONDUIT SUPPORT

NOT TO SCALE

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

THESE DOCUMENTS ARE FOR BIDDING, CONSTRUCTION, AND PERMIT PURPOSES.
DATE: 7-16-2018
McCREARY & ASSOCIATES, INC.
Consulting Engineers
Dallas, Texas FIRM No. F-338

LEWISVILLE

ENGINEERING DIVISION
CITY OF LEWISVILLE

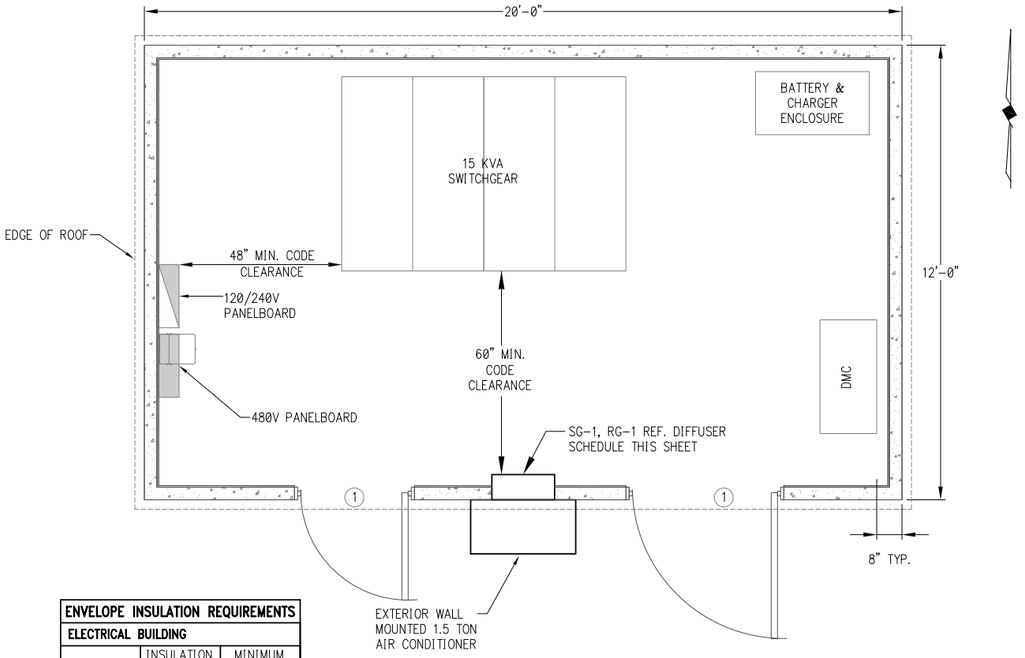
WASTEWATER TREATMENT PLANT
EMERGENCY GENERATOR

ELECTRICAL DETAILS

STATE OF TEXAS JOSEPH V. KOTRLA 56361 REGISTERED PROFESSIONAL ENGINEER

JULY 2018
date

Sheet E12 of 12



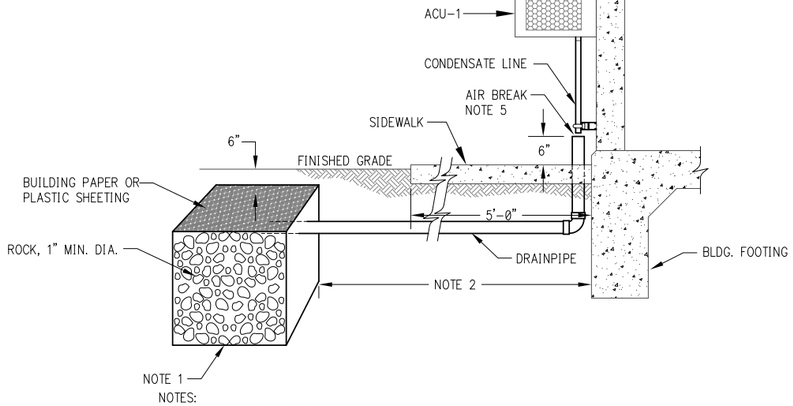
ENVELOPE INSULATION REQUIREMENTS		
ELECTRICAL BUILDING		
COMPONENT	INSULATION R-VALUE	MINIMUM U-FACTOR
NORTH WALL	7.0	0.102
SOUTH WALL	7.0	0.102
EAST WALL	7.0	0.102
WEST WALL	7.0	0.102
CEILING	19.0	0.048
DOORS	5.5	0.200

SWITCHGEAR BUILDING HVAC PLAN

SCALE: 1/2"=1'-0"

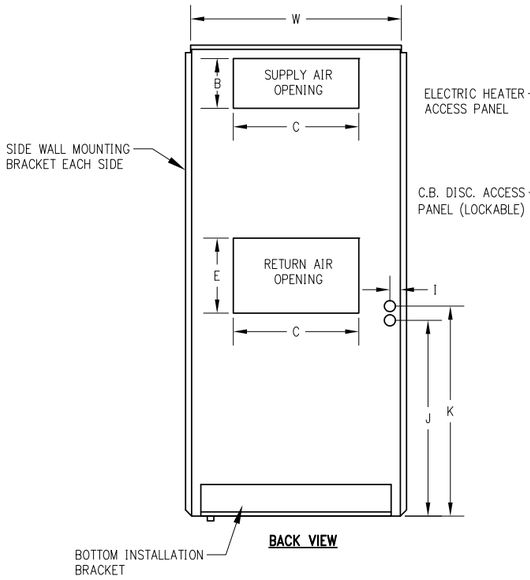
0 2 4

SCALE IN FEET

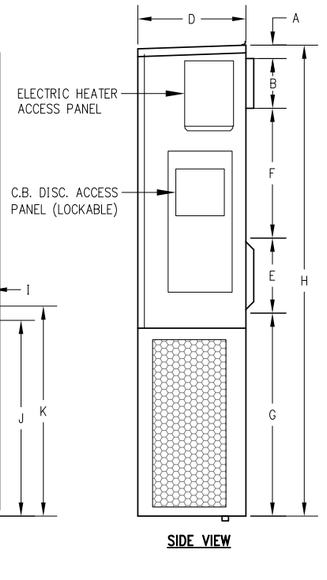


NOTES:
1. MINIMUM 48"x48"x48" OR EQUAL.
2. THE NEAREST EDGE OF THE DRYWELL SHALL BE AT LEAST 3 FEET FROM ANY STRUCTURE OR BUILDING FOUNDATION.
3. THE DRYWELL SHALL BE FILLED WITH MIN. 1" ROCK.
4. THE TOP OF THE DRYWELL SHALL BE COVERED WITH BUILDING PAPER OR PLASTIC SHEETING WITH 6" OF EARTH OR CONCRETE OVER THAT.
5. THE CONDENSATE PIPE FROM THE COOLING COIL (MIN. 3/4") SHALL INDIRECTLY CONNECT TO A MINIMUM 1 1/2" DRAINPIPE. THE INDIRECT CONNECTION SHALL BE MADE BY AN AIR BREAK AT THE EDGE OF THE FOUNDATION.

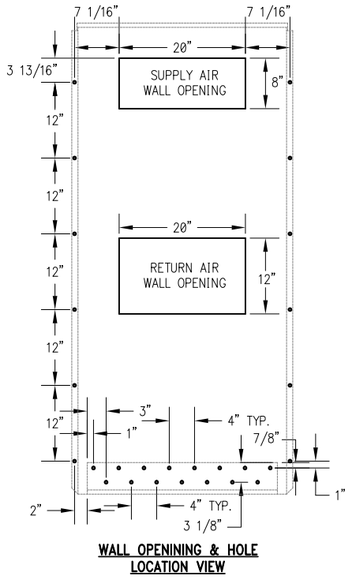
H-102 CONDENSATE LINE & DRYWELL
NOT TO SCALE



BACK VIEW



SIDE VIEW



WALL OPENINING & HOLE LOCATION VIEW

A/C UNIT SCHEDULE

DESIGNATION	S/A CFM	HTG. KW	VOLT/PH	MANUFACTURER/MODEL	ACCESSSORIES
ACU-1	600	5	480/3	BARD #WA181-C5XP6X3	REF. DET. H-101

A/C UNIT DIMENSIONS

UNIT	WIDTH (W)	DEPTH (D)	HEIGHT (H)		SUPPLY		RETURN						
				A	B	C	E	C	F	G	I	J	K
ACU-1	33.300	17.125	74.563	2.13	7.88	19.88	11.88	19.88	20.56	32.06	1.65	31.00	33.25

DIFFUSER SCHEDULE

DESIGNATION	CFM	BLOW PATTERN	MFGR	MODEL	COMMENT
SG-1	600	2 WAY	NAILOR	51DFV-HD-20X8-S-AL-A	SUPPLY
RG-1			NAILOR	51FV-HD-20X12-S-AL-A	RETURN

NOTES:
1. DIMENSIONS SHOWN ARE IN INCHES.
2. ROUTE CONDENSATE DRAIN TO DRYWELL.
3. UNIT SHALL INCLUDE BAROMETRIC FRESH AIR DAMPER, 2 INCH PLEATED FILTERS AND PHENOLIC COATED EVAPORATOR AND CONDENSER COILS SUITABLE FOR H2S ENVIRONMENTS.
4. FINISHED INSTALLATION SHALL BE WEATHERPROOF.

H-101 DETAIL-AIR CONDITIONING UNIT
NOT TO SCALE

McCREARY & ASSOCIATES, INC.
CONSULTING ENGINEERS FIRM# F-338 972/458-8745
6310 LBJ FREEWAY SUITE 217 DALLAS, TEXAS 75240

THESE DOCUMENTS ARE FOR BIDDING, CONSTRUCTION, AND PERMIT PURPOSES.
DATE: 7-16-2018
McCREARY & ASSOCIATES, INC.
Consulting Engineers
Dallas, Texas FIRM No. F-338

LEWISVILLE

ENGINEERING DIVISION
CITY OF LEWISVILLE

WASTEWATER TREATMENT PLANT EMERGENCY GENERATOR

SWITCHGEAR BUILDING HVAC PLAN & DETAILS

STATE OF TEXAS JOSEPH V. KOTRLA 56361 REGISTERED PROFESSIONAL ENGINEER

JULY 2018
date

Sheet H1 of 1

STANDARD SPECIFICATIONS

1.00 GENERAL

1.1 DEFINED TERMS

Terms used in these Instructions to Bidders have the meanings assigned to them in the General Conditions.

1.2 QUALIFICATIONS OF BIDDERS

A. All bidders are to submit qualification statements with the Bid to demonstrate that the Contractor is qualified by experience and capability to successfully construct the project within the Contract Time and for the Contract Amount. Information requested may include:

1. Qualifications and experience of the Bidders, including key personnel to be assigned to the project.
2. Qualifications and experience of Subcontractors.
3. Qualifications of manufacturers proposed to furnish the principal items of material or equipment.
4. Financial data consisting of audited financial statements.
5. Previous experience and present contracts.
6. List of available equipment.

B. Owner may conduct investigations as considered necessary to establish the responsibility, qualifications and financial ability of the Bidders, proposed Subcontractors and other persons and organizations to do the work in accordance with the Contract Documents, to Owner's satisfaction, and within the prescribed time.

1.3 EXAMINATION OF CONTRACT DOCUMENTS AND SITE

A. Examine Contract Documents, make observations and investigations, correlate knowledge and observations with the requirements of the Contract Documents and consider these in preparation of a bid for the project.

1. Read the Contract Documents and related technical data and reports thoroughly. Use a complete set of Contract Documents in preparing Bids. Assume responsibility for errors or misinterpretations resulting from the use of partial or incomplete contract documents.
2. Visit the site to become familiar with general, local and site conditions that may affect cost, progress or performance of the work in any manner.
3. Become familiar with federal, state and local laws, ordinances, rules and regulations affecting cost, progress or performance of the work.

B. Surveys and investigation reports of subsurface or latent physical conditions at the site, or conditions or situations affecting the design of the Project used by the Engineer in preparing the Contract Documents are referenced in the Supplementary Conditions.

1. These reports are available for information only and neither the Owner nor Engineer guarantees their accuracy or that any opinions expressed in the report are correct.

2. Make additional surveys and investigations as necessary to determine the bid price for performance of the work in compliance with the terms of the Contract Documents before submitting a bid.
3. Cost for these investigations is to be paid by the Bidders.

C. Acknowledge sole responsibility for job site safety, including trench excavation and confined space entry safety, by the submission of a Bid for this project.

D. A non-mandatory pre-bid conference for the project will be held on **Wednesday, October, 3 2018, 10:00 am local time** at Public Services at 1100 N. Kealy St. Suite C, Lewisville, Texas 75057 in the Conference Room. A site visit at the plant will follow the pre-bid conference.

E. The submission of a Bid is incontrovertible representation by the Bidder that he has complied with every requirement of this Section.

1.4 INTERPRETATIONS

Submit all questions about the meaning or intent of the Contract Documents thru Bidsync. All responses to question will be made thru Bidsync. Any questions are to be posted on BidSync. Bidders may post questions up to **2:00 pm Thursday, October 4, 2018**. All questions will be responded to by **2:00 pm Monday, October 8, 2018**.

1.5 BID SECURITY

A. Submit a bid security in the amount of five (5%) percent of the amount of the maximum total bid as a guarantee that the Bidder will promptly enter into a Contract and execute a Performance, Payment and Maintenance Bonds on the forms included in the Contract Documents if awarded the contract.

B. Bidders are required to submit a cashier's or certified check issued by a bank satisfactory to the City of Lewisville, or a Bid Bond (with proper Power of Attorney) from a surety licensed to do business in the State of Texas, payable without recourse to the City of Lewisville, in an amount not less than five (5%) percent of the total amount of the base bid submitted to insure that the successful bidder will enter into a contract and execute all necessary bonds within fifteen (15) days after notice of award of the contract to him. **This bid security must be uploaded to BidSync or included in the bid envelope along with the bid sheet for the bidder to be considered responsive.**

1.6 CONTRACT TIME

This project is to be substantially complete (ready for operation) within 300 consecutive calendar days from the date of the Notice to Proceed. Final Completion of the project shall be achieved within 30 consecutive calendar days of the Substantial Completion date. Liquidated damages are set forth at $500.00 per day and are applicable to each schedule milestone delineated in Section 01 13 13, Schedule of Completion.

1.7 BID FORM

A. Submit bids on the Bid forms provided with the Contract Documents for each contract Bid. Include supplemental data to be furnished in the same sealed envelope with Bid.

B. The Bid price of each item on the form must be stated in words and/or numerals. Words take precedence in case of a conflict. In the case of a conflict between the unit price indicated and the extended amount shown, the unit price indicated multiplied by the stated quantity shall govern.

C. Execute bids by corporations in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign.

D. Execute bids by partnerships in the partnership name. Forms are to be signed by a partner. Print the name below the signature. Write the title of the Partner and show the official address of the partnership shown below the signature.

E. Acknowledge receipt of all Addenda on the bid form by signing beside the Addenda number.

1.8 SUBMISSION OF BIDS

Sealed bids will be received at www.bidsync.com or the Finance Administration - Purchasing Division at 151 West Church Street, Lewisville, Texas 75057 until **2:00 p.m. local time, October 11, 2018**. Bids will be publicly opened and read aloud by a Purchasing Division Representative for the construction project listed above **at 2:30 pm, October 11, 2018**. If a paper bid is provided, envelopes are to be clearly marked with the bid number, bid opening date and company submitting the bid.

1.9 MODIFICATION AND WITHDRAWL OF BIDS

Modify or withdraw bids by submitting an appropriate document executed in the manner that a Bid must be executed. Deliver the modification or withdrawal to the place where Bids are to be submitted at any time prior to the opening of Bids.

1.10 OPENING OF BIDS

A. Bids will be opened as indicated in the Invitation for Bids.

B. All Bids shall remain open and may not be withdrawn within sixty (60) days from date on which bids are opened.

1.11 AWARD OF CONTRACT

A. Owner may reject Bids, waive formalities, or disregard nonconforming, conditional Bids or counter proposals.

B. Owner may consider the following in evaluating the bids and awarding the contract:

1. Contractor's qualifications and ability to demonstrate current capability to complete the project in conformance with the requirements of the contract documents.

2. Compliance of the Bids with requirements of the Contract Documents
3. Alternates and unit prices if requested in the Bid forms.
4. The amount bid.

C. The contract will be awarded to the lowest responsible Bidder whose evaluation by Owner indicates that the award will be in the best interests of the City if a contract is to be awarded.

D. Each Bidder agrees to waive any claim it has or may have against the Owner, the Architect/Engineer, and their respective employees, arising out of or in connection with the administration, evaluation, or recommendation of any bid.

1.12 EXECUTION OF CONTRACT

A. The successful Bidder must execute the formal Contract Agreement and required Bonds on the forms prepared and submitted by the Owner within fifteen (15) days after the Notice of Award.

B. A Notice to Proceed authorizing the Contractor to commence work will be issued after the Contract Documents have been executed.

1.13 WAGE RATES

Contractor must pay no less than the general prevailing rates for the Project location as determined in accordance with statutory requirements. The minimum rates for various labor classifications as established by the Owner are included in the Contract Documents below.

General Decision Number: TX180026 06/29/2018 TX26

Superseded General Decision Number: TX20170026

State: Texas

Construction Type: Heavy

County: Denton County in Texas.

Heavy Construction, Including Treatment Plants (Does not include water/sewer lines)

Modification Number	Publication Date
0	01/05/2018
1	06/29/2018

ASBE0021-003 06/01/2016	Rates	Fringes

ASBESTOS WORKER/HEAT & FROST

INSULATOR (Includes

application of all insulating materials, protective coverings, coatings, and finishings to all types of mechanical systems)..... $ 24.32 7.52

---

* ElEC0020-004 12/01/2012

	Rates	Fringes
Electricians:		
Cable Splicer.....	$ 29.81	8.840
Electrician.....	$ 29.35	9.49

ELEC0220-001 06/04/2017

	Rates	Fringes
Line Construction:		
CABLE SPLICER.....	$ 17.12	14.5%+3.75
GROUNDMAN.....	$ 18.96	20%+5.50
LINEMAN & EQUIPMENT	$31.60	20%+5.50
OPERATOR.....	$ 25.28	20%+5.50

ENGI0178-001 06/01/2009

	Rates	Fringes
Cranes:		
Hydraulic Crane (35 ton & under).....	$ 23.70	9.35
Hydraulic over 35 tons, Derricks, Overhead Gentry, Stiffleg, Tower, etc., and Cranes with Pile driving or Caisson attachments.....	$ 24.70	9.35

IRON0263-010 06/01/2012

	Rates	Fringes
Ironworkers:		
Reinforcing & Structural....	$ 23.25	

PLUM0100-002 11/01/2017

	Rates	Fringes
Plumbers and Pipefitters.....	$ 30.84	11.51

---

* SHEE0068-002 11/01/2012

	Rates	Fringes
Sheet metal worker.....	$ 27.64	8.84

SUTX1990-39 08/01/1990

	Rates	Fringes
CARPENTER.....	$ 10.536	
Concrete Finisher.....$	9.603	
Form Builder.....	$ 8.036	
Form Setter.....	$ 9.578	
Laborers:		
Common.....	$ 7.25	
Utility.....	$ 7.25	
Pipe layer.....	$ 7.961	
Power equipment operators:		
Backhoe.....	$ 10.971	
Bulldozer.....	$ 9.942	
Front end loader.....	$ 10.771	
Mechanic.....	$ 9.88	
Motor Grader.....	$ 11.633	
Oiler.....	$ 9.183	
Scraper.....	$ 8.00	
TRUCK DRIVER.....	$ 7.465	

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

==========

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work,up to 56 hours of paid sick

leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1)(ii)).

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

Union Rate Identifiers

A four-letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

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

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

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

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

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

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

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

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

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

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

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

==========

END OF GENERAL DECISION

END OF SECTION

General Services Commission
1711 San Jacinto – P.O. Box 13047
Austin, Texas 78711-3047
Web Site: www.gsc.state.tx.us
(512) 463-3035

Prevailing Wage Rate Determination Information

The following information from Chapter 2258 Texas Government Code Title 10 should be included in your bid specification documents and contract documents:

2258.021. Duty of Government Entity to Pay Prevailing Wage Rages

(a) The state or any political subdivision of the state shall pay a worker employed by it or on behalf of it:
(1) not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the work is performed; and
(2) not less than the general prevailing rate of per diem wages for legal holiday and overtime work.
(b) Subsection (a) does not apply to maintenance work.
(c) A worker employed on a pubic work for the purposes of this section if the worker is employed by a contractor or subcontractor in the execution of a contract for the public work with the state, a political subdivision of the state, or any or any officer or public body of the state or a political subdivision of the state.

2258.023. Prevailing Wage Rates to be Paid by Contractor and Subcontractor; Penalty

(a) The contractor who is awarded a contract by a public body or a subcontractor of the contractor shall pay not less than the rates determined under Section 2258.022 to a worker employed by it in the execution of the contract.
(b) A contractor or subcontractor who violates this section shall pay to the state or a political subdivision of the state on whose behalf the contract is made, $60 for each worker employed for each calendar day or part of the day that the worker is paid less than the wage rates stipulated in the contract.
Note: This penalty applies even if the contractor or subcontractor and the worker come to an agreement on the underpaid wages (see Attorney General Opinion DM-469).

(c) A contractor or subcontractor does not violate this section if a public body awarding a contract does not determine the prevailing wage rates and specify the rates in the contract as provided by Section 2258.022
(d) The public body shall use any money collected under this section to offset the costs incurred in the administration of this chapter.
(e) A municipality is entitled to collect a penalty under this section only if the municipality has population of more than 10,000.

2258.051. Duty of Public Body to Hear Complaints and Withhold Payment

(a) A public body awarding a contract, and an agent or officer of the public body, shall:
(1) take cognizance of complaints of all violations of this chapter committed in the execution of the contract, and
(2) withhold money forfeited or required to be withheld under this chapter from the payments to the contractor under the contract, except that the public body may not withhold money from other than the final payment without determination by the public body that there is good cause to believe that the contractor has violated this chapter.

WR1001 March 1998

City of Lewisville
Special Supplemental General Conditions

The Standard Specifications for this project are the "Public Works Construction Standards" as published under the authority of the North Central Texas Council of Governments (NCTCOG); Latest Edition The NCTCOG Public Works Construction Standards shall be modified, revised or amended as listed below. The referenced sections of the NCTCOG Public Works Construction Standards listed below shall replace or supplement those of the original document.

A. Special Provisions to the General Provisions of the Standard Specifications:

1. Technical specifications (Special Specifications) included in the Contract document package shall supersede the standard technical specifications of the Engineer presented herein.

2. Prospective bidders may make written request to the Engineer for clarification and alterations in the plans, specifications, and form of contract. Such request must be received by the Engineer no later than 2:00 p.m. on the Wednesday first preceding the Thursday on which the bids are to be opened. The Engineer will be the sole judge as to the necessity to an addendum or letter of clarification. Oral statements shall in no way be considered as part of the contract and will not be considered as binding.

3. "Engineer" shall refer to the independent consultant hired by the Owner to design the Project and represent the OWNER in the administration of the Contract. The Engineer shall be understood to be the Consulting Engineer of the OWNER, and nothing contained in the Contract Documents shall be construed to make the Consulting Engineer an employee of the OWNER, nor shall they be construed to create any contractual or agency relationship between the Consulting Engineer and the CONTRACTOR. The term includes the officers, employees, associates, agents, and subconsultants of Consulting Engineer, if any.

4. Five (5) sets of the contract documents, exclusive of the "Public Works Construction Standards" referenced above will be furnished without charge to the CONTRACTOR for construction purposes. Additional copies may be obtained from the City at actual reproduction cost.

5. **Item 102.3. Examination of Plans, Specifications and Site of The Work**: Add the following paragraphs after Paragraph 2:

   In preparation of Drawings and Specifications, Engineer has established and relied upon the following report of explorations and tests of subsurface conditions at the site of the work:

   Report dated March 20, 201s prepared by Gorrondona & Associates, 7524 Jack Newell Blvd, S. Ft. Worth, Texas, 76118 entitled: "SUE Field Sketch" included in the Appendix. Variations from the conditions indicated by the boring shall not be used as a basis for a claim of changed conditions. The CONTRACTOR may

take borings at the site to satisfy himself as to subsurface conditions prior to bidding, upon granting of permission by the property owner.

6. **Item 102.4. Preparation of Proposal**: Sentence 4 shall be changed to read: "In the cases of discrepancy between unit prices and amounts, the unit price shown in figures shall stand and the amount and total will be adjusted to correspond to the unit price shown".

7. **Item 103.3.1.1. Performance Bonds: Paragraph (a) Performance Bond**: The last sentence of this paragraph is hereby deleted and replaced with: This bond shall provide for the repair and/or replacement of all defects due to faulty materials and workmanship that appears within a period of two years from the date of acceptance of the improvements by the Lewisville City Council.

8. **Item 103.3.3. Sureties: The following applies to Surety Bonds**:

Texas Government Code Title 10, Chapter 2253

"(d) A bond required by this section must be executed by corporate surety in accordance with Chapter 3503, Texas Insurance Code."

Texas Insurance Code Section 3503.005. Additional Requirements for Certain Bonds

"(a) A bond that is made, given, tendered, or filed under Chapter 53, Property Code, or Chapter 2253, Government Code, may be executed only by a surety company that is authorized to write surety bonds in this state. If the amount of the bond exceeds $100,000, the surety company must also:

(1) hold a certificate of authority from the United States secretary of the treasury to qualify as a surety on obligations permitted or required under federal law; or

(2) have obtained reinsurance for any liability in excess of $100,000 from a reinsurer that:

(A) is an authorized reinsurer in this state; and

(B) holds a certificate of authority from the United States secretary of the treasury to qualify as a surety or reinsurer on obligations permitted or required under federal law.

(b) To determine whether the surety on the bond or the reinsurer holds a certificate of authority from the United States secretary of the treasury, a party may conclusively rely on the list published in the Federal Register by

the United States Department of the Treasury, covering the date on which the bond was executed, of the companies holding certificates of authority as acceptable sureties on federal bonds and as acceptable reinsuring companies. A purchaser, insurer of title, or lender acquiring or insuring an interest in or title to real property may also conclusively rely on, and is protected by, a statement on a recorded bond or a sworn, recorded statement by the surety that refers to the specific recorded bond and states that, at the time the bond was executed, the surety complied with Subsection (a)(1) or (2)."

9. **Item 103.4. Insurance**: delete and replace with the following.

Vendor shall procure and maintain for the duration of the contract, insurance against claims for injuries to persons or damages to property, which may arise from or in connection with the performance of the work hereunder by the vendor, his agents, representatives, employees or subcontractors. The cost of such insurance shall be included in the Vendor's bid.

A. MINIMUM SCOPE OF INSURANCE

Coverage shall be at least as broad as:

1. Insurance Services Office Commercial General Liability coverage "occurrence" form CG 00 01 (10 01). "**Claims Made" form is unacceptable.**

2. Workers' Compensation insurance as required by the Labor Code of the State of Texas, including Employers' Liability Insurance.

3. Automobile Liability – as required by the State of Texas, covering all owned, hired, or non-owned vehicles. Automobile Liability is only required if vehicle(s) will be used under this contract. Coverage not required for delivery services.

B. MINIMUM LIMITS OF INSURANCE

Vendor shall maintain throughout contract limits not less than:

1. Commercial General Liability: $500,000 per occurrence/$1,000,000 aggregate for bodily injury, personal injury and property damage. Policy will include coverage for:

a. Premises – Operations

b. Broad Form Contractual Liability

c. Products and Completed Operations

d. Use of Contractors and Subcontractors

e. Personal Injury

f. Broad Form Property Damage

g. If applicable, Explosion Collapse and Underground (XCU) Coverage, Fire Damage, and Medical Expenses.

NOTE: The aggregate loss limit applies to each project.

2. Workers' Compensation and Employer's Liability: Workers' Compensation Statutory limits as required by the Labor Code of the State of Texas and Employer's Liability minimum limits of $500,000 per injury, $500,000 per occurrence, and $500,000 per occupational disease.

3. Automobile Liability - $500,000 Combined Single Limit. Limits can only be reduced if approved by the HR Director or designee.

4. Builders' Risk Insurance (as applicable) – Completed value form, insurance carried must equal the completed value of the structure.

C. DEDUCTIBLES AND SELF-INSURED RETENTIONS

Any deductible or self-insured retentions must be declared to and approved by the City.

D. OTHER INSURANCE PROVISIONS

The policies are to contain, or be endorsed to contain the following provisions:

1. General Liability and Automobile Liability Coverages

a. The City, its officers, officials, employees, boards/commissions and volunteers are to be added as "Additional Insured" as respects liability arising out of activities performed by or on behalf of the vendor, products and completed operations of the vendor, premises owned, occupied or used by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the City, its officers, officials, employees or volunteers. It is understood that the business auto policy under "Who is an Insured" automatically provides liability coverage in favor of the City. The coverage shall include defense of claims against the City as additional insured.

b. The vendor's insurance coverage shall be primary and non-contributory insurance as respects the City, its officers, officials, employees and volunteers. Any insurance or self-insurance maintained by the City, its officers, officials, employees or volunteers shall be excess of the vendor's insurance and shall not contribute with it.

c. Any failure to comply with reporting provisions of the policy shall not affect coverage provided to the City, its officers, officials, and employees, Boards and Commissions or volunteers.

d. The vendor's insurance shall apply separately to each insured against whose claim is made or suit is brought, except to the limits of the insured's liability.

2. Waiver of Subrogation – All coverages
Each insurance policy required by this exhibit shall waive all rights of subrogation against the City, its officers, officials, employees, and volunteers for losses arising from work performed by the vendor for the City.

3. Notice of Cancellation - All Coverages
Each insurance policy required by this exhibit shall be endorsed to state that coverag

suspended, voided, canceled or non-renewed by either party, reduced in coverage or in limits except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given the City, or ten (10) days prior written notice for non-payment of premium.

E. ACCEPTABILITY OF INSURERS

The City prefers that Insurance be placed with insurers with an A.M. Best's rating of no less than **A-:VI, or, A or better** by Standard and Poors.

F. VERIFICATION OF COVERAGE

Contractor shall furnish the City with certificates of insurance affecting coverage required. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. Certificates of Insurance must be provided on forms approved by the Texas Department of Insurance. City will not accept Memorandums of Insurance or Binders as proof of insurance. The City reserves the right to require complete, certified copies of all required insurance policies at any time.

G. HOLD HARMLESS AND INDEMNIFICATION

THE CONSULTANT/CONTRACTOR AGREES TO DEFEND, INDEMNIFY AND HOLD THE CITY, ITS OFFICERS, AGENTS AND EMPLOYEES, HARMLESS AGAINST ANY AND ALL CLAIMS, LAWSUITS, JUDGMENTS, COSTS AND EXPENSES FOR PERSONAL INJURY (INCLUDING DEATH), PROPERTY DAMAGE OR OTHER HARM FOR WHICH RECOVERY OF DAMAGES IS SOUGHT, SUFFERED BY ANY PERSON OR PERSONS, THAT MAY ARISE OUT OF OR BE OCCASIONED BY CONSULTANT'S/CONTRACTOR'S BREACH OF ANY OF THESE TERMS AND CONDITIONS OR BY ANY NEGLIGENT OR STRICTLY LIABLE ACT OR OMISSION OR INTENTIONAL TORT, INTELLECTUAL PROPERTY INFRINGEMENT, OR FAILURE TO PAY A SUBCONTRACTOR OR SUPPLIER COMMITTED BY, CONSULTANT/CONTRACTOR, ITS OFFICERS, AGENTS, EMPLOYEES OR SUBCONTRACTORS, IN THE PERFORMANCE OF THIS AGREEMENT; EXCEPT THAT THE INDEMNITY PROVIDED FOR IN THE PARAGRAPH SHALL NOT APPLY TO ANY LIABILITY RESULTING FROM THE SOLE NEGLIGENCE OR FAULT OF THE CITY, ITS OFFICERS, AGENTS, EMPLOYEES OR SEPARATE CONTRACTORS, AND IN THE EVENT OF JOINT AND CONCURRING NEGLIGENCE OR FAULT OF THE CONSULTANT/CONTRACTOR AND THE CITY, RESPONSIBILITY AND INDEMNITY, IF ANY, SHALL BE APPORTIONED IN ACCORDANCE WITH THE LAW OF THE STATE OF TEXAS, WITHOUT WAIVING ANY GOVERNMENTAL IMMUNITY AVAILABLE TO THE CITY UNDER TEXAS LAW AND WITHOUT WAIVING ANY DEFENSES OF THE PARTIES UNDER TEXAS LAW AND THE CITY'S REASONABLE ATTORNEY'S FEES SHALL BE REIMBURSED IN PROPORTION TO THE CONSULTANT'S LIABILITY. THE PROVISIONS OF THIS PARAGRAPH ARE SOLELY FOR THE BENEFIT OF THE PARTIES HERETO AND NOT INTENDED TO CREATE OR GRANT ANY RIGHTS, CONTRACTUAL OR OTHERWISE, TO ANY OTHER PERSON OR ENTITY.

I. STATE REQUIREMENTS FOR WORKERS COMPENSATION INSURANCE

As required by: 28 Tex.Admin.code §110.110(c)(7):

A. Definitions:

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 (DWC-81, DWC-82, DWC-83, or DWC-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.

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.

Persons providing services on the project ("subcontractor" in §406.096) - 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.

B. 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.

C. The Contractor must provide a certificate of coverage to the governmental entity prior to being awarded the contract.

D. If the coverage period shown on the contractor's current certificate of coverage ends during the duration of the project, the contractor must, prior to the end of the coverage period, file a new certificate of coverage with the governmental entity showing that coverage has been extended.

E. The contractor shall obtain from each person providing services on a project, and provide to the governmental entity:

(1) a certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage showing coverage for all persons providing services on the project; and

(2) no later than seven days after receipt by the contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.

F. The contractor shall retain all required certificates of coverage for the duration of the project and for one year thereafter.

G. The contractor shall notify the governmental entity in writing by certified mail or personal delivery, within 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.

H. The contractor shall post on each project site a notice, in the text, form and manner prescribed by the Texas Department of Insurance, Division of Workers' Compensation, 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.

I. The contractor shall contractually require each person with whom it contracts to provide services on a project, to:

(1) provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all of its employees providing services on the project, for the duration of the project;

(2) provide to the contractor, prior to that person beginning work on the project, a certificate of coverage showing that coverage is being provided for all employees of the person providing services on the project, for the duration of the project;

(3) 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;

(4) obtain from each other person with whom it contracts, and provide to the contractor:

(a) a certificate of coverage, prior to the other person beginning work on the project; and

(b) a new certificate of coverage showing extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(5) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(6) notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and

(7) contractually require each person with whom it contracts, to perform as required by paragraphs (1) - (7), with the certificates of coverage to be provided to the person for whom they are providing services.

J. By signing this contract or providing or causing to be provided a certificate of coverage, the contractor is representing to the governmental entity that all employees of the contractor who will provide services on the project will be covered by workers' compensation coverage for the duration of the project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions.

K. The contractor's failure to comply with any of these provisions is a breach of contract by the contractor which entitles the governmental entity to declare the contract void if the contractor does not remedy the breach within ten days after receipt of notice of breach from the governmental entity.

10. **Item 105.1.1. Priority of Contract Documents** is revised as follows: Insert the words "addenda (last over first)" between "Proposal" and "Special Provision".

11. **Item 105.1.3. Contract Drawings and Specifications**: Obtaining copies of NCTCOG Public Works Construction Standards is the responsibility of the CONTRACTOR.

12. **Item 105.2.2. Special Warranty**: The first sentence of this paragraph is hereby deleted and replaced with:

    "If within two years after the final acceptance of the work by the OWNER, as evidenced by the final certificate of acceptance or within a longer or shorter period of time as may be prescribed by law or by the terms of any other special warranty on designated equipment, any of the work is found to be defective or not in accordance with the contract documents, the CONTRACTOR shall correct it promptly after receipt of a written notice from the OWNER to do so".

13. **Special Provision to Item 105.3. Shop Drawings, Product Data and Samples**; add the following:

"Review of Shop Drawings by the Engineer shall be for the sole purpose of determining the sufficiency of said drawings or schedules to result in finished improvements in conformance with the plans and specifications and shall not relieve the CONTRACTOR of his duty as an independent contractor. It being understood and agreed that the Engineer does not assume any duty to pass upon the propriety or adequacy of such drawings or schedules or any means or methods reflected thereby in relation to the safety of either person or property during the contractor's performance hereunder."

14. **Special Provision to Item 105.4. Construction Stakes**; add the following:

"The ENGINEER will furnish and set survey control staking for this project as follows:

a. Project Alignment Control

b. Benchmarks

The CONTRACTOR shall provide any additional stakes and other materials and incidentals necessary for the correct construction of all facilities at no additional charge. It is the CONTRACTOR'S sole responsibility to ensure the correctness of any additional stakes and that the work is constructed to the lines and grades shown on the plans."

15. **Item 105.6. Supervision by Contractor**: The CONTRACTOR shall designate a full-time superintendent who shall be on the job site at all times during construction including times when work is being performed by subcontractors. The OWNER'S Representative will communicate only with the superintendent. The

CONTRACTOR may replace the designated superintendent by written notification to the OWNER.

16. **Special Provision to Item 105.7.1. Authority of the Engineer**; add the following:

"The Engineer shall make periodic visits to the site to familiarize himself generally with the progress of the executed work and to determine if such work generally meets the essential performance and design features and the technical and functional engineering requirements of the Contract Documents; provided and except, however, that the Engineer shall not be responsible for making any detailed, exhaustive, comprehensive or continuous on-site inspection of the quality or quantity of the work or be in any way responsible, directly or indirectly, for the construction means, methods, techniques, sequences, quality, procedures, programs, safety precautions or lack of same incident thereto or in connection therewith. Notwithstanding any other provision of this agreement or any other Contract Document, the Engineer shall not be in any way responsible or liable for any acts, errors, omissions or negligence of the CONTRACTOR, any subcontractor or any of the CONTRACTOR'S or sub-contractor's agents, or employees or any other person, firm or corporation performing or attempting to perform any of the work."

17. **Item 106.1. Substitution of Material:** Delete the first sentence of the third paragraph and replace with the following:

"Where the term 'or equal' or 'or approved equal' is not used in the specifications no substitutions will be allowed."

18. **Item 106.5. Samples and Tests of Materials**: Delete the first and last paragraphs of Item 106.5. and replace with the following:

"The CONTRACTOR shall engage the services of an acceptable testing laboratory company to perform all required testing services. The CONTRACTOR (not the OWNER) shall pay all costs for these services, including any retesting after failure to pass tests. The CONTRACTOR shall obtain OWNER'S acceptance of the testing laboratory before having services performed.

Written reports of tests and engineering data furnished by CONTRACTOR for OWNER'S review shall be submitted as specified in Item 105.3. Shop Drawings, Product Data and Samples."

19. **Special Provisions to Item 107.2. Indemnification**; delete Item 107.2. in its entirety and substitute the following:

"The CONTRACTOR and his sureties shall indemnify, defend and save harmless the OWNER and all of their officers, agents and employees, Engineer and all of its officers and employees from all suits, actions or claims of any character, name and description brought for or on account of any injuries, including death or damages

received or sustained by any person, persons or property on account of the operations of the CONTRACTOR, his agents, employees or subcontractors; or on account of any negligent act or fault of the CONTRACTOR, his agents, employees or subcontractors in the execution of said contract; or on account of the failure of the CONTRACTOR to provide the necessary barricades, warning lights or signs; and shall be required to pay any judgment, with cost, which may be obtained against the OWNER or Engineer growing out of such injury, including death or damage."

20. **Item 107.11. Supervision and Construction Procedures**: The CONTRACTOR'S attention is drawn to paragraphs 1 and 4 of this item and paragraphs 1 and 3 of Item 105.6.

21. **Item 107.24. Project Clean-Up**: All objectionable surplus and waste material due to construction shall be removed from the site at the CONTRACTOR'S expense.

22. **Item 108.1. Progress Schedule**; add the following paragraph:

"The CONTRACTOR shall submit to the OWNER a construction schedule setting out items of construction, road closing, detours, utility interruptions, limits, times and actual dates. If the schedule is acceptable to the OWNER, the OWNER will approve it; if the schedule is unacceptable, it will be returned to the CONTRACTOR for revision and resubmittal. If the CONTRACTOR wants to deviate from the approved schedule, he must submit a revised schedule to the OWNER for consideration. The entire work shall be prosecuted in a continuous manner in accordance with the approved schedule. Proposed stockpile locations must be approved by the OWNER prior to depositing material. The CONTRACTOR shall update this schedule on a monthly basis."

23. **Item 108.5. Subcontracts**: add the following paragraph:

"The CONTRACTOR shall perform with his own organization and with the assistance of workmen under his immediate superintendence, work of a value not less than 50 percent of the value of all work embraced in the contract exclusive of items not commonly found in contract for similar work and exclusive of items that require highly specialized knowledge, craftsman and/or equipment not ordinarily available in the organization of CONTRACTORS performing work of the character embraced in the contract". For the purpose of evaluating the percentage of work performed by subcontractors, the cost of all equipment, supplies, and materials used or installed on the project by subcontractors shall be considered as part of the work of subcontractors. This will apply even if the contractor supplies and pays for some or all equipment, supplies, or materials used by subcontractors.

24. **Item 108.8. Delays; Extension of Time; Liquidated Damages**; Delete the first paragraph of Section 108.8. and replace with the following:

"The CONTRACTOR hereby agrees that no work will be performed on CITY holidays or on Sundays. In addition, he agrees that work will be performed between 7:00 a.m. and sunset on weekdays and between 9:00 a.m. and 6:00 p.m. on Saturdays. The only exception to the preceding will be the performance of work in response to emergency situations and/or when directed to work by the CITY. Also, the CONTRACTOR hereby concurs that the preceding has been taken into account in setting the contract time." The CONTRACTOR will be responsible for reimbursing the City of Lewisville for overtime charges for construction inspection services on Saturdays, Sundays and all City holidays. The overtime charges will be based on a rate of forty-five dollars ($45.00) per hour and a minimum of four (4) hours will be charged for each occurrence of such service. The overtime charges will be billed on a monthly basis. Failure to pay for these services will result in delaying the final acceptance and payment.

"The CONTRACTOR shall be entitled to an extension of working time under this contract only when claim for such extension is submitted to the OWNER in writing by the CONTRACTOR within seven days from and after the time when any alleged cause of delay shall occur; and then only when such time is approved by the OWNER. In adjusting the working time for the completion of the project, the OWNER will consider delays due to acts of God, or the public enemy, acts of the OWNER, fires, floods, epidemics and quarantine restrictions. The OWNER may, but is not obligated to, take into account any unforeseeable causes of delay which the OWNER considers beyond the control and without the fault or negligence of the CONTRACTOR. It is anticipated that during the course of the contract, inclement weather (rain or freezing temperatures) will hinder or prevent work. The contract time has been established assuming that up to 20% of the contract days will be inclement weather days, during which no work can be performed. No extension of time will be granted for such inclement weather days. The OWNER may grant an extension of time for inclement weather days beyond 20% of the contract time, but is under no obligation to do so."

25. **Item 109.3. Payment for Extra Work**; replace the first sentence of 109.3.1. General; with the following:

"No work shall be undertaken which requires extra payment without having executed a change order or field change approved by the CONTRACTOR and the OWNER, except when specifically ordered to do so in writing."

26. **Item 109.5. Monthly Estimate, Partial Payments, Retainage, Final Inspection, Acceptance and Final Payment**

Delete from the first paragraph of 109.5.1:

"The monthly estimate may include acceptable non-perishable materials delivered to the work; such payment shall be allowed on same percentage basis of the net invoice value as provided hereinafter."

Add in its place, the following:

The City will pay for materials on hand only under the following conditions:

a. The CONTRACTOR shall provide proof of payment for the materials.

b. The materials shall be secured in a manner acceptable to the City.

c. Payment will not be made for small items, and other items not easily measured.

d. No payment will be made for small quantities of material on hand (less than 0.5 percent of the contract amount).

e. No payment for materials on hand will be made for items such as paint, mastics, cement, and other similar materials.

27. Delays associated with delivery of materials or appurtenances by the manufacturers will not be considered for any extension of contract time. It shall be the sole responsibility of the CONTRACTOR to ensure that the materials are manufactured and delivered on time.

GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

The General Conditions for this project shall be those of the North Central Texas Council of Governments, Public Works Standard, and Latest Edition as amended and supplemented.

The City of Lewisville Texas has adopted the North Central Texas Council of Governments, Public Works Construction Standards as the Standard General Conditions for all City wide construction projects. By reference (copy not contained herein) the general conditions section(s) of the standard shall be the controlling conditions for this project and shall be a part in whole of this project requirements by reference.

The Contractor may obtain a copy of referenced standard and general conditions (at fee) at:
NCTCOG Regional Information Center
616 Six Flags Drive
P.O. Box 5888
Arlington, Texas 76005-
5888 Phone Number 817-
695-9140

The City of Lewisville has developed Special provisions to the North Central Texas Council of Governments Public Works Construction Standards which are presented herein as "Owners Special Provisions to the General Provisions of the Standard Specifications" These Owner Special Provisions shall amend, supplement and revise the referenced sections and provisions of the NCTCOG Public Works Construction Standards, latest Edition.

The Engineer has included Special Supplemental General Conditions, which are intended to support and reinforce the provisions of the Owners General Conditions.

Should there be a conflict between the NCTCOG, Owners Special Provisions to the General Provisions, or Engineers Special Supplemental General Conditions the following hierarchy shall govern;

1) Owners Special Provisions to the General Provisions of the NCTCOG Documents
2) North Central Texas Council of Governments Public Works, General Conditions
3) Engineers Special Supplemental General Conditions
4) Engineer's Technical Project Specifications

NCTCOG Technical Project Specifications.

BASIS OF BID EVALUATION AND AWARD

All bids will be evaluated on like item basis with consideration of qualifications of the Vendor to perform the Work. The City reserves the right to award this contract to the lowest responsive bidder based on the base bid only or any combination of the base bid and alternates that provide the best value to the Owner for this project. The Offerer/Contractor shall maintain their price bid for all alternate bid item(s) not originally awarded for a period of 120 days from the date of the Notice to Proceed. The undersigned bidder will execute the Contract Agreement within fifteen (15) calendar days after receiving a Notice of Award and will furnish approved bonds and insurance as required by the Contract Documents for the faithful performance of the Contract. The attached bid security in the amount of five (5) percent of the amount bid is to become the property of the Owner as liquidated damages for the delay and additional work caused by the failure of the bidder to enter into a contract in the event the Contract Agreement and bonds are not executed within fifteen (15) calendar days.

ALL BIDDERS ARE NOTIFIED THAT THE FOLLOWING QUALIFICATION STATEMENT MUST BE COMPLETED AND SUBMITTED WITH THE BID PROPOSAL.

Contractor's Qualifications

The contractor shall show that he has experience with similar projects that require working in confined areas in close proximity to many physical features (fences, utility poles, gas lines, gas lines and meters, sewer manholes and cleanouts, etc.) which requires the contractor to plan work efforts and equipment needs with these limitations in mind. The contractor shall submit a list of Public Works Projects successfully completed within the last three (3) years. This list shall include the names of supervisors and type of equipment used to perform this work.

BIDDER'S QUALIFICATION STATEMENT

Project:

Contractor:

Indicate One: ☐ Sole Proprietor ☐ Partnership ☐ Other
☐ Corporation ☐ Joint Venture

Name:

Title:

Address:

City:

State & Zip:

Phone:

State and Date of Incorporation, Partnership, Ownership, Etc.
Location of Principal Office:
Contact and Phone at Principal Office:
Liability Insurance Provided and Limits of Coverage:
Workers Compensation Insurance Provider:
Surety Bonding Company (Performance & Payment:
Insurance Agency Name:

Insurance Agency Address:

Contact Person:

Phone Number:

Total Number of Employees to be Associated with this Job:

Managerial	Administrative	Professional
Skilled	Semi-Skilled	Other

Percentage of Work to be Done by Bidder's Employees (Based on Dollars Bid):

Type(s) of Work to be Done by Bidder's Employees (Examples: Concrete Paving, Structural Concrete, Water Lines, Sanitary Sewer Lines, Storm Pipe, Storm Inlets, Excavation, Lime, Bridge Fencing, etc.)

Access to Tools and Equipment: Percent Owned Percent Rented

Number of Years in Business as a Contractor on Above Types of Work:

Type(s) of Work to be Done by Sub-Contractors:

Include Name, Address, and Phone Number of Sub-Contractor. (Use Additional Sheets, if needed.)

Type of Work	Sub-Contractor

List your most current completed projects, with information, similar to the type of work bid.
(Use Additional Sheets, if necessary.)

Project:

Project Description:

Owner/Agency:

Year Built: Contract Price:

Contact Person: Phone:

Project:

Project Description:

Owner/Agency:

Year Built: Contract Price:

Contact Person: Phone:

Project:

Project Description:

Owner/Agency:

Year Built: Contract Price:

Contact Person: Phone:

Project:

Project Description:

Owner/Agency:

Year Built: Contract Price:

Contact Person: Phone:

Project:

Project Description:

Owner/Agency:

Year Built: Contract Price:

Contact Person: Phone:

Project:

Project Description:

Owner/Agency:

Year Built: Contract Price:

Contact Person: Phone:

Trade References (List Company, Address, Contact Person, and Phone):

Bank References (List Institution, Address, Contact Person, and Phone):

Claims and Suits (If the answer to any of the questions is yes, please attach details):

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

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

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

Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract?

PROPOSED SUBCONTRACT BREAKDOWN

1. Subcontractor _____

   Address _____

   Phone # _____

   Description of Work _____

2. Subcontractor _____

   Address _____

   Phone # _____

   Description of Work _____

3. Subcontractor _____

   Address _____

   Phone # _____

   Description of Work _____

4. Subcontractor _____

   Address _____

   Phone # _____

   Description of Work _____

Reference is made to Item 21 on Page SS-11.

LIST OF SUPPLIERS

1. Item Supplied _____

   Supplier _____

   Address _____

   Phone # _____

2. Item Supplied _____

   Supplier _____

   Address _____

   Phone # _____

3. Item Supplied _____

   Supplier _____

   Address _____

   Phone # _____

4. Item Supplied _____

   Supplier _____

   Address _____

   Phone # _____

The undersigned Bidder agrees to execute the Agreement and furnish the required Performance Bond and Payment Bond within fifteen calendar days from the date of award of a contract by the City; and agrees that any delay in furnishing the signed Agreement and Bonds will result in liquidated damages being applied in accordance with Item 108.8.1. of the Standard Specifications.

The undersigned Bidder has attached and made a part of this Proposal a bid security in conformance with Item 102.5. of the Standard Specifications and in accordance with the Notice to Bidders.

Submitted:

_____
(Signature)

_____
(Name - Typed or Printed)

_____
(Title)

(Seal, if corporation)

_____
(Firm Name)

_____
(Address)

_____
(City/County/State/Zip Code)

_____
(Telephone Number/Include Area Code)

_____
(Date)

_____
(Attest)

STATE RECIPROCAL REQUIREMENT

The City of Lewisville, as a governmental agency of the State of Texas, may not award a contract for general construction, improvements, services or public works projects or purchases of supplies, materials, or equipment to a non-resident bidder unless the non-resident's bid is lower than the lowest bid submitted by a responsible Texas resident bidder by the same amount that a Texas resident bidder would be required to underbid a non-resident bidder to obtain a comparable contract in the state in which the non-resident's principal place of business is located (Section 2252.002 of the Government Code). Bidder shall answer all the following questions by encircling the appropriate response or completing the blank provided.

1. Where is your principal place of business? _____

2. Only if your principal place of business is not in the state of Texas, please indicate:

   A. In which state is your principal place of business located? _____

   B. Does that state favor resident bidders (bidders in your state) by some dollar increment or percentage? ☐ YES ☐ NO

   C. If "YES", what is that dollar increment or percentage? _____

NON-COLLUSION STATEMENT

The undersigned affirms that they are duly authorized to execute this contract, that this company, corporation, firms, partnership or individual has not prepared this bid in collusion with any other Bidder, and that the contents of this bid as to prices, terms or conditions of said bid have not been communicated by the undersigned nor by any employer or agent to any other person engaged in this type of business prior to the official opening of this bid.

Vendor:	
Address:	
City, State, Zip:	
Phone	
Email Address:	
Bidder (Print name)	
Bidder Signature	
Position with Company	
Signature of company official authorizing this bid:	
Company Official (Print name):	
Position with company:	

CITY OF LEWISVILLE PURCHASING DIVISION
ADDITIONAL TERMS

ANTI-LOBBYING PROVISION

During the period between proposal / sealed bid submission date and the contract award, proposers, including their agents and representatives, shall not directly discuss or promote their proposal with any member of the City of Lewisville City Council or City staff except in the course of City-Sponsored inquiries, briefings, interviews, or presentations, unless requested by the City.

This provision is not meant to preclude offerors from discussing other matters with City Council members or City staff. This policy is intended to create a level playing field for all potential offerors, assure that contract decisions are made in public, and to protect the integrity of the RFP / Bid Evaluation process. Violation of this provision may result in rejection of the offeror's proposal.

LAWS AND ORDINANCES

Laws and Ordinances: The Contractor shall at all times observe and comply with all Federal, State and local laws, ordinances and regulations which in any manner affect the Contract or the work, and shall indemnify and save harmless the City against any claim arising from the violation of any such laws, ordinances and regulations whether by the Contractor or his employees.

PROTECTION OF RESIDENT WORKERS

Protection of Resident Workers: The City of Lewisville actively supports the Immigration and Nationality Act (INA) which includes provisions addressing employment eligibility, employment verification, and nondiscrimination. Under the INA, employers may hire only persons who may legally work in the United States (i.e., citizens and nationals of the U.S.) and aliens authorized to work in the U.S. The employer must verify the identity and employment eligibility of anyone to be hired, which includes completing the Employment Eligibility Verification Form (I-9). The Contractor and its Subcontractors shall establish appropriate procedures and controls so no services or products under the Contract Documents will be performed or manufactured by any worker who is not legally eligible to perform such services or employment. The City reserves the right to audit Contractor's or Subcontractor's employment records to verify the existence of a completed Employment Eligibility Verification Form (I-9) for every worker performing services or manufacturing products under the Contract Documents. The audit will be at the City's expense.

IMMIGRATION REFORM AND CONTROL ACT

Immigration Reform and Control Act (8 U.S.C. §1324a): The City of Lewisville supports the Immigration Reform and Control Act (IRCA) which is a comprehensive scheme prohibiting the employment of unauthorized aliens in the United States. The Contractor shall submit a declaration signed under penalty of perjury of the laws of the State of Texas stating that it has not been found in violation of IRCA by the United States Attorney General or Secretary of Homeland Security in the preceding five (5) years. The Contractor shall ensure that its Subcontractors submit a declaration signed under penalty of perjury of the

laws of the State of Texas stating that they have not been found in violation of IRCA by the United States Attorney General or Secretary of Homeland Security in the preceding five (5) years. The Contractor and its Subcontractors shall at all times during the term of the contract with the City comply with the requirements of IRCA and shall notify the City within fifteen (15) working days of receiving notice of a violation of IRCA. The City may terminate a contract with the Contractor if the City determines that (a) the Contractor or its Subcontractors have been untruthful regarding IRCA violations in the preceding five (5) years; (b) if the Contractor fails to ensure that its Subcontractors submit the aforementioned declaration; or (c) the Contractor or its Subcontractors fail to timely notify the City of an IRCA violation.

Contractor Name

Authorized Signature

Date

3 4

CITY OF LEWISVILLE, TEXAS

CONSTRUCTION AGREEMENT

Project: Wastewater Treatment Plant Emergency Generator, Project No. U1501 (the "Project").

This Construction Agreement (the "Agreement") is made on this date, [MONTH] _____, 2018_, between the **City of Lewisville** (the "City") and _____ (the "Contractor").

1. Services. The Contractor shall commence and complete the construction of Main Street, Mill Street and Charles Street Paving, Drainage, Landscape, and Signalization Improvements (the "Services"), and all extra work in connection with the Services, under the terms as stated in the Specifications and Contract Documents for the Construction of Main Street, Mill Street and Charles Street Paving, Drainage, Landscape, and Signalization Improvements (the "Specifications"), attached hereto as **Exhibit A**, the Main Street, Mill Street and Charles Street Paving, Drainage, Landscape, and Signalization Improvements Final Plans (the "Plans"), attached hereto as **Exhibit B**, and this Agreement, and at the Contractor's own proper cost and expense to furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories and services necessary to complete the Services, in accordance with the conditions and prices stated in the Contractor's Proposal (the "Proposal") attached hereto as **Exhibit C**, and in accordance with the Specifications (**Exhibit A**) and Plans (**Exhibit B**), as prepared by the City and attached hereto. The Contractor will perform all Services in a good and professional manner and in accordance with industry standards. The Contractor is responsible for constructing a final product that is fully functional and fit for its intended purposes, and meets all requirements set forth in the Agreement, the Specifications (**Exhibit A**), and the Plans (**Exhibit B**). The City will be the sole judge of the acceptability of all work and Services performed under this Agreement.

   The City shall perform such services as outlined in the Specifications (**Exhibit A**), if any.

2. Completion of Services. The Contractor hereby agrees to commence work within ten (10) calendar days after the date of the written notice to commence work and to fully complete the same within __540_____ consecutive calendar days after the date of the written notice to commence work, subject to such extensions of time as are provided by the Specifications (**Exhibit A**).

3. Agreement Documents. The Agreement shall include the following documents, and this Agreement does hereby expressly incorporate same herein as if set forth verbatim in this Agreement:
   A. This Agreement
   B. The Specifications (**Exhibit A**) and the Plans (**Exhibit B)**
   C. The Proposal (**Exhibit C**)

To the extent that any exhibit is in conflict with provisions of this Agreement or each other, the provisions of this Agreement, then the provisions of **Exhibit A** and **Exhibit B** jointly, then **Exhibit C** shall prevail in the order.

4. Confidential Information. To the extent allowed by law, the City will safeguard and keep from release any documents marked "proprietary" or information not generally available to the public. However, the City will, if required, comply with all requirements of the Texas Public Information Act with regard to any documents in its possession at the time of a request made under that Act.

5. Pricing. The City agrees to pay the Contractor in current funds the price or prices shown in the Proposal (**Exhibit C**).

6. Payment. Payments will be subject to the terms outlined in the Specifications (**Exhibit A**). The City shall remit payment within thirty (30) days after receipt of an invoice, in accordance with the Texas Prompt Payment Act (Tex. Gov't Code Ch. 2251). All original invoices are to be sent to the City of Lewisville, Attention: AP Division, 151 West Church Street, Lewisville, Texas 75057 or P.O. Box 299002, 75029-9002.

7. Change Orders. Any changes to the Services that change the Agreement price or the Agreement time, as specified herein, must be authorized by the City in writing PRIOR to commencement of said work. Any work performed without the City's prior written consent will be at the sole expense of the Contractor.

8. Subcontractors. If subcontractors are used, the subcontractor will be directed and supervised solely by the Contractor. The Contractor shall require the subcontractor to hold the same insurance as required of the Contractor under this Agreement.

9. Right of Inspection and Required Repairs. The City shall have the right to observe and check all ongoing work in sufficient detail to determine if the Services are proceeding satisfactorily. The City shall have the right to inspect all Services completed before accepting them and making payments in accordance with this Agreement. Should any portion of the completed Services fail to meet the requirements of the City, the Contractor shall repair or replace items failing to meet requirement until items can be demonstrated to comply.

10. Termination. This Agreement may be terminated by the City under the terms outlined in the Specifications (**Exhibit A**).

11. Insurance. During the period of this Agreement, the Contractor will maintain, at its expense, insurance with limits not less than those prescribed in the Specifications (**Exhibit A**). All insurance must be reviewed and approved by the City **prior to commencement of work.**

12. Bonds. The Contractor shall provide bonds as required by the Specifications (**Exhibit A**) **prior to commencement of work**.

13. Worker's Compensation. The Contractor shall abide by the workers compensation requirements outlined in the Specifications (**Exhibit A**).

14. Independent Contractor. Contractor shall be considered an independent contractor and not an agent, servant, employee, or representative of the City in the performance of the work and Services. No term or provision herein or act of the City shall be construed as changing that status.

15. Compliance with Laws. The Contractor shall comply with all applicable federal, state, and local statutes, regulations, ordinances, and other laws, including, but not limited to the Immigration Reform and Control Act (IRCA).

16. Governing Law and Venue. This Agreement is governed by the laws of the State of Texas. Exclusive venue for any dispute arising out of this Agreement is in Denton County, Texas.

17. Arbitration. In the event of a dispute which may arise under this Agreement, the City does not agree to arbitration.

18. Tax Exempt Status. The City is exempt from and shall not pay state and local sales and use taxes on labor and materials incorporated into the Project. If necessary, it is the responsibility of the Contractor to obtain from the State Comptroller's Office a sales tax permit, resale certificate, and exemption certificate that will enable the Contractor to buy any materials for the Services and then resell the aforementioned materials to the City without paying the tax on the materials at the time of purchase.

19. Entire Agreement. This Agreement and its exhibits contain the entire agreement of the parties with respect to the matter contained herein. All provisions of this Agreement shall be strictly complied with and conformed to by the Contractor, and no amendment to the Agreement shall be made except upon the written agreement of the parties, which shall not be construed to release either party from any obligation of the Agreement except as specifically provided for in such amendment.

20. Assignment. This Agreement may not be assigned except as provided for in the Specifications (**Exhibit A**).

21. Governmental Immunity. Unless otherwise required under the law, the Parties agree that the City has not waived its governmental immunity by entering into and performing their obligations under this Agreement.

22. Notice. Any notice provided or permitted to be given under this Agreement must be in writing and may be served by depositing same in the United States mail, addressed to the party to be notified, postage pre-paid and registered or certified with return receipt requested, or by delivering the same in person to such party via a hand-delivery service, Federal Express or any courier service that provides a return receipt showing the date of actual delivery of same, to the address thereof. Notice given in accordance herewith shall be effective upon receipt at the address of the addressee. For purposes of notification, the addresses of the parties shall be as follows:

    If to Contractor, to: _____
    _____
    _____
    _____

    If to City, to: City of Lewisville
    Attn: Todd White, C.P.M.
    151 W. Church Street
    Lewisville, Texas 75057

23. Severability. In case any one or more of the provisions contained in this Agreement shall for any reason be held to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality, or unenforceability shall not affect any other provision thereof, and this Agreement shall be construed as if such invalid, illegal, or unenforceable provision had never been contained herein.

24. Representations. Each signatory represents this Agreement has been read by the party for which this Agreement is executed and that such party has had an opportunity to confer with its counsel.

25. Miscellaneous Drafting Provisions. This Agreement shall be deemed drafted equally by all parties hereto. The language of all parts of this Agreement shall be construed as a whole according to its fair meaning, and any presumption or principle that the language herein is to be construed against any party shall not apply. Headings in this Agreement are for the convenience of the parties and are not intended to be used in construing this document.

26. Force Majeure. If by reason of Force Majeure, either party hereto shall be rendered unable wholly or in part to carry out its obligations under this Agreement then such party shall give notice and full particulars of Force Majeure in writing to the other party within a reasonable time after occurrence of the event or cause relied upon, and the obligation of the party giving such notice, so far as it is affected by such Force Majeure, shall be suspended during the continuance of the inability then claimed, except as hereinafter provided, but for no longer period, and such party shall endeavor to remove or overcome such inability with all reasonable dispatch. The term Force Majeure as employed herein, shall mean acts of God, strikes, lockouts, or other industrial disturbances, act of public enemy, order of any kind of government of the United States or the

State of Texas or any civil military authority, insurrections, riots, epidemics, landslides, lightning, earthquakes, fires, hurricanes, storms, floods, washouts, droughts, arrests, restraint of government and people, civil disturbances, explosions, breakage or accidents to machinery, pipelines or canals, or other causes not reasonably within the control of the party claiming such inability.

27. Waiver. No claim or right arising out of a breach of this Agreement can be discharged in whole or in part by a waiver or renunciation of the claim or right unless the waiver or renunciation is supported by consideration and is in writing signed by the aggrieved.

28. **INDEMNIFICATION. CONTRACTOR AGREES TO DEFEND, INDEMNIFY AND HOLD THE CITY, ITS OFFICERS, AGENTS AND EMPLOYEES, HARMLESS AGAINST ANY AND ALL CLAIMS, LAWSUITS, JUDGMENTS, COSTS AND EXPENSES FOR PERSONAL INJURY (INCLUDING DEATH), PROPERTY DAMAGE OR OTHER HARM FOR WHICH RECOVERY OF DAMAGES IS SOUGHT, SUFFERED BY ANY PERSON OR PERSONS, THAT MAY ARISE OUT OF OR BE OCCASIONED BY CONTRACTOR'S BREACH OF ANY OF THESE TERMS AND CONDITIONS OR BY ANY NEGLIGENT OR STRICTLY LIABLE ACT OR OMISSION, INTENTIONAL TORT, INTELLECTUAL PROPERTY INFRINGEMENT, OR FAILURE TO PAY A SUBCONTRACTOR OR SUPPLIER COMMITTED BY OF CONTRACTOR, ITS OFFICERS, AGENTS, EMPLOYEES OR SUBCONTRACTORS, IN THE PERFORMANCE OF THIS AGREEMENT; EXCEPT THAT THE INDEMNITY PROVIDED FOR IN THIS PARAGRAPH SHALL NOT APPLY TO ANY LIABILITY RESULTING FROM THE SOLE NEGLIGENCE OR FAULT OF THE CITY, ITS OFFICERS, AGENTS, EMPLOYEES OR SEPARATE CONTRACTORS, AND IN THE EVENT OF JOINT AND CONCURRING NEGLIGENCE OR FAULT OF THE CONTRACTOR AND THE CITY, RESPONSIBILITY AND INDEMNITY, IF ANY, SHALL BE APPORTIONED IN ACCORDANCE WITH THE LAW OF THE STATE OF TEXAS, WITHOUT WAIVING ANY GOVERNMENTAL IMMUNITY AVAILABLE TO THE CITY UNDER TEXAS LAW AND WITHOUT WAIVING ANY DEFENSES OF THE PARTIES UNDER TEXAS LAW AND THE CITY'S REASONABLE ATTORNEY'S FEES SHALL BE REIMBURSED IN PROPORTION TO THE CONTRACTOR'S LIABILITY. THE PROVISIONS OF THIS PARAGRAPH ARE SOLELY FOR THE BENEFIT OF THE PARTIES HERETO AND NOT INTENDED TO CREATE OR GRANT ANY RIGHTS, CONTRACTUAL OR OTHERWISE, TO ANY PERSON OR ENTITY. ANY INDEMNIFICATION AGREED TO BY THE CITY IS ONLY TO THE EXTENT ALLOWED BY LAW.**

29. Immigration Reform and Control Act (8 U.S.C. 1324a). The City of Lewisville supports the Immigration Reform and Control Act (IRCA) which is a comprehensive scheme prohibiting the employment of unauthorized aliens in the United States. The Contractor shall submit a declaration signed under penalty of perjury of the laws of the State of Texas stating that it has

not been found in violation of IRCA by the United States Attorney General or Secretary of Homeland Security in the preceding five (5) years. The Contractor shall ensure that its Subcontractors submit a declaration signed under penalty of perjury of the laws of the State of Texas stating that they have not been found in violation of IRCA by the United States Attorney General or Secretary of Homeland Security in the preceding five (5) years. The Contractor and its Subcontractors shall at all times during the term of the contract with the City comply with the requirements of IRCA and shall notify the City within fifteen (15) working days of receiving notice of a violation of IRCA. The City may terminate a contract with the Contractor if the City determines that (a) the Contractor or its Subcontractors have been untruthful regarding IRCA violations in the preceding five (5) years; (b) if the Contractor fails to ensure that its Subcontractors submit the aforementioned declaration; or (c) the Contractor or its Subcontractors fail to timely notify the City of an IRCA violation.

30. ADA Compliance. All goods and services provided to the City must be compliant with the Americans with Disabilities Act and any amendments thereto (the "ADA') and all regulations promulgated pursuant to the ADA. Contractor will be required to certify compliance, if required under the law or otherwise required by the City.

31. Protection of Resident Workers. The City actively supports the Immigration and Nationality Act (INA), which includes provisions addressing employment eligibility, employment verification, and nondiscrimination. Under the INA, employers may hire only persons who may legally work in the United States (i.e., citizens and nationals of the U.S.) and aliens authorized to work in the U.S. The employer must verify the identity and employment eligibility of anyone to be hired, which includes completing the Employment Eligibility Verification Form (I-9) for every worker performing services under the Agreement. be hired, which includes completing the Employment Eligibility Verification Form (I-9). The Contractor and its Subcontractors shall establish appropriate procedures and controls so no services or products under the Contract Documents will be performed or manufactured by any worker who is not legally eligible to perform such services or employment. The City reserves the right to audit Contractor's or Subcontractor's employment records to verify the existence of a completed Employment Eligibility Verification Form (I-9) for every worker performing services or manufacturing products under the Contract Documents. The audit will be at the City's expense.

32. Advertising. Contractor shall not advertise or publish, without the City's prior consent, the fact that the Contractor has entered into this Agreement, except to the extent necessary to comply with proper requests for information from an authorized representative of the federal, state or local government.

33. Disclosure. Pursuant to Chapter 176 of the Texas Local Government Code, a person or agent of a person who contracts or seeks to contract with the City of Lewisville must complete a conflict of interest questionnaire if the person or agent has an affiliation or business relationship that might cause a conflict of interest with the City. The conflict of interest questionnaire, which is

available online at ethics.state.tx.us, must be filed with the City Secretary of the City of Lewisville no later than the seventh business day after the person or agent begins contract discussions or negotiations with the City of Lewisville or submits to the City of Lewisville an application, response to a request for proposal or bid, correspondence, or another writing related to a potential agreement with the City of Lewisville. An updated conflict of interest questionnaire must be filed in accordance with Chapter 176 of the Local Government Code. An offense under Chapter 176 is a Class C misdemeanor.

Contractor should consult with legal counsel if you have questions regarding its compliance with the requirements of Chapter 176. It is the responsibility of each person or agent who is contracting or seeking to contract with the City of Lewisville to comply with the filing requirement of Chapter 176.

34. Texas Government Code Chapter 2270. Pursuant to Texas Government Code Chapter 2270, Contractor affirms that execution of this Agreement serves as written verification that Contractor: (1) does not boycott Israel, as defined by Texas Government Code Section 808.001; and (2) will not boycott Israel during the term of the Agreement.

35. Texas Government Code Chapter 2252. Pursuant to Texas Government Code Chapter 2252, Subchapter F, Contractor affirms, by entering into this Agreement, that is it not identified on a list created by the Texas Comptroller of Public Accounts as a company known to have contracts with or provide supplies or services to Iran, Sudan, or a foreign terrorist organization.

(SIGNATURES ON FOLLOWING PAGE)

IN WITNESS, WHEREOF, we, the contracting parties, by our duly authorized agents, hereto affix our signatures as of the date listed above.

CITY OF LEWISVILLE, TEXAS
Approved by the Lewisville City Council _____

By: _____
Donna Barron, City Manager

Date: _____

CONTRACTOR:
[CONTRACTOR NAME]

By: _____

Date: _____

[ADDRESS]

_____
Telephone Number

_____
E-mail Address

_____
Federal Tax ID Number

Attest: _____
Julie Worster

Attest: _____

CITY OF LEWISVILLE
151West Church Street
Lewisville, Texas 75057

APPROVED AS TO FORM:

_____
Lizbeth Plaster, City Attorney

BOND REQUIREMENTS and RETAINAGE

BONDS

The successful bidder will be required to furnish the following bonds from a surety licensed to do business in the State of Texas. These bonds, along with proper insurance papers, will be incorporated as part of the final contract documents and will remain in effect until the completion and acceptance of the project. Maintenance bonds shall be in effect based on their stated term after final acceptance of the project:

Project amount $10,001 to $24,999 – a payment bond at the project amount and a maintenance bond for one year from the date of final payment.

Project amount $25,000 to $99,999 – a payment bond at the project amount and a maintenance bond for two years from the date of the final payment.

Project amount $100,000 and grater – **a bid bond equal to 5% of the project amount is to be included with the sealed bid;** a payment bond and performance bond at the project amount and a maintenance bond for two years from the date of the final payment.

RETAINAGE

Retainage will be based on the following: 15 percent retainage for contracts up to $25,000; 10 percent retainage for contracts in excess of $25,000 and less than $400,000; 5 percent retainage for contracts in excess of $400,000.

PERFORMANCE BOND

STATE OF TEXAS
COUNTY OF DENTON

KNOW ALL MEN BY THESE PRESENTS: That _____ of the City of _____, County of _____, and State of _____, as Principal, and _____ authorized under the laws of the State of Texas to act as Surety on bonds for Principal, are held and firmly bound unto the City of Lewisville (Owner), in the penal sum of _____ Dollars ($_____) for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns, jointly and severally, by these presents:

WHEREAS, the Principal has entered into a certain written contract (Contract) with the Owner, dated the ____ day of _____, 20____ to construct:

Midway Road Rehabilitation (Paving and Drainage)
PROJECT NO. G1108

which Contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall faithfully perform said Contract and shall in all respects duly and faithfully observe and perform all and singular the covenants, conditions and agreements in and by said Contract agreed and covenanted by the Principal to be observed and performed, and according to the true intent and meaning of said Contract and the Plans and Specifications hereto annexed, then this obligation shall be void; otherwise to remain in full force and effect;

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

Surety, for value received, stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract, or to the work performed thereunder, or the plans, specifications, or drawings accompanying the same, shall in anyway affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract, or to the work to be performed thereunder.

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

Principal	Surety
By:	By
Title:	Title
Address:	Address:

The name and address of the Resident Agent of Surety is:

Bond Number_____

PAYMENT BOND

STATE OF TEXAS
COUNTY OF DENTON

KNOW ALL MEN BY THESE PRESENTS: That _____ of the City of _____, County of _____, and State of _____, as Principal, and _____ authorized under the laws of the State of Texas to act as Surety on bonds for Principal, are held and firmly bound unto the City of Lewisville (Owner), in the penal sum of _____ Dollars ($_____) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, by these presents:

WHEREAS, the Principal has entered into a certain written contract (Contract) with the Owner, dated the _____ day of _____, 20___ to construct:

Midway Road Rehabilitation (Paving and Drainage)
PROJECT NO. G1108

which Contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall pay all claimants supplying labor and material to him or a subcontractor in the prosecution of the work provided for in said Contract, then, this obligation shall be void; otherwise to remain in full force and effect;

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

Surety, for value received, stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract, or to the work performed thereunder, or the plans, specifications or drawings accompanying the same, shall in anyway affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract, or to the work to be performed thereunder.

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

Principal	Surety
By:	By
Title:	Title
Address:	Address:

The name and address of the Resident Agent of Surety is:

_____
_____
_____

MAINTENANCE BOND

Bond No. _____

KNOW ALL MEN BY THESE PRESENTS:

That we, _____ (hereinafter called **Principal**), and _____, a corporation organized under the laws of the State of _____ and authorized to do a surety business in the State of Texas, (hereinafter called **Surety**), are held and firmly bound unto the City of Lewisville, Texas (hereinafter called the **City**) in the full and just sum of _____, lawful money of the United States of America, for the payment of which sum, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, said **Principal** has performed _____ **improvements**, which have been or are about to be completed and accepted by the **City** for the project known as:

Midway Road Rehabilitation (Paving and Drainage)
PROJECT NO. G1108

AND WHEREAS, it is required that the **Principal** should guarantee the project from defects caused by faulty or defective materials, workmanship, or design for a period of two years from and after the date of acceptance of the completed project by the **City**.

NOW, THEREFORE, if the **Principal** shall for a period of two years from and after the date of acceptance of the completed project by the **City** replace any and all defects arising in said work whether resulting from faulty or defective materials, workmanship, or design, then the above obligation shall be null and void; otherwise the obligation shall remain in full force and effect for two years from the date of acceptance of the completed project by the **City**.

The **City** shall notify the **Principal** in writing of any defects for which the **Principal** is responsible and shall specify in said notice a reasonable time within which the **Principal** shall have to correct said defects. If the **Principal** fails to correct said defects within the time specified in said notice,

the **City**, in its discretion, may permit the **Surety** to correct said defects. If the **City** allows the **Surety** to correct said defects, the **Surety** shall have sixty (60) days thereafter within which to take such action as it deems necessary to insure performance of the **Principal's** obligation.

If such defects are not corrected after the time period specified in the notice or after the expiration of the sixty (60) day time period, whichever is applicable, the **City** shall have the right to correct the defects, and the **Principal** and **Surety**, jointly and severally, shall pay all costs and expenses incurred by the **City** in correcting the defects, including, but not limited to, the engineer, legal and other costs, together with any damages either direct or consequential, which the **City** sustains, or may sustain, on account of the **Principal's** failure to correct the defects. In addition, the **City** shall have the right to contract for the correction of said defects and, upon acceptance of a bid in accordance with the **City's** normal bidding process, the **Principal** and **Surety** shall become immediately liable for the amount of the bid. In the event that the **City** commences legal proceedings for the collection thereof, interest shall accrue on said amount at the rate of six (6) percent per annum, beginning at the commencement of said legal proceedings.

If the City commences suit for collection of any sums due hereunder, the **Principal** and **Surety**, jointly and severally, agree to pay all costs and expenses incurred by the **City**, including, but not limited to, attorney's fees.

IN WITNESS WHEREOF, the parties have caused this instrument to be signed and sealed by their respective authorized officers this _____ day of _____ 20___.

Principal:_____	***Surety:***_____
By:_____	***By:***_____
	_____***, Attorney-in-Fact***
Address:_____	***Address:***_____
_____	_____

Witness as to Principal

_____

CITY OF LEWISVILLE
PURCHASING DIVISION

INSTRUCTIONS TO BIDDERS

INSTRUCTIONS: These instructions apply to all bids and become a part of the terms and conditions of any bid submitted.

BIDS must not be faxed but are to be submitted to the City in **one** of the following manners:

A. **Electronic Receipt:** Bidders are encouraged to submit bids to the City through Bidsync.com. The City is a member of this internet service and the submittal of bids to the City is at no cost to the bidder. The internet site is www.bidsync.com.

or

B. **Paper Bid Receipt:** Paper bids may be submitted to the City. Bidders are to submit the original and one copy of their bid in a sealed envelope to the Purchasing Division prior to response due date/time. The sealed envelope is to be marked on the outside with the Bidder's name, address, the bid invitation number and closing date recorded on the bottom left corner of the envelope.

Address to:

City of Lewisville
Purchasing Division
P.O. Box 299002
Lewisville, Texas 75029-9002

Sealed bids may be delivered in person or by courier to the Purchasing Division on the First Floor of City Hall, 151 Church Street, Lewisville, Texas 75057.

Sealed bids must be returned in sufficient time as to be received and time stamped at the above location on or before the published bid date and time shown on the bid invitation. Bids received after submission deadline shall be returned unopened and will be considered void and unacceptable. The City of Lewisville is not responsible for lateness of mail carrier, etc.

BID: The bidder should quote its lowest and best price, F.O.B. destination on each item bid. If delivery and shipping quantities affect unit bid price, multiple bids may be made so as to indicate "price break" quantities in order for the City to determine maximum economic benefits. Pricing for paper bids shall be entered on the Bid Sheet in ink or typewritten. Totals shall be entered in the "Total Price" column of the Bid Sheet. In all cases of discrepancy between unit price and extended price, the unit price will be presumed to be correct.

MAKE-MODEL Items must be the best and latest model available of the type specified. If the bid invitation indicates a specific brand of product, the brand listed is deemed to be descriptive and not restrictive, and is used to indicate the type and quality level desired for comparison purposes. Bidders may offer an approved equal to the brand listed, unless otherwise noted. The City shall make the final determination as to the brand offered being an approved equal to the brand listed. A Complete catalog or brochure showing in detail the item offered must accompany the bid.

SPLIT-AWARD: Bidders may furnish pricing for all or any portion of the bid invitation. Unless the bidder specifies otherwise in his bid, the City may award the contract for any item or group of items shown on the bid invitation.

BID FORMS: Bids submitted on other than City forms, whether electronic or paper, or with different terms or provisions may not be considered as responsive bids.

Bids must be held firm for ninety (90) days to allow for evaluation unless otherwise noted in the bid document.

F.O.B./DAMAGE: Quotations shall be bid F.O.B. Inside Delivery, Municipal Facility, Lewisville, Texas, and shall include all delivery and packaging costs. The City of Lewisville assumes no liability for goods delivered in damaged or unacceptable condition. The successful bidder shall handle all claims with carriers, and in case of damaged goods, shall ship replacement goods immediately upon notification by the City of damage.

INVOICES: Invoices must be submitted by the successful bidder in duplicate to the City of Lewisville Accounts Payable, P O Box 299002, Lewisville, TX 75029-9002.

TAXES: The City of Lewisville is exempt from Federal Manufacturer's Excise, and State Sales taxes. TAX MUST NOT BE INCLUDED IN BID. Tax exemption certificates will be executed by the City and furnished upon request.

PRICING: Bids should be firm. If the bidder, however, believes it necessary to base its price on price adjustment, such a bid may be considered, but only as an alternate bid.

PAYMENT TERMS: Payment terms are net 30 days after the goods are provided or services are completed, as required, or a correct invoice is received, whichever is later.

DELIVERY PROMISE - PENALTIES: Bids MUST show the number of calendar days required to place the materials in the possession of the City. DO NOT quote shipping dates. Consistent failure of a bidder to meet his delivery promises without valid reason may be cause for removal from the Bidder's List. When Delivery delays can be foreseen, the bidder shall give prior notice to the Purchasing Division which shall have the right to extend the delivery due date if reasons for delay appear acceptable. Default in promised delivery, without acceptable reasons, or failure to meet specifications, authorizes the Purchasing Division to purchase the goods elsewhere, and charge any increase in cost and handling to the defaulting bidder.

PACKAGING: Unless otherwise indicated, items will be new, unused, and in first class condition in containers suitable for damage-free delivery and storage.

CORRESPONDENCE: The bid number must appear on ALL correspondence, inquiries, etc. pertaining to the bid.

DELIVERY TIMES: Deliveries will be acceptable only during normal working hours at the designated City Municipal Facility.

PATENT RIGHTS: The Vendor agrees to indemnify and hold the City harmless from any and all claims involving patent right infringement or copyrights on goods supplied.

EVALUATION: Response to the specification in this bid is of primary importance in determining the lowest responsible bid.

BID AWARD: Bids will be awarded either on Lowest Responsible Bid or Best Value. The Criteria used to determine Best Value is as follows:

Purchase Price
The reputation of the bidder and of the bidder's goods and service
The quality of the bidder's goods or services
The extent to which the goods or services meet the municipality's needs.
The bidder's past relationship with the municipality.
The impact on the ability of the city to comply with laws and rules relating to contracting with historically underutilized businesses and non-profit organizations employing persons with disabilities.

The total long-term cost to the city to acquire the bidders good or services (Life Cycle Costing).

Any other relevant factors that a private business would consider in selecting a bidder.

FUNDING: The City of Lewisville is a home-rule municipal government operated and funded on an October 1 to September 30 Fiscal Year; accordingly, the City reserves the right to terminate, without liability to the City any contract for which funding is not available.

RESERVATIONS: The City expressly reserves the right to:

A. Waive as an informality, minor deviations from specifications.
B. Waive any defect, irregularity or informality in any bid or bidding procedure.
C. Reject or cancel any or all bids.
D. Reissue a bid invitation.
E. Extend the bid opening time and date.
F. Procure any item by other means.
G. Increase or decrease the quantity specified in the bid invitation, unless the Bidder specifies otherwise.
H. Consider and accept an alternate bid as provided herein when most advantageous to the City.

ASSIGNMENT: The successful bidder shall not sell, assign, transfer or convey this contract in whole or in part, without the prior written consent of the City.

AUDIT: The City of Lewisville reserves the right to audit the records and performance of the successful bidder during the term of the contract and for three years after the contract is completed.

PROTESTS: All protests regarding the bid solicitation process must be submitted in writing to the City Purchasing Manager within five (5) working days following the opening of bids. This includes all protests relating to advertising of bid notices, deadlines, bid opening, and all other related procedures under the Local Government Code, as well as any protests relating to alleged improprieties with the bidding process.
This limitation does not include protests relating to staff recommendations as to award of this bid. Protests relating to staff recommendations may be directed to the City Council by contacting the City Secretary.
Failure to Protest within the time allotted shall constitute a waiver of any protest.

ALTERING BIDS: Bid cannot be altered or amended after submission deadline. Any interlineation, or alteration made before opening time for sealed bids must be initialed by the signer of the bid, guaranteeing authenticity.

CHANGE ORDERS: No oral statement of any person shall modify or otherwise change, or affect the terms, conditions or specifications stated in the resulting contract. All change orders to the contract will be made in writing by the City of Lewisville.

ADDENDA: Any interpretations, corrections or changes to this Invitation for Bid and Specifications will be made by ADDENDA. Sole authority to issue addenda shall be vested in the City of Lewisville. Bidders shall acknowledge receipt of all addenda on bid form.

MINIMUM STANDARDS FOR RESPONSIBLE PROSPECTIVE BIDDERS: A prospective bidder must affirmatively demonstrate bidder's responsibility. A prospective bidder must meet the following requirements:
Have adequate financial resources, or the ability to obtain such resources as required;
Be able to comply with the required or proposed delivery schedule;
Have a satisfactory record of performance;
Have a satisfactory record of integrity and ethics;
Be otherwise qualified and eligible to receive an award; and
The City of Lewisville may request representation and other information sufficient to determine bidder's ability to meet these minimum standards listed above.

BIDDER SHALL PROVIDE with this bid response, all documentation required. Failure to provide this information may result in rejection of bid.

SUCCESSFUL BIDDER SHALL defend, indemnify and save harmless the City of Lewisville and all its officers, agents and employees and all entities, their officers, agents and employees who are participating in this contract from all suits, actions, or other claims of any character, name and description brought for or on account of any injuries or damages received or sustained by any person, persons, or property on account of any negligent act or fault of the successful bidder, or of any agent, employee, subcontractor or supplier in the execution of, or performance under, any contract which may result from bid award. Successful bidder shall pay any judgment with cost which may be obtained against the City of Lewisville and participating entities growing out of such injury or damages.

TERMINATION FOR DEFAULT: The City of Lewisville reserves the right to enforce the performance of this contract in any manner prescribed by law or deemed to be in the best interest of the City in the event of breach or default of this contract. The City reserves the right to terminate the contract immediately in the event the successful bidder fails to 1) meet delivery schedules, or 2) otherwise perform in accordance with these specifications. Breach of contract or default authorizes the City to award to another bidder. Purchase elsewhere and charge the full increase in cost and handling to the defaulting successful bidder.

TESTING: Testing may be performed at the request of the City without expense to the City.

REMEDIES: The successful bidder and City of Lewisville agree that each party have all rights, duties, and remedies available as stated in the Uniform Commercial Code.

VENUE: This agreement will be governed and construed according to the laws of the State of Texas. This agreement is performable in Denton County, Texas.

SILENCE OF SPECIFICATION: The apparent silence of these specifications as to any detail or to the omission from it of a detailed description concerning any point shall be regarded as meaning that only the best commercial products and practices are to prevail. All interpretations of the specifications in this bid shall be made on the basis of this statement.

DEVIATIONS from specifications and alternate bids must be clearly shown on the bid form with complete information attached to form. They may or may not be considered.

NO EMPLOYEE of the City of Lewisville who has a financial interest in a prospective vendor shall participate in submitting a bid or proposal to conduct work for the City.

NO EMPLOYEE of the City of Lewisville shall receive any compensation for or as a result of a contract for goods or services purchased by the City if that employee was in a position to influence the City with respect to the contract.

ELIGIBLE BIDDER: Bidders are limited to those persons or firms who are qualified and engaged in a full-time business and can assume liabilities for any performance or warranty service required.

REJECTED ITEM(S): Item(s) that are rejected for failure to meet prescribed minimum specifications shall be returned to the supplier at no cost to the City of Lewisville.

INDEMNITY: The City of Lewisville will not accept a contract that contains any provision causing the City of Lewisville to indemnify the vendor for any reason.

VENDOR AGREEMENT: Any vendor agreements (service, maintenance, etc.) to be signed by the City of Lewisville **must** be submitted with your bid.

CITY OF LEWISVILLE
DISCLOSURE OF INTEREST

Pursuant to Chapter 176 of the Texas Local Government Code, a person or agent of a person who contracts or seeks to contract with the City of Lewisville must complete a conflict of interest questionnaire if the person or agent has an affiliation or business relationship that might cause a conflict of interest with the City. The conflict of interest questionnaire, which is available online at ethics.state.tx.us, must be filed with the City Secretary of the City of Lewisville no later than the seventh (7^{th}) business day after the person or agent begins contract discussions or negotiations with the City of Lewisville or submits to the City of Lewisville an application, response to a request for proposal or bid, correspondence, or another writing related to a potential agreement with the City of Lewisville. An updated Conflict of Interest Questionnaire must be filed in accordance with Chapter 176 of the Local Government Code.

Seller should consult with legal counsel if they have questions regarding its compliance with the requirements of Chapter 176. It is the responsibility of each person or agent who is contracting or seeking to contract with the City of Lewisville to comply with the filing requirements of Chapter 176.

Lewisville 2025 - Sustainability

Lewisville City Council unanimously adopted the Lewisville 2025 plan on July 14, 2014. The plan was developed after more than a year of public input and discussion that garnered hundreds of ideas and suggestions. That input was studied extensively by the Lewisville 2025 Steering Committee, City staff and professional consultants and formulated into the Lewisville 2025 plan. The plan provides a clear shared vision for the kind of community Lewisville wants to be when it turns 100 years old in 2025: a place that people choose to live, work and visit.

Lewisville 2025 identifies nine "Big Moves" to guide the community's efforts toward being a thriving, desirable community. One of these Big Moves is sustainability. Lewisville defines sustainability in this way:

> *Limited resources, such as land, water, energy, clean air, natural assets, and public funds are used efficiently to provide a desirable quality of life and business climate today without reducing Lewisville's ability to provide the desired quality of life and business climate for success of future generations.*

The Purchasing Division's goal is to support and encourage sustainable management practices through the purchase and use of materials, products and services that demonstrate environmental stewardship as well as fiscal and social responsibility. To that end, Lewisville will consider environmental factors such as but not limited to, recycled content, product life cycle, waste reduction, energy efficiency, toxicity, water consumption, and human health impacts when making purchasing recommendations. To assist City staff with evaluating these factors, prospective vendors may be required to provide specific information about their products and services that addresses environmental impacts.

Does Product or Service?	Yes	No	Details
Reduce energy consumption			
Reduce toxicity, including emissions			
Reduce waste			
Contain recyclable materials			
Reduce water consumption			
List other environmental impacts			

Attach supporting documentation if needed

PURCHASE ORDER
TERMS & CONDITIONS

Seller and Buyer agree to comply with the following terms and conditions. These Terms and Conditions along with the purchase order shall constitute a contract between the Seller and Buyer upon the Seller issuing an invoice and/or providing any of the goods and services described in the purchase order. In the event of a conflict between these Terms and Conditions and a separate written agreement between the Seller and Buyer, the terms of the separate written agreement shall prevail.

1. SELLER TO PACKAGE GOODS: Seller will package goods in accordance with good commercial practice. Each shipping container shall be clearly and permanently packed as follows: (a) Seller's name and address; (b) Consignee's name, address and purchase order or purchase order release number and the supply agreement number if applicable; (c) Container number and total number of containers, e.g. box 1 of 4 boxes; and (d) the number of the container bearing the packing slip. Seller shall bear cost of packaging unless otherwise provided. Goods shall be suitably packed to secure lowest transportation costs and to conform with requirements of common carriers and any applicable specifications. Buyer's count or weight shall be final and conclusive on shipments not accompanied by packing lists.

2. SHIPMENT UNDER RESERVATION PROHIBITED: Seller is not authorized to ship the goods under reservation and no tender of a bill of lading will operate as a tender of goods.

3. TITLE AND RISK OF LOSS: The title and risk of loss of the goods shall not pass to Buyer until Buyer actually receives and takes possession of the goods at the point or points of delivery.

4. DELIVERY TERMS AND TRANSPORTATION CHARGES: F.O.B. Inside Delivery, Municipal Facility, Lewisville, Texas, and shall include all delivery and packaging costs. The Buyer assumes no liability for goods delivered in damaged or unacceptable condition. The Seller shall handle all claims with carriers, and in case of damaged goods, shall ship replacement goods immediately upon notification by Seller of damage.

5. NO REPLACEMENT OF DEFECTIVE TENDER: Every tender or delivery of goods must fully comply with all provisions of this contract as to time of delivery, quality and the like. If a tender is made which does not fully conform, this shall constitute a breach and Seller shall not have the right to substitute a conforming tender provided, where the time for performance has not yet expired, the Seller may notify Buyer of his intention to cure and may then make a conforming tender within the contract time but not afterward.

6. PLACE OF DELIVERY: The place of delivery shall be that set forth on the purchase order. Any change thereto shall be effected by modification as provided for in Clause 20, "Modifications", hereof. The terms of this contract are "no arrival, no sale".

7. INVOICES AND PAYMENTS: (a) Seller shall submit separate invoices on each purchase order after each delivery. Invoices shall indicate the purchase order number, shall be itemized and transportation charges, if any, shall be listed separately. A copy of the bill of lading, and the freight weigh bill when applicable, should be attached to the invoice. Mail to: City of Lewisville Accounts Payable, PO Box 299002 Lewisville, Texas 75029-9002. Payments shall be made thirty days after the goods are delivered to the Buyer, or a correct invoice is received, whichever is later. Suppliers should keep the Accounts Payable Office advised of any changes in remittance addresses. (b) Buyer's obligation is payable only and solely from funds available for the purpose of the purchase. Lack of funds shall render this contract null and void to the extent funds are not available and any delivered but unpaid for goods will be returned to Seller by Buyer. (c) Do not include Federal Excise, State or City Sales Tax. Buyer shall furnish tax exemption certificate, if required.

8. GRATUITIES: The Buyer may, by written notice to the Seller, cancel this contract without liability to Seller if it is determined by Buyer that gratuities, in the form of entertainment, gifts, or otherwise, were offered or given by the Seller, or any agent, or representative of the Seller, to any officer or employee of the City of Lewisville with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending or the making or any determinations with respect to the performing of such a contract. In the event this contract is cancelled by Buyer pursuant to this provision, Buyer shall be entitled, in addition to any other rights and remedies, to recover or withhold the amount of the cost incurred by Seller in providing such gratuities.

9. SPECIAL TOOLS AND TEST EQUIPMENT: If the price stated on the face hereof includes the cost of any special tooling or special test equipment fabricated or required by Seller for the purpose of filling this order, such special tooling equipment and any process sheets related thereto shall become the property of the Buyer and to the extent feasible shall be identified by the Seller as such.

10. WARRANTY PRICE: (a) The price to be paid by the Buyer shall be that contained in Seller's bid which Seller warrants to be no higher than Seller's current prices on orders by others for products of the kind and specification covered by this contract for similar quantities under similar or like conditions and methods of purchase. In the event Seller breaches this warranty, the prices of the items shall be reduced to the Seller's current prices on orders by others, or in the alternative, Buyer may cancel this contract without liability to Seller for breach or Seller's actual expense. (b) The Seller warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for commission, percentage, brokerage, or contingent fee excepting bona fide employees of bona fide established commercial or selling agencies maintained by the Seller for the purpose of securing business. For breach of violation of this warranty, the Buyer shall have the right in addition to any other right or rights to cancel this contract without liability and to deduct from the contract price, or otherwise recover the full amount of such commission, percentage, brokerage or contingent fee.

11. WARRANTY PRODUCTS: Seller shall not limit or exclude any implied warranties and any attempt to do so shall render this contract voidable at the option of the Buyer. Seller warrants that the goods furnished will conform to the specifications, drawings and descriptions listed in the bid invitation and to the sample(s) furnished by Seller, if any. In the event of a conflict between the specifications, drawings and descriptions, the specifications shall govern.

12. SAFETY WARRANTY: Seller warrants that the product sold to Buyer shall conform to the standards promulgated by the U. S. Department of Labor under the Occupational Safety and Health Act of 1970. In the event the product does not conform to OSHA standards, Buyer may return the product for correction or replacement at the Seller's expense. In the event Seller fails to make the appropriate correction within a reasonable time, correction made by Buyer will be at Seller's expense.

13. NO WARRANTY BY BUYER AGAINST INFRINGEMENTS: As part of this contract for sale Seller agrees to ascertain whether goods manufactured in accordance with the specifications attached to this contract will give rise to the rightful claim of any third person by way of infringement or the like. Buyer makes no warranty that the production of goods according to the specification will not give rise to such a claim, and in no event shall Buyer be liable to Seller for indemnification in the event that Seller is sued on the grounds of infringement or the like. If seller is of the opinion that an infringement or the like will result, he will notify Buyer to this effect in writing within two weeks after the signing of this contract. If Buyer does not receive notice and is subsequently held liable for the infringement of the like, Seller will save Buyer harmless. If Seller in good faith ascertains that production of the goods in accordance with the specifications will result in infringement or the like, this contract shall be null and void except that Buyer will pay Seller the reasonable cost of his search as to infringements.

14. RIGHT OF INSPECTION: Buyer shall have the right to inspect the goods at delivery before accepting them.

15. CANCELLATION: Buyer shall have the right to cancel for default all or any part of the undelivered portion of this order if Seller breaches any of the terms hereof including warranties of Seller or if the Seller becomes insolvent or commits acts of bankruptcy. Such right of cancellation is in addition to and not in lieu of any other remedies which Buyer may have in law or equity.

16. TERMINATION: The performance of work under this order may be terminated in whole or in part by the Buyer in accordance with this provision. Termination of work hereunder shall be effected by the delivery to the Seller of a "Notice of Termination" specifying the extent to which performance of work under the order is terminated and the date upon which such termination becomes effective. Such right of termination is in addition to and not in lieu of rights of Buyer set forth in Clause 15, herein.

17. FORCE MAJEURE: If by reason of Force Majeure, either party hereto shall be rendered unable wholly or in part to carry out its obligations under this contract then such party shall give notice and full particulars of Force Majeure in writing to the other party within a reasonable time after occurrence of the event or cause relied upon, and the obligation of the party giving such notice, so far as it is affected by such Force Majeure, shall be suspended during the continuance of the inability then claimed, except as hereinafter provided, but for no longer period, and such party shall endeavor to remove or overcome such inability with all reasonable dispatch. The term Force Majeure as employed herein, shall mean acts of God, strikes, lockouts, or other industrial disturbances, act of public enemy, orders of any kind of government of the United States or the State of Texas or any civil military authority, insurrections, riots, epidemics, landslides, lightning, earthquakes, fires, hurricanes, storms, floods, washouts, droughts, arrests, restraint of government and people, civil disturbances, explosions, breakage or accidents to machinery, pipelines or canals, or other causes not reasonably within the control of the party claiming such inability.

18. ASSIGNMENT DELEGATION: No right or interest in this contract shall be assigned or delegation of any obligation made by Seller without the written permission of the Buyer. Any attempted assignment or delegation by Seller shall be wholly void and totally ineffective for all purposes unless made in conformity with this paragraph.

19. WAIVER: No claim or right arising out of a breach of this contract can be discharged in whole or in part by a waiver or renunciation of the claim or right unless the waiver or renunciation is supported by consideration and is in writing signed by the aggrieved.

20. MODIFICATIONS: This contract may be modified or rescinded only by a writing signed by both of the parties or their duly authorized agents. This shall include any change orders.

21. INTERPRETATION PAROLE EVIDENCE: This writing is intended by the parties as a final expression of their agreement and is intended also as a complete and exclusive statement of the terms of their agreement. No course of prior dealings between the parties and no usage of the trade shall be relevant to supplement or explain any term used in this contract. Acceptance or acquiescence in a course of performance rendered under this contract shall not be relevant to determine the meaning of this contract even though the accepting or acquiescing party has knowledge of the performance and opportunity for objection. Whenever a term defined by the Uniform Commercial Code is used in this contract, the definition contained in the Code is to control.

22. APPLICABLE LAW: This contract shall be governed by the Uniform Commercial Code. Wherever the term "Uniform Commercial Code" is used, it shall be construed as meaning the Uniform Commercial Code as adopted in the State of Texas as effective and in force on the date of this contract.

23. ADVERTISING: Seller shall not advertise or publish, without Buyer's prior consent, the fact that Buyer has entered into this contract, except to the extent necessary to comply with proper requests for information from an authorized representative of the federal, state or local government.

24. RIGHT TO ASSURANCE: Whenever one party to this contract in good faith has reason to question the other party's intent to perform he may demand that the other party give written assurance of his intent to perform. In the event that a demand is made and no assurance is given within five (5) days, the demanding party may treat this failure as an anticipatory repudiation of the contract.

25. VENUE: Both parties agree that venue for any litigation arising from this contract shall lie in Denton County, Texas.

26. DISCLOSURE: Pursuant to Chapter 176 of the Texas Local Government Code, a person or agent of a person who contracts or seeks to contract with the City of Lewisville must complete a conflict of interest questionnaire if the person or agent has an affiliation or business relationship that might cause a conflict of interest with the City. The conflict of interest questionnaire, which is available online at ethics.state.tx.us, must be filed with the City Secretary of the City of Lewisville no later than the seventh business day after the person or agent begins contract discussions or negotiations with the City of Lewisville or submits to the City of Lewisville an application, response to a request for proposal or bid, correspondence, or another writing related to a potential agreement with the City of Lewisville. An updated conflict of interest questionnaire must be filed in accordance with Chapter 176 of the Local Government Code

Seller should consult with legal counsel if you have questions regarding its compliance with the requirements of Chapter 176. It is the responsibility of each person or agent who is contracting or seeking to contract with the City of Lewisville to comply with the filing requirements of Chapter 176.

27. INDEPENDENT CONTRACTOR: Seller shall be considered an independent contractor and not an agent, servant, employee, or representative of Buyer in the performance of the work. No term or provision herein or act of the Seller shall be construed as changing that status.

28. TERMINATION FOR DEFAULT: Buyer reserves the right to enforce the performance of any Purchase Order in any manner prescribed by law or deemed to be in the best interest of Buyer in the event of breach or default. The Buyer reserves the right to terminate any purchase order and/or agreement with the Seller in the event the Seller fails to: (a) meet delivery schedules, or (b) otherwise perform in accordance with these terms and conditions.

29. PROTESTS: All protests regarding the solicitation process must be submitted in written form to the Purchasing Manager within five (5) working days following the opening of bids/proposals. This includes all protests relating to legal advertisements, deadlines, bid/proposal openings, and all other related procedures under the Local Government Code

Post-award protests must be submitted in written form to the City Manager within five (5) working days after award. The protest must include, at a minimum, the name of protester, bid/proposal number or description of goods or services, and a statement of grounds for protest.

30. INDEMNIFICATION: SELLER AGREES TO DEFEND, INDEMNIFY AND HOLD BUYER, ITS OFFICERS, AGENTS AND EMPLOYEES, HARMLESS AGAINST ANY AND ALL CLAIMS, LAWSUITS, JUDGMENTS, COSTS AND EXPENSES FOR PERSONAL INJURY (INCLUDING DEATH), PROPERTY DAMAGE OR OTHER HARM FOR WHICH RECOVERY OF DAMAGES IS SOUGHT, SUFFERED BY ANY PERSON OR PERSONS, THAT MAY ARISE OUT OF OR BE OCCASIONED BY SELLER'S BREACH OF ANY OF THESE TERMS AND CONDITIONS OR BY ANY NEGLIGENT OR STRICTLY LIABLE ACT OR OMISSION, INTENTIONAL TORT, INTELLECTUAL PROPERTY INFRINGEMENT, OR FAILURE TO PAY A SUBCONTRACTOR OR SUPPLIER COMMITTED BY SELLER, ITS OFFICERS, AGENTS, EMPLOYEES OR SUBCONTRACTORS, IN THE PERFORMANCE OF THIS CONTRACT; EXCEPT THAT THE INDEMNITY PROVIDED FOR IN THIS PARAGRAPH SHALL NOT APPLY TO ANY LIABILITY RESULTING FROM THE SOLE NEGLIGENCE OR FAULT OF BUYER, ITS OFFICERS, AGENTS, EMPLOYEES OR SEPARATE CONTRACTORS, AND IN THE EVENT OF JOINT AND CONCURRING NEGLIGENCE OR FAULT OF THE SELLER AND BUYER, RESPONSIBILITY AND INDEMNITY, IF ANY, SHALL BE APPORTIONED IN ACCORDANCE WITH THE LAW OF THE STATE OF TEXAS, WITHOUT WAIVING ANY GOVERNMENTAL IMMUNITY AVAILABLE TO BUYER UNDER TEXAS LAW AND WITHOUT WAIVING ANY DEFENSES OF THE PARTIES UNDER TEXAS LAW. THE PROVISIONS OF THIS PARAGRAPH ARE SOLELY FOR THE BENEFIT OF THE PARTIES HERETO AND NOT INTENDED TO CREATE OR GRANT ANY RIGHTS, CONTRACTUAL OR OTHERWISE, TO ANY OTHER PERSON OR ENTITY.

31. SEVERABILITY: In case any one or more of the provisions contained in these Terms and Conditions shall for any reason be held to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality, or unenforceability shall not affect any other provision thereof, and these Terms and Conditions shall be construed as if such invalid, illegal, or unenforceable provision had never been contained herein.

32. IMMIGRATION REFORM AND CONTROL ACT (8 U.S.C 1324a): The Buyer supports the Immigration Reform and Control Act (IRCA), which is a comprehensive scheme prohibiting the employment of unauthorized aliens in the United States. The Seller and its subcontractors shall at all times during the term of the contract with the Buyer comply with the requirements of IRCA and shall notify the Buyer within fifteen (15) working days of receiving notice of a violation of IRCA. The Seller also warrants that it has not had an IRCA violation within the last five (5) years. The Buyer may terminate a contract with the Seller if the Buyer determines that (a) the Seller or its subcontractors have been untruthful regarding IRCA violations in the preceding five (5) years or (b) the Seller or its subcontractors fail to timely notify the Buyer of an IRCA violation.

33. ADA COMPLIANCE: All goods and services provided to the Buyer must be compliant with the Americans with Disabilities Act and any amendments thereto (the "ADA") and all regulations promulgated pursuant to the ADA. Seller will be required to certify compliance, if required under the law or otherwise required by the Buyer.

34. PROTECTION OF RESIDENT WORKERS: The Buyer actively supports the Immigration and Nationality Act (INA), which includes provisions addressing employment eligibility, employment verification, and nondiscrimination. Under the INA, employers may hire only persons who may legally work in the United States (i.e., citizens and nationals of the U.S.) and aliens authorized to work in the U.S. The employer must verify the identity and employment eligibility of anyone to be hired, which includes completing the Employment Eligibility Verification Form (I-9). The Seller shall establish appropriate procedures and controls so no services under the contract will be performed by any worker who is not legally eligible to perform such services or employment. The Buyer reserves the right to audit Seller's employment records to verify the existence of a completed Employment Eligibility Verification Form (I-9) for every worker performing services under the contract. The audit will be at the Buyer's expense.

35. NO BOYCOTT OF ISRAEL. Pursuant to Texas Government Code Chapter 2270, the Seller agrees that acceptance of these Terms & Conditions serves as written verification that Contractor: (1) does not boycott Israel, as defined by Texas Government Code Section 808.001; and (2) will not boycott Israel during the term of the contract.

36. COMPANIES ENGAGED IN BUSINESS WITH IRAN, SUDAN, OR FOREIGN TERRORIST ORGANIZATION. Pursuant to Texas Government Code Chapter 2252, Subchapter F, Seller affirms that is it not identified on a list created by the Texas Comptroller of Public Accounts as a company known to have contracts with or provide supplies or services to a foreign terrorist organization.

CITY OF LEWISVILLE
PURCHASING DIVISION

Exceptions

Bid

On the lines below, please list any exceptions taken to this bid invitation.

Item#	Description

Signature
Company
Date

No Exceptions taken to this bid invitation.

Signature
Company
Date

Question and Answers for Bid #18-23-I - Wastewater Treatment Plant Emergency Generator

Overall Bid Questions
There are no questions associated with this bid.