



Michael Stephens, PE
Stephens Engineering Services, LLC
P. O. Box 15
Welling, Oklahoma 74471
918 458-5256

SPECIFICATIONS AND CONTRACT DOCUMENTS

Okay 2016 Waterline Replacement Project - Phase 1

For improvements to the system owned by:

Okay Public Works Authority

SES, LLC
P. O. Box 15
Welling, OK 74471
918 458-5256

Okay Public Works Authority
P. O. BOX 505
Okay, OK 74446
918 687-6454

TABLE OF CONTENTS

Division 00 - Bidding and Contract Requirements

00004	Cover Page
00005	Table of Contents
00020	Advertisement for Bids - Notice to Bidders
00100	Information for Bidders
00311	Bid Proposal
00312	Substitution List
00313	Affidavits
00314	Bid Bond
00501	Agreement
00502	Performance Bond
00503	Statutory Bond
00504	Maintenance Bond
00506	Certificate of Approval of Contracts and Bonds
00507	Notice of Award
00508	Notice to Proceed
00520	EJCDC Standard General Conditions
00520	Supplemental Conditions

Division 01 – General Requirements

01010	Summary of Work Contract
01019	Considerations
01025	Measurement and Payment
01027	Application for Payment
01028	Change Order Procedures
01030	Work Change Directive
01039	Coordination and Meetings
01050	Field Engineering
01200	Project Meetings
01300	Submittals
01310	Construction Schedules
01500	Construction Facilities and Temporary Controls
01570	Traffic Regulation
01600	Material & Equipment
01640	Materials Handling, Transportation and Storage
01700	Contract Closeout
01710	Warranty Bonds

Division 02 - Site Work

02221	Trenching, Backfilling and Compacting
02713	Water Distribution System

ADVERTISEMENT FOR BID

Okay PWA
7420 N. 37th Street
Okay, OK 74446
Brad Matthews, Chairman

Separate sealed BIDS for the Construction of Okay 2016 Waterline Replacement Project will be received by Wagoner County Commissioners in their office located at 307 E Cherokee St, Wagoner, OK until 4:00 p.m. on the 26th day of August, 2016 and then at said office publicly opened and read aloud on the 29th day of August, 2016.

SMALL BUSINESSES AND MINORITY OWNED BUSINESS SOURCES ARE ENCOURAGED TO BID ON THIS PROJECT.

IMPORTANT - SURETY COMPANIES EXECUTING BONDS MUST APPEAR ON THE TREASURY DEPARTMENTS MOST CURRENT LIST AND BE AUTHORIZED TO TRANSACT BUSINESS IN THE STATE OF OKLAHOMA.

The CONTRACT DOCUMENTS may be examined at the following locations:

Town Hall, Okay, Oklahoma (918) 687-6585
Stephens Engineering Services, LLC, Welling, Oklahoma (918) 458-5256

Copies of the CONTRACT DOCUMENTS may be obtained at the office of Stephens Engineering Services, LLC, located at 21298 S Welling Rd, Welling, Oklahoma 74471, or at the Town Hall upon payment of \$ 100 for each set. Contract documents are available online at www.wagonercounty.ok.gov.

Any Bidder, upon returning the Contract Documents within seven (7) calendar days after bids are opened and in good condition, will be refunded the payment, and any Non-bidders will receive no refund.

Date

Chairman

INFORMATION FOR BIDDERS

BIDS will be received by Wagoner County at 307 E Cherokee St, Wagoner, OK, 74467 until 4:00 p.m., Friday, August 26th, 2016, and then at said office publicly opened and read aloud on Monday August 29th, 2016 at 9:00 a.m.

Each BID must be submitted in a sealed envelope, delivered to attention Carolyn Henderson, Wagoner County Purchasing Agent at 307 E Cherokee St., Wagoner, OK 74467. Each sealed envelope containing a BID must be plainly marked on the outside as BID for Okay 2016 Waterline Replacement Project and the envelope should bear, on the outside, the BIDDER'S name, address, and license number if applicable. If forwarded by mail, the sealed envelope containing the BID must be enclosed in another envelope addressed to the Carolyn Henderson, Wagoner County Purchasing Agent at, P.O. Box 156, Wagoner, OK 74477.

All BIDS must be made on the required BID form. All blank spaces for BID prices must be filled in, in ink or typewritten, and the BID form must be fully completed and executed when submitted. Only one copy of the BID form is required.

The OWNER may waive any informalities or minor defects or reject any and all BIDS. Any BID may be withdrawn prior to the above scheduled time for the opening of BIDS or authorized postponement thereof. Any BID received after the time and date specified shall not be considered. No BIDDER may withdraw a BID within 60 days after the actual date of the opening thereof. Should there be reasons why the contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the OWNER and the BIDDER.

BIDDERS must satisfy themselves of the accuracy of the estimated quantities in the BID Schedule by examination of the site and a review of the drawings and specifications including ADDENDA. After BIDS have been submitted, the BIDDER shall not assert that there was a misunderstanding concerning the quantities of WORK or of the nature of the work to be done.

The OWNER shall provide to BIDDERS prior to BIDDING, all information which is pertinent to, and delineates and describes, the land owned and rights of way acquired or to be acquired.

The CONTRACT DOCUMENTS contain the provisions required for the construction of the PROJECT. Information obtained from an officer, agent, or employee of the OWNER or any other person shall not affect the risks or obligations assumed by the CONTRACTOR or relieve the contractor from fulfilling any of the conditions of the contract.

Each BID must be accompanied by a BID BOND payable to the OWNER for FIVE PERCENT of the total amount of the BID. As soon as the BID prices have been compared, the OWNER will return the BONDS of all except the three lowest responsible BIDDERS. When the Agreement is executed the bonds of the two remaining unsuccessful BIDDERS will be returned. The BID BOND of the successful BIDDER will be retained until the MAINTENANCE BOND, PAYMENT BOND AND PERFORMANCE BOND and/or STATUTORY BOND have been executed and approved, after which it will be returned. A certified check may be used in lieu of the BID BOND.

A MAINTENANCE BOND, PERFORMANCE BOND and a STATUTORY BOND each in the amount of 100 PERCENT of the CONTRACT PRICE, with a corporate surety approved by the OWNER, will be required for the faithful performance of the contract.

Attorneys-in-fact who sign BID BONDS or MAINTENANCE BONDS, PAYMENT BONDS and PERFORMANCE BONDS must file with each BOND a certified and effective dated copy of their Power of Attorney.

The party to whom the contract is awarded will be required to execute the Agreement and obtain the MAINTENANCE BOND, PERFORMANCE BOND and STATUTORY BOND within ten (10) calendar days from the date when NOTICE OF AWARD is delivered to the BIDDER. The NOTICE OF AWARD shall be accompanied by the necessary AGREEMENT and BOND forms. In case of failure of the BIDDER to execute the Agreement, the OWNER may consider the BIDDER in default, in which case the BID BOND accompanying the proposal shall become the property of the OWNER.

The OWNER within ten (10) days of receipt of acceptable PERFORMANCE BOND, STATUTORY BOND and AGREEMENT signed by the party to whom the Agreement was awarded shall sign the Agreement and return to such party an executed duplicate of the Agreement. Should the OWNER not execute the Agreement within such period, the BIDDER may by WRITTEN NOTICE withdraw the signed AGREEMENT. Such notices of withdrawal shall be effective upon receipt of the notice by the OWNER.

The NOTICE TO PROCEED shall be issued within ten (10) days of the execution of the Agreement by the OWNER. Should there be reasons why the NOTICE TO PROCEED cannot be issued within such period, the time may be extended by mutual agreement between the OWNER and CONTRACTOR. If the NOTICE TO PROCEED has not been issued within the ten (10) days period or within the period mutually agreed upon, the CONTRACTOR may terminate the Agreement without further liability on the part of either party.

The OWNER may make investigations as deemed necessary to determine the ability of the BIDDER to perform the WORK, and the BIDDER shall furnish to the OWNER all such information and data for this purpose as the OWNER may request. The OWNER reserves the right to reject any BID if the evidence submitted by, or investigation of, such BIDDER fails to satisfy the OWNER that such BIDDER is properly qualified to carry out the obligations of the AGREEMENT and to complete the WORK contemplated therein.

A conditional or qualified BID will not be accepted.

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout.

Each BIDDER is responsible for inspecting the site and for reading and being thoroughly familiar with the CONTRACT DOCUMENTS. The failure or omission of any BIDDER to do any of the foregoing shall in no way relieve any BIDDER from any obligation in respect to its BID.

Further, the BIDDER agrees to abide by the requirements under Executive Order No. 11246, as amended, including specifically the provisions of the Equal Opportunity clause set forth in the SUPPLEMENTAL GENERAL CONDITIONS.

When alternate BIDS are taken, they will be listed in numerical order with the highest priority being number one, second, number two, etc.

When alternates are used, the low BIDDERS will be selected by the lowest and best BID considering all BIDS which include the selected alternate BIDS.

The alternates will be listed in consecutive priority order to remain within the funds available for the project.

The low BIDDERS shall supply the names and addresses of major materials SUPPLIERS and SUBCONTRACTORS when required to do so by the OWNER.

The ENGINEER is Michael Stephens, PE, of Stephens Engineering Services, LLC, whose address is: P. O. Box 15, Welling, OK 74471.

SPECIAL NOTE TO BIDDERS:

As a part of the bid on this project, the successful bidder will be required to meet all requirements of the Underground Facilities Damage Prevention Act when engaged in work within the public right-of-way in the same manner as in private right-of-way.

Tracer wire or tape standard for the industry must be included in the bid price for all underground pipelines in the bid unless the engineer has included it in the bid schedule as a separate item. State law now requires that “any new underground facilities shall contain materials capable of being detected so that the facilities can be accurately located.”

The engineer shall have the right to reject pipe based upon visual defects including out-of-roundness, rough interior, discoloration, warping, or other visual defects which in the opinion of the engineer affect the function or the life of the pipe.

Bid Proposal

Project Identification: *Okay 2016 Waterline Replacement Project – Phase 1*

Project Number: 160615

TABLE OF ARTICLES

	Page
Article 1 - Bid Recipient	1
Article 2 - Bidder's Acknowledgments	1
Article 3 - Bidder's Representations	1
Article 4 - Further Representations	2
Article 5 - Basis of Bid	3
Article 6 - Time of Completion	3
Article 7 - Attachments to Bid	4
Article 8 - Defined Terms	4
Article 9 - Bid Submittal	4

ARTICLE 1 - BID RECIPIENT

- 1.01 This Bid Is Submitted To: **Wagoner County Commissioners**
307 E Cherokee St
Wagoner, OK 74467
- 1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in the Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 - BIDDER'S ACKNOWLEDGMENTS

- 2.01 Bidder accepts all of the terms and conditions of the Advertisement and Instructions to Bidders, including without limitations those dealing with the dispositions of Bid security. The Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 - BIDDER'S REPRESENTATIONS

- 3.01 In submitting this Bid, Bidder represents that:
- A. Bidder has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged.
- | Addendum No. | Addendum Date |
|--------------|---------------|
| _____ | _____ |
| _____ | _____ |
- B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local, and site conditions that may affect cost, progress, and performance of the Work.
- C. Bidder is familiar with and is satisfied as to all Federal, State, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

- ~~D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in SC 4.02, and (2) reports and drawings of a Hazard Environmental Condition, if any, which has been identified in SC 4.06.~~
- E. Bidder has obtained and carefully studied (or accepts the consequences for not doing so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by the Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents to be employed by Bidder, and safety precautions and programs incident thereto.
- F. Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.
- G. Bidder is aware of the general nature of the Work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- H. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.
- I. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.
- J. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.
- K. Bidder will submit written evidence of its authority to do business in the State where the Project is located not later than the date of its execution of the Agreement.

ARTICLE 4 - FURTHER REPRESENTATIONS

4.01 Bidder further represents that:

- A. This Bid is genuine and not made in the interest of or on the behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over Owner.

ARTICLE 5 - BASIS OF BID

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

Item No.	Description	Units	Estimated Quantity	Unit Price	Total Estimated Cost
1	6" PVC CL 160, installed with appurtenances	LF	1,727		
2	Connect to existing 6-inch AC pipe	EA	3		

Total Construction: _____

A. Unit Prices have been computed in accordance with paragraph 11.03.A of the General Conditions. B.

Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities, determined as provided in the contract Documents.

C. Bidder acknowledges that the unit price to install waterlines shall include parts, labor and installation of all fittings, tees, valves, reducers, tapping saddles and required fittings, repair of streets, driveways, parking areas and other hardened surfaces. Repairs to existing utilities and service connections to the newly installed line shall also be included in the unit price for installation of waterline.

D. This project will be limited in scope to that portion of the waterline shown on the plans from STA 0+61 to STA 17+27. The remainder of the project will be constructed in subsequent phases.

ARTICLE 6 - TIME OF COMPLETION

6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with paragraph 14.07.B of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the work within the Contract Times.

ARTICLE 7 - ATTACHEMENTS TO THIS BID

7.01 The following documents are attached to and made a condition of the Bid:

- A. Required Bid security in the form of a Bid Bond or Certified Check (circle type of security provided);
- B. A tabulation of Subcontractors, Suppliers and other individuals and entities required to be identified in this Bid;
- C. Required bidder qualifications statement with supporting data; and

ARTICLE 8 - DEFINED TERMS

8.01 The terms used in this Bid with the initial capital letters have the meanings indicated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 - BID SUBMITTAL

9.01 This Bid submitted by:

An Individual

Name (typed or printed): _____

By: _____

(Individual's signature)

SEAL,
if required
by State

Doing business as: _____

A Partnership

Partnership Name: _____

By: _____

(Signature of general partner -- attach evidence of authority to sign)

SEAL,
if required
by State

Name (typed or printed): _____

A Corporation

Corporation Name: _____

State of Incorporation: _____

Type (General Business, Profession, Service, Limited Liability): _____

By: _____

(Signature -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Attest _____

(Signature of Corporate Secretary)

CORPORATE
SEAL,
if required by State

Date of Qualification to do business in _____ [State where Project is located] is ____/____/____

A Joint Venture

Name of Joint Venture: _____

First Joint Venture Name: _____

By: _____

(Signature of joint venture partner -- attach evidence of authority to sign)

SEAL,
if required
by State

Name (typed or printed): _____

Title: _____

Second Joint Venture Name: _____

SEAL,
if required
by State

By: _____
(Signature of joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is party to the venture should be in the manner indicated above.)

Bidder's Business address: _____

Business Phone No. (_____) _____

Business FAX No. (_____) _____

Business E-Mail Address _____

State Contractor License No. _____ (If applicable)

Employer's Tax ID No. _____

Business DUNS No. _____

Phone and FAX Numbers, and Address for receipt of official communications, if different from Business contact information:

9.02 Bid submitted on _____, 20__.

BUSINESS RELATIONSHIPS AFFIDAVIT

STATE OF OKLAHOMA)
)ss.
COUNTY OF _____)

_____, of lawful age, being first duly sworn, on oath says that (s)he is the agent authorized by the bidder to submit the attached bid. Affiant further states that the nature of any partnership, joint venture, or other business relationship presently in effect or which existed within one (1) year prior to the date of this statement with the architect, engineer, or other party to the project is as follows:

Affiant further states that any such business relationship presently in effect or which existed within one (1) year prior to the date of this statement between any officer or director of the bidding company and any officer or director of the architectural or engineering firm or other party to the project is as follows:

Affiant further states that the names of all persons having any such business relationships and the positions they hold with their respective companies or firms are as follows:

(If none of the business relationships hereinabove mentioned exist, affiant should so state.)

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

Notary Public

My Commission Expires

NOTE: This form is to be submitted with the BID.

PAYROLL AFFIDAVIT

I _____, of lawful age, being first duly sworn, on oath says that (s)he is the agent authorized by the bidder to submit the attached bid. Affiant further states that (s)he has submitted the required payroll information to the State Department of Labor. Affiant further states that (s)he is in compliance with the requirements of Title 40 O.S., 1981, Sections 196.1 through 196.12 and any amendments thereto.

Signature

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

Notary Public

My Commission Expires:

NOTE: This form is to be submitted with the BID.

CLAIM OR INVOICE AFFIDAVIT

STATE OF OKLAHOMA)

)SS

COUNTY OF MAYES)

The undersigned Engineer, of lawful age, being first duly sworn, on oath says that this contract is true and correct. Affiant further states that he has made no payment, given, or donated or agreed to pay, give, or donate, either directly or indirectly, to any elected official, officer, or employee of the State of Oklahoma, of money or any other thing of value to obtain payment or the award of this contract.

Engineer or other Supervisory Official
CA 110 - 6/30/07

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

Notary Public

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the

Undersigned, _____ as

Principal, and _____ as

Surety, are hereby held and firmly bound unto _____

As OWNER in the penal sum of _____

for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed, this _____ day of _____, 20__.

The Condition of the above obligation is such that whereas the Principal has submitted to _____ a certain BID,

Attached hereto and hereby made a part hereof to enter into a contract in writing, for the

NOW, THEREFORE,

- (a) If said BID shall be rejected, or
- (b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attachment hereto (properly completed in accordance with said BID) and shall furnish a BOND for faithful performance of said contract, and for the payment of all persons performing labor furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID that this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

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

_____(L.S.)
Principal

ATTEST: (If by Corporation)

Surety

By: _____

IMPORTANT – Surety companies executing BONDS must appear on the Treasury Department’s most current list (Circular 570 as amended) and be authorized to Transact business in the state of Oklahoma.

**AGREEMENT
BETWEEN OWNER AND CONTRACTOR
FOR CONSTRUCTION CONTRACT**

THIS AGREEMENT is by and between _____ Okay Public Works Authority _____ (“Owner”) and

_____ (“Contractor”).

Owner and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1 – WORK

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

Installation of approximately 1,700 LF of 6-inch PVC waterline with appurtenances.

ARTICLE 2 – THE PROJECT

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

To replace a portion of 6-inch AC Transite pipe with 6-inch PVC pipe as part of the distribution system for Okay PWA.

ARTICLE 3 – ENGINEER

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

ARTICLE 4 – CONTRACT TIMES

4.01 *Time of the Essence*

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

4.02 *Days to Achieve Substantial Completion and Final Payment*

A. The Work will be substantially completed within 60 days after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions within 90 days after the date when the Contract Times commence to run.

4.03 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence of this Agreement and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that

Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 14.02 of the General Conditions:

- a. 85 percent of Work completed (with the balance being retainage); and
 - b. 85 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
2. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 85 percent of the Work completed, less such amounts as Engineer shall determine in accordance with Paragraph 14.02.B.5 of the General Conditions.

6.03 *Final Payment*

- A. Upon receipt of the final Application for Payment accompanied by Engineer's recommendation of payment in accordance with Paragraph 14.07 of the General Conditions, Owner shall pay Contractor as provided in Paragraph 14.07 of the General Conditions the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 14.07, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages.

ARTICLE 7 – INTEREST

- 7.01 All moneys not paid when due as provided in Article 14 of the General Conditions shall bear interest at the maximum legal rate.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

- 8.01 In order to induce Owner to enter into this Agreement Contractor makes the following representations:
- A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
 - B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 - C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.
 - D. Contractor does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.
 - E. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
 - F. Contractor has correlated the information known to Contractor, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.
 - G. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

- H. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 *Contents*

- A. The Contract Documents consist of the following:
1. This Agreement (pages 1 to 6, inclusive).
 2. Performance bond
 3. Statutory bond
 4. Maintenance bond
 5. General Conditions (pages 1 to 46, inclusive).
 6. Supplementary Conditions (2 pages).
 7. Specifications as listed in the table of contents of the Project Manual.
 8. Drawings consisting of 5 sheets with each sheet bearing the following general title: Okay 2016 Waterline Replacement Project
 9. Addendum.
 10. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid (pages ____ to ____, inclusive).
 - b. Documentation submitted by Contractor prior to Notice of Award (pages ____ to ____, inclusive).
 - c. ____.
 11. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
 - a. Notice to Proceed (pages ____ to ____, inclusive).
 - b. Work Change Directives.
 - c. Change Order(s).
- B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 9.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the General Conditions.

ARTICLE 10 – MISCELLANEOUS

10.01 *Terms*

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

10.02 *Assignment of Contract*

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

10.03 *Successors and Assigns*

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

10.04 *Severability*

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

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement in four copies. One counterpart each has been delivered to Owner, Contractor, Engineer, and Agency. All portions of the Contract Documents have been signed, initialed, or identified by Owner and Contractor or identified by Engineer on their behalf.

This Agreement is dated _____. This Agreement shall not be effective unless and until Agency's designated representative concurs.

OWNER:

CONTRACTOR

By: _____

By: _____

Title: _____

Title: _____

[CORPORATE SEAL]

[CORPORATE SEAL]

Attest: _____

Attest: _____

Title: _____

Title: _____

Address for giving notices:

Address for giving notices:

Agent for service of process:

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

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That

(Name of Contractor)

(Address of Contractor)

a _____, hereinafter called PRINCIPAL, and
(Corporation, Partnership, or Individual)

(Name of Surety)

(Address of Surety)

hereinafter called SURETY, are held and firmly bound unto _____

Okay Public Works Authority

(Name of Owner)

P.O. Box 505, Okay, OK 74446

(Address of Owner)

hereinafter called OWNER, and in the total aggregate penal sum of _____
Dollars (\$ _____)

in lawful money of the United States, 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.

THE CONDITION OF THIS OBLIGATION is such that whereas, the PRINCIPAL entered into a certain contract with the OWNER, dated the _____ day of _____, 2016, a copy of which is hereto attached and made a part hereof for the construction of: _____

NOW, THEREFORE, if the PRINCIPAL shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the OWNER, with or without notice to the SURETY and during the one year guaranty period including defective materials and workmanship and if the PRINCIPAL shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reasons of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the liability of the PRINCIPAL and SURETY hereunder shall be subject to the same limitations and defenses as may be available to them against a claim hereunder by the OWNER, provided, however, that it may, at its option, perform any obligation of the OWNER required by the contract.

PROVIDED, FURTHER, that the said SURETY, for value received hereby stipulates and agrees that no change, extension of time, alterations or additions to the terms of the contract or to work to be performed thereunder or the specifications, accompanying same shall in any way 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 or to the specifications;

PROVIDED, FURTHER, that it is expressly agreed that the bond shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the contract not increasing the contract price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the contract as so amended. The term "Amendment", wherever used in the bond, and whether referring to this bond, the contract or the loan documents shall include any alteration, addition, extension, or modification of any character whatsoever.

PROVIDED FURTHER, that no final settlement between the OWNER and the PRINCIPAL shall abridge the right of the other beneficiary hereunder, whose claim may be unsatisfied. The OWNER is the only beneficiary hereunder.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, each which shall be deemed an original, this the _____ day of _____, 2016.

ATTEST:

Principal_

(Principal) Secretary
(SEAL)

By _____ (s)

Witness as to Principal (Address)

(Address)

ATTEST: Surety

By (Attorney-in-Fact)

Witness as to Surety

NOTE: Date of bond must not be prior to date of contract.
If contractor is partnership, all partners should execute bond.

IMPORTANT: Surety companies executing bonds must appear on the Treasury Department's most current list (circular 570 as Amended) and be authorized to transact business in the state where the project is located.

STATUTORY BOND

No. _____

KNOW ALL MEN BY THESE PRESENTS;

That we, _____ As Principal, and _____ a Corporation organized under laws of _____, as Surety, are held and firmly bound unto the State of Oklahoma, in the amount of _____ Dollars (_____) for the payment of which we hereby bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

Dated _____

WHEREAS, the said _____ did on _____ enter into a certain contract with Okay Public Works Authority for construction of Okay 2016 Waterline Replacement Project.

WHEREAS, this bond is given in compliance with OKLAHOMA STATUTES ANNOTATED, 1941, Title 61, Sections 1 and 2, as amended.

NOW THEREFORE, the condition of the above obligation is such, that if the Principal shall pay all indebtedness incurred for labor or material or rental of machinery or equipment furnished in the construction of said a public building or in making said public improvements, then this obligation shall be void, otherwise to remain in full force and effect.

IN WITNESS WHEREOF, we have hereunto set our hands and seals the day first above written.

ATTEST: (If by Corporation)

By: _____
Bonding Company

By: _____
Attorney

MAINTENANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That _____, as principal;
and _____, as Surety, are held and firmly bound unto the Okay Public Works Authority, in the sum of _____ Dollars (\$_____) lawful money of the United States, for the payment of which, well and truly to be made, we bind ourselves, and each of us, our heirs, executors, successors and assigns, jointly and severally, firmly by these presents.

Signed, and sealed this _____ day of _____, 20__.

The said _____ entered into a contract in writing with the Okay Public Works Authority

NOW, if said project (Okay 2016 Waterline Replacement Project) so constructed by said _____ under said contract shall endure without defects caused by careless workmanship, sub-standard materials or equipment failure, and if said Principal or Surety shall pay repair costs to other utility lines owned by the owner together with the wholesale cost of utilities permitted to escape from the same, arising out of the improvements herein contemplated, for a period of one year from the date of completion of contract or date of final estimate, then and in that event this obligation shall be null and void; otherwise this obligation shall be and remain in full force and effect.

Principal

By: Attorney-in-Fact

ATTEST:

Twenty (20%) percent of Contract amount rounded to nearest \$500.00

**CERTIFICATE OF APPROVAL
OF CONTRACT AND BONDS**

I, the undersigned _____ the duly
Authorized and acting legal representative of _____
_____, _____ County

Oklahoma, do hereby certify as follows:

I have examined the construction contract between the contractor, _____
_____ and the above

named entity, and the surety bonds given by the contractor in connection with the performance of said contract, and the manner of execution of the contract and surety bonds; and I am of the opinion that each of the aforesaid agreements has been duly executed by the proper parties thereto, acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named therein; and that the foregoing contract and surety bonds constitute valid and legally binding obligations upon the parties executing the same in accordance with the terms, conditions, and provisions thereof.

Dated this _____ day of _____, _____.

Attorney

County, Oklahoma

NOTICE OF AWARD

TO: _____

PROJECT DESCRIPTION: _____

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for Bids dated _____, _____, and Information for Bidders.

You are hereby notified that your BID has been accepted for items in the amount of \$ _____.

You are required by the Information for Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance BOND, Payment BOND and certificates of insurance within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said BONDS within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID as abandoned and as a forfeiture off your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this _____ day of _____, _____.

OWNER

By

Title

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged by _____
_____ this the _____ day of _____, _____.
By _____, Title _____.

NOTICE TO PROCEED

TO: _____

Date: _____
Project: _____

You are hereby notified to commence WORK in accordance with the Agreement dated _____, on or before _____, and you are to complete the WORK within 60 consecutive calendar days thereafter. The date of completion of all WORK is therefore _____.

OWNER

By
Chairman

Title

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TOPROCEED is hereby acknowledged by _____
_____ this the _____ day of _____.
By _____, Title _____.

GENERAL CONDITIONS

TABLE OF CONTENTS

	PAGE
ARTICLE 1 - DEFINITIONS AND TERMINOLOGY.....	4
1.01 Defined Terms.....	4
1.02 Terminology.....	6
ARTICLE 2 - PRELIMINARY MATTERS.....	7
2.01 Delivery of Bonds.....	7
2.02 Copies of Documents.....	7
2.03 Commencement of Contract Times; Notice to Proceed.....	7
2.04 Starting the Work.....	7
2.05 Before Starting Construction.....	7
2.06 Preconstruction Conference.....	7
2.07 Initial Acceptance of Schedules.....	7
ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE.....	8
3.01 Intent.....	8
3.02 Reference Standards.....	8
3.03 Reporting and Resolving Discrepancies.....	8
3.04 Amending and Supplementing Contract Documents.....	8
3.05 Reuse of Documents.....	9
ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS	
REFERENCE POINTS.....	9
4.01 Availability of Lands.....	9
4.02 Subsurface and Physical Conditions.....	9
4.03 Differing Subsurface or Physical Conditions.....	9
4.04 Underground Facilities.....	10
4.05 Reference Points.....	11
4.06 Hazardous Environmental Condition at Site.....	11
ARTICLE 5 - BONDS AND INSURANCE.....	12
5.01 Performance, Payment and Other Bonds.....	12
5.02 Licensed Sureties and Insurers.....	12
5.03 Certificates of Insurance.....	12
5.04 Contractor’s Liability Insurance.....	12
5.05 Owner’s Liability Insurance.....	13
5.06 Property Insurance.....	13
5.07 Waiver of Rights.....	14
5.08 Receipt and Application of Insurance Proceeds.....	14
5.09 Acceptance of Bonds and Insurance; Option to Replace.....	15
5.10 Partial Utilization, Acknowledgment of Property Insurer.....	15
ARTICLE 6 - CONTRACTOR’S RESPONSIBILITIES.....	15
6.01 Supervision and Superintendence.....	15
6.02 Labor; Working Hours.....	15
6.03 Services, Materials, and Equipment.....	15
6.04 Progress Schedule.....	16
6.05 Substitutes and “Or-Equals”.....	16
6.06 Concerning Subcontractors, Suppliers, and Others.....	17
6.07 Patent Fees and Royalties.....	18
6.08 Permits.....	18
6.09 Laws and Regulations.....	18
6.10 Taxes.....	18
6.11 Use of Site and Other Areas.....	18
6.12 Record Documents.....	19
6.13 Safety and Protection.....	19
6.14 Safety Representative.....	19
6.15 Hazard Communication Programs.....	20
6.16 Emergencies.....	20
6.17 Shop Drawings and Samples.....	20
6.18 Continuing the Work.....	21
6.19 Contractor’s General Warranty and Guarantee.....	21

6.20	Indemnification.	21
ARTICLE 7 - OTHER WORK.		22
7.01	Related Work at Site.	22
7.02	Coordination.	22
ARTICLE 8 - OWNER'S RESPONSIBILITIES.		22
8.01	Communications to Contractor.	22
8.02	Replacement of Engineer.	22
8.03	Furnish Data.	22
8.04	Pay Promptly When Due.	23
8.05	Lands and Easements; Reports and Tests.	23
8.06	Insurance.	23
8.07	Change Orders.	23
8.08	Inspections, Tests, and Approvals.	23
8.09	Limitations on Owner's Responsibilities.	23
8.10	Undisclosed Hazardous Environmental Condition.	23
8.11	Evidence of Financial Arrangements.	23
ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION.		23
9.01	Owner's Representative.	23
9.02	Visits to Site.	23
9.03	Project Representative.	24
9.04	Clarifications and Interpretations.	24
9.05	Authorized Variations in Work.	24
9.06	Rejecting Defective Work.	24
9.07	Shop Drawings, Change Orders and Payments.	24
9.08	Determinations for Unit Price Work.	24
9.09	Decisions on Requirements of Contract Documents and Acceptability of Work.	24
9.10	Limitations on Engineer's Authority and Responsibilities.	25
ARTICLE 10 - CHANGES IN THE WORK; CLAIMS.		25
10.01	Authorized Changes in the Work.	25
10.02	Unauthorized Changes in the Work.	25
10.03	Execution of Change Orders.	25
10.04	Notification to Surety.	25
10.05	Claims and Disputes.	26
ARTICLE 11 - COST OF THE WORK; CASH ALLOWANCES,; UNIT PRICE WORK.		26
11.01	Cost of the Work.	26
11.02	Cash Allowances.	28
11.03	Unit Price Work.	28
ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES.		28
12.01	Change of Contract Price.	28
12.02	Change of Contract Times.	29
12.03	Delays Beyond Contractor's Control.	29
12.04	Delays Within Contractor's Control.	29
12.05	Delays Beyond Owner's and Contractor's Control.	29
12.06	Delay Damages.	29
ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK.		29
13.01	Notice of Defects.	29
13.02	Access to Work.	30
13.03	Tests and Inspections.	30
13.04	Uncovering Work.	30
13.05	Owner May Stop the Work.	30
13.06	Correction or Removal of Defective Work.	31
13.07	Correction Period.	31
13.08	Acceptance of Defective Work.	31
13.09	Owner May Correct Defective Work.	31
ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION.		32
14.01	Schedule of Values.	32
14.02	Progress Payments.	32
14.03	Contractor's Warranty of Title.	33
14.04	Substantial Completion.	33
14.05	Partial Utilization.	34

14.06	Final Inspection.	34
14.07	Final Payment.	34
14.08	Final Completion Delayed.	35
14.09	Waiver of Claims.	35
ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION.		35
15.01	Owner May Suspend Work.	35
15.02	Owner May Terminate for Cause.	35
15.03	Owner May Terminate for Convenience.	36
15.04	Contractor May Stop Work or Terminate.	36
ARTICLE 16 - DISPUTE RESOLUTION.		36
16.01	Methods and Procedures.	36
ARTICLE 17 - MISCELLANEOUS.		36
17.01	Giving Notice.	36
17.02	Computation of Times.	36
17.03	Cumulative Remedies.	36
17.04	Survival of Obligations.	37
17.05	Controlling Law.	37

GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01 DEFINED TERMS

A. Wherever used in the Contract Documents and printed with initial or all capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof.

1. Addenda - Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the 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. Bidding Documents - The Bidding Requirements and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

7. Bidding Requirements - The Advertisement or Invitation to Bid, Instructions to Bidders, Bid security form, if any, and the Bid form with any supplements.

8. Bonds - Performance and payment bonds and other instruments of security.

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 - The Contract Documents establish the rights and obligations of the parties and include the Agreement, Addenda (which pertain to the Contract Documents), CONTRACTOR's Bid (including documentation accompanying the Bid and any post Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Notice to Proceed, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are specifically identified in the Agreement, together with all Written Amendments, Change Orders, Work Change Directives, Field Orders, and ENGINEER's written interpretations and clarifications issued on or after the Effective Date of the Agreement. Approved Shop Drawings and the reports and drawings of subsurface and physical conditions are not Contract Documents. Only printed or hard copies of the items listed in this paragraph are Contract Documents. Files in electronic media format of text, data, graphics, and the like that may be furnished by OWNER to CONTRACTOR 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 Substantial Completion; and (ii) complete the Work so that it is ready for final payment as evidenced by ENGINEER's written recommendation of final payment.

15. Contractor - The individual or entity with whom OWNER has entered into the Agreement.

16. Cost of the Work - See paragraph 11.01.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 - The individual or entity named as such in the Agreement.

20. Engineer's Consultant - An individual or entity having a contract with ENGINEER to furnish services as ENGINEER's independent professional associate or consultant with respect to the Project and who is identified as such in the Supplementary Conditions.

21. Field Order - A written order issued by ENGINEER which requires minor change in the Work but which does not involve a change in the Contract Price or the Contract Times.

22. General Requirements - Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

23. Hazardous Environmental Condition - The presence at the Site of Asbestos, PCB's, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

24. 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.

25. 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.

26. Liens-Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

27. 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.

28. Notice of Award - The written notice by OWNER to the apparent successful bidder stating that upon timely compliance by the apparent successful bidder with the conditions precedent listed therein, OWNER will sign and deliver the Agreement.

29. 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.

30. Owner - The individual, entity, public body, or authority with whom CONTRACTOR has entered into the Agreement and for whom the work is to be performed.

31. Partial Utilization- Use by OWNER of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all the Work.

32. PCB's Polychlorinated biphenyl's.

33. 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.

34. Project - The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part as may be indicated elsewhere in the Contract Documents.

35. 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.

36. 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.

37. Resident Project Representative - The authorized representative of ENGINEER who may be assigned to the Site or any part thereof.

38. 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.

39. 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.

40. 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.

41. Specifications - That part of the Contract Documents consisting of written technical descriptions of materials, equipment, systems, standards, and workmanship as applied to the Work and certain administrative details applicable thereto.

42. 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.

43. 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.

44. Supplementary Conditions - That part of the Contract Documents which amends or supplements these General Conditions.

45. 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 any Subcontractor.

46. 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.

47. Unit Price Work - Work to be paid for on the basis of unit prices.

48. Work - The entire completed 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.

49. 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.

50. Written Amendment - A written statement modifying the Contract Documents, signed by OWNER and CONTRACTOR on or after the Effective Date of the Agreement and normally dealing with the nonengineering or nontechnical rather than strictly construction - related aspects of the Contract Documents.

1.02 TERMINOLOGY

A. Intent of Certain Terms or Adjectives

1. Whenever in the Contract Documents the terms “as allowed,” “as approved,” or terms of like effect or import are used, or 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 action or determination will be solely to evaluate, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed 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 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 9.10 or any other provision of the Contract Documents.

B. Day

1. The work “day” shall constitute a calendar day of 24 hours measured from midnight to the next midnight.

C. Defective

1. The work “defective,” when modifying the work “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it does not conform to the Contract Documents or does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents, or 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).

D. 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 conditions.

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, 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.

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

ARTICLE 2 - PRELIMINARY MATTERS

2.01 DELIVERY OF BONDS

A. When CONTRACTOR delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER such Bonds as CONTRACTOR may be required to furnish.

2.02 COPIES OF DOCUMENTS

A. OWNER shall furnish to CONTRACTOR up to ten copies of the Contract Documents. Additional copies will be furnished upon request at the cost of reproduction.

2.03 COMMENCEMENT OF CONTRACT TIMES; NOTICE TO PROCEED

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

2.04 STARTING THE WORK

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

2.05 BEFORE STARTING CONSTRUCTION

A. CONTRACTOR's Review of Contract Documents: 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 may discover and shall obtain a written interpretation or clarification from ENGINEER before proceeding with any Work affected thereby; however, 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 knew or reasonably should have known thereof.

B. Preliminary Schedules: Within ten days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), CONTRACTOR shall submit to ENGINEER for its timely review:

1. a preliminary progress schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents.
2. a preliminary schedule of Shop Drawing and Sample submittals which will list each required submittal and the times for submitting, reviewing, and processing such 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 to 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.

C. 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..

2.06 PRECONSTRUCTION CONFERENCE

A. Within 20 days after the Contract Times start to run, but before any Work at the Site is started, a conference attended by 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.B, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.07 INITIAL ACCEPTANCE OF SCHEDULES

A. Unless otherwise provided in the Contract Documents, at least ten 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.B. CONTRACTOR shall have an additional ten 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 any specified Milestones and 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 Shop Drawing and Sample submittals will be acceptable to ENGINEER if it provides a workable arrangement for reviewing and processing the required submittals.

3. CONTRACTOR's schedule of values will be acceptable to ENGINEER as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 - CONTRACT DOCUMENTS; INTENT, AMENDING, REUSE

3.01 INTENT

- A. The Contract Documents are complementary; what is called for by one is as binding as if called for 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 may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to OWNER.
- C. Clarifications and interpretations of the Contract Documents shall be issued by ENGINEER as provided in Article 9.

3.02 REFERENCE STANDARDS

- A. Standards, Specifications, Codes, Laws, and Regulations.
 - 1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 - 2. No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or responsibilities of OWNER, CONTRACTOR, or ENGINEER, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall any such provision or instruction be effective to assign to OWNER, ENGINEER, or any of ENGINEER's Consultants, agents, or employees any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 REPORTING AND RESOLVING DISCREPANCIES

- A. Reporting Discrepancies
 - 1. 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 any provisions of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of an Supplier, CONTRACTOR shall report it to ENGINEER in writing at once. 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; provided, however, that CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any such conflict, error, ambiguity, or discrepancy unless CONTRACTOR knew or reasonably should have known 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 instruction (whether or not specifically incorporated by reference in the Contract Documents); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 AMENDING AND SUPPLEMENTING CONTRACT DOCUMENTS

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways: (i) a Written Amendment; (ii) a Change Order; or (iii) 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: (i) a Field Order; (ii) ENGINEER's approval of a Shop Drawing or Sample; or (iii) ENGINEER's written interpretation or clarification.

3.05 REUSE OF DOCUMENTS

- A. CONTRACTOR and any Subcontractor or Supplier or other individual or entity performing or furnishing any of the Work under a direct or indirect contract with OWNER; (i) shall not 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 Consultant, including electronic media editions; and (ii) shall not reuse any of 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. This prohibition will survive final payment, completion, and acceptance of the Work, or termination or completion of the Contract. Nothing herein shall preclude CONTRACTOR from retaining copies of the Contract Documents for record purposes.

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

4.01 AVAILABILITY OF LANDS

A. OWNER shall furnish the Site. OWNER shall notify CONTRACTOR of any encumbrances or restrictions not of general application but specifically related to use of the Site with which CONTRACTOR must comply in performing the Work. OWNER will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If CONTRACTOR and OWNER are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in OWNER's furnishing the Site, CONTRACTOR may make a Claim therefor as provided in paragraph 10.05.

B. Upon reasonable written request, OWNER shall furnish CONTRACTOR with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and OWNER's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

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

4.02 SUBSURFACE AND PHYSICAL CONDITIONS

A. Reports and Drawings: The Supplementary Conditions identify:

1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that ENGINEER has used in preparing the Contract Documents.
2. those drawings of physical conditions in or relating to existing surface or subsurface structures 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 upon 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, ENGINEER, or any of ENGINEER's Consultants with respect to:

1. the completeness of such reports and drawings for CONTRACTOR's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by CONTRACTOR, and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. any CONTRACTOR interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 DIFFERING SUBSURFACE OR PHYSICAL CONDITIONS

A. Notice: If CONTRACTOR believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

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

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

B. ENGINEER's Review: After receipt of written notice as required by paragraph 4.03.A, ENGINEER will promptly review the pertinent condition, determine the necessity of OWNER's obtaining additional exploration or tests with respect thereto, and advise OWNER in writing (with a copy to CONTRACTOR) of ENGINEER's findings and conclusions.

C. Possible Price and Times Adjustments

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in CONTRACTOR's cost of, or time required for, performance of the Work; subject, however, to the following.
 - a. such condition must meet any one or more of the categories described in paragraph 4.03.A; and

b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of paragraphs 9.08 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 in respect of 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 within the time and 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, OWNER, ENGINEER, and ENGINEER's Consultants 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.

4.04 UNDERGROUND FACILITIES

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

1. OWNER and ENGINEER shall not be responsible for the accuracy or completeness of any such information or data; and

2. the cost of all of the following will be included in the Contract Price, and CONTRACTOR shall have full responsibility for:

a. reviewing and checking all such information and data,

b. locating all Underground Facilities shown or indicated in the Contract Documents.

c. coordination of the Work with the owners of such Underground Facilities, including OWNER, during construction, and

d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. Not Shown or Indicated

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to OWNER and ENGINEER. ENGINEER will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, CONTRACTOR shall be responsible for the safety and protection of such Underground Facility.

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

4.05 REFERENCE POINTS

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

4.06 HAZARDOUS ENVIRONMENTAL CONDITION AT SITE

A. Reports and Drawings: Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the ENGINEER in the preparation of the Contract Documents.

B. Limited Reliance by CONTRACTOR on Technical Data Authorized: CONTRACTOR may rely upon 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, ENGINEER or any of ENGINEER's Consultants with respect to:

1. the completeness of such reports and drawings for CONTRACTOR's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any CONTRACTOR interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

C. CONTRACTOR shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. CONTRACTOR shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by CONTRACTOR, Subcontractors, Suppliers, or anyone else for whom CONTRACTOR is responsible.

D. If CONTRACTOR encounters a Hazardous Environmental Condition or if CONTRACTOR or anyone for whom CONTRACTOR is responsible creates a Hazardous Environmental Condition, CONTRACTOR shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by paragraph 6.16); 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.

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 resume by CONTRACTOR, either party may make a Claim therefor as provided in paragraph 10.05.

F. If after receipt of such written notice CONTRACTOR does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then OWNER may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If OWNER and CONTRACTOR cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in paragraph 10.05. OWNER may have such deleted portion of the work performed by OWNER's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, OWNER shall indemnify and hold harmless CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants and the officers, directors, partners, employees, agents, other consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by CONTRACTOR or by anyone for whom CONTRACTOR is responsible. Nothing in this paragraph 4.06.E shall obligate OWNER to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees, agents, other 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.F shall obligate CONTRACTOR to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

I. The provisions of paragraphs 4.02, 4.03, and 4.04 are not intended to apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 - BONDS AND INSURANCE

5.01 PERFORMANCE, PAYMENT, AND OTHER BONDS

A. CONTRACTOR shall furnish performance and payment Bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all CONTRACTOR's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents. CONTRACTOR shall also furnish such the 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 current 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 must be accompanied by a certified copy of such agent's authority to act.

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 within 20 days thereafter substitute another Bond and surety, both of which shall comply with the requirements of paragraphs 5.01.B and 5.02.

5.02 LICENSED SURETIES AND INSURERS

A. All Bonds and insurance required by the Contract Documents to be purchased and maintained by OWNER or CONTRACTOR shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue Bonds or insurance policies for the limits and coverage's so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 CERTIFICATES OF INSURANCE

A. CONTRACTOR shall deliver to OWNER, with copies to each additional insured 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. OWNER shall deliver to CONTRACTOR, with copies to each additional insured 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.

5.04 CONTRACTOR'S LIABILITY INSURANCE

A. CONTRACTOR shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of our 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 worker's 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; (i) by any person as a result of an offense directly or indirectly related to the employment of such person by CONTRACTOR, or (ii) 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 to be purchased and maintained shall:

1. with respect to insurance required by paragraphs 5.04.A.3 through 5.04.A.6 inclusive, include as additional insured (subject to any customary exclusion in respect of professional liability) OWNER, ENGINEER, ENGINEER's Consultants, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insured, and include coverage for the respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insured shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverage's 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 completed operations insurance;
4. include contractual liability insurance covering CONTRACTOR's indemnity obligations under paragraphs 6.07, 6.11, and 6.20;
5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least thirty 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);
6. 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
7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment (and CONTRACTOR shall furnish OWNER and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to OWNER and any such additional insured of continuation of such insurance at final payment and one year thereafter).

5.05 OWNER'S LIABILITY INSURANCE

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

5.06 PROPERTY INSURANCE

A. Unless otherwise provided in the Supplementary Conditions, OWNER shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

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

B. OWNER shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and any other individuals or entities identified in the Supplementary Conditions, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to OWNER and CONTRACTOR and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with paragraph 5.07.

D. OWNER shall not be responsible for purchasing and maintaining any property insurance specified in this paragraph 5.06 to protect the interests of CONTRACTOR, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified

deductible amount will be borne by CONTRACTOR, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

E. If CONTRACTOR requests in writing that other special insurance be included in the property insurance policies provided under paragraph 5.06, OWNER shall, if possible, include such insurance, and the cost thereof will be charged to CONTRACTOR by appropriate Change Order or Written Amendment. Prior to commencement of the Work at the Site, OWNER shall in writing advise CONTRACTOR whether or not such other insurance has been procured by OWNER.

5.07 WAIVER OF RIGHTS

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

B. OWNER waives all rights against CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to OWNER's property or the Work caused by, arising out of, or resulting from fire or other peril whether or not insured by OWNER; and
2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by OWNER during partial utilization pursuant to paragraph 14.05, after Substantial Completion pursuant to paragraph 14.04, or after final payment pursuant to paragraph 14.07.

C. Any insurance policy maintained by OWNER covering any loss, damage or consequential loss referred to in paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against CONTRACTOR, Subcontractors, ENGINEER, or ENGINEER's Consultants and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them.

5.08 RECEIPT AND APPLICATION OF INSURANCE PROCEEDS

A. Any insured loss under the policies of insurance required by paragraph 5.06 will be adjusted with OWNER and made payable to OWNER as fiduciary for the insureds, as their interests may appear, subject to the requirement of any applicable mortgage clause and of paragraph 5.08.B. OWNER shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order or Written Amendment.

B. OWNER as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to OWNER's exercise of this power. If such objection be made, OWNER as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, OWNER as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, OWNER as fiduciary shall give bond for the proper performance of such duties.

5.09 ACCEPTANCE OF BONDS AND INSURANCE; OPTION TO REPLACE

A. If either OWNER or CONTRACTOR has any objection to the coverage afforded by or other provisions of the Bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by paragraph 2.05.C.

OWNER and CONTRACTOR shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the Bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent Bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 PARTIAL UTILIZATION, ACKNOWLEDGMENT OF PROPERTY INSURER

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

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.01 SUPERVISION AND SUPERINTENDENCE

A. CONTRACTOR shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction, but 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. CONTRACTOR shall be responsible to see that the completed Work complies accurately with the Contract Documents.

B. At all times during the progress of the Work, CONTRACTOR shall assign a competent resident superintendent thereto who shall not be replaced without written notice to OWNER and ENGINEER except under extraordinary circumstances. 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.

6.02 LABOR; WORK HOURS

A. CONTRACTOR shall provide competent, suitably qualified personnel to survey, lay out, and construct the Work 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, and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday, or any legal holiday without OWNER's written consent (which will not be unreasonably withheld) given after prior written notice to ENGINEER.

6.03 SERVICES, MATERIALS, AND EQUIPMENT

A. Unless otherwise specified in the General Requirements, 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 warranties and guarantees specifically called for 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. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 PROGRESS SCHEDULE

A. CONTRACTOR shall adhere to the progress schedule established in accordance with paragraph 2.07 as it may be adjusted from time to time as provided below.

1. CONTRACTOR shall submit to ENGINEER for acceptance (to the extent indicated in paragraph 2.07) proposed adjustments in the progress schedule that will not result in changing the Contract Times (or Milestones). Such adjustments will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the progress schedule that will change the Contract Times (or Milestones) shall be submitted in accordance with the requirements of Article 12. Such adjustments may only be made by a Change Order or Written Amendment in accordance with Article 12.

6.05 SUBSTITUTES AND "OR-EQUALS"

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to ENGINEER for review under the circumstances described below.

1. "Or-Equal" Items: If in ENGINEER's sole discretion an item of material or equipment proposed by CONTRACTOR is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by ENGINEER as an "or-equal" item, in which case review and approval of the

proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

- a. in the exercise of reasonable judgment ENGINEER determines that: (i) it is at least equal in quality, durability, appearance, strength, and design characteristics; (ii) it will reliably perform at least equally well the function imposed by the design concept of the completed Project as a functioning whole, and;
- b. CONTRACTOR certifies that (i) there is no increase in cost to the OWNER; and (ii) it will conform substantially, even with deviations, 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 that 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 procedure for review by ENGINEER will be as set forth in paragraph 6.05.A.2.d, as supplemented in the General Requirements and as ENGINEER may decide is appropriate under the circumstances.
- d. CONTRACTOR shall first 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 shall certify that the proposed substitute item will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified, and be suited to the same use as that specified. The application will state the extent, if any, to which the use of the proposed substitute item will prejudice CONTRACTOR's achievement of Substantial Completion on time, whether or not 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 work on the Project) to adapt the design to the proposed substitute item and whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute item from that specified will be identified in the application, and available engineering, sales, maintenance, repair, and replacement services will be indicated. The application will also 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, all of which will be considered by ENGINEER in evaluating the proposed substitute item. ENGINEER may require CONTRACTOR to furnish additional data about the proposed substitute item.

B. Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence, or procedure of construction is shown or indicated in and 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 procedure for review by ENGINEER will be similar to that provided in subparagraph 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 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 either a Change Order for a substitute or 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 time required by ENGINEER and ENGINEER's Consultants in evaluating substitute proposed or submitted by CONTRACTOR pursuant to paragraphs 6.05.A.2 and 6.05.B and in making changes in the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) occasioned thereby. Whether or not ENGINEER approves a substitute item so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER's Consultants for evaluating each such proposed substitute.

F. CONTRACTOR's Expense: CONTRACTOR shall provide all data in support of any proposed substitute or "or-equal" at CONTRACTOR's expense.

6.06 CONCERNING SUBCONTRACTORS, SUPPLIERS, AND OTHERS

A. CONTRACTOR shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to OWNER as indicated in paragraph 6.06.B), whether initially or as a replacement, against whom OWNER may have reasonable objection. CONTRACTOR shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom CONTRACTOR has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to OWNER in advance for acceptance by OWNER by a specified date prior to the Effective Date of the Agreement, and if CONTRACTOR has submitted a list thereof in accordance with the Supplementary Conditions, OWNER's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. CONTRACTOR shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued or Written Amendment signed. 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, Supplies, 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 shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between OWNER or ENGINEER any such Subcontractor, Supplier or other individual or entity, nor shall it 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 amount 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 an additional insured 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, ENGINEER's Consultants, and all other individuals or entities identified in the Supplementary Conditions to be listed as insured or additional insureds (and the officers, directors, partners, employees, agents, and other consultants and subcontractor of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, CONTRACTOR will obtain the same.

6.07 PATENT FEES AND ROYALTIES

A. CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject to 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. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees or agents, and other consultants of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 PERMITS

A. Unless otherwise provided in the Supplementary Conditions, CONTRACTOR shall obtain and pay for all construction permits and licenses. OWNER shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the

Agreement. CONTRACTOR shall pay all charges of utility owners for connections to the Work, and OWNER shall pay all charges of such utility owners for capital costs related thereto, such as plant investment fees.

6.09 LAWS AND REGULATIONS

A. CONTRACTOR shall give all notices and 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 may 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, ENGINEER, ENGINEER's Consultant, and the officers, directors, partners, employees, agents, and other consultants 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 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, Written Amendments, 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. 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. 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 ENGINEER's Consultant, 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). 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 to ENGINEER for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. All submittals will be identified as ENGINEER may require and in the number of copies specified in the General Requirements. The 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.E.

B. CONTRACTOR shall also submit Samples to ENGINEER for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. Each Sample will be identified clearly as to material, Supplier, pertinent data such as catalog numbers, and the use for which intended and otherwise as ENGINEER may require to enable ENGINEER to review the submittal for the limited purposes required by paragraph 6.17.E. The numbers of each Sample to be submitted will be as specified in the Specifications.

C. Where a Shop Drawing or Sample is required by the Contract Documents or the schedule of Shop Drawings and Sample submittals acceptable to ENGINEER as required by paragraph 2.07, 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.

D. Submittal Procedures

1. Before submitting each Shop Drawing or Sample, CONTRACTOR shall have determined and verified:
 - a. all field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
 - b. all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;
 - c. all information relative to means, methods, techniques, sequences, and procedures of construction and safety precautions and programs incident thereto; and
 - d. CONTRACTOR shall also have 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.
2. Each submittal shall bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's obligations under the Contract Documents with respect to CONTRACTOR's review and approval of that submittal.
3. At the time of each submittal, CONTRACTOR shall give ENGINEER specific written notice of such variations, if any, that the Shop Drawing or Sample submitted may have from the requirements of the Contract Documents, such notice to be in a written communication separate from the submittal; and, in addition, shall cause a specific notation to be made on each Shop Drawing and Sample submitted to ENGINEER for review and approval of each such variation.

E. Engineer's Review

1. ENGINEER will timely review and approve Shop Drawings and Samples in accordance with the schedule of Shop Drawings and Sample 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 of Shop Drawings or Samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called ENGINEER's attention to each such variation at the time of each submittal as required by paragraph 6.17.D.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 approval; nor will any approval by ENGINEER relieve CONTRACTOR from responsibility for complying with the requirements of paragraph 6.17.D.1.

F. 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, ENGINEER, and ENGINEER's Consultants that all work will be in accordance with the Contract Documents and will not be defective. 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.

B. 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 acceptance by OWNER or any failure to do so;
6. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by ENGINEER;
7. any inspection, test, or approval by others; or
8. 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, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to 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 tangible property (other than the Work itself), including the loss of use resulting therefrom; and
2. is caused in whole or in part by any negligent act or omission of CONTRACTOR, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable, regardless of whether or not caused in part by any negligence or omission of an individual or entity indemnified hereunder or whether liability is imposed upon such indemnified party by Laws and Regulations regardless of the negligence of any such individual or entity.

B. In any and all claims against OWNER or ENGINEER or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of CONTRACTOR, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for CONTRACTOR or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of CONTRACTOR under paragraph 6.20.A shall not extend to the liability of ENGINEER and ENGINEER's Consultants or to the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them arising out of:

1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

ARTICLE 7 - OTHER WORK

7.01 RELATED WORK AT SITE

A. OWNER may perform other work related to the Project at the Site by OWNER's employees, or let 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 and each utility owner (and OWNER, if OWNER is performing the other work with OWNER's employees) proper and safe access to the Site and 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. Unless otherwise provided in the Contract Documents, 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 their work and will only cut or alter their work with the written consent of ENGINEER and the others whose work will be affected. The duties and responsibilities of CONTRACTOR under this paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of CONTRACTOR in said direct contracts between OWNER and such utility owners and other contractors.

C. If the proper execution or results of any part of CONTRACTOR's Work depends upon work performed by others under this Article 7, CONTRACTOR shall inspect such other work and promptly report to ENGINEER in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of CONTRACTOR's Work. CONTRACTOR's failure to so report will constitute an acceptance of such other work as fit and proper for integration with CONTRACTOR's Work except for latent defects and deficiencies in such other work. that render it unavailable or unsuitable for the proper execution and results of CONTRACTOR's Work. CONTRACTOR's failure to so report will constitute an acceptance of such other work as fit and proper for integration with CONTRACTOR's work except for latent defects and deficiencies in such other work.

7.02 COORDINATION

A. If OWNER intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
2. the specific matters to be covered by such authority and responsibility will be itemized; and
3. the extent of such authority and responsibilities will be provided.

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

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.01 COMMUNICATIONS TO CONTRACTOR

A. Except as otherwise provided in these General Conditions, OWNER shall issue all communications to CONTRACTOR through ENGINEER.

8.02 REPLACEMENT OF ENGINEER

A. In case of termination of the employment of ENGINEER, OWNER shall appoint an engineer to whom CONTRACTOR makes no reasonable objection, whose status under the Contract Documents shall be that of the former ENGINEER.

8.03 FURNISH DATA

A. OWNER shall promptly furnish the data required of OWNER under the Contract Document.

8.04 PAY PROMPTLY WHEN DUE

A. OWNER shall make payments to CONTRACTOR promptly when they are due as provided in paragraphs 14.02.C and 14.07.C.

8.05 LANDS AND EASEMENTS; REPORTS AND TESTS

A. OWNER's duties in respect of 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 in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by ENGINEER in preparing the Contract Documents.

8.06 INSURANCE

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

8.07 CHANGE ORDERS

A. OWNER is obligated to execute Change Orders as indicated in paragraph 10.03.

8.08 INSPECTIONS, TESTS, AND APPROVALS.

A. OWNER's responsibility in respect to certain inspections, tests, and approvals is set forth in paragraph 13.03.B.

8.09 LIMITATIONS ON OWNER'S RESPONSIBILITIES

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

8.10 UNDISCLOSED HAZARDOUS ENVIRONMENTAL CONDITION

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

8.11 EVIDENCE OF FINANCIAL ARRANGEMENTS

A. 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.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.01 OWNER'S REPRESENTATIVE

A. ENGINEER will be OWNER's representative during the construction period. The duties and responsibilities and the limitations of authority of ENGINEER as OWNER's representative during construction are set forth in the Contract Documents and will not be changed without written consent of OWNER and ENGINEER.

9.02 VISITS TO SITE

A. ENGINEER will make visits to the Site at intervals appropriate to the various stages of construction as ENGINEER deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of CONTRACTOR's executed Work. Based on information obtained during such visits and observations, ENGINEER, for the benefit of OWNER, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. ENGINEER will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. ENGINEER's efforts will be directed toward providing for OWNER a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, ENGINEER will keep OWNER informed of the progress of the Work and will endeavor to guard OWNER against defective Work.

B. ENGINEER's visits and observations are subject to all the limitations on ENGINEER's authority and responsibility set forth in paragraph 9.10, and particularly, but without limitation, during or as a result of ENGINEER's visits or observations of CONTRACTOR's Work ENGINEER will not supervise, direct, control, or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the performance of the Work.

9.03 PROJECT REPRESENTATIVE

A. If OWNER and ENGINEER agree, ENGINEER will furnish a Resident Project Representative to assist ENGINEER in providing more extensive observation of the Work. The responsibilities and authority and limitations thereon of any such Resident Project Representative and assistants will be as provided in paragraph 9.10 and in the Supplementary Conditions. If OWNER designates another representative or agent to represent OWNER at the Site who is not ENGINEER's Consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 CLARIFICATIONS AND INTERPRETATIONS

A. ENGINEER will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents as ENGINEER may determine necessary, which shall be consistent with the intent of and reasonably inferable from the Contract Documents. Such written clarifications and interpretations will be binding on OWNER and CONTRACTOR. 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, that should be allowed as a result of a written clarification or interpretation, a Claim may be made therefor as provided in paragraph 10.05.

9.05 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 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, as a result of a Field Order, a Claim may be made therefor as provided in paragraph 10.05.

9.06 REJECTING DEFECTIVE WORK

A. ENGINEER will have authority to disapprove or 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.

9.07 SHOP DRAWINGS, CHANGE ORDERS AND PAYMENTS

- A. In connection with ENGINEER's authority as to Shop Drawings and Samples, see paragraph 6.17.
- B. In connection with ENGINEER's authority as to Change Orders, see Articles 10, 11, and 12.

C. In connection with ENGINEER's authority as to Applications for Payment, see Article 14.

9.08 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.

9.09 DECISIONS ON REQUIREMENTS OF CONTRACT DOCUMENTS AND ACCEPTABILITY OF WORK

A. ENGINEER will be the initial interpreter of the requirement of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work, the quantities and classifications of Unit Price Work, the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, and Claims seeking changes in the Contract Price or Contract Times will be referred initially to ENGINEER in writing, in accordance with the provisions of paragraph 10.05, with a request for a formal decision.

B. When functioning as interpreter and judge under this paragraph 9.09, 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. The rendering of a decision by ENGINEER pursuant to this paragraph 9.09 with respect to any such Claim, dispute, or the matter (except any which have been waived by the making or acceptance of final payment as provided in paragraph 14.07) will be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such Claim, dispute, or other matter.

9.10 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, 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 9.10 shall also apply to ENGINEER's Consultants, Resident Project Representative, and assistants.

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

10.01 AUTHORIZED CHANGES IN THE WORK

A. without invalidating the Agreement 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 Written Amendment, a Change Order, or a Work Change Directive. Upon receipt of any such document, CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If OWNER and CONTRACTOR are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in paragraph 10.05.

10.02 UNAUTHORIZED CHANGES IN THE WORK

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

10.03 EXECUTION OF CHANGE ORDERS

A. OWNER and CONTRACTOR shall execute appropriate Change Orders recommended by ENGINEER (or Written Amendments) covering:

1. changes in the work which are : (i) ordered by OWNER pursuant to paragraph 10.01.A, (ii) required because of acceptance of defective Work under paragraph 13.08.A or OWNER's correction of defective Work under paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by ENGINEER pursuant to paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, CONTRACTOR shall carry on the Work and adhere to the progress schedule as provided in paragraph 6.18.A.

10.04 NOTIFICATION TO SURETY

A. If notice 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) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be CONTRACTOR's responsibility. The amount of each applicable Bond will be adjusted to reflect the effect of any such change.

10.05 CLAIMS AND DISPUTES

A. Notice: Written notice stating the general nature of each Claim, dispute, or other matter 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. Notice of the amount or extent of the Claim, dispute, or other matter 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, dispute, or other matter). 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 Price shall be prepared in accordance with the provisions of paragraph 12.01.B. A Claim for an adjustment in Contract Time 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 submittals (unless ENGINEER allows additional time).

B. ENGINEER's Decisions: ENGINEER will render a formal decision in writing within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any. ENGINEER's written decision on such Claim, dispute, or other matter will be final and binding upon OWNER and CONTRACTOR unless:

1. an appeal from ENGINEER's decision is taken within the time limits and in accordance with the dispute resolution procedures set forth in Article 16; or

2. if no such dispute resolution procedures have been set forth in Article 16, a written notice of intention to appeal from ENGINEER's written decision is delivered by OWNER or CONTRACTOR to the other and to ENGINEER within 30 days after the date of such decision, and a formal proceeding is instituted by the appealing party in a forum of competent jurisdiction within 60 days after the date of such decision or within 60 days after Substantial

Completion, whichever is later (unless otherwise agreed in writing by OWNER and CONTRACTOR), to exercise such rights or remedies as the appealing party may have with respect to such Claim, dispute, or other matter in accordance with applicable Laws and Regulations.

C. If ENGINEER does not render a formal decision in writing within the time state in paragraph 10.05.B, a decision denying the Claim in its entirety shall be deemed to have been issued 31 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.

D. No Claim for an adjustment in Contract Price or Contract Times (or Milestones) will be valid if not submitted in accordance with this paragraph 10.05.

ARTICLE 11 - COST OF THE WORK; CASH ALLOWANCES, UNIT PRICE WORK

11.01 COST OF THE WORK

A. Costs Included: The term Cost of the Work means the sum of all costs 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 include only the following items, and shall not include any of the costs itemized in paragraph 11.01.B.

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 at the Site. 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 advise 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, expressage, and similar petty cash items in connection with the Work.

i. When the cost of the Work is used to determine the value of a Change Order or of a Claim, the cost of premiums for additional Bonds and insurance required because of the changes in the Work or caused by the event giving rise to the Claim.

j. When all the work is performed on the basis of cost-plus, 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 (or partnerships and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by CONTRACTOR, whether at the Site or in CONTRACTOR's principal or branch office for general administration of the work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 11.01.A.1 or specifically covered by paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the CONTRACTOR's fee.

2. Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the Site.

3. Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the Work and charges against CONTRACTOR for delinquent payments.

4. Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 11.01.A and 11.01.B.

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 determine pursuant to paragraphs 11.01.A and 11.01.B, CONTRACTOR will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to ENGINEER an itemized cost breakdown together with supporting data.

11.02 CASH 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 as may be acceptable to OWNER and ENGINEER. CONTRACTOR agrees that:

1. the 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

2. CONTRACTOR's costs for unloading and handling on the Site, labor, installation costs, overhead, profit, and other expenses contemplated for the 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.

B. Prior to final payment, an appropriate Change Order will be issued as recommended by ENGINEER to reflect actual amounts due CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 UNIT PRICE WORK

A. Where the Contract Documents provide that all or part of the work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. 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 9.08.

B. 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.

C. 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 any other item of Work; and

3. if CONTRACTOR believes that CONTRACTOR is entitled to an increase in Contract Price as a result of having incurred additional expense or OWNER believes that OWNER is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

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

12.01 CHANGE OF CONTRACT PRICE

A. The Contract Price may only be changed by a Change Order or by a Written Amendment. 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 1.01.C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and CONTRACTOR will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
 - d. no fee shall be payable on the basis of costs itemized under paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
 - e. the amount of credit to be allowed by CONTRACTOR to OWNER for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in CONTRACTOR's fee by an amount equal to five percent of such net decrease; and
 - f. when both additions and credits are involved in any one change, the adjustment in CONTRACTOR's fee shall be computed on the basis of the net change in accordance with paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 CHANGE OF CONTRACT TIMES

A. The Contract Times (or Milestones) may only be changed by a Change Order or by a Written Amendment. Any Claim for an adjustment in the Contract Times (or Milestones) 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 (or Milestones) covered by a Change Order or of any Claim for an adjustment in the Contract Times (or Milestones) will be determined in accordance with the provisions of this Article 12.

12.03 DELAYS BEYOND CONTRACTOR'S CONTROL

A. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of CONTRACTOR, the Contract Times (or Milestones) 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.

12.04 DELAYS WITHIN CONTRACTOR'S CONTROL

A. The Contract Times (or Milestones) will not be extended due to 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.

12.05 DELAYS BEYOND OWNER'S AND CONTRACTOR'S CONTROL

A. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of both OWNER and CONTRACTOR, an extension of the Contract Times (or Milestones) in an amount equal to the time lost due to such delay shall be CONTRACTOR's sole and exclusive remedy for such delay.

12.06 DELAY DAMAGES

A. In no event shall OWNER or ENGINEER be liable to CONTRACTOR, any Subcontractor, any Supplier, or any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from:

1. delays caused by or within the control of CONTRACTOR; or
2. delays beyond the control of both OWNER and CONTRACTOR including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God, or acts or neglect by utility owner or other contractors performing other work as contemplated by Article 7.

B. Nothing in this paragraph 12.06 bars a change in Contract Price pursuant to this Article 12 to compensate CONTRACTOR due to delay, interference, or disruption directly attributable to actions or inaction's of OWNER or anyone for whom OWNER is responsible.

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

13.01 NOTICE OF DEFECTS

A. Prompt notice of all defective Work of which OWNER or ENGINEER has actual knowledge will be given to CONTRACTOR. All defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 ACCESS TO WORK

A. OWNER, ENGINEER, ENGINEER's Consultants, 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, inspecting, 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.

13.03 TESTS AND INSPECTIONS

A. CONTRACTOR shall give ENGINEER timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. OWNER shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by paragraphs 13.03.C and 13.03.D below;
2. that costs incurred in connection with tests or inspections conducted pursuant to paragraph 13.04.B

shall be paid as provided in said paragraph 13.04.B; 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, testing, 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 inspection, tests, or approvals shall be performed by organization 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, it must, if requested by ENGINEER, be uncovered 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 an ENGINEER has not acted with reasonable promptness in response to such notice.

13.04 UNCOVERING WORK

A. If any Work is covered contrary to the written request of ENGINEER, it must, if requested by ENGINEER, be uncovered for ENGINEER's observation and replaced at CONTRACTOR'S expense.

B. If ENGINEER considers it necessary or advisable that covered Work be observed by ENGINEER or inspected or tested by others, CONTRACTOR, at ENGINEER's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as ENGINEER may require, that portion of the work in questions, furnishing all necessary labor, material, and equipment. If it is found that such 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. If, however, such 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 Milestones), or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a Claim therefor as provided in paragraph 10.05.

13.05 OWNER MAY STOP THE WORK

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

13.06 CORRECTION OR REMOVAL OF DEFECTIVE WORK

A. 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).

13.07 CORRECTION PERIOD

A. If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or 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; (i) repair such defective land or areas, or (ii) correct such defective Work or, if the defective Work has been rejected by OWNER, remove it from the Project and replace it with work that is not defective, and (iii) 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. If CONTRACTOR does not promptly comply with the terms of such 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, and all Claims, costs, losses, and damages (including but 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.

B. 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 or by Written Amendment.

C. 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 from an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

D. CONTRACTOR's obligations under this paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

13.08 ACCEPTANCE OF DEFECTIVE WORK

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

13.09 OWNER MAY CORRECT DEFECTIVE WORK

A. If CONTRACTOR fails within a reasonable time after written notice from ENGINEER to correct defective Work or to remove and replace rejected Work as required by ENGINEER in accordance with paragraph

13.06.A, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Document, OWNER may, after several days written notice to CONTRACTOR, correct and remedy any such deficiency.

B. In exercising the rights and remedies under this paragraph, OWNER shall proceed expeditiously. In connection with such corrective and 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 (or Milestones) because of any delay in the performance of the Work attributable to the exercise by OWNER of OWNER's rights and remedies under this paragraph 13.09.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 SCHEDULE OF VALUES

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

14.02 PROGRESS PAYMENTS

A. Applications for Payments

1. At least 20 days before the date established 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 on the Site 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 9.08, 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: (i) 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 (ii) that 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 to supervise, direct, or control the Work or for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for CONTRACTOR's failure to comply with Laws and Regulations applicable to CONTRACTOR's performance of the Work. Additionally, said review or recommendation will not impose responsibility on ENGINEER to make any examination to ascertain how or for what purposes CONTRACTOR has used the moneys paid on account of the Contract Price, or to determine that title to any of the Work, materials, or equipment has passed to OWNER free and clean 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 referred to 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 Written Amendment or 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 must 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 corrects to OWNER's satisfaction the reasons for such action.

3. If it is subsequently determined 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.

14.03 CONTRACTOR'S WARRANTY OF TITLE

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

14.04 SUBSTANTIAL COMPLETION

A. When CONTRACTOR considers the entire Work ready for its intended use CONTRACTOR shall notify OWNER and ENGINEER in writing that the entire Work is substantially complete (except for items specifically listed by CONTRACTOR as incomplete) and request that ENGINEER issue a certificate of Substantial Completion. Promptly thereafter, 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. If ENGINEER considers the Work substantially complete, ENGINEER will prepare and 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. 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.

B. OWNER shall have the right to exclude CONTRACTOR from the Site after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

14.05 PARTIAL UTILIZATION

A. Use by OWNER at OWNER's option of 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 may be accomplished prior to Substantial Completion of all the Work subject to the following conditions.

1. OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and substantially complete. If CONTRACTOR agrees that such part of the Work is substantially complete, CONTRACTOR will certify to OWNER and ENGINEER that such part of the Work is substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. 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. Within 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.

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

14.06 FINAL INSPECTION

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

14.07 FINAL PAYMENT

A. Application for Payment

1. After CONTRACTOR has, in the opinion of ENGINEER, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents (as provided in paragraph 6.12), and other documents, CONTRACTOR may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by: (i) all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by subparagraph 5.04.B.7; (ii) consent of the surety, if any, to final payment; and (iii) complete and legally effective releases or waivers (satisfactory to OWNER) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in paragraph 14.07.A.2 and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full and an affidavit of CONTRACTOR that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which OWNER or OWNER's property might in any way be responsible 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. 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, 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 will become due and, when due, will be paid by OWNER to CONTRACTOR.

14.08 FINAL COMPLETION DELAYED

A. If, through no fault of CONTRACTOR, final completion of the work is significantly delayed, and if ENGINEER so confirms, OWNER shall, upon receipt of Contractor's final Application for Payment and recommendation of ENGINEER, and without terminating the Agreement, make payment of the balance due for that

portion of the Work fully completed and accepted. If the remaining balance to be held by OWNER for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if Bonds have been furnished as required in paragraph 5.01, the written consent of the Surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to ENGINEER with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 WAIVER OF CLAIMS

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by OWNER against CONTRACTOR, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from CONTRACTOR's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by CONTRACTOR against OWNER other than those previously made in writing which are still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 OWNER MAY SUSPEND WORK

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

15.02 OWNER MAY TERMINATE FOR CAUSE

A. The occurrence of any one or more of the following events will justify termination for cause:

1. CONTRACTOR's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under paragraph 2.07 as adjusted from time to time pursuant to paragraph 6.04);

2. CONTRACTOR's disregard of Laws or Regulations of any public body having jurisdiction;

3. CONTRACTOR's disregard of the authority of ENGINEER; or

4. CONTRACTOR's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more the events identified in paragraph 15.02.A occur, OWNER may, after giving CONTRACTOR (and the surety, if any) seven days written notice, terminate the services of CONTRACTOR, 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), 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 Finish the work as OWNER may deem expedient. In such case, CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. 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.

C. 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.

15.03 OWNER MAY TERMINATE FOR CONVENIENCE

A. Upon seven days written notice to CONTRACTOR and ENGINEER, OWNER may, without cause and without prejudice to any other right or remedy of OWNER, elect to terminate the Contract. In such case, CONTRACTOR shall be paid (without duplication of any items):

1. for 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. for expenses sustained prior to the effective date of termination in performing services and furnishing labor, material, 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. for 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. for reasonable expenses directly attributable to termination.

B. CONTRACTOR shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 CONTRACTOR MAY STOP WORK OR TERMINATE

A. If, through no act or fault of CONTRACTOR, the Work is suspended for more than 90 consecutive days by OWNER or under an order of court or other public authority, or ENGINEER fails to act on any Application for Payment within 30 days after it is submitted, or 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. 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 paragraphs 9.09 and 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

17.01 GIVING NOTICE

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if 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 if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 COMPUTATION OF TIMES

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

17.03 CUMULATIVE REMEDIES

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

17.04 SURVIVAL OF OBLIGATIONS

A. All representations, indemnification's, 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 Agreement.

17.05 CONTROLLING LAW

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

SUPPLEMENTAL CONDITIONS

1. REFERENCE GENERAL CONDITIONS, ARTICLE 2, PARAGRAPH 2.01: Provide BONDS in the face amount of the BID or CONTRACT as prescribed on the BOND forms contained in the BID DOCUMENTS.
2. REFERENCE GENERAL CONDITIONS, ARTICLE 2, PARAGRAPH 2.02: Modify the paragraph to read as follows; OWNER will provide up to three (3) copies of the CONTRACT DOCUMENTS. CONTRACTOR shall secure other copies directly from ENGINEER, upon request, at the ENGINEERS customary charge.
3. REFERENCE GENERAL CONDITIONS, ARTICLE 2, PARAGRAPH 2.03: Delete paragraph 2.03 in its entirety and substitute; The Contract Time will commence to run on the date set out in the NOTICE TO PROCEED.
4. REFERENCE GENERAL CONDITIONS, ARTICLE 2, PARAGRAPH 2.04: Delete paragraph 2.04 in its entirety and substitute as follows; CONTRACTOR shall start to perform the work on or before the date when the contract time commences to run, as set forth in the NOTICE TO PROCEED.
5. REFERENCE GENERAL CONDITIONS, ARTICLE 2, PARAGRAPH 2.05C: Delete the following language from paragraph 2.05C and provide insurance meeting the requirements of these supplemental conditions, " and OWNER shall deliver to CONTRACTOR certificates (and other evidence of insurance requested by CONTRACTOR) which OWNER is required to purchase and maintain in accordance with Article 5."
6. REFERENCE GENERAL CONDITIONS, ARTICLE 5, PARAGRAPH 5.03, Certificates of Insurance: Delete the following "OWNER shall deliver to CONTRACTOR, with copies to each additional insured identified in the Supplemental Conditions, Certificates of Insurance (and other evidence of insurance requested by CONTRACTOR or any other additional insured's) which OWNER is required to purchase and maintain."
7. REFERENCE GENERAL CONDITIONS, ARTICLE 5, PARAGRAPH 5.04B7: Delete in its entirety
8. REFERENCE GENERAL CONDITIONS, ARTICLE 5, and PARAGRAPH 5.04: Provide insurance coverage with the following minimum amounts;
 - a. Contractors General Public Liability and Property Damage Insurance, including vehicle coverage, issued to the Contractor and protecting the Contractor from all claims for personal injury, including death, and all claims for destruction of or damage to property, arising out of or in connection with any operations under the CONTRACT DOCUMENTS, whether such operations be by the Contractor or by any Subcontractor employed by the Contractor or anyone directly or indirectly employed by the Contractor or by a Subcontractor employed by the Contractor. Insurance shall be written with a limits of liability of not less than \$1,000,000 for all damages arising out of bodily injury, including death, at any time resulting there from, sustained by any one person in any one accident; and a limit of liability of not less than \$1,000,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than \$500,000 for all property damages sustained by any one person in any one accident; and a limit of liability of not less than \$500,000 aggregate for any such damages sustained by two or more persons in any one accident.
 - b. The Contractor shall procure and maintain, at the Contractors own expense, during the contract time, in accordance with the provisions of the laws of the State of Oklahoma, Workman's Compensation Insurance, including occupational disease provisions, for all of the Contractors employees at the site of the project and in case any work is sublet, the Contractor shall require such Subcontractor similarly to provide Workman's Compensation Insurance, including occupational disease provisions for all of the

latter's employees, unless such employees are covered by the protection afforded by the Contractor. In case any class of employees engaged in hazardous work under this contract at the site of the project is not protected under Workman's Compensation statutes, the Contractor shall provide, and shall cause each Subcontractor to provide, adequate and suitable insurance for the protection of its employees not otherwise protected. Workman's Compensation Insurance shall be written with the limitations as prescribed by law.

c. The Contractor shall secure, "all risk," type builders risk insurance for work to be performed. Unless specifically authorized by the Owner to the contrary, the amount of such insurance shall not be less than the contract price totaled in the bid, but in no case less than the total replacement value, whether one or more, of the article, piece, vessel, building, or other thing to which the contract and bid is directed. The policy shall cover not less than the losses due to fire, explosion, hail, lightning, vandalism, malicious mischief, wind, riot, air craft, and smoke during the contract time, and until the work is accepted by the Owner. The all risk builder's insurance policy shall name, as the insured, the Contractor and the Owner.

9. REFERENCE GENERAL CONDITIONS, ARTICLE 5: Delete entirely the following paragraphs; 5.06, 5.07, 5.08, 5.09, 5.10.

10. REFERENCE GENERAL CONDITIONS, ARTICLE 12, PARAGRAPH 12.03: Add the following

a. Provided, however, this provision shall not limit OWNER from seeking other damages if a breach by the CONTRACTOR should occur other than completion of the contract within the specified time.

b. "It being difficult to accurately assess the damages which will be suffered by the OWNER if the CONTRACTOR fails to complete the work IN THE STIPULATED TIME, it is agreed that the CONTRACTOR, shall pay the OWNER as liquidated damages and not as a penalty the sum as set forth on sheet 1 of the bid proposal, for each and every calendar day during which the WORK is not completed following the agreed upon completion date.

**SPECIFICATION 01110
SUMMARY OF WORK**

PART 1 – GENERAL

1.1 RELATED REQUIREMENTS

- A. Section 01.33.00-Submittal Procedures

1.2 REFERENCE STANDARDS

- A. United States Code (USC)
 - 1. Davis Bacon Act (DBA), 40 USC 3141-3148

1.3 MEASUREMENT AND PAYMENT

The work performed by the Contractor under this Section shall not be paid for directly, but shall be considered subsidiary to the various Bid Items under this Contract.

1.4 WORK COVERED BY THE CONTRACT DOCUMENTS

- A. Project Identification
 - The Project to be constructed under this Contract is identified as follows:
 - 1. Name of Project
 - "Okay 2016 Waterline Replacement Project"
 - 2. Location of Project
 - Town of Okay, Wagoner County, Oklahoma
- B. General Description of Work
 - 1. The Work for this project generally consists of replacement of approximately 1,700 lineal feet of 6-inch AC Transite waterline distribution piping with 6-inch PVC waterline and appurtenances, in order to take aging pipe out of service and reduce the water losses incurred by the Owner.
 - 2. The major construction efforts include the following tasks:
 - a. Location of existing utilities.
 - b. Installation of replacement waterlines, valve and accessories.
 - c. Testing of new waterlines.
 - d. Placing new waterlines into service and abandonment of existing distribution piping.
 - e. Connection of water services to new piping.
 - f. Repairs to roads, streets, driveways, sidewalks and other improved surfaces.
 - g. Cleanup of project area.

C. Utilities

It is the Contractor's responsibility to identify all existing utilities within the project limits as well as coordinating any work associated with these utilities with the utility company.

1.5 SEQUENCE OF WORK/TIME FOR COMPLETION OF WORK

A. The work is to be performed as shown on the Contract Drawings.

B. After receipt of the Contract Notice to Proceed (NTP) the Contractor shall comply with all submittal requirements as covered under these Sections and obtain Government review of each submission.

1. No construction shall be started, with the exception of preparing the construction laydown and staging areas, until the Owner reviews the required submittals and determines it satisfactory for purposes of beginning construction.

2. The Owner will not grant any time extension for any resubmittal required when, in the opinion of the Owner's representative, the initial submission failed to meet the minimum quality requirements as set forth in the Contract.

3. If the Owner allows the Contractor to proceed with limited construction based on pending minor revisions to the reviewed submittals, no payment will be made for any in-place construction related to the pending revisions until they are completed, resubmitted and are satisfactory to the Owner.

4. No payment will be made for any in-place construction until all submittals required for that portion of the work and/or required prior to the start of construction have been made, reviewed, and are satisfactory to the Owner.

C. The work under this Contract shall be completed within the timeframe specified in the Contract Provisions.

1.6 LABOR AND STAFFING

A. Contractors are responsible for determining the appropriate staffing necessary to perform the Contract work. Contractors are also responsible for complying with the minimum wage and benefits requirements for each labor classification performing work on the Contract.

B. If a classification considered necessary by the Contractor for performance of the work is not listed on the applicable wage determination, the Contractor must initiate a request for approval of an additional classification along with the proposed wage and benefit rates for that classification.

C. The Owner will attach the appropriate Davis-Bacon wage determination to this Contract. The Contractor is responsible for all requirements of the Davis-Bacon Act.

1.7 PROJECT LOCATION

The work is within the United States, in Wagoner County, Oklahoma.

1.8 INVESTIGATION OF SITE CONDITIONS

- A. The Contractor, as well as their subcontractors, is urged to visit the job site and to become fully aware as to the existing conditions affecting the work to be performed under the Contract documents.
- B. The Contractor shall be responsible for ensuring that all of its suppliers, manufactures, and subcontractors have reviewed all applicable Contract documents relative to their work. The Contractor shall provide all labor, material, equipment, and services not provided by the Contractor's suppliers, manufacturers, fabricators, and/or subcontractors but required for complete and operable facilities as described in the Contract documents.

1.9 OTHER CONTRACTUAL REQUIREMENTS

- A. Items mentioned in the Sections and not shown on the Drawings, or shown on the Drawings and not mentioned in the Sections, shall be of like effect as if shown or mentioned in both.
- B. The Contractor is required to report any ambiguities that exist within the terms of these Contract documents to the Owner.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED MATERIALS

The Owner will not provide any materials for this project.

2.2 PRODUCTS TO BE FURNISHED BY THE CONTRACTOR

- A. The Contractor shall provide all labor, all equipment, and all products required to execute the Project.
- B. All materials provided by the Contractor for the Project shall be new or recycled, high grade, free from defects, meeting the Sections herein. The minimum quality of the work shall be in accordance with the Sections herein.
- C. Materials, equipment, and work quality not conforming to the requirements of these Sections shall be considered defective and will be subject to rejection. Defective work material, whether in place or not, or equipment shall be removed immediately from the site by the Contractor, at its expense, when so directed by the Engineer.
- D. If the Contractor fails to replace any defective or damaged work, materials, or equipment after receiving notice, the Owner may cause such work or materials to be replaced by other forces. The replacement expense shall be deducted from the amount to be paid to the Contractor. Defective equipment will not be allowed in the performance of any work.

PART 3 - EXECUTION

3.1 SUBMITTALS REQUIRED PRIOR TO MOBILIZATION

- A. Specific Sections detail submittal requirements. The list below are the submittals required prior to full mobilization, and prior to starting construction activities.
 - 1. Submittal Register (01.33.00)
- B. Once these required submittals have been compliance confirmed by the Owner, the Contractor will be allowed to mobilize and begin work within Owner's right-of-way.

3.2 USE OF RIGHT-OF-WAY

- A. The Contractor shall provide and maintain continuous public vehicle access, with detour signs and flaggers if necessary.

--End of Section--

SECTION 01019
CONTRACT CONSIDERATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Application for Payment.
- B. Change procedures.
- C. Measurement and Payment - Unit Prices

1.02 RELATED SECTIONS

- A. Section 01300 - Submittals: Schedule of Values.
- B. Section 01600 - Material and Equipment: Product substitutions.
- C. Section 01028 - Change Order Procedures

1.03 APPLICATIONS FOR PAYMENT

- A. Submit three copies of each application for payment, in accordance with EJCDC 1910-8-E, where the form and content of the estimate is provided by the Engineer.
- B. Payment Period: The Board of Directors meets regularly on the second Monday of each Month. Applications for payment must be in the Engineer's hand a minimum of 10 days prior to the Board of Directors meeting.
- C. Waiver of previous month's payment for materials on hand will be required in accordance with EJCDC appropriate sections. Proof of payment, consisting of photocopies of the canceled checks or affidavit of payment receipt from appropriate vendors, must be attached to the next months pay request.
- D. Execute the appropriate affidavits, notarize the pay estimate, all as required by the application for payment form furnished by the Engineer.

1.04 *CHANGE PROCEDURES*

- A. The Engineer will advise of minor changes in the Work not involving an adjustment to the Contract Price or Time as authorized by EJCDC Article 9.5, by issuing a field order.
- B. The Engineer may issue a Notice of Change, which will include a detailed description of the proposed changes along with supplementary or revised Drawings and specifications, to and include a change in Contract Time, for executing the change. Contractor will prepare and submit an estimate within 15 calendar days.
- C. The Contractor may propose changes by submitting a request for change to the Engineer, describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, and the effect on the Contract Price and Contract Time with full documentation. Document any requested substitutions in accordance with Section 01300.
- D. Unit Price Change Order: For pre-determined unit prices and quantities, the Change Order will be executed on a fixed unit price basis. For unit costs or quantities of units of work which are not pre-determined, execute Work under a Notice of Change. Changes in contract price or contract time will be computed as specified in EJCDC 1910-8, Article No. 10.
- E. Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract. Engineer will determine the

change allowable in Contract Price and Contract Time as provided in the EJCDC 1910-8, Article No. 10.

- F. Maintain detailed records of work done on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.
- G. Execution of Change Orders: Engineer will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
- H. Change orders will be issued as specified in Section 01028.

1.05 MEASUREMENT AND PAYMENT - UNIT PRICES

- A. Authority: Measurement methods are delineated in the individual specification sections.
- B. Take all measurements and compute quantities. The Engineer will verify measurements and quantities.
- C. Unit Quantities: Quantities and measurements indicated in the Bid Schedule are for contract purposes only. Quantities and measurements supplied or placed in the Work shall determine payment.
- D. Payment Includes: Full compensation for all required labor, Products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.
- E. Defect Assessment: The Work, or portions of the Work, not conforming to specified requirements, shall be replaced. If, in the opinion of the Engineer, it is not practical to remove and replace the Work, the Engineer will direct an appropriate remedy or adjust payment accordingly.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01025
MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Measurement and payment criteria applicable to contract work performed under a unit price payment.
- B. Defect assessment and non-payment for rejected work.

1.02 AUTHORITY

- A. Measurement methods delineated in the individual specification sections are intended to complement the criteria of this section. In the event of conflict, the requirements of the individual specification section shall govern.
- B. Take all measurements and compute quantities. The Engineer will verify measurements and quantities.

1.02 UNIT QUANTITIES SPECIFIED

- A. Quantities and measurements indicated in the Bid specifications and/or individual specification are for bidding and contract purposes only. Quantities and measurements supplied or placed in the Work and verified by the Engineer shall determine payment.
- B. If the actual Work requires more or fewer quantities than those quantities indicated, provide the required quantities at the unit price rate contracted.

1.04 MEASUREMENT OF QUANTITIES

- A. Measurement Devices:
 - 1. Weigh Scales: Inspected, tested and certified by the Oklahoma Weights and Measures department within the past year.
 - 2. Platform Scales: Of sufficient size and capacity to accommodate the conveying vehicle.
 - 3. Metering Devices: Inspected, tested and certified by the Oklahoma State Department within the past year.
- B. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.
- C. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.
- D. Measurement by Area: Measured by square dimension using mean length and width or radius.
- E. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.
- F. Stipulated Sum/Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.

1.05 PAYMENT

- A. Payment Includes: Full compensation for all required labor, Products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of any item of the Work; overhead and profit.
- B. Final payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities accepted by the Engineer multiplied by the unit price for Work which is incorporated in or made necessary by the Work.

1.06 DEFECT ASSESSMENT

- A. Replace the Work, or portions of the Work, not conforming to specified requirements.
- B. If, in the opinion of the Engineer, it is not practical to remove and replace the Work, the Engineer will direct one of the following remedies:
 - 1. The defective Work may remain, but the unit price will be adjusted/reduced no more than 60%, solely at the discretion of the Engineer.

2. The defective Work will be partially repaired to the instructions of the Engineer, and the unit price will be reduced to 50% solely at the discretion of the Engineer.
- C. The individual specification sections may modify these options or may identify a specific formula or percentage sum/price reduction.
- D. The authority of the Engineer to assess the defect or identify payment adjustment is final.

1.07 NON-PAYMENT FOR REJECTED PRODUCTS

- A. Payment will not be made for any of the following:
 1. Products wasted or disposed of in a manner that is not acceptable.
 2. Products determined as unacceptable before or after placement.
 3. Products not completely unloaded from the transporting vehicle.
 4. Products placed beyond the lines and levels of the required Work.
 5. Products remaining on hand after completion of the Work.
 6. Loading, hauling and disposing of rejected Products.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 SCHEDULE OF WORK AND MEASUREMENT

- A. Pay items only as noted on the bid schedule. All other work units are to be included in appropriate bid items.

END OF SECTION

SECTION 01027
APPLICATIONS FOR PAYMENT

PART 1 GENERAL

1.01 DESCRIPTION

- A. Comply with procedures described in this section when applying for progress payments and final payments under the contract.

1.02 RELATED SECTIONS

- A. EJCDC 1910-8, article 14, including sub-references.

1.03 FORMAT

- A. EJCDC 1910-8-E - Application for Payment including continuation sheets when required.
- B. For each major work item, in accordance with the schedule of values previously submitted and approved, show the percentage of completion, balance to finish, and appropriate retainage.

1.04 PREPARATION OF APPLICATIONS

- A. Fill out the payment form using a Typewriter.
- B. Execute certification by signature of authorized officer.
- C. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed.
- D. List each authorized Change Order as an extension on continuation sheet, listing Change Order number and dollar amount as for an original item of Work.

1.05 SUBMITTAL PROCEDURES

- A. Submit three (3) copies of each Application for Payment.
 - 1. Approved pay estimates will be distributed as follows;
 - a. One copy to the Contractor
 - b. One copy to the Owner
 - c. One copy to the Engineer
 - 2. Owner will, upon approval, disburse funds directly to the Contractor.
- B. Submit an updated construction schedule with each Application for Payment.
- C. Payment Period: Submit at dates established in the project meetings, in sufficient advanced time for consideration and approval on second Monday of each Month.
- D. Submit lien waivers and payroll affidavits concurrently with application for payment.

1.06 SUBSTANTIATING DATA

- A. When Engineer requires substantiating information, submit data justifying the requested information.
- B. Provide one copy of data with cover letter for each copy of submittal. Show Application number and date, and line item by number and description.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

Contractor's Application for Payment No.

1

	Application Period:	Application Date:
To (Owner):	From (Contractor):	Via (Engineer): Michael Stephens Stephens Engineering Services, LLC
Project:	Contract:	
Owner's Contract No.:	Contractor's Project No.:	Engineer's Project No.:

**Application For Payment
Change Order Summary**

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

- 1. ORIGINAL CONTRACT PRICE..... \$ _____
- 2. Net change by Change Orders..... \$ _____
- 3. Current Contract Price (Line 1 ± 2)..... \$ _____
- 4. TOTAL COMPLETED AND STORED TO DATE
(Column F on Progress Estimate)..... \$ _____
- 5. RETAINAGE:
 - a. 15% X _____ Work Completed..... \$ _____
 - b. 15% X _____ Stored Material..... \$ _____
 - c. Total Retainage (Line 5a + Line 5b)..... \$ _____
- 6. AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5c)..... \$ _____
- 7. LESS PREVIOUS PAYMENTS (Line 6 from prior Application)..... \$ _____
- 8. AMOUNT DUE THIS APPLICATION..... \$ _____
- 9. BALANCE TO FINISH, PLUS RETAINAGE
(Column G on Progress Estimate + Line 5 above)..... \$ _____

Contractor's Certification

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

By: _____ Date: _____

Payment of: \$ _____
(Line 8 or other - attach explanation of the other amount)

is recommended by: _____
(Engineer - Stephens Engineering Services, LLC) (Date)

Payment of: \$ _____
(Line 8 or other - attach explanation of the other amount)

is approved by: _____
(Owner - Peggs Water Company) (Date)

Approved by: _____
Funding Agency (if applicable) (Date)

END OF SECTION

SECTION 01028
CHANGE ORDER PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Submittals.
- B. Documentation of change in Contract Sum and Contract Time.
- C. Change procedures.
- D. Construction Change Directive.
- E. Stipulated Price change order. Supplemental Agreement required to be executed by Contractor and Owner.
- F. Unit price change order.
- G. Time and material change order.
- H. Execution of change orders.
- I. Correlation of Contractor submittals.

1.02 DESCRIPTION

- A. This section includes detailed procedural requirements for considering and executing change orders to the work/contract.

1.03 RELATED SECTIONS

- A. Section 01300 - Submittals.
- B. Section 01027 - Application for Payment.
- C. Section 01310 - Project Schedule.
- D. EJDC - Standard General Conditions of the Construction Contract.

1.04 SUBMITTALS

- A. Submit name of the individual authorized to receive change documents, and be responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.
- B. Change Order Forms: EJCDC 1910-8-B Change Order; Work Change Directive EJCDC 1910-8-F.

1.05 DOCUMENTATION OF CHANGE IN CONTRACT PRICE AND CONTRACT TIME

- A. Maintain detailed records of work done on a time and material force account basis. Provide full information required for evaluation of proposed changes, and to substantiate costs of changes in the Work.
- B. Document each quotation for a change in cost or time with sufficient data to allow evaluation of the quotation.
- C. On request, provide additional data to support computations:
 - 1. Quantities of products, labor, and equipment.
 - 2. Taxes, insurance and bonds.
 - 3. Overhead and profit.
 - 4. Justification for any change in Contract Time.
 - 5. Credit for deletions from Contract, similarly documented.
- D. Support each claim for additional costs, and for work done on a time and material force account basis, with additional information:
 - 1. Origin and date of claim.
 - 2. Dates and times work was performed, and by whom.
 - 3. Time records and wage rates paid.
 - 4. Receipts for products, equipment, and subcontracts, similarly documented.

1.06 CHANGE PROCEDURES

- A. The Engineer will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time as authorized by EJCDC 1910-B Paragraph 9.5 by issuing a "Field Order" (copy attached this section).
- B. The Engineer may issue a Notice of Change which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor will prepare and submit an estimate within 15 days.
- C. The Contractor may propose a change by submitting a request for change to the Engineer, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change,

and the effect on the Contract Sum/Price and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01300.

1.07 WORK CHANGE DIRECTIVE

- A. Engineer may issue a document, signed by the Owner, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
- B. The document will describe changes in the Work, and will designate method of determining any change in Contract Sum/Price or Contract Time.
- C. Promptly execute the change in Work.

1.08 UNIT PRICE CHANGE ORDER

- A. For predetermined unit prices and quantities, the Change Order will be executed on a fixed unit price basis.
- B. For unit costs or quantities of units of work which are not predetermined, execute work under a Work Change Directive.
- C. Changes in Contract Sum/Price or Contract Time will be computed as specified for Time and Material Change Order.

1.09 TIME AND MATERIAL CHANGE ORDER

- A. Submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.
- B. Engineer will determine the change allowable in Contract Price and Contract Time as provided in the Contract Documents.
- C. Maintain detailed records of work done on Time and Material basis.
- D. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.

1.10 EXECUTION OF CHANGE ORDERS

- A. Execution of Change Orders: Engineer will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

1.10 CORRELATION OF CONTRACTOR SUBMITTALS

- A. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum/Price.
- B. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust time for other items of work affected by the change, and resubmit.
- C. Promptly enter changes in Project Record Documents.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

WORK CHANGE DIRECTIVE

No. _____

DATE OF ISSUANCE _____ EFFECTIVE DATE _____

OWNER _____

CONTRACTOR _____

Contract:: _____

Project:: _____

OWNER's Contract No. _____ ENGINEER's Project No _____

You are directed to proceed promptly with the following change(s):

Description:

Purpose of Work Change Directive:

Attachments: (List documents supporting change)

If OWNER or CONTRACTOR believe that the above change has affected Contract Price any Claim for a Change Order based thereon will involve one or more of the following methods as defined in the Contract Documents.

Method of determining change in Contract Price:

{ } Unit Prices

{ } Lump Sum

{ } Cost of the Work _____

Estimated increase (decrease) in Contract Price
\$ _____

If the change involves an increase, the estimated amount is not to be exceeded without further authorization.

Estimated increase (decrease) in Contract Times:

Substantial Completion _____ days;
Ready for final payment _____ days.

RECOMMENDED:

AUTHORIZED:

ENGINEER

OWNER

By: _____ By: _____
EJCDC No.1930-8-F (1996 Edition)

Prepared by the Engineers Joint Contract Documents Committee and endorsed by The Associated General Contractors of America and the Construction Specifications Institute.

CHANGE ORDER(Instructions on reverse side)

No _____

PROJECT _____

DATE OF ISSUANCE _____ EFFECTIVE DATE.

OWNER _____

OWNER'S CONTRACT NO _____.

CONTRACTOR _____

ENGINEER _____

You are directed to make the following changes in the Contract Documents.

Description:

Reason for Change Order:

Attachments: (List documents supporting change)

CHANGE IN CONTRACT PRICE:

CHANGE IN CONTRACT TIMES:

Original Contract Price
\$ _____

Original Contract Times
Substantial Completion: _____
Ready for final payment: _____

Net changes from previous Change Orders No. ___ to No. ___ \$ _____

Net change from previous Change Orders No. ___ to No. ___ \$ _____

Contract Price prior to this Change Order

Contract Times prior to this Change Order

\$ _____

Substantial Completion: _____
Ready for final payment: _____

Net Increase (increase) of this Change Order

Net Increase (decrease) of this Change Order

\$ _____

\$ _____

Contract Price with all approved Change Orders

Contract Times with all approved Change Orders

\$ _____

Substantial Completion: _____
Ready for final payment: _____

RECOMMENDED:

APPROVED:

ACCEPTED:

By: _____

By: _____

By: _____

Engineer (Authorized Signature)

Owner (Authorized Signature)

Contractor (Authorized Signature)

Date: _____

Date: _____

Date: _____

EJCDC No. 1910-8-B (1990 Edition)

Prepared by the Engineers Joint Contract Documents Committee and endorsed by the Associated General Contractors of America

WORK CHANGE DIRECTIVE

No. _____

DATE OF ISSUANCE: _____ EFFECTIVE DATE: _____

OWNER: _____

CONTRACTOR: _____

Contract: _____

Project: _____

OWNER's Contract No. _____ ENGINEER's Project No. _____

You are directed to proceed promptly with the following change(s):
Description:

Purpose of Work Change Directive:

Attachments: (List documents supporting change)

If OWNER or CONTRACTOR believe that the above change has affected Contract Price any Claim for a Change Order based thereon will involve one or more of the following methods as defined in the Contract Documents.

Method of determining change
in Contract Price:

- Unit Prices
- Lump Sum
- Cost of the Work _____

Estimated increase (decrease) in Contract Price:
\$ _____

If the change involves an increase, the estimated amount is not to be exceeded without further authorization.

Estimated increase (decrease) in
Contract Times:
Substantial Completion _____ days;
Ready for final payment _____ days.

RECOMMENDED:

AUTHORIZED:

ACKNOWLEDGED:

ENGINEER

OWNER

USDA Rural Development
FUNDING AGENCY

By: _____

By: _____

By: _____

WORK CHANGE DIRECTIVE

INSTRUCTIONS

A. GENERAL INFORMATION

This document was developed for use in situations involving changes in the Work which, if not processed expeditiously, might delay the project. These changes are often initiated in the field and may affect the Contract Price or the Contract Times. This is not a Change Order, but only a directive to proceed with Work that may be included in a subsequent Change Order.

For supplemental instructions and minor changes not involving a change in the Contract Price or the Contract Times a Field Order should be used.

B. COMPLETING THE WORK CHANGE DIRECTIVE FORM

Engineer initiates the form, including a description of the items involved and attachments.

Based on conversations between Engineer and Contractor, Engineer completes the following:

METHOD OF DETERMINING CHANGE, IF ANY IN CONTRACT PRICE: Mark the method to be used in determining the final cost of Work involved and the estimated net effect on the Contract Price. If the change involves an increase in the Contract Price and the estimated amount is approached before the additional or changed Work is completed, another Work Change Directive must be issued to change the estimated price or Contractor may stop the changes Work when the estimated time is reached. If the Work Change Directive is not likely to change the Contract Price, the space for estimated increase (decrease) should be marked "Not Applicable".

Once Engineer has completed and signed the form, all copies should be sent to Owner for authorization because Engineer alone does not have authority to authorize changes in Price or Times. Once authorized by Owner, a copy should be sent by Engineer to Contractor. Price and Times may only be changed by Change Order signed by Owner and Contractor with Engineer's recommendation.

Paragraph 10.030A02 of the General Conditions requires that a Change Order be initiated and processed to cover any undisputed sum or amount of time for Work actually performed to this Work Change Directive.

Once the Work covered by this directive is completed or final cost and times are determined, Contractor should submit documentation for inclusion in a Change Order.

THIS IS A DIRECTIVE TO PROCEED WITH A CHANGE THAT MAY AFFECT THE CONTRACT PRICE OR CONTRACT TIMES. A CHANGE ORDER, IF ANY, SHOULD BE CONSIDERED PROMPTLY.

SECTION 01039
COORDINATION AND MEETINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Coordination.
- B. Field engineering.
- C. Preconstruction conference.
- D. Progress meetings.

1.02 RELATED SECTIONS

- A. EJCDC, Article 2, Coordination with Project Manager.
- B. Documents affecting work of this section, includes but are not necessarily limited to, General Conditions, General Provisions, Supplemental Conditions, and Construction Specifications.

1.03 COORDINATION

- A. Coordinate scheduling, submittals, and work of the various locations to assure efficient and orderly sequence of the construction elements, taking into account certain construction items which must be installed at a later date.
- B. Verify that connection requirements shown on the plans meet the characteristics of the utility conduit onto which connections are to be made. Field verify each connection prior to ordering the materials therefore.
- C. Coordinate the space requirements for the installation of the utilities, including the necessary stockpiling of excavated materials. Follow the routing shown for the pipes, ducts, conduit, as closely as practical. Do not deviate in laying grade, or alignment, except under the specific written instruction of the Engineer.
- D. Coordinate completion and clean up of work of separate Sections in preparation for Substantial Completion and for portions of the work, where connected to construction performed by the Owner.
- E. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.04 FIELD ENGINEERING

- A. Contractor to locate and protect survey control and reference points.
- B. Control datum for survey is that as shown on the drawings.
- C. Engineering services. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.
- D. Submit a copy of the site drawing and a certificate signed by the Land Surveyor that the elevations and locations of the work are in conformance with the Contract Documents.
- E. Provide the services of a registered Professional Engineer in the State of Oklahoma for the design and inspection of the protective system necessary for the excavation.
- F. Use the services of a recognized soil engineer as necessary for work in regards to trench stabilization, sheeting, shoring, and other requirements of the Occupational Safety and Health Administration (OSHA).

1.04 ALTERATION PROJECT PROCEDURES

- A. Engineer will schedule a conference after the Notice of Award has been issued and the contracts, bonds and insurance requirements of the contract have been satisfied by the Contractor.
- B. Attendance Required: The Owner, Engineer, Contractors Authorized Representative, Contractor's Field Superintendent, Project Inspector.
- C. Agenda:
 - 1. Execution of the Notice to Proceed
 - 2. Distribution of Contract Documents.
 - 3. Submission of list of Subcontractors, list of products, Schedule of Values, and progress schedule.
 - 4. Designation of personnel representing the parties in the Contractor, Owner's Representative, Contractor's signatory agent, and the Engineer.
 - 5. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders and Contract close-out procedures.
 - 6. Scheduling.
 - 7. Scheduling activities of the protective systems design engineer.
 - 8. Stockpile locations for materials on hand.

9. Procedure for payment for materials on hand.

1.06 PROGRESS MEETINGS

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

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01050
FIELD ENGINEERING

PART 1 - GENERAL

1.00 DESCRIPTION

A. *Work included: Provide such field engineering or survey services as are required for proper completion of the work including, but not necessarily limited to:*

1. Establishing and maintaining lines and levels;
2. Structural design of shores, embankments, forms, and similar items provided by the Contractor as part of his means and methods of construction.

B. *Related work:*

1. Documents affecting work of this Section include, but are not necessarily limited to, General Provisions, Supplementary Conditions, and sections in Division 1 of these specifications.
2. Coordinate requirements of tapping sleeves with gate valves and other fittings as required.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.02 FIELD MEASUREMENTS

A. Make necessary measurements in the field to assure precise fit of items in accordance with the approved design.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01200
PROJECT MEETINGS

PART 1 GENERAL

1.01 DESCRIPTION

- A. Work included: To enable orderly review during progress of the work, and to provide for systematic discussion of problems, the Engineer will conduct project meetings throughout the construction period.
- B. Related Work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these specifications.
 - 2. The Contractor's relations with his subcontractors and materials suppliers, and discussions relative thereto, are the Contractor's responsibility and normally are not part of project meeting content.

1.02 QUALITY ASSURANCE

- A. For this persons designated by the Contractor to attend and participate in project meetings, provide required authority to commit the contractor to solutions agreed upon in the project meetings.

1.03 SUBMITTALS

- A. Agenda items: To the maximum extent practicable, advise the Engineer at least 24 hours in advance of project meetings regarding items to be added to the agenda.
- B. Minutes:
 - 1. The Engineer will compile minutes of each project meeting, and will furnish one copy to the Contractor and required copies to the Owner.
 - 2. Recipients of copies may make and distribute such other copies as they wish.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 MEETING SCHEDULE

- A. Except as noted below for Preconstruction Meeting, project meetings will be held weekly.
- B. Coordinate as necessary to establish mutually acceptable schedule for meetings.

3.02 MEETING LOCATION

- A. The Engineer will establish meeting location. to the maximum extent practicable, meetings will be held at the job site.

3.03 PRECONSTRUCTION MEETING

- A. Preconstruction Meeting will be scheduled to be held within 15 working days after the Owner has issued the Notice to Proceed.
 - 1. Provide attendance by authorized representatives of the Contractor and major subcontractors.

2. The Engineer will advise other interested parties, including the Owner, and request their attendance.
- B. Minimum agenda: Data will be distributed and discussed on at least the following items.
1. Organizational arrangement of Contractor's forces and personnel, and those of subcontractors, materials suppliers, and Engineer.
 2. Channels and procedures for communication.
 3. Construction schedule, including sequence of critical work.
 4. Contract Documents, including distribution of required copies of original Documents and revisions.
 5. Processing of Shop Drawings and other data submitted to the Engineer for review.
 6. Processing of Bulletins, field decisions, and Change Orders.
 7. Rules and regulations governing performance of the work; and
 8. Procedures for safety and first aid, security, quality control, housekeeping, and related matters.

3.04 PROJECT MEETINGS

- A. Attendance:
1. To the maximum extent practicable, assign the same person or persons to represent the Contractor at project meetings throughout progress of the work.
 2. Subcontractors, materials suppliers, and others may be invited to attend those project meetings in which their aspect of the work is involved.
- B. Minimum Agenda:
1. Review, revise as necessary, and approve minutes of previous meetings.
 2. Review progress of the work since last meeting, including status of submittals for approval.
 3. Identify problems which impede planned progress.
 4. Develop corrective measures and procedures to regain planned schedule.
 5. Complete other current business.
 6. New Business.
 7. Old Business.
- C. Revisions to Minutes:
1. Unless published minutes are challenged in writing prior to the next regularly scheduled progress meeting, they will be accepted as properly stating the activities and decisions of the meeting.
 2. Persons challenging published minutes shall reproduce and distribute copies of the challenge to all indicated recipients of the particular set of minutes.
 3. Challenge to minutes shall be settled as priority portion of "Old Business" at the next regularly scheduled meeting.

END OF SECTION

SECTION 01300
SUBMITTALS AND SUBSTITUTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Submittal procedures.
- B. Construction progress schedules.
- C. Proposed products list.
- D. Product data.
- E. Manufacturers' instructions.
- F. Manufacturers' certificates.

1.02 RELATED SECTIONS

- A. EJCDC 1910-8, Article 6.
- B. Section 01700 - Contract Closeout.

1.03 SUBMITTAL PROCEDURES

- A. Transmit each submittal with a separate transmittal form.
- B. Sequentially number the transmittal forms. Re-submittals to have original number with an alphabetic suffix.
- C. Identify Project, Contractor, Subcontractor or supplier; pertinent Drawing sheet and detail number(s), and specification Section number, as appropriate.
- D. Apply Contractor's stamp, signed or initialed certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite the Project, and deliver to Engineer at P. O. Box 15, Welling, OK 74471. Coordinate submission of related items.
- F. Identify variations from Contract Documents and Product or system limitations, which may be detrimental to successful performance of the completed Work.
- G. Provide space for Contractor and Engineer review stamps.
- H. Revise and resubmit submittals as required, identify all changes made since previous submittal.
- I. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

1.04 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit initial progress schedule in duplicate, within 15 days after date of the Notice of Award, to the Engineer for review.
- B. Revise and resubmit as required.
- C. Submit revised schedules with each Application for Payment, identifying changes since previous version.
- D. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities.
- E. Indicate estimated percentage of completion for each item of Work at each submission.
- F. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and under Allowances.

1.05 PROPOSED PRODUCTS LIST

- A. Within 30 days after date of the Owner's Notice of Award, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.06 PRODUCT DATA

- A. Submit one copy of the product data to the Engineer. Engineer will review and return the original.
- B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.
- C. After review, distribute copies as necessary for your vendors, subcontractors, and others. Approved review copies of the data will be distributed by the Engineer to the Owner, Inspectors, and others.

1.07 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification Sections, submit manufacturers' printed instructions for delivery, handling, installation, and testing, in quantities as specified above in "Product Data".
- B. Identify conflicts between manufacturers' instructions and Contract Documents.

1.08 MANUFACTURER'S CERTIFICATES

- A. Submit manufacturers' certificate to Engineer for review, in quantities as specified above in "Product Data".
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Engineer.

1.09 SUBSTITUTIONS

- A. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
- B. That the Contractor:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
 - 2. Will provide the same warranty for the Substitution as for the specified product.
 - 3. Will coordinate installation and make changes to other work, which may be required for the Work to be complete with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension, which may subsequently become apparent.
 - 5. Will reimburse Owner for review or redesign services associated with re-approval by authorities.
- C. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

PART 2 PRODUCTS

2.01 SUBSTITUTIONS

- A. The Contract is based on the standards of quality established in the Contract documents. Substitutions will be considered only when listed at time of bidding, on the form provided therefore in the bid documents, and when substantiated by the Contractor's submittal of required data within 15 calendar days after award of the contract.
- B. The following products do not require further approval except for interface within the work, however, Manufacturers literature must be submitted.

- a. Products specified by reference to standard specifications such as ASTM and similar standards.
- b. Products specified by manufacturer's name and catalog model number.
- C. Do not substitute materials, equipment, or methods unless the Engineer has specifically approved such substitution in writing for this work.

2.02 "OR EQUAL"

- A. Where the phrase "or equal", or "or equal as approved by the Engineer," occurs in the Contract Documents, do not assume that the materials, equipment, or methods will be approved as equal unless the item has been specifically so approved for this work by the Engineer.
- B. The decision of the Engineer shall be final.

2.03 SUBMITTALS

- A. Make Submittals of Shop Drawings, Samples, substitution requests, and other items in accordance with the provisions of this section.

2.03 SHOP DRAWINGS

- A. Scale and measurements: Make Shop Drawings accurately to a scale sufficiently large to show all pertinent aspects of the item and its method of connection to the work. Applicable size drawings are 8 1/2" x 11"; 11" x 17" and 24" x 36".
- B. Types of Prints Required:
 - 1. Submit shop drawings in the form of one sepia or Xerox transparency.
 - 2. Blue lines, black lines, or blueprints will not be acceptable.
- D. Review comments of the Engineer will be shown on the transparency when returned to the Contractor. The contractor may make and distribute such copies as are required for his purposes.

2.04 MANUFACTURER'S LITERATURE

- A. Where contents of submitted literature from manufacturers includes data not pertinent to the submittal, clearly show which portion of the contents is being submitted for review.
- B. Submit one copy of the manufacturers literature. Engineers comments will be noted thereon, Engineer will keep his copy, the original with notations will be returned to the Contractor, who may make and distribute such copies as may be required for his purpose.

2.04 SAMPLES

- A. Provide sample or samples identical to the precise article proposed to the provided. Identify as described under "Identification of Submittals" below.
- B. Number of Samples Required:
 - 1. Unless otherwise specified, submit Samples in the quantity, which is required to be returned, plus one, which will be retained by the Engineer.
 - 2. By pre-arrangement in specific cases, a single Sample may be submitted for review and, when approved, be installed in the work at a location agreed upon by the Engineer.

PART 3 EXECUTION

3.01 IDENTIFICATION OF SUBMITTALS

- A. Consecutively number all Submittals
 - 1. When material is resubmitted for any reason, transmit under a new letter of transmittal and with a new transmittal number.
 - 2. On re-submittals, cite the original submittal number for reference.
- B. Accompany each submittal with a letter of transmittal showing all information required for identification and checking.

- C. On at least the first page of each submittal, and elsewhere as required for positive identification, show the submittal number in which the item was included.
- D. Maintain an accurate submittal log for the duration of the work, showing current status of all submittals at all times. Make the submittal log available to the Engineer for his review upon request.

3.02 GROUPING OF SUBMITTALS

- A. Unless otherwise specified, make submittals in groups containing all associated items to assure that information is available for checking each item when it is received.
 - 1. Partial submittals may be rejected as not complying with the provisions of the contract.
 - 2. The Contractor may be held liable for delays so occasioned.

3.03 TIMING OF SUBMITTALS

- A. Make submittals far enough in advance of scheduled dates for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and re-submittals, and for placing orders and securing delivery.
- B. In scheduling, allow at least ten working days for review by the Engineer following his receipt of the submittal.

3.04 ENGINEER'S REVIEW

- A. Review by the Engineer does not relieve the Contractor from responsibility for errors, which may exist in the submitted data.
- B. Revisions:
 - 1. Make revisions required by the Engineer.
 - 2. If the Contractor considers any required revision to be a change, he shall so notify the Engineer as provided for in Article 11 and 12 of the General Conditions.
 - 3. Make only those revisions directed or approved by the Engineer.
- C. Reimbursement of Engineer's Costs:
 - 1. In the event substitutions are proposed to the Engineer after the Contract has been awarded, which substitutions are not included on the list submitted with the bid, the Engineer will record all time used by him in evaluation of each such proposed substitution.
 - 2. Whether or not the Engineer approves a proposed substitution, the Contractor promptly, upon receipt of the Engineer's billing, shall reimburse the Engineer at the rate of two and one-half times the direct cost to the Engineer for all time spent by him in evaluating the proposed substitution, or said monies will be deducted from funds which are due the Contractor under the Agreement.

END OF SECTION

SECTION 01310
CONSTRUCTION SCHEDULES

PART 1 GENERAL

1.01 DESCRIPTION

- A. Work included: To assure adequate planning and execution of the Work so that the work is completed within the number of calendar days allowed in the Contract, and to assist the Engineer in appraising the reasonableness of the proposed schedule and in evaluating progress of the work, prepare and maintain the schedules and reports described in this Section.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and other sections within Division 1.
 - 2. Requirements for progress schedule: General Conditions.
 - 3. Construction period: Form of Agreement.
- C. Definitions:
 - 1. "Day", as used throughout the Contract unless otherwise stated, means "calendar day."

1.02 QUALITY ASSURANCE

- A. Employ a scheduler who is thoroughly trained and experienced in compiling construction schedule data, and in preparing and issuing periodic reports as required below.
- B. Perform data preparation, analysis, charting, and updating in accordance with standards approved by the Engineer.
- D. Reliance upon the approved schedule.
 - 1. The construction schedule as approved by the Engineer will be an integral part of the Contract and will establish interim completion dates for the various activities under the Contract.
 - 2. Should any activity not be completed within 15 days after the stated scheduled date, the Owner shall have the right to require the Contractor to expedite completion of the activity by whatever means the Owner deems appropriate and necessary, without additional compensation to the Contractor.
 - 3. Should any activity be 30 days or more behind schedule, the Owner shall have the right to perform the activity or have the activity performed by whatever method the Owner deems appropriate.
 - 4. Costs incurred by the Owner and by the Engineer in connection with expediting construction activity under this Article shall be reimbursed by the Contractor.
 - 5. It is expressly understood and agreed that failure by the Owner to exercise the option either to order the Contractor to expedite an activity or to expedite the activity by others means shall not be considered to set a precedent for any other activities.

1.03 SUBMITTALS

- A. Comply with pertinent provisions of Section 01300.
- B. Preliminary analysis: Within ten calendar days after the Contractor has received the Owner's Notice to Proceed, submit one reproducible copy of a preliminary construction schedule prepared in accordance with Part 3 of this section.
- C. Construction schedule: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit one reproducible copy of a construction schedule prepared in accordance with Part 3 of this Section.
- D. Periodic reports: On the agreed upon day for submittal of periodic pay request, submit four prints of the construction schedule updated as described in Part 3 of this Section.

PART 2 PRODUCTS

2.01 CONSTRUCTION ANALYSIS

- A. Graphically show by bar-chart the order and interdependence of all activities necessary to complete the work, and the sequence in which each activity is to be accomplished, as planned by the Contractor and his project field superintendent in coordination with all subcontractors whose work is shown on the diagram.
- B. Include, but do not necessarily limit indicated activities to:
 - 1. Project mobilization;
 - 2. Submittal and approval of Shop Drawings and Samples;
 - 3. Procurement of equipment and critical materials;
 - 4. Fabrication of special material and equipment, and its installation and testing.
 - 5. Final cleanup;
 - 6. Final inspection and testing; and
 - 7. All activities by the Engineer that effect progress, required dates for completion, or both, for all and each part of the work.

PART 3 EXECUTION

3.01 PRELIMINARY ANALYSIS

- A. Contents
 - 1. Show all activities of the Contractor under this work for the period between receipt of Notice to Proceed and submittal of construction schedule required under Paragraph 1.03-C above.
 - 2. Show the Contractor's general approach to remainder of the work.
 - 3. Show cost of all activities scheduled for performance before submittal and approval of the construction schedule.
- B. Submit in accordance with Paragraph 1.03-B above.

3.02 CONSTRUCTION SCHEDULE

- A. As soon as practicable after receipt of Notice to Proceed, but not later than ten (10) days, complete the construction analysis in preliminary form, meet with the Engineer, review contents of the proposed construction schedule, and make all revisions agreed upon.
- B. Submit in accordance with Paragraph 1.03C above.

3.03 PERIODIC REPORTS

- A. As required under Paragraph 1.03-D above, update the approved construction schedule.
 - 1. Indicate "actual" progress in percent completion for each activity.
 - 2. Provide written narrative summary of revisions causing delay in the program, and an explanation of corrective actions taken or proposed.

3.04 REVISIONS

- A. Make only those revisions to approved construction schedule as are approved in advance by the Engineer.

END OF SECTION

SECTION 01500
CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Temporary Utilities: Electricity, lighting, heat, ventilation, telephone service, water, and sanitary facilities.
- B. Temporary Controls: including construction parking control, flagman, flares and lights, traffic signs and signals, and the removal thereof.

1.02 RELATED SECTIONS

- A. EJCDC 1910-8, Article 6.
- B. Section 01010 - Summary of Work

1.03 TEMPORARY UTILITIES

- A. Provide and pay for all temporary services required for this project, consisting of electric, water, sewer, telephone, etc.

1.04 TEMPORARY CONTROLS

- A. Provide, erect, and maintain sufficient signs, barricades, and other signals, including flagman when required, so as to adequately control public access to the construction activities.
- B. Construction Parking Control: Control construction vehicular parking so as to prevent interference with public traffic, access by emergency vehicles, and Owners operations. Carefully monitor parking of construction personal vehicles. Maintain vehicular access to and through parking areas to private property. Do not allow parking on public traveled ways.
- C. Security: Provide security and facilities to protect the work, materials, and other Owners operations, from unauthorized entry, vandalism, and theft.
- D. Provide and display construction signs as specified by Engineer - See attachment to this section for dimensions and required information.

PART 2 PRODUCTS

2.01 UTILITIES

- A. Water:
 - 1. Provide necessary temporary piping and water supply and, upon completion of the work, remove such temporary facilities.
- B. Electricity:
 - 1. Provide necessary temporary wiring and, upon completion of the work, remove such temporary facility.
 - 2. Provide area distribution boxes so located that the individual trades may furnish and use 100 ft. maximum length extension cords to obtain power and lighting at point where needed for work, inspection, and safety.
 - 3. Provide and pay for electricity used in construction.

- C. Heating: Provide and maintain heat necessary for proper conduct of operations needed in the work.
- D. Telephone:
 - 1. Make necessary arrangements and pay costs for installation and operation of telephone service to the Contractor's field office.

2.02 FIELD OFFICES AND SHEDS

- A. Contractor's Facilities:
 - 1. Provide a field office building and/or sheds adequate in size and accommodation for Contractor offices, supply, and storage.
 - 2. Within the Contractor's facilities, provide enclosed space adequate for holding project meetings.
- B. Sanitary Facilities:
 - 1. Provide temporary sanitary facilities in the quantity required for use by all personnel.
 - 2. Maintain in a sanitary condition at all times.

2.03 ENCLOSURES

- A. Provide and maintain for the duration of construction all scaffolds, tarpaulins, canopies, warning signs, steps, platforms, bridges, and other temporary construction necessary for proper completion of the work in compliance with pertinent safety and other regulations.

2.04 TEMPORARY FENCING

- A. Provide and maintain for the duration of construction a temporary fence of design and type needed to prevent entry onto the work at the lift station site by the public.

PART 3 EXECUTION

3.01 MAINTENANCE AND REMOVAL

- A. Maintain temporary facilities and controls as long as needed for safe and proper completion of the work.
- B. Remove such temporary facilities and controls as rapidly as progress of the work will permit, safety concerns are abated or as directed by the Engineer.

3.02 PROTECTION OF INSTALLED WORK

- A. Protect installed work and provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate work area to minimize damage.

END OF SECTION

SECTION 01570

TRAFFIC REGULATION

PART 1 GENERAL

1.00 DESCRIPTION

- A. Provide, erect, and maintain sufficient signs, barricades, and other signals, including flagmen when required, so as to adequately control public access to the roadways and railways. Consult with the County Foreman, notify the applicable departments, for any necessary closing of the roadways, streets or other access or walkway locations.

1.01 SECTION INCLUDES

- A. Construction Parking Control.
- B. Flagmen.
- C. Flares and Lights.
- D. Haul Routes.
- E. Traffic Signs and Signals.
- F. Removal.

1.02 RELATED SECTIONS

- A. Section 01010 - Summary of Work.
- B. Section 01039 - Coordination and Meetings.
- C. Section 01300 - Submittals

1.03 SIGNS, SIGNALS, AND DEVICES

- A. Post Mounted and Wall Mounted Traffic Control and Informational Signs as needed for diversions of public traffic.
- B. Traffic Cones and Drums, Flares and Lights.
- C. Flagman Equipment.

1.04 CONSTRUCTION PARKING CONTROL

- A. Control construction vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and Owner's operations.
- B. Carefully monitor parking of construction personnel's vehicles. Maintain vehicular access to and through parking areas for private property. Do not allow parking on public thoroughfares.
- C. Prevent parking on or adjacent to access roads or in non-designated areas.

1.05 FLARES AND LIGHTS

- A. Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

1.06 TRAFFIC SIGNS, SIGNALS, AND BARRICADES

- A. At approaches to site and on site, install at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
- B. Install and operate traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control, and areas affected by Contractor's operations.
- C. Relocate as Work progresses, to maintain effective traffic control.

1.07 REMOVAL

- A. Remove equipment and devices when no longer required.
- B. Repair damage caused by installation.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01600
MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Products.
- B. Transportation and handling.
- C. Storage and protection.
- D. Product options.

1.02 RELATED SECTIONS

- A. Documents affecting this work include but are not necessarily limited to, Contracts and Bonds, General Conditions, General Provisions, Supplemental Conditions, and Construction Specifications.
- B. Section 01400 - Quality Control: Product quality monitoring.

1.03 PRODUCTS

- A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the work. Products may also include existing materials or components required for reuse.
- B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.
- C. Provide interchangeable components of the same manufacturer, for similar components.

1.04 TRANSPORTATION AND HANDLING

- A. Transport and handle Products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.
- C. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.05 STORAGE AND PROTECTION

- A. Store and protect Products in accordance with manufacturers' instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated Products, place on sloped supports, above ground.
- C. Provide off-site storage and protection when site does not permit on-site storage or protection.
- D. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
- E. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- F. Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- G. Arrange storage of Products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained in acceptable condition.

1.06 PRODUCT OPTIONS

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

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01640
MATERIAL HANDLING, TRANSPORTATION, AND STORAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Transportation and handling.
- B. Storage and protection.

1.02 RELATED SECTIONS

- A. Instructions to Bidders: Product options and substitution procedures.
- B. Section 01039 - Quality Control: Product quality monitoring.
- C. Section 01300 - Submittals

1.03 TRANSPORTATION AND HANDLING

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.04 STORAGE AND PROTECTION

- A. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated products, place on sloped supports, above ground.
- C. Provide off-site storage and protection when site does not permit on-site storage or protection.
- D. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
- E. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- F. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- G. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not used

END OF SECTION

**SECTION 01700
CONTRACT CLOSE-OUT**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Close-out procedures.
- B. Final cleaning.
- C. Adjusting.
- D. Project record documents.

1.02 RELATED SECTIONS

- A. Reference EJCDC, 1910-8, Article 14.
- B. Documents affecting work of this section include, but are not necessarily limited to, General Conditions, General Provisions, Supplemental Conditions, and Construction Specifications.

1.03 CLOSE-OUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's inspection.
- B. Provide submittals to Engineer as required by other authorities.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- D. Owner will occupy all portions of the system prior to final payment.

1.04 FINAL CLEANING

- A. Execute final cleaning prior to final inspection.
- B. Clean all construction debris from area, including roadways, ditches, gutters, pavement, etc.
- C. Clean site; sweep paved areas, rake clean landscaped surfaces.
- D. Remove waste and surplus materials, rubbish and construction facilities from the site.

1.05 ADJUSTING

- A. Adjust all valve boxes and other appurtenances to the water line to grade, fine grade the protective covers, and insure that installation is plumb and square over the valve nuts.

1.06 PROJECT RECORD DOCUMENTS

- A. Maintain on site, one set of the following record documents; record actual revisions to the Work:
 - 1. Contract Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other Modifications to the Contract.
 - 5. Reviewed shop drawings, product data, and samples.
- B. Store Record Documents separate from documents used for construction.
- C. Record information concurrent with construction progress.
- D. Record Documents and Shop Drawings; Legibly mark each item to record actual construction including;

1. Measure depths of pipes and there underground conduits in relation to datum or finish grades on abutting streets.
 2. Measure horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements. Provide a minimum of three measurements to permanent features for each valve or other appurtenance as well as the valve or other appurtenance to other valves and appurtenances.
 3. Field changes of dimension and detail.
 4. Details not on original Contract Drawings.
- E. Submit documents to the Engineer prior to or concurrent with the final application for payment. Engineer will review documents and make appropriate changes to the "originals" from the information supplied by the Contractor, will verify appropriate items of measurements, and may require substantiation of data from Contractor. Record drawings will be completed prior to recommendation for final payment. Delays in submitting proper documentation will delay final payment for the work.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

**SECTION 01740
WARRANTIES AND BONDS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preparation and submittal.
- B. Time and schedule of submittals.

1.02 RELATED SECTIONS

- A. Section 01730 - Operation and Maintenance Data.
- B. Section 00120 - Information for Bidders.
- C. Section 00530/40 - General and Supplemental Conditions.
- D. Individual Specifications Sections: warranties required for specific products of work.

1.03 DESCRIPTIONS

- A. This section includes procedural requirements for executing, assembling and submitting warranties and bonds.

1.04 FORM OF SUBMITTALS

- A. Bind in commercial quality, 8-1/2 x 11 inch 216 x 279 mm, three-ring hardback binder, cleanable, with plastic covers.
- B. Label binder with "WARRANTIES AND BONDS", title, with title of Project, name, address and telephone number of Contractor with supplier and subcontractor on inside cover.
- C. Provide neatly type Table of Contents, in the specification section specified, and the name of the product of work items.
- D. Separate each warranty or bond with index tab sheets keyed to the Table of Contents.
- E. Provide full information (use separate typed sheets where necessary) listing subcontractor, suppliers, and manufacturers with name, address, and telephone number of responsible principal.

1.05 PREPARATION OF SUBMITTALS

- A. Obtain within 10 days of completion of applicable work the bonds (executed in duplicate) executed by responsible subcontractor, suppliers and manufacturers. Leave date of beginning of time of warranty until the date of substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.

1.06 TIME OF SUBMITTALS

- A. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten (10) days after acceptance.
- B. Make other submittals within 15 days after Date of Substantial Completion, prior to final Application for Payment.
- C. For items of Work not accepted is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 02221
TRENCHING, BACKFILLING, AND COMPACTING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Work included: Trench, backfill, and compact as specified herein and as needed for installation of underground utilities associated with the work.
1. Furnish all labor, materials, tools, equipment, and machinery necessary for removing, wherever located, all earth, rock, and other materials to be excavated.
 - a. Remove existing structures except where specifically paid for as a separate contract pay item.
 - b. Strip or remove top soil or sod, pile separately from other excavated materials and later restore to its original place after backfilling is completed, all in accordance with Section 02110, CLEARING.
 - c. Furnish, place, and maintain all sheeting, shoring, and bracing necessary to protect the work and adjacent property, in accordance with Section 02151, PROTECTIVE SYSTEMS.
 - d. Provide pumping, bailing, and draining necessary to keep the excavation free from seepage water, water from sewers, drains, ditches, creeks, and other sources, in accordance with Section 02151, PROTECTIVE SYSTEMS
 - e. Provide for the uninterrupted flow of sewers and surface water during progress of the construction.
 - f. Dispose of excess or unsuitable materials not required or which cannot be used.
 - g. Backfill, tamp, compact, and refill after settlement of all excavated areas.
 - h. Restore all streets, alleys, fences, rights of way, and other lands or structures, private or public, damaged or occupied by the contractor in the performance of the contract, to as good a condition as they were prior to the beginning of the work.
 2. Trenches for utility line construction will be unclassified and will include all materials and conditions encountered in the excavation.
 3. Subsurface information, pertaining to the character of material to be encountered in the excavation work, found by making soundings or otherwise, the results of which are contained on the plans or in the specifications expressly understood that there is no guarantee nor any inference intended by the Owner that any materials to be encountered at any other point or points is even approximately the same, either in character or elevation, as that shown on the plans or found in the specifications.
- B. Related Work:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these specifications.
 2. Section 02110: Site Clearing
 3. Section 02151: Protective Systems

1.02 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.
- C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the soil engineer.
- D. Excavate trenches by trenching machines, hoes, or drag lines, except in locations where hand trenching is required.

1.03 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01640.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

- A. Fill and backfill materials:
1. Provide soil materials free from organic matter and deleterious substances, containing no rocks or lumps over 6" in greatest dimension, and with not more than 15% of the rocks or lumps larger than 2-3/8" in their greatest dimension.
 2. Fill material is subject to the approval of the soil engineer, and is that material removed from excavations or imported from off-site borrow areas, predominantly granular, non-expansive soil free from roots and other deleterious matter.
 3. Do not permit rocks having a dimension greater than 3" in the upper 12" of fill.
 4. Cohesionless material used for backfill: Provide sand, free from organic material and other foreign matter, as approved by the engineer.

5. Provide on all sanitary sewer pipe, and other pipes requiring strict grade and alignment control bedding or cradling material of crushed limestone rock, or pit run gravel.
 - a. Granular cradle material, may be pit run limestone aggregate consisting of hard, durable, uncoated particles or stone particles mixed with sand, free from clay lumps shale, salt or alkali, well graded from coarse to fine with at least 55% material retained on the 1/4-inch screen or the granular material may be pea gravel or washed gravel meeting the above gradation.
 - b. Wash gravel shall be uniformly graded from 1/4 inch to 1 1/2-inch mesh and shall be free flowing in nature.
 - c. Either material when wet, shall not form mud or muck.
6. Furnish concrete encasement when required by the plans or Engineer, said material shall be composed of free flowing material consisting of small stone, pea gravel, limestone chat, or pit run sand and gravel.
 - a. Material shall be free of sticks, lumps, stones, or organic matter. Concrete encasement may be poured either wet or dry, but in either case, the reacted material shall have an average compressive strength of 2500 ponds per square inch at 28 days.
 - b. Place encasement material specified to be poured dry one each side of the pipe for the full width of the trench and cut under the pipe with shovels or other suitable equipment, and the dry material shall be compacted by tamping to a height of 3 inches above the pipe.
 - c. Exercise caution and care when concrete encasement is to be poured wet, so as not to float the pipe out of place.
 - d. Remove and relay pipe moved out of alignment or grade at the expense of the contractor.
7. During trenching, if in the opinion of the Engineer the subgrade material encountered at grade is soft, spongy, or unsuitable, it shall be removed to such a depth as determined by the soil engineer.
 - a. Replacement of the undercut area shall be backfilled with firmly tamped gravel or crushed stone to provide an unyielding, stable foundation.
 - b. Gravel or stone used in the replacement of the foundation material shall be pit run gravel or crushed stone, of the size and gradation which the soil engineer determines necessary to stabilize the at grade material, and shall be free from silt, loam, vegetable matter, and other deleterious substances.
 - c. The actual quantity of gravel utilized to satisfy the requests of unstable foundation, is unknown at the time of bid but shall be paid for, at the stated unit price in the bid or the negotiated unit price, in cubic yards in place, and such bid unit price or negotiated unit, irrespective of the quantity used, shall be the total compensation for furnishing all labor, materials, tools, and equipment for performing this particular phase of work.
 - d. Remove unstable subgrade and replace with gravel or stone at the expense of the contractor if condition was due to neglect by the contractor, for improper drainage or lack of drainage.

2.02 TRACER TAPE FOR NON-METALLIC PIPE

- A. Provide detectable tracer tape for all non-metallic pipe systems in a three (3) inch wide form, of the color and markings as required by the American Public Works Association (APWA). Utilize polyethylene tape with a total thickness of at least 5 mils, tested in accordance with ASTM D2103. The 3-inch wide foil back product shall have a tensile strength of at least 3900 psi when tested in accordance with ASTM D882. Ensure the detectable tape has a solid aluminum foil core of at least 0.35 mils thickness and said core is completely encased in a protective polyethylene plastic jacket. Foil core shall be visible so as to verify continuity.
- B. Color codes are as follows;
 1. RED; for electrical power distribution and transmission lines mark "caution electric line buried below".
 2. YELLOW; for oil and gas distribution and transmission lines and also for dangerous materials, product lines and steam lines, mark "caution gas line buried below".
 3. BLUE; for water systems, mark "caution water line buried below".
 4. GREEN; for sewer lines, mark "caution sewer line buried below".
 5. ORANGE; for telephone, telegraph, cable TV, and secure communication lines, mark "caution telephone line buried below".

The ink used for the markings shall be chemically stable and provide a permanent mark on the polyethylene material so as to not be removed upon handling or underground burial.
- C. Provide the tape in as long a section as possible so as to minimize the number of underground splices required for electrical continuity. Utilize materials from the manufacturer, carefully following his instructions, for the joining of the tape, including the type and style of the pin connector, environmental protection, and taping of the joint.

2.03 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the contractor subject to the approval of the Engineer.
- B. Schedule material deliveries to provide the least interference and inconvenience to the general public.
 1. Delivery of materials in advance to the job site may be accomplished provided the area of storage is secure.

2. Materials delivered and stored, onsite, will be paid for as materials on hand provided the Contractor provides the Engineer copies of invoices of said materials and provided further that proof of previous payments for materials on hand are submitted to the Engineer.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.
- B. All work shall have continuous inspection. Inspectors or technicians are authorized to inspect all work done and all materials furnished. Inspection may extend to all or any part of the work and to the preparation, fabrication or manufacturer of the materials to be used. Inspector is not authorized to alter or waive the provisions of the plans or specifications or is not authorized to issue instructions contrary to the plans and specifications, or to act as foreman for the contractor. The Owner, its inspectors and employees, shall be allowed access to all part of the work and shall be furnished with such information and assistance by the contractor as is required to make a complete and detailed inspection.
- C. If the inspector requests, the contractor, at any time before acceptance of the work, shall remove or uncover such portions of the finished work as may be directed. After examination, the contractor shall restore said portions of the work to the standards required by the specifications. Should the work so exposed or examined prove acceptable, the uncovering, or removing, and the replacing of the covering and making good the parts removed will be paid for by the Owner; but should the work exposed or examined prove unacceptable, the uncovering, or removing and the replacing of the covering or making good the parts removed, will be at the contractor's expense.
- D. Any work done or materials used without supervision or inspection by an authorized Owner representative may be ordered removed and replaced at the contractor's expense unless the Owner's representative failed to inspect after having been given reasonable notice in writing that the work was to be performed.
 1. Make excavation by open cut from the surface of the ground and no larger than necessary to permit proper construction of the work. Open only so much excavation in advance of the work as approved by the Engineer.
 2. Walls of excavation shall be cut and maintained as nearly vertical as practical, except as herein provided.
 3. Provide a foundation area in the bottom of all excavation which is firm, stable and of uniform density as nearly as practical, and unless necessary, materials shall not be disturbed below grade.
 4. Remove soft, wet, disintegrated or other unsuitable materials, at foundation level, to a depth below grade as directed by the Engineer and any rock or extremely hard material shall be removed to a depth of not less than 6 inches below grade.
 5. Remove rock or other extremely hard materials, to such a width to provide a minimum of six (6) inches clearance from pipe bells.
 6. Replace material removed from below grade in the trench with suitable materials compacted to the finish grade elevation and in a manner satisfactory to the Engineer.
 7. Provide trenches for water pipes with a minimum two feet of vertical separation from sewer pipes at crossover points and at least ten feet laterally from sanitary sewers. If this requirement for vertical clearance cannot be met because of physical conditions, the water mains shall be placed so that no water pipe joints will exist within nine feet of the crossover point and the sewer line shall be reconstructed to the same standards as the water line with sewer pipe joints equidistant and not less than nine (9) feet from the water line.
 8. Width of the trench at the ground surface may vary with, and depend upon, its depth and the nature of the ground encountered.
 - a. Provide a minimum clear width of trench, measured at the horizontal diameter of the pipe, of 16 inches, or one foot greater than the outside diameter of the barrel of the pipe, whichever is greater, if the pipe must be assembled in the trench.
 - b. Prevent the maximum width of trench at the top of the pipe from being more than the outside diameter of the barrel of the pipe plus two feet. Greater width of trench at the top of the pipe shall be permitted only on written approval by the Engineer.
 9. Correct any part of the trench excavation below grade with compacted material approved by the Engineer.
 10. Saw cut all concrete, asphaltic concrete and/or asphaltic concrete base for driveways, parking areas, or streets, where encountered in the project and where boring is not required by Governmental Agencies having jurisdiction.
 - a. Obtain permits from the Owner of the facility, where required, and maintain a copy of the permit on the job site, for examination by the Engineer.
 - b. Cut and dispose of all paving as shown on the plans.
 - c. Provide moist, clean river sand, "Flushed with water to obtain full compaction" as backfill material from the bottom of the pipe trench to the subgrade of the temporary paving.
 - d. Extend sand backfill for a distance of at least 3 feet laterally from the edge of the paving.
 - e. Maintain all temporary paving over trenches.

11. Remove and replace pipe side drains and headwalls in a condition equal to or better than the original installation. No additional compensation will be made for this work, cost of the same shall be included in other pay items, as delineated on the bid proposal.
- E. Examine the character of the foundation material at the elevation shown on the plans.
 1. When directed by the Engineer in writing, the contractor shall deepen the excavation to obtain a proper foundation.
 2. Foundation materials other than solid rock or other hard materials shall be free of loose materials, cleaned and cut out either entirely level, or when approved by the Engineer, shall be step or serrated.
 3. The final cleaning off and the preparing of the foundation area shall be done immediately prior to the placement of concrete, piping materials, or other structures.
- F. Prevent destruction of natural trees and bushes beyond lines reasonably necessary for the prosecution of the work.
- G. Use of explosives to loosen rock or for any other purpose in the prosecution of the work, shall require permits and written permission of the Engineer and Owner.
 1. Make good and be responsible for any damage caused by blasting or accidental explosions.
 2. Take all necessary precautions as required by City regulations and the laws of the State of Oklahoma relative to blasting.
 3. Provide a special blasting insurance policy to the Owner.
 4. Prevent blasting within fifty (50') feet of the completed work or exposed pipes, conduits, etc.
 5. Assume all liability for any injury or damage to persons or property.
 6. Maintain only a sufficient quantity of explosives, caps, and detonators on the job for the immediate day's work.
 7. Comply with the requirements of the Occupational Safety and Health Administrative (OSHA) rules and regulations and in specific Title 29, Chapter XVII, Part 1926, Subpart U and any revision thereof.
- H. Coordinate construction on railroad right of way with the Railroad Company.
 1. Utilize utmost care to protect all railroad property and operation.
 2. Restore railroad property to its original condition to the satisfaction of the Railroad Company and the Owner.
 3. The Owner will secure all permits necessary for the Contractor to enter upon railroad property, at the site of the completed work.
 4. Assume all responsibility for all other cost associated with this work, including flagmen etc., required by the Railroad Company.
 5. Restore the site and obtain a release from the Railroad Company stating that all work has been accomplished to their satisfaction and that clean up is complete.
 6. Provide this release to the Owners prior to final payment.
- I. Coordinate construction on State Highway right of way with the Division Engineer.
 1. Exercise utmost care to protect Highway property, its operations, and all areas must be restored to their original condition to the satisfaction of the Oklahoma Department of Transportation and the Owner.
 2. The Owner will secure permits as necessary for the Contractor to enter upon highway property at the site of the completed work.
 3. Assume all responsibility for all other costs associated with the work including signs, barricades, flagmen etc., as may be required by the Oklahoma Department of Transportation.
 4. Restore the property and obtain a release from the Department stating that the work has been completed to their satisfaction and that clean up is complete.
 5. Provide this release to the Owner prior to final payment.
- J. Coordinate construction on County rights of way with the County Commissioners.
 1. Exercise utmost care to protect County property, its operation, and all areas must be restored to their original condition, to the satisfaction of the Commissioner and Owner.
 2. The Owner will secure permits where necessary for the Contractor to enter upon County property at the site of the contemplated work.
 3. Assume responsibility for all other costs associated with the work including signs, barricades, flagmen, etc., as may be required by the Commissioner.
 4. Obtain a release from the Commissioner stating that the work has been completed to his satisfaction and that clean up is complete.
 5. Provide this release to the Owner prior to final payment.

3.02 FINISH ELEVATIONS AND LINES

- A. Comply with pertinent provisions of Section 01050. Grade lines shown on the plans are the elevation of the invert or the flow line of the pipeline. Where a grade line is shown, lay line to conform.
 1. Establish the grade line in the trench by the use of batter board or if batter boards are not used utilize grade stakes not further than 50 feet apart.
 - a. Maintain a minimum of 3 batter boards in the correct position, continuously, during the construction of the utility line.
 - b. Provide batter boards of good straight, sound material, fastened to substantial stakes or uprights.

- c. Provide a suitable fine cord or wire stretched tightly between batter boards over the exact center line of the sewer.
 - d. Provide a graduated pole or rod for measurement from cord stretched between batter boards to the bottom of the trench or the flow line of the pipe as is applicable.
 - 2. Contractor may elect to use the laser beam method to establish grade and alignment of pipe. Assure, by proper test, that the instrument is in correct adjustment.
 - 3. Irregardless of the method of establishing grade by the contractor, the owners engineer shall provide only the base line control points and the bench marks necessary for the construction. The contractor, under Section 01050, FIELD ENGINEERING, shall furnish all services and bear the cost necessary to establish grades at the manhole, appurtenances, or at other location need by the contractor.
 - 4. Provide all water lines with a minimum over of thirty (30) inches unless otherwise shown on the plans or the Special Provisions.
 - a. Measure cover of the lines located in improved street with curb and gutter from the top of the curb to the top of the water pipe.
 - b. Measure cover of the water lines located in unimproved streets without curb and gutter from the bottom of road ditch to the top of the pipe regardless of the cover over the pipe at other points in the street.
 - c. Measure cover across natural ground from natural ground to the top of the pipe.
 - 5. Excavate deeper if it is necessary, so that a water line will not exceed the manufacturer's recommendations for deflection of the pipe joint and receive no extra compensation.
 - 6. Lay concrete cylinder pipe on a grade to insure proper jointing of the pipe.
 - a. Utilize grades in such a manner so as to avoid excessive use of fittings and specials and to provide a uniform grade between low points and high points.
 - b. Expect no additional compensation for extra trench depth required to meet these conditions.
 - c. Resolve any differences of opinion concerning the grades as set by the Engineer prior to pipe laying.
- B. Open only sufficient trench to handle one days work and the amount of trench excavated to grade shall not exceed one hundred fifty (150) feet and no trench excavation shall be made further than three hundred (300) feet in advance of construction.
- C. Construction of all gravity sewer shall begin at the low point in the line working toward the high point.
 - 1. Construction of tributary lines will not be started until the main or the submain has been completed to a point where the tributary or lateral discharges.
 - 2. Construct sewer appurtenances as soon as the sewer which they serve is constructed at their location. Postponing of the construction of appurtenance until the sewer line has been completed or the building of appurtenance in advance of the construction of the sewer line will not be permitted.
 - 3. Construction of sewers eighteen (18) inches in diameter and smaller for more than six hundred (600) feet in advance of the appurtenances which are incomplete or the construction of which has not been started will not be permitted.

3.03 PROCEDURES

- A. Utilities:
 - 1. Unless shown to be removed, protect active utility lines shown on the drawings or otherwise made known to the Contractor prior to trenching. If damaged, repair or replace at no additional cost to the Owner.
 - 2. If active utility lines are encountered, and are not shown on the drawings or otherwise made known to the Contractor, promptly take necessary steps to assure that service is not interrupted.
 - 3. If service is interrupted as a result of work under this Section, immediately restore service by repairing the damaged utility at no additional cost to the Owner.
 - 4. If existing utilities are found to interfere with the permanent facilities being constructed under this section, immediately notify the Engineer and secure his instructions.
 - 5. Do not proceed with permanent relocation of utilities until written instructions are received from the Engineer.
- B. Protection of persons and property:
 - 1. Barricade open holes and depressions occurring as part of the work, and post warning lights on property adjacent to or with public access.
 - 2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
 - 3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement
- C. Dewatering:
 - 1. Remove all water, including rain water, encountered during trench and substructure work to an approved location by pumps, drains, and other approved methods.
 - 2. Keep trenches and site construction areas free from water.
- D. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.
- E. Maintain access to adjacent areas at all times.

3.04 TRENCHING

- A. Comply with pertinent provisions of Section 02151, and the provisions of this Section.
- B. Provide sheeting and shoring necessary for protection of the work and for the safety of personnel.
 - 1. Prior to backfilling, remove all sheeting.
 - 2. Do not permit sheeting to remain in the trenches except when, in the opinion of the Engineer, field conditions or the type of sheeting or methods of construction, such as use of concrete bedding, are such as to make removal of sheeting impracticable. In such cases, the Engineer may permit portions of sheeting to be cut off and remain in the trench.
- C. Trenches will be excavated to the lines and grades as shown on the plans or laid out by the engineer. No change in location of the lines are contemplated, but should any changes be made in the lines, not materially changing the amount or character of the trenching to be done, the contractor shall proceed with the changed alignment at the bid proposal price. In case any changes involve greater or lesser construction difficulties or quantities than the original alignment, the Owner and the Engineer will agree with the Contractor for a change in compensation for the work, prior to the construction of the changed line or lines.
 - 1. Provide a width of the trench six (6) inches minimum and eight (8) inches maximum on each side of the pipe bell to a point at least 2 feet above said pipe bell and as shown in the tables of this specification. Provide trenches for utility lines, which are to be laid to grade, of such depth so that the invert elevation meets and matches the grade line shown on the plans or established by the Engineer.
 - 2. Advance excavation not more than three hundred (300) feet ahead of the completed backfill line. Lay pipe in all trench that has been opened at the end of each day, unless written permission to do otherwise is secured from the Engineer. Remove unstable material and provide the necessary backfill to bring the trench to proper grade with approved compacted gravel or stone should the foundation become unstable through the neglect of the contractor to adequately shore or dewater the trench. Claim no extra compensation for this work. Replace over excavation of trench with compacted gravel or stone at the contractor's expense.
 - 3. Remove unsuitable material, encountered at the grade depth, which constitute an unstable foundation for the pipe and backfill the trench to the proper grade with compacted gravel or stone. Compensation for this rock bedding will be in accordance with the bid proposal or if no proposal price is listed, shall be in accordance with the negotiated price for the work.
 - 4. Grade, form and align the bottoms of pipe trenches to the grads and dimensions required by the plans. Cradling shall be approved by the job inspector before any sewer pipe is laid therein. Excavate bell hole by hand in order to clear pipe wall.
 - 5. Excavate all trenches, including work necessary around existing pipe line or other obstructions. Provide notice to the Owner of any such line or obstructions so that the utilities may have time to take the necessary precautions for protection of their property. Protect the Owner from any damages occasioned by the work of the contractor.
 - 6. Provide holes for the bells of the pipe at every joint of sufficient size and depth to relieve the bell of all loads, permitting the barrel to be firmly bedded throughout its length and to provide ample space for forming the joint. Filling or ramming earth or other materials beneath the pipe to raise it to grade, rather than regarding the trench cradle material will not be permitted.
 - 7. Cease laying pipe unless the foundation is of a condition satisfactory to the Engineer. Laying of pipe in a wet trench shall only be done when and if approved by the Engineer. Lay spigot end of all gravity flow pipes in the direction of flow. No buckling in or laying of pipe downgrade will be permitted. Lay pipe to the bottom of the trench in a careful manner approved by the Engineer.
 - 8. Trenching crossing cultivated field shall first have the area of the excavation stripped of topsoil to a depth of twelve (12) inches or to the base of the organic soil layer, whichever is least.
 - 9. Trenching crossing areas with sod or greens shall have the sod or greens stripped and piled separately from other excavated materials, including the topsoil, and later restored to its original place, after other backfilling operations are completed.
 - a. Sod or greens removed in making the excavation shall be backfilled with the same sod or greens replaced in good condition or other sod or grass of the same kind and in as good a condition placed in its stead. Provide burlap or canvas over lawns in parkways and easements to receive excavated material to prevent contact between lawns and excavated materials.
 - b. Remove sod in areas of such size that they may be handled conveniently without unduly breaking. Remove sod in one (1) layer not less than four (4) inches in depth, carefully store sod where it is protected from injury and continuously keep sod in moist condition.
 - c. Protect stored sod, during hot dry weather, by covering with topsoil, other earth, canvas or burlap.
 - 10. Place sod to cover the entire area of the excavation in a thorough manner, approved by the Engineer, while the sod or greens are in good condition.
 - a. Wet the entire area after sod replacement. Replace sod which cannot be preserved due to weak or damaged roots or other causes, the area occupied by the excavation shall be replanted with grass or roots of the same variety as the original grass.
- D. Provide sheeting and shoring necessary for protection of the work and for the safety of personnel.

- E. Open cut:
1. Excavate for utilities by open cut along lines and grades as shown on the plans.
 2. If conditions at the site prevent such open cut, and if approved by the Engineer, trenching may be used.
 3. Short sections of a trench may be tunneled if, in the opinion of the Engineer, the conductor can be installed safely and backfill can be compacted properly into such tunnel.
 4. Where it becomes necessary to excavate beyond the limits of normal excavation lines in order to remove boulders or other interfering objects, backfill the voids remaining after removal of the objects as directed by the soil engineer.
 5. When the void is below the subgrade for the utility bedding, use suitable earth materials and compact to the relative density directed by the soil engineer, but in no case to a relative density less than 90%.
 6. When the void is in the side of the utility trench or open cut, use suitable earth or sand compacted or consolidated as approved by the soil engineer, but in no case to a relative density less than 80%.
 7. Remove boulders and other interfering objects, and backfill voids left by such removals, at no additional cost to the Owner.
 8. Excavating for appurtenances:
 - a. Excavate for manholes and similar structures to a distance sufficient to leave at least 12" clear between outer surfaces and the embankment or shoring that may be used to hold and protect the banks.
 - b. Over depth excavation beyond such appurtenances that has not been directed will be considered unauthorized. Fill with sand, gravel, or lean concrete as directed by the soil engineer, and at no additional cost to the Owner.
- F. Trench to the minimum width necessary for proper installation of the utility, with sides as nearly vertical as possible. Accurately grade the bottom to provide uniform bearing for the utility.
- G. Depressions:
1. Dig bell holes and depressions for joints after the trench has been graded. Provide uniform bearing of the pipe on prepared bottom of the trench.
 2. Except where rock is encountered, do not excavate below the depth indicated or specified.
 3. Where rock is encountered, excavate rock to a minimum over depth of 6" below the trench depth indicated or specified.
- H. Where utility runs traverse public property or are subject to governmental or utility company jurisdiction, provide depth, bedding, cover, and other requirements as set forth by legally constituted authority having jurisdiction, but in no case less than the depth shown in the Contract Documents.
- I. Where trenching occurs in existing lawns, remove turf in sections and keep damp. Replace turf upon completion of the backfilling.
- J. Cover:
1. Provide minimum trench depth indicated below to maintain a minimum cover over the top of the installed item below the finish grade or subgrade unless other grades are shown on the plans.
 - a. Areas subject to vehicular traffic:

(1) Sanitary sewers:	48"
(2) Storm drains:	36"
 - b. Areas not subject to vehicular traffic:

(1) Sanitary sewers:	30"
(2) Storm drains:	18"
 - c. All areas:

(1) Water lines:	30"
(2) Natural gas lines:	24"
(3) Electrical cables, Primary	48"
(4) Electrical ducts, Secondary	36"
 - d. Concrete encased:

(1) Pipe sleeves for water and gas lines:	24"
(2) Sanitary sewers and storm drains:	12"
(3) Electrical ducts:	24"
 2. Where utilities are under a concrete structure slab or pavement, the minimum depth need only be sufficient to completely encase the conduit or pipe sleeve, and electrical long-radius rigid metal conduit riser, provided it will not interfere with the structural integrity of the slab or pavement.
 3. Where the minimum cover is not provided, encase the pipes in concrete as indicated. Provide concrete with a minimum 28-day compressive strength of 2500 psi.
- K. Provide an electrically continuous conductor tracer wire (copper) AWG 12, solid, insulated with polyethylene complying with the physical and electrical properties per ASTM D-1248, or tracer tape in the trench along or over the pipe and terminating above ground with 24 inch leads taped around each riser.

3.05 BEDDING

- A. Provide bedding as indicated on the drawings.

3.06 BACKFILLING

A. General:

1. Do not completely backfill trenches until required pressure and leakage tests have been performed, and until the utilities system as installed conform to the requirements specified in the pertinent sections of these specifications.
2. Except as otherwise specified or directed for special conditions, backfill trenches to the ground surface with selected material approved by the soil engineer.
3. Reopen trenches which have been improperly backfilled, to a depth as required for proper compaction. Refill and compact as specified, or otherwise correct to the approval of the soil engineer.
4. Do not allow or cause any of the work performed or installed to be covered up or enclosed by work of this section prior to required inspections, tests, and approvals.
5. Should any of the work be so enclosed or covered up before it has been approved, uncover all such work and, after approvals have been made, refill and compact as specified, all at no additional cost to the Owner.

B. Lower portion of trench:

1. Deposit approved backfill and bedding material in layers of 6" maximum thickness, and compact with suitable tampers to the density of the adjacent soil, or grade as specified herein, until there is a cover of not less than 24" over sewers and 12" over other utility lines.
2. Take special care in backfilling and bedding operations to not damage pipe and pipe coating.
3. Install the tracer tape or warning tape and wire, as applicable to this project, after the initial backfilling and/or bedding operations so that the tape is a minimum of 12" over utility lines and 24" over sewer lines, except the tape shall never be less than 12" below the natural ground or the finish grade line.
4. Place warning tape or tracer tape directly over the conduit for which it is providing security.
5. Install the tracer tape or wire continuously and minimize the number of splices between pull and attachment boxes.
6. At valve locations, underground structures, and locations specified by the Engineer, loop the tracer tape or tracer wire to the top of the valve or other structure and provide sufficient tracer tape or wire length so that the tracer tape or wire may be raised at least 2 feet above natural ground or finish grade.
7. Test the tracer tape or wire used and the installation thereof in the presence of the Resident Project Representative (RPR) by either the inductive or the conductive method, as chosen by the Contractor. Any loss of signal requires re-opening the trench, uncovering the tracer tape or wire, and determining the problem and repair of the same. Thereafter retest the segment(s) until a continuous signal is available.

C. Remainder of trench:

1. Except for special materials for pavements, backfill the remainder of the trench with material meeting 2.01A herein.
2. Deposit backfill material in layers not exceeding the thickness specified, and compact each layer to the minimum density directed by the soil engineer.

D. Adjacent to buildings; Mechanically compact backfill within ten feet of buildings.

E. Consolidation of backfill by jetting with water may be permitted, when specifically approved by the soil engineer, in areas other than building and pavement areas.

3.07 TEST FOR DISPLACEMENT OF SEWERS AND STORMDRAINS

- A. Check sewers and stormdrains to determine whether displacement has occurred after the trench has been backfilled to above the pipe and has been compacted as specified.
- B. Flash a light between manholes or, if the manholes have not yet been constructed, between the locations of the manholes, by means of a flashlight or by reflecting sunlight with a mirror.
- C. If the illuminated interior of the pipe line shows poor alignment, displaced pipes, or any other defects, correct the defects to the specified conditions and at no additional cost to the Owner.

3.08 PIPE JACKING

- A. The Contractor shall not install steel pipe casings under existing roads or pavement by jacking.

3.09 FIELD QUALITY CONTROL

- A. The soil engineer will inspect and approve open cuts and trenches before installation of utilities, and will make the following tests:
 1. Assure that trenches are not backfilled until all tests have been completed;
 2. Check backfilling for proper layer thickness and compaction;
 3. Verify that test results conform to the specified requirements, and that sufficient tests are performed;
 4. Assure that defective work is removed and properly replaced.

3.10 DISPOSAL OF EXCAVATED MATERIALS

- A. Excavated material so far as needed and of a suitable character, shall be piled adjacent to the work to be used for backfilling.
 1. Material unsuitable for backfilling or material in excess of that required for backfilling shall be disposed of in an approved manner and at locations provided by the Contractor.
 - a. Such material as above described will be entirely removed from the site in an approved manner and to a location selected by the Contractor. Such site or sites for disposal of unsuitable excavation will be by private

agreement of the disposal site. The OWNER of the project shall be provided written evidence that such agreements exist.

- b. Should material as described above and removed from the trenching site result in depressions in excess of three inches (3") in depth, the Contractor will import materials meeting paragraph 2.1A of this section to bring the cross section of the excavated area into a reasonable grade match with the adjoining undisturbed lands.
2. Excavated materials shall be handled in such a manner so as to cause minimum of inconvenience to the public travel, to the safe and convenient access to public or private property adjacent to or along the line of work, or so as not to impede the natural drainage of flow water.

END OF SECTION

**SECTION 02713
WATER DISTRIBUTION SYSTEM**

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Work included: Provide water distribution system as shown on the drawings, specified herein, and needed for a complete and proper installation.
1. These specifications for construction of water mains are intended to be so written that only first class workmanship and finish of the best grade and quality will result. The contractor shall furnish all materials, labor, and equipment for constructing the work included in these specifications as detailed on the plans, unless shown or described otherwise.
 2. Provide tight fitting stoppers or bulkheads securely placed in or across the ends of all pipes at the end of each day's work. Assume responsibility for the care of all work until final completion and acceptance, and make good, at own expense, any damage or injury sustained from any cause. Assume all risks from floods and casualties of every description and make no charge for damages from such cause.
 3. Allow continuous inspection. Inspectors or technicians will be authorized to inspect all work done and all materials furnished. Such inspection may extend to all or any part of the work and to the preparation, fabrication or manufacturer of the materials. The inspector will not be authorized to alter or waive the provisions of the plans or specifications or will not be authorized to issue instructions contrary to the plans and specifications, or to act as foreman for the contractor. The Owner, its inspectors and employees, shall be allowed access to all part of the work and shall be furnished with such information and assistance by the contractor as is required to make a complete and detailed inspection. If the inspector requests, the contractor, at any time before acceptance of the work, shall remove or uncover such portions of the finished work as may be directed. After examination, the contractor shall restore said portions of the work to the standard required by the specifications. Should the work so exposed or examined prove acceptable, the uncovering, or removing, and the replacing of the covering and making good the parts removed will be paid for by the Owner, but should the work so exposed or examined prove unacceptable, the uncovering, or removing, and the replacing of the covering or making good the parts removed, will be at the contractor's expense. Any work done or materials used without inspection by an authorized Owner representative may be ordered removed and replaced at the contractor's expense unless the Owner's representative failed to inspect after having been given reasonable notice in writing that the work was to be performed.
- B. Related Work:
1. Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these specifications.
 2. Section 02151, Protective Systems
 3. Section 02221, Trenching, Backfilling and Compacting

1.02 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are appropriately trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

1.03 SUBMITTALS

- A. Comply with pertinent provisions of Section 01300.
- B. Product data: Within 35 calendar days after the contractor has received the Owner Notice to Proceed, submit:
1. Materials list of items proposed to be provided under this section;
 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
 3. Names and addresses of the nearest service and maintenance organization that readily stocks repair parts;
 4. Manufacturer's recommended installation procedures which, when approved by the Engineer, will become the basis for accepting or rejecting actual installation procedures used on the work.

1.04 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01640.

PART 2 - PRODUCTS

2.01 PIPE AND FITTINGS

- A. General: The type, size, thickness class or pressure rating of pipe shall be as shown on the plans and called for in the bid schedule. Fitting, appurtenance and specials shall have pressure rating equal to or greater than the pipe pressure rating. The following specifications set forth the material requirements for pipe, appurtenances and specials.
- B. Pipe:
1. Cast Iron pipe, three (3) inches in diameter and larger shall conform with the following standards:
 - a. ANSI A21.1 American National Standards for Thickness Design of Cast Iron Pipe. This standard covers both 18/40 and 21/45 iron strength. The plans and/or bid schedule will set forth the thickness class required for 18/40 iron strength. The Contractor may substitute 21/45 iron strength material of comparable thickness class.
 - b. ANSI A21.6 American National Standards for Cast-Iron Pipe Centrifugally Cast in Metal Molds, for Water and other Liquids.
 - c. ANSI A21.8 American National Standards for Cast-Iron Pipe Centrifugally Cast in Sand-Lined Molds, for water and other liquids.
 - d. Pipe and fittings shall be lined in accordance with ANSI A21.4 American National Standards for Cement-Mortar lining for Cast-Iron and Ductile Iron Pipe and fittings for water.
 - e. Joints shall be as called for on the plans or on the bid schedule and will generally either be the push-on joint having a single rubber gasket meeting the requirements of ANSI A21.11 or the mechanical joint meeting the requirements of ANSI A21.11 or flanged joints meeting the requirements of ANSI A21.14. If no joint is listed, the push-on shall be furnished.
 - f. Fitting shall conform with the requirements of ANSI A21-10 of the joint design called for on the plans.
 - g. Pipe, used in the project, unless stated otherwise on the plans or in the specifications, shall be at the least thickness class 22 with iron strength of not less than 18/40.
 - h. Provide polyethylene encasement for all cast iron pipe and fittings per ANSI A21.5 unless stated otherwise in the bid proposal.
 2. Ductile iron pipe, three (3) inches in diameter and larger shall conform with the following standards:
 - a. ANSI A21.50 American National Standard for the Thickness Design of Ductile Iron Pipe. The iron incorporated in ductile pipe shall have a minimum tensile strength of 60,000 psi, a minimum yield strength of 42,000 psi; and a minimum elongation of 10 percent, commonly shown as 60-42-10.
 - b. ANSI A21.51 American National Standard for Ductile-Iron Pipe Centrifugally Cast in Metal Molds or Sand-Lined Molds, for water or other liquids.
 - c. Pipe and fittings shall be lined in accordance with ANSI A21.4 American National Standards for Cement-Lining for Cast-Iron and Ductile Iron Pipe and fittings for water.
 - d. Joints shall be as called for on the plans or on the bid schedule and will generally either be the push-on joint having a single rubber gasket meeting the requirements of ANSI A21.11 or the mechanical joint meeting the requirements of ANSI A21.11 or flanged joints meeting the requirements of ANSI A21.15. If no joint is listed, the push on joint shall be furnished.
 - e. Provide polyethylene encasement for all ductile iron pipe and fittings per ANSI A21.5 unless stated otherwise in the bid proposal.
 3. Steel pipe shall conform with AWWA C200-75 where the wall thickness or schedule will be set forth on the plans.
 - a. Coat pipe and fitting in accordance with AWWA C203, Coal Tar Protective Coating and linings for Steel Water Pipe Lines - Enamel and Tape - Hot Applied, where pipe is to be installed below grade.
 - b. Line pipe and fitting in accordance with AWWA C205, Cement-Mortar protective coating and lining for Steel Water Pipe.
 - c. Joints shall be in accordance with the special provisions and in general shall be butt welded, coupled, screwed or flanged in accordance with AWWA C207 Standards for Steel Pipe Flanges.
 - d. Fittings shall conform with AWWA C208. Preference will be given to smooth drawn bends, however the use of fabricated multi-piece bends will be allowed.
 4. Concrete pipe, when called for on the plans, shall conform with the following specifications as stated in the bid proposal.
 - a. AWWA C303 Reinforced Concrete Water Pipe, Water Pipe Steel Cylinder Type, Pretensioned.
 - b. AWWA C301 Prestressed Concrete Lined Cylinder Water Pipe.
 - c. Fittings and special shall be as detailed on the plans or approved by the Engineer.
 - d. Joints shall be the rubber gasket type meeting the applicable requirements of AWWA and ASTM.

5. Plastic pipe, designated as C900 shall meet the following standards:
 - a. AWWA C900-75 having elastomeric-gaskets composed of PVC 1120 in 4 inch and larger sizes.
 - b. The pipe will be specified as Iron pipe size or for a pressure class. All pipe must bear the seal of the National Sanitation Foundation (NSF).
 - c. Joints for the pipe must be sealed by elastomeric gaskets meeting the requirements of ASTM D3139. The pipe may be furnished plain end and provided with two gaskets for the separate coupling or the pipe may be integral belled end, wall-thickened or sleeve reinforced using only one gasket and meeting the requirements of ASTM D2122.
 - d. Fittings for the pipe shall be cast or ductile iron, cement lined, meeting the requirements of ANSI A21.10, A21.11 and A21.4 utilizing transition gaskets, if required.
6. Polyvinyl chloride pipe (PVC) 1120 shall meet the specifications requirements for Class 160 (SDR 26) and Class 200 (SDR 21) polyvinyl chloride (PVC) pressure rated pipe designed to carry potable water at pressures up to the maximum class ratings. Materials used to produce the pipe, couplings, fittings, where allowed, shall conform in all respects to ASTM D1784, Type 1, Grade 1, having a design stress of 2000 psi. All polyvinyl chloride pipe shall conform to the latest revision of the following specifications:
 - a. ASTM specifications D2241 (PVC plastic pipe SDR-PR)
 - b. National Sanitation Foundation Testing Laboratories (NSF)
 - c. (Joint for elastomeric seals), ASTM F477 (elastomeric seals)
 - d. Couplings and fittings shall be approved by the pipe manufacturers and shall accommodate the pipe for which they are to be used. Provide a minimum pressure rating of 200 psi or the pressure rating of the pipe, whichever is greater.
 - e. Coupling methods shall allow for one-half of the expansion and contraction of each separate pipe section to be taken up at the end of that pipe.
 - f. Fittings, ells, tees, crosses, (for use with pipe of 4 inch or larger diameter), shall be cast iron fittings, mechanical joint or slip joint, cement lined meeting the requirements of ANSI A21.10, A21.11 and A21.4 utilizing transition gasket.
 - g. Pipe marking shall include the following; marked continuously along the length of each joint; manufacturers name; nominal size; class pressure rating; PVC compound; identification code, and NSF seal of approval.
 - h. Pre-approved manufacturers:
 - (1) Vinyl-Plex
 - (2) Quail
 - (3) CAN-TEX Industries
 - (4) CertainTeed
7. Polyethylene Pipe (PE) shall meet the requirements of ASTM D2239 and have wall thickness (SDR) or pressure rating (PR) as set forth on the plans or in the specifications.
 - a. All pipe to bear the Seal of the National Sanitation Foundation Testing Laboratories, Inc., (NSF).
 - b. Utilize PE 2306, 2406, 3306 or 3406, at the Contractors option unless a specific compound is called for on the plans or in the specifications.
 - c. Join pipe to pipe and pipe to fittings by butt welding, performed in accordance to ASTM D3261, the manufacturers recommendations and instructions by the Engineer.
8. The following listed material is considered suitable for service lines and pigtails and any may be used at the contractor's option. However, the contractor must use the same material throughout the job. In certain instances, the type of service line materials will be shown on the plans and if shown the contractor must use that material.
 - a. Copper service line shall be of the size specified meeting the requirements of ASTM B88-47, Type K or the latest revision thereof. The material may also be approved under Federal Specifications WW-T-799. The minimum wall thickness for 3/4", 1" and 1 1/4" shall be 0.065 inches nominal.
 - b. Polyvinyl Chloride (PVC) Pipe shall be of the size specified meeting the requirements for PVC line pipe, except pipe to be threaded must be schedule 80. Schedule 40 pipe will be used elsewhere. Belled end pipe is not acceptable in this size. The use of "O" couplings is encouraged, however solvent cement joints will be allowed. If solvent cement is used, it shall meet the requirements of ASTM D2564. Fittings shall meet the requirements of ASTM D2122.
 - c. Polyethylene Plastic Pipe shall meet the requirements of ASTM D1248 and have a Plastic Pipe Institute designation of PE 3406. The material shall carry the seal of the National Sanitation Foundation.
 - d. Service lines shall be 3/4-inch size for single meter set and 1-inch size for double meter sets.
9. Valves
 - a. Gate Valves: In general, all valves shall conform to the standard specifications for gate valves for ordinary water work service AWWA C500 or the latest revision thereof, except for changes or additions specifically outlined as follows: Valves shall have hub, flange, mechanical joint ends, or a combination of hub, flange, mechanical joint ends as may be specified. Bell and spigot pipe, sizes 2 inch to 48 inch, will use valves with slip on joint ends conforming to ANSI A21.6 or A21.8 standard specifications for ductile or cast iron

pressure fittings AWWA C100 or the latest revision thereof. Mechanical joint pipe, sizes 2 inch to 48 inch, will use valves with Bell conforming to AWWA C111 or a mechanical joint cast iron pressure pipe and fitting ANSI A21.11.

1. All gate valves shall be iron bodied, bronze mounted, double disk, parallel seat, non rising stem, internal wedging type.
2. Valves must embody the best workmanship and finish and open and close freely and easily.
3. In closing, the gates must move without friction to the position opposite their ports, both discs being then closed squarely against the seat rings.
4. When valves are in the full open position, the disc shall be raised clear of the water way and provide an opening equal to the full nominal diameter of the valve.
5. Gate valves shall be tested at a hydrostatic pressure of 300 pounds per square inch, and shall be guaranteed for 150 psig working pressure. Any leakage at the test pressure, through any castings or between the bronze ring and the cast iron body, shall cause said casting or assembly fitting to be rejected. No plugging or patching to stop any leakage will be permitted.
6. All gate valves shall open by turning to the left. Gate valves, 2 inch thru 12 inches, inclusive, shall be nut operated. Gate valves larger than 12 inch shall be gear operated.
7. Line valves, smaller than 2 inch, shall be plug or ball valves meeting the following requirements.
 - a. Body shall be red brass (85-5-5) with female iron pipe size threads meeting the requirements of AWWAC800-66 or the latest revision thereof.
 - b. Plug or ball shall be red brass as above with metal to metal seat. Valve operating head shall be the standard tee head with a 2-inch square adaptor nut meeting the dimensions for standard operating nuts for AWWA gate valves.
 - c. Butterfly valves (when explicitly listed in plans): All butterfly valves shall be manufactured in accordance with the latest revision of AWWA C504 for Class 150B service and comply with the following details
 - i. Valve Bodies shall be constructed of cast iron ASTM A-126 Class B and conform to AWWA C504 in terms of laying lengths and minimum body shell thickness. End connections shall be as specified on the plans. Bolts and nuts for the shell, actuators, glands, and bearing covers shall be stainless steel.
 - ii. Valve Discs shall also be made from cast iron ASTM A-126 Class B or ASTM A-48 Class 40 in sizes 24" and smaller. Sizes 30" and larger shall be built from ductile iron in conformance to ASTM A-536. Disc shall seal against body through Buna-N rubber/316 stainless steel contact.
 - iii. Valve shafts shall be 18-8 type 304 stainless steel conforming to ASTM A-276. Shaft seals shall be standard self-adjusting split V packing. Shaft seals shall be of a design allowing replacement without removing the valve shaft.
 - iv. Valve bearings shall be sleeve type that are corrosion resistant and self lubricating.
 - v. Butterfly valves shall be guaranteed for 200 psig working pressure. Any leakage at the test pressure, through any castings or between the wedge and the cast iron body, shall cause said casting or assembly fitting to be rejected. No plugging or patching to stop any leakage will be permitted.
 - vi. Valve actuators shall be fully grease packed and have stops in the open/close position. The actuator shall have a mechanical stop which will withstand an input torque of 450 ft. lbs. against the stop. The traveling nut shall engage alignment grooves in the housing. The actuators shall have a built in packing leak bypass to eliminate possible packing leakage into the actuator housing. Buried valves shall be fitted with a ductile iron 2" AWWA square operating nut. Operators shall be capable of developing torques listed in AWWA C504 for class 150B Valves.
 - vii. The valve internal surfaces shall be covered with a polyamide cured epoxy coating applied over a sand blasted "new white metal surface" per SSPC-SP10 to a minimum of 6 mils in compliance with AWWA C550. The valve exterior surfaces shall be coated with two coats of asphalt varnish in accordance with TT-C-494A and AWWA C504.
 - viii. Suggested Manufacturer, Pratt Groundhog butterfly valve, or engineer approved equal
 - d. Check valves
 - i. Use check valves designed for a working pressure of not less than 150 psi, or as indicated or directed, with a clear waterway equal to the full nominal diameter of the valve.
 - ii. Use valves designed to permit flow in one direction, when the inlet pressure is greater than the discharge pressure, and to close tightly to prevent return flow when discharge pressure exceeds inlet pressure.
 - iii. Distinctly cast on the body of each valve:
 - a. Manufacturer's name, initial, or trademark by which he can be identified readily;

- b. Valve size;
 - c. Working pressure;
 - d. Direction of flow.
 - iv. Valves 2" and smaller: Provide all bronze, designed for screwed fittings.
 - v. Valves larger than 2":
 - a. Provide iron body, bronze mounted, with flanged ends, of the non-slam type;
 - b. Provide class 125 flanges complying with ANSI B16.2.
10. Fire Hydrants, when required and when shown on the plans, shall conform strictly to AWWA standards for fire hydrants for ordinary water works service (AWWA C502-64) or the latest revisions thereof, with the following supplemental detail changes or additions:
- a. Type of shutoff may be compression type with the flow or compression type against the flow.
 - b. Unless otherwise ordered, the hub for the 4 inch shall be of the 4 inch standard Flanged joint complete with all joint accessories.
 - c. The hose nozzle shall be 2 1/2-inch nominal ID national standard thread.
 - d. All 4 inch hydrants shall be equipped with two (2) hose nozzles only, conforming with the above size and threading.
 - e. Unless otherwise ordered, hydrants shall be furnished with a four (4) foot depth of bury.
 - f. A drain opening will be required and a drain valve operating through gravity will not be accepted.
 - g. All fire hydrants shall be painted in accordance with Appendix D of the AWWA specifications C502-64 for Class C hydrants unless stated otherwise. Under this classification, the barrels of all hydrants shall be painted chrome yellow and the tops and nozzle caps of the hydrants shall be painted red.
 - h. All fire hydrants shall open by turning to the left (counterclockwise). No hydrants will be accepted that requires less than twelve (12) turns to open.
 - i. Hydrants shall be of the breakable type, designed to break approximately 3 inches but not over 5 inches, above the ground line. These parts shall be of the breakable flange type or of the integral flange with sawed bolts. Breakable flanges screwed to the standpipe are not acceptable. Flanges shall be so designed that end wrenches can be used on the nuts and bolts. Provisions shall be made in the design of the stems to disconnect the stem from the hydrant parts above the standpipe break position in event of traffic accident. If breakable or sleeve type couplings are used, they shall be of sufficient torsional strength such that a torsional failure of the stem will be such that when the coupling is broken, no parts will come loose and fall into the hydrant, and the break will not occur to the pins or bolts holding the coupling to the stem.
11. The air release or the air and vacuum release valve, as called for on the plans, shall be furnished with both a large and small orifice and shall function automatically to release to atmosphere both large and small quantities of air that might accumulate in the pipe line or to admit large quantities of air into a line under emergency conditions as when the line is being drained. The valve body and cover shall be either high grade gray iron casting or semi-steel depending upon the pressure design. Floats shall be of stainless steel levers of bronze, and the seats of a resilient material resistant to the action of potable chlorinated water of medium hardness. Included in the air and vacuum release valve installation shall be a line sized tee reduced to the air and vacuum release valve tap size or a cast iron sleeve tapped to the air and vacuum release size. Additionally, the contractor shall provide and set a standard 24-inch diameter meter can, 30 inches long, over the installation. The entire backfill under the pipe up to and including the stem to the air and vacuum release valve shall be of an open graded gravel or crushed stone.
- The inlet end shall be screwed for 2 inch and smaller and flanged for 3 inch and larger. Install an isolation valve between the line and the air release or air and vacuum release valve. This isolation valve shall meet the requirements of section 9a except it shall be fitted with an operating lever in sizes smaller than 2 inch or with a standard AWWA handwheel in sizes 2 inch and larger.
12. Reaction or thrust backing shall be of concrete or a mix not leaner than 1 cement, 2 1/2 sand, 5 stone, having compressive strength of not less than 2,500 psi, in 24 hours when using high early strength cement and 7 days when using standard cement. Backing shall be placed between solid ground and the fitting to be anchored. The area of bearing on pipe and on ground in each instance shall be that required by the plans and specifications. The backing shall be placed so that the pipe and fitting joints will be accessible for repair unless otherwise directed by the Engineer.
13. When called for on the plans, joint restraining shall be used and shall meet the requirements for the different piping material as follows:
- a. Cast iron or ductile iron systems in sizes of 4 inch through 12 inch shall use an internal locked, push on joint design. The pipe, special spool or spigot end of fittings shall have a special groove which will engage metal struts which are embedded in the molded gasket. When this system is used, only ductile iron pipe and spool pieces shall be used. The struts shall be low alloy steel compatible with the gasket and pipe material. The entire assembly shall be approved by the Underwriters Laboratories, Inc.

- b. Cast iron or ductile systems larger than 12 inch. When joint restraint for a 14" and larger is required and indicated on the plans or specifications, specially modified push-on joints with joint restraint provided by ductile iron retainer rings joined together by corrosion resistant, low alloy, high strength steel tee head bolts and nuts shall be provided. Restrained push-on joint pipe and fittings shall be ductile iron only.
 - c. Fittings with joint restraint feature shall be ductile iron and shall conform to ANSI standards.
 - d. Loose retainer rings shall be ductile iron. The bell retainer ring shall be seated in a groove in the O.D. of the pipe bell. The spigot retainer ring shall be held on the pipe spigot by a steel retainer bar securely welded to the pipe barrel. Retainer rings on push-on joint centrifugal pipe shall be capable of rotation to facilitate aligning bolt holes during assembly. The bell retainer ring and spigot retainer ring on fittings shall be cast integral with the fitting.
 - e. Restrained push-on joints for pipe and fittings shall be designed for a maximum water working pressure of 250 psi.
 - f. Push-on joints with joint restrains shall be capable of deflection during assembly. After assembly, either straight or deflected, the joint shall be essentially rigid. Angles of deflection obtained during assembly shall not exceed the manufacturers recommendations.
 - g. Other piping systems, such as Plastic, which require joint restraint, shall utilize Midco fittings. Harness, rods and clamps shall be rust proofed or shall be stainless steel as shown on the plans.
14. Service connections shall be made by the use of service saddles irregardless of the piping system used. The following specifications cover the components of the complete installation.
- a. Service Saddles:
 - i. Cast or ductile iron systems shall utilize the double strap design or full band saddle type. The body casting for the double strap design shall be of high tensile ductile iron meeting the requirements of ASTM A536 and the gasket shall be Buna-N or Neoprene. Full band saddles shall have the body and boss made from 18-8 stainless steel. Straps, nuts, washers, and other hardware for the double strap design shall utilize stainless steel. The straps, nuts, washers and other hardware for the full band saddles shall be of 18-8 stainless steel. The threads for all bolts, etc. shall be of National Coarse. Threads for the Corporation stops shall be of the size as specified of iron pipe size.
 - ii. Asbestos Cement or Polyvinyl Chloride (PVC) systems shall utilize the full band saddle, which has the body, shell, boss and all hardware made from 18-8 stainless steel. The band shall be fitted with a partial tapered gasket with a integral molded "O" ring.
 - b. Corporation stops shall be manufactured from waterworks brass of 85-5-5-5 composition meeting the requirements of AWWA C800. The corporation stop shall have an iron pipe thread on the inlet side, have a tee head operator and have the outlet side match the type of service pipe to be used by the contractor. For service lines of copper, the outlet shall use a compression connection for 3/4" copper. No flaring shall be required. For service line of PVC, the insertion of a PVC threaded adaptor, male, by socket female fitting. For polyethylene tubing service line, the corporation stop shall be identical with the one described above for copper, except a stainless steel insert shall be provided for strengthening the P.E. tubing.
 - c. Meter yokes shall be manufactured from copper pipe with waterwork brass fitting meeting the requirements of AWWA C800. The meter yokes shall have horizontal inlet and outlet with multi-purpose thread ends. The meter yoke shall be fitted with an angle meter stop on the inlet side of the meter complete with lock wing. The yoke shall be designed for standard 5/8 x 3/4 inch meters and have 7 inch setting height complete with an integral brace near the inlet connection.
 - i. The inlet coupling shall have the same connection as used on the outlet of the corporation stop, depending upon the service line material used by the contractor. The outlet coupling shall be multi purpose nut compression connection for iron pipe size polyethylene plastic or Polyvinyl (PVC) plastic pipe.
 - d. Meters shall be of standard manufacturer, made and manufactured in the Continental limits of the United States, 5/8 x 3/4-inch size, frost proof case and a sealed magnetic drive disc meter. The register shall be straight reading calibrated in gallons, and furnished with a 10-gallon test sweep hand. The meter shall comply with AWWA C700 or the latest revision.
 - e. Meter boxes (base bid). The meter box and lid shall comply with the following specifications. Meter box shall be made from a 24-inch length of 18-inch diameter corrugated galvanized metal culvert pipe. The pipe shall be 16 gauge and have at least 2 ounces per square foot of surface area, inside and outside, or zinc galvanizing meeting the requirements of ASTM. The meter box cover shall be cast iron. The frame of the cover shall have protruding lip for engagement to the metal box. The lid shall be the non-locking type with at least a 11-inch diameter cover. The cover shall overlap the frame and the frame and cover shall weigh at least 27 pounds.
15. Gate valves boxes shall be three piece, screw type, extension type of cast iron construction with oval bases for fitting the installed gate valve or plug or ball valve. The shaft of the valve box shall be at least 5 inches in diameter. The valve box pieces shall be so manufactured that the oval bases may be interchanged for different

- size gate valves. The cover shall be cast iron, insert flush type with the word water imprinted thereon. The completed assembly shall be adjustable from 24 inches to 30 inches of length.
16. Blowoff shall be set at the end of every dead end line. The blowoff shall consist of a 1 1/4 inch plug or ball valve, screwed fittings, standard meter box and lid and the necessary schedule 80 PVC fittings solvent welded.
 - a. Valve shall meet the requirements of 2.1B9a complete with 2-inch standard square adaptor nuts.
 - b. Meter boxes and cover shall meet the requirements of 2.1A14e.
 - c. All PVC piping shall be Schedule 80 either threaded or solvent welded.
 17. Tapping sleeves
 - a. Provide split sleeve type coupling for existing watermains, furnished with outlet flanged to American 125 standard (ASA series 15):
 - i. Acceptable products: (a). Clow Corporation, Mueller Corporation, Tyler Pipe Company
 - ii. Coordinate requirements of tapping sleeves with gate valves and other fittings as required.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.02 FIELD MEASUREMENTS

- A. Make necessary measurements in the field to assure precise fit of items in accordance with the approved design.

3.03 HANDLING

- A. Handle pipe accessories so as to ensure delivery to the trench in sound, undamaged condition:
 1. Carry pipe into position; do not drag.
 2. Use pinch bars or tongs for aligning or turning the pipe only on the bare end of the pipe.
- B. Clean interior of pipe and accessories before lowering pipe into trench. Keep clean during laying operations by plugging or other method approved by the Engineer.
- C. Before installation, inspect each piece of pipe and each fitting for defects:
 1. Material found to be defective before or after laying: Replace with sound material meeting the specified requirements, and without additional cost to the Owner.
- D. Rubber gaskets: Store in a cool dark place until just prior to time of installation.

3.04 PIPE CUTTING

- A. Cut pipe neatly and without damage to the pipe.
- B. Unless otherwise recommended by the pipe manufacturers, and authorized by the Engineer, cut pipe with mechanical cutter only.
 1. Use wheel cutters when practicable.
 2. Cut plastic pipe square, and remove all burrs.

3.05 LOCATING

- A. Locate water pipe at least ten feet away, horizontally, from sewer pipes.
- B. Where water lines cross gravity-flow sewer line with less than 24" of clearance provide pressure pipe with no joint located within 9 feet of the crossing.
- C. Do not place water lines in the same trench with sewer lines, electric wiring, gas lines or other facilities without the express approval of the Engineer, in writing.

3.06 JOINT DEFLECTION

A. Cast Iron Pipe

1. Maximum allowable deflection will be given in AWWA C600.
2. If alignment requires deflection exceeding limits shown in Table I, furnish special bends or a sufficient number of shorter lengths of pipe to provide angular deflections within the limits shown.

B. Plastic pipe: Unless a lesser amount is recommended by the pipe manufacturer, maximum allowable deflections from a straight line or grade, or offsets, will be given in degrees.

3.07 PLACING AND LAYING

A. General

1. Provide trenching, backfill and compaction per Section 02221.
2. Protect and support all water, sewer, gas, and other conduits crossed by the excavation or work or arrange for their temporary removal and subsequent replacement. All expense incidental to this phase of the work shall be borne by the Contractor.
3. Provide proper implements, tools, and facilities, satisfactory to the Engineer, for the safe and efficient execution of the work. Pipe, fittings, valves, hydrants and accessories shall be carefully lowered into the trench by means of derrick, ropes, or other suitable equipment in such a manner as to prevent damage to pipe and fittings. Under no circumstances shall pipe or accessories be dropped or dumped into the trench.
4. Inspect pipe and accessories for defects prior to lowering into trench. Any defective, damaged or unsound pipe shall be repaired or replaced.
5. Remove all foreign matter or dirt from the interior of pipe before lowering into position in the trench. Pipe shall be kept clean by means approved by the Engineer during and after laying.
6. Seal each pipe with a bell or coupling consisting of a bell or sleeve and one or two rubber rings, respectively.
7. Clean the ends of the pipe to be jointed, the inside of the bell or sleeve and the rubber ring(s) immediately before jointing the pipes.
8. Except where necessary in making connections to other lines, lay pipe with the bells facing in the direction of laying.
9. Rest the full length of each section of pipe solidly on the pipe bed, with recesses excavated to accommodate bells, couplings, and joints.
10. Take up and relay pipe that has the grade or joint disturbed after laying.
11. Assemble the joint recommended by the manufacturer. Accomplishing with an assembly tool so that the resulting position of the bell or sleeve will be centered over the pipe ends.
12. Separate the assembly of the joint at least 1/4" to allow for expansion.
13. Check the rubber ring location with a suitable gauge. Ring(s) for the full circumference of the pipe shall be located a distance from the joint ends as recommended by the manufacturer. If the distance does not fall within the required limits, the joint shall be disassembled and reassembled in an acceptable manner.
14. Deflect pipe no greater, either vertically or horizontally, than recommended by the manufacturers.
15. When pipe laying is not in progress, the open ends of pipe shall be closed by approved means to prevent entrance of trench water into the line.
16. Provide adequate backfill deposited on the pipe to prevent floating. Any pipe which has floated shall be removed from the trench and be relayed as directed by the Engineer.
17. No pipe shall be laid in water, or on frozen trench bottom, or when in the opinion of the Engineer the trench conditions or weather are unsuitable for such work.
18. Connect each cast iron valve, hydrant, or fitting to the pipe with a profile such that a seal can be made between the pipe and the bell of the fitting with a rubber ring.
19. Cutting of pipe for inserting into the bells of valves and fittings, or for closures, shall be done in a neat and workmanlike manner without damage to the pipe, and in accordance with the manufacturer's instructions.
20. Securely close open ends of pipe, fittings, and valves when work is not in progress.
21. Where any part of coating or lining is damaged, repair to the approval of the Engineer and at no additional cost to the Owner.
22. Provide tracer wire or tracer tape entire length of all underground piping with wire riser end 2' long extended above ground at all piping risers.

B. Plastic Pipe:

1. Position pipe and fittings in trench in a manner that identifying markings will be readily visible for inspection.
2. Cutting and joining:
 - a. Protect against abrasion from serrated holding devices.
 - b. Remove burrs from surfaces to be jointed; use abrasive paper, file, or steel wool.
 - c. Remove dirt, dust, and moisture by wiping clean with chemical cleaner or dry cloth.
 - d. Apply an even coat of the specified lubricant to the pipe surface to be jointed.
 - e. Promptly insert pipe into bottom of the fitting socket; turn the pipe slightly to clean sealing gasket.
 - f. Remove excess lubricant from exterior of the joint.
 - g. Should lubricant begin to dry before the joint is made, reapply before assembling.
 - h. Carefully handle pipe so the joint remains home.
3. Do not thread plastic pipe; make connections only with the special adapter fittings designed for the purpose.
4. Align pipe system components without strain.
5. Support piping at intervals of not more than four feet, at ends, branch fittings, and change of direction or elevation.
6. Support plastic pipe in trenches with a 4" layer of select material. Allow no rocks, debris, or potentially damaging substances within 6" of plastic pipe in trenches.

C. Cast Iron or Ductile Iron Pipe

1. Mechanical joints, flanged joints and push on type joints: Install in accordance with AWWA C600, modified as necessary by the recommendation of the manufacturer to provide for special requirements of the pipe.
2. Make connections between different types of pipe and accessories with transition fittings.
3. Rubber gaskets: Handle, lubricant where necessary, and install in strict accordance with the recommendations of the manufacturer.
4. Wrap pipe, fitting and valves with polyethylene per ANSI A21.5.

D. Steel Pipe

1. Weld field joints to meet AWWA C206.
2. Flange joints to meet AWWA C207.

E. Reinforced Concrete Pressure Pipe with Rubber and Steel "O" Ring Joint.

1. Provide equipment for handling of sufficient size, adequately maintain and safeguarded, and operated with experience and good judgment.
2. Handle pipe units at all times under control.
3. Never dump or allow pipe to roll uncontrolled so as not to allow damage to the product or expose men and equipment to great safety risks.
4. Provide handling devices adequate for the weight of the units. Check slings, chains and handling devices frequently for wear or fatigue.
5. Handle the pipe units carefully to prevent chipping and damage. Pipe inadvertently damaged or dropped should be carefully inspected for needed repair by experienced personnel.
6. Prior to lowering the pipe units into the ditch, the bell and spigot ends should be examined for rough spots or chips.
7. Dry and clean the bell of the previously installed pipe.
8. Apply gasket lubricant liberally from the bell flare back to the bell seat and throughout the full circumference of the bell. It is of utmost importance that the bell flare be liberally lubricated.
9. Use gasket lubricant not diluted and apply with the palm of the hand. Rubber gloves will protect the hand against prolonged contact with the lubricant. Utilize type of gasket lubricant manufactured to accommodate cold weather, hot weather or underwater installations, as applicable.
10. Store gaskets in a dry area away from direct sunlight. Care should be taken to avoid gasket contact with other materials which might be corrosive or detrimental to the gasket.
11. After lowering the pipe to be laid, a gasket should be wiped clean and well lubricated. Lubricate spigot groove and the nose of the spigot ring to ease the joining operation. Avoid contamination by dirt and foreign particles which will stick in the lubricant. Snap the gasket into the spigot groove and with a hammer handle, dowel pin, or bar, inserted beneath the gasket, run around the pipe to assure even seating of the gasket in the spigot groove.
12. Enter the spigot into the pipe bell previously installed. Avoid touching the spigot to the trench bottom or pushing dirt into the bell. Contaminated joint surfaces and gasket will have to be cleaned and relubricated. Enter pipe being installed into the previously laid bell, parallel and on line and grade. Assure even gasket compression and minimize the possibility of "looped" gaskets. Inserting the top of the spigot and dropping the

pipe while pulling the spigot inward is not recommended as this practice causes non-uniform gasket compression, consequently the possibility of "looped" gaskets and often results in damage to the joint surfaces. Utilize wood blocks when mechanical force is applied directly to the ends of the pipe to prevent metal to concrete contact. Come-a-longs, coffin hoists, or other methods, are generally required to joint large diameter pipe. Any installation method which employs entering the spigot at an angle greater than that allowed by maximum recommended joint openings, provides possibility for uneven gasket compression and the possible consequence of "Looped" gaskets.

13. Check the joint with a feeler gauge to feel for the gasket. The feeler gauge can be either steel or celluloid to bend around the joint to determine that the gasket is in the proper position. Where at all possible gaskets should be felt from the inside of the pipe.

F. Connections: Use specials and fittings to suit the actual conditions where connections are made between new work and exiting mains. Use only those specials and fittings approved by the utility having jurisdiction.

G. Sleeves:

1. Where pipe passes through walls of valve pits or structures, provide cast iron wall sleeves.
2. Fill annular space between walls and sleeves with rich cement mortar.
3. Fill annular space between pipe and sleeves with mastic.

H. Valves and Valve Boxes

1. Lower valves into the trench, inspect and clean as specified; joint to the pipe as specified; set reaction or thrust backing provided as specified.
2. Cast-iron valve boxes shall be firmly supported and maintained centered and plumb over the wrench nut of the gate valve, with box cover flush with the surface of the finished pavement or at such other level as may be directed by the Engineer. All geared valves and such other valves as may be designated by the Engineer shall be set in masonry valve pits with the wrench nuts readily accessible for operation through the manhole opening. Pits shall be constructed in a manner that will permit minor valve repairs and afford protection to the pipe from impact or settlement where it passes through the pit walls.
3. A reaction or thrust backing shall be provided for valves as indicated on the plans and in these specifications.
4. Center valve boxes on the valves, setting plumb.
5. Tamp earth fill around each valve box to a distance of four feet on all sides, or to the undisturbed trench face if less than four feet.
6. Tighten stuffing boxes, and fully open and close each valve to assure that all parts are in working condition.

I. Blow Off

1. Lower blow off fittings and valves into the trench, inspect and clean, join to the pipe, set reaction of thrust backing.

J. Hydrants

1. Lower hydrants into the trench, inspect and clean as specified, joint to the pipe as specified, set reaction or thrust backing.
2. Locate to provide complete accessibility and to minimize possibility of damage from vehicles or injury to pedestrians.
3. Connected to the main pipe with a 6-inch branch controlled by an independent 6-inch gate valve, except as otherwise directed or shown on the plans.
4. For hydrants set in soil classified as impervious, provide a drainage pit two feet in diameter and two feet deep excavated below each hydrant. The pit shall be filled and compacted with coarse gravel or broken stone mixed with coarse sand, under and around the bowl of the hydrant to a level six inches above the waste opening. No hydrant drainage pit shall be connected to a sewer.
5. Provide reaction or thrust backing at the bowl of each hydrant, and place so as not to obstruct the drainage outlet of the hydrant, or tie the bowl of the hydrant to the pipe main with rods as directed by the Engineer.
6. Clean hydrants of dirt or foreign matter before setting.

K. Dead Ends

1. Provide standard plugs and insert into the bells of all dead end fittings. Spigot ends of fittings and plain ends of pipe shall be capped. Plugs and caps shall be lowered into the trench, inspected and cleaned, set reaction or thrust backing.

L. Setting Bends, Tees, and Reducers

1. Lower bends, tees, and reducers into the trench, inspect and clean, join to the pipe as specified, set reaction or thrust backing.
2. Provide reaction or thrust backing at bends and tees, and where changes in pipe diameter occur at reducers or in fittings.
 - a. Size and shape of concrete thrust backing shall be in accordance with these specifications.
 - b. Backing shall be placed between solid ground and the fitting to be anchored.
 - c. Area of bearing on pipe and on ground in each instance shall be that as shown.
 - d. Backing shall be placed so that the pipe and fitting joints will be accessible for repair.
3. Metal harness of tie rods and pipe clamps shall be used to prevent movement when specifically directed by the Engineer. Steel rods and clamps shall, as directed by the Engineer, be galvanized or otherwise rust proofed or painted.

M. Thrust Blocking

1. Provide thrust blocking for all changes in direction such as at tees, crosses and bends; for all changes in size such as at reducers; for all dead ends; for all valves and at such other locations as detailed on the plans. Thrust blocking shall be provided as shown on the plans and any deviation shall be only at the direction of the Engineer.
2. Concrete for thrust blocks shall be at least 2,500 psi at 28 days and shall be deposited against undisturbed earth. Blocking shall be so placed such that the pipe and fitting(s) will be accessible for repair. The following table provides the minimum undisturbed earth (restrictive areas) and the volume of concrete needed. The table is based on a minimum thickness of four (4") inches or the nominal diameter of the pipe, whichever is greater. The length of the contact surface with the pipe or fitting shall be the pipe diameter plus four (4") inches.

Minimum Restrictive Areas and Volumes of Thrust Blocking

Pipe Size	90° Bend		45° Bend		22-1/2 Bend		Dead End or Tee	
	Res. Area Sq.ft.	Vol. cu. Ft.	Res. Area sq.ft.	Vol. cu.ft.	Res. Area sq.ft.	Vol. cu.ft.	Res. Area sq.ft.	Vol. cu.ft.
1-1/2"	.21	.50	.11	.50	.06	0.50	.15	0.50
2"	.32	.50	.18	.50	.09	0.50	.23	0.50
2-1/2"	.47	.50	.26	.50	.13	0.50	.33	0.50
3"	.70	.50	.38	.50	.19	0.50	.49	0.50
4"	1.15	.50	.62	.50	.32	0.50	.81	0.50
5"	1.76	1.00	.96	.50	.49	0.50	1.25	1.00
6"	2.47	1.00	1.34	.50	.68	0.50	1.75	1.00
8"	4.28	2.00	2.32	1.00	1.17	0.50	3.03	1.50
10"	6.44	4.00	3.47	2.00	1.77	1.50	4.75	3.00

3.08 TESTING, INSPECTING AND DISINFECTING OF COMPLETED PIPELINE

- A. Closing uninspected work: Do not allow or cause any of the work of this section to be covered up or enclosed until after it has been completely inspected and tested, and has been approved by the Engineer.
1. Before being placed in service and before certification of completion by the Engineer, all new water systems, extensions to existing systems or valved sections of such extensions or any replacement in an existing water system shall be hydrostatically tested and disinfected in accordance with the following provisions. Water for these requirements shall be furnished and paid for by the Owner.
 2. The completed pipeline or valved sections thereof shall be slowly filled from the existing system. During the filling of the line, all air shall be expelled. To accomplish this, taps shall be made, if necessary, at point(s) of highest elevation, and after completion of the tests the taps shall be tightly plugged unless otherwise specified.

3. Great care shall be exercised in the manipulation of valves to prevent backflow of contaminated water. In some cases, the Engineer may direct the contractor to provide and install a check valve for greater protection. Such a directive will be paid for at a predetermined price.

B. Preliminary Flushing

The line shall be flushed, prior to testing and chlorination, as completely as possible with the water pressure and outlets available. It must be understood that flushing removes only the lighter solids and cannot be relied upon to remove heavy material allowed to get into the main during laying. If no hydrant is installed at the end of the main, a tap should be provided large enough to develop a velocity in the main of at least 2.5 fps velocity throughout the line or section thereof.

C. Swabbing

If in the opinion of the Engineer and job Inspector, based on the conditions surrounding the pipe laying and results of the preliminary flushing, the line contains dirt or other debris that cannot be removed during the flushing operation, the interior of the pipe shall be cleared utilizing a commercial swab (pig) and adequate water pressure. No additional payment will be made for this work, if directed, as the probable cause is due to improper workmanship by the contractor.

- D. Valve and Hydrant Damage: Unless proper care and thorough inspection are practiced during the laying of water mains, small stones, pieces of concrete, particles of metal, or other foreign material may gain access to mains newly laid or repaired. If it is believed that such foreign material may be in the main, all hydrants on the line shall be flushed and each hydrant and valve shall be carefully inspected to see that the entire valve operation mechanism is in good condition.
- E. Hydrostatic and Leakage Tests: After the pipe has been laid and backfilled but prior to replacement of pavement, each valved section of newly laid pipe shall be subjected to a hydrostatic and leakage pressure test. For any section being tested, the pressure applied shall be the rated pressure class of the type pipe being tested. Adjustment as required shall be made for differential in elevation between the low point of the section being tested and the centerline of the pressure test gauge.
 1. The specified test pressure, measured to the point of lowest elevation, shall be supplied by means of a pump connected to the pipe in a satisfactory manner. The pumps, pipe connection, and all necessary apparatus including gauges and meters shall be furnished by the contractor. The Owner will furnish water for filling lines and making tests through existing mains.
 2. The duration of each pressure and leakage test shall be four (4) hours.
 3. At intervals during the test, the entire route of the pipeline shall be inspected to locate any leaks or breaks. Any defective joints, cracked or defective pipe, fittings, or valves discovered in consequence of this test shall be removed and replaced with sound material in the manner provided, and the test shall be repeated until satisfactory results are obtained.
 4. No pipe installation will be accepted until the leakage is less than a rate equal to ten (10) gallons per inch of nominal diameter of pipeline per mile over a 24-hour period.
 5. Should any test of pipe in place disclose leakage greater than that specified, the contractor should at his own expense locate and repair the defective joints until the leakage is within the specified allowance.
- F. Disinfecting Water Mains: When the entire pipe line or certain selected sections thereof has been completed, tested, and made ready for turning over to the Owner ready for use, the line or section of line shall be thoroughly sterilized according to the following procedures or in compliance with AWWA C601.
 1. The line shall be flushed out, completely replacing its entire volume with water from the Owner's mains.
 2. Chlorine will be injected into the section of line being sterilized so that its entire capacity will be filled with water containing chlorine in the amount of 50-ppm minimum. The sterilizing agent shall be introduced at one end of the section and the water release from the opposite end until the sterilizing agent is present at the discharge end in said 50 ppm residual chlorine. All valves shall then be closed and the sterilizing solution permitted to remain in the pipe line section for not less than 24 hours and said pipe contents shall have a minimum of 10 ppm residual chlorine or the disinfecting procedure shall be repeated.
 3. The preferred point of application of the chlorinating agent is at the beginning of the pipeline extension or any valved section of it and through a corporation stop in the top of the newly laid pipe. The water injector for delivering the chlorine bearing water into the pipe should be supplied from a tap on the pressure side of the gate valve controlling the flow into the pipeline extension. In a new system, application of chlorine may be made advantageously at the pumping station, the elevated tank, the standpipe, or the reservoir.

4. Water from the existing distribution system or other source of supply shall be controlled so as to flow slowly into the newly laid pipeline during the application of chlorine. The rate of chlorine mixture flow shall be in such proportion to the rate of water entering the pipe that the chlorine dose applied to the water entering the newly laid pipe shall produce at least 10 ppm after 24 hours standing.
5. Any of the flowing methods for procedure shall be followed, subject to the approval of the Engineer.
 - a. Liquid chlorine gas-water mixture, direct chlorine feed, calcium or sodium hypochlorite and water mixture.
 - i. A chlorine gas-water mixture shall be applied by means of a solution-feed chlorinating device, or, if approved by the Engineer, the dry gas may be fed directly through proper devices for regulating the rate of flow and providing effective diffusion of the gas into the water within the pipe being treated. Chlorinating devices for feeding solutions of the chlorine gas or the gas itself must provide means for preventing the backflow of water into the chlorine cylinder.
 - ii. On approval of the Engineer, a mixture of water and chlorine bearing compound of known chlorine content may be substituted for liquid chlorine.
 - iii. The chlorine bearing compounds that may be used are: calcium hypochlorite, and sodium hypochlorite.
 - iv. High test calcium hypochlorite or bleaching powder must be prepared as a water mixture for introduction into the water mains. The powder should first be made into a paste and then thinned to approximately a 1 percent chlorine solution (10,000 ppm).
 - b. At the end of the sterilizing period, the sterilizing solution shall be discharged from the pipe and replaced with water direct from a main of the Owner.
 - c. A sample of water from the sterilized main shall be taken (not through a fire hydrant) from a suitable tap under the supervision of the Engineer or his inspector two consecutive days and submitted to an approved testing laboratory or the State Health Department for analysis. If the test shows a satisfactory quality of water, the line so sterilized shall then be placed in service by the Contractor who shall notify the water superintendent and assist him in location and operation of all valves installed by the contractor. If the sample shown unsatisfactory quality of water, the process of sterilization, sampling and testing, shall be repeated until a satisfactory water is obtained.
 - d. Sterilization of the line or any section thereof shall not be commenced until the Engineer's approval of the method, apparatus, sterilizing agent, and the section of the line has been obtained.

Test Reports: Indicate results comparative to specified requirements.

Disinfection report:

Type and form of disinfectant used.

Date and time of disinfectant injection start and time of completion.

Test locations.

Initial and 24-hour disinfectant residuals (quantity in treated water) in ppm for each outlet tested.

Date and time of flushing start and completion.

Disinfectant residual after flushing in ppm for each outlet tested.

Bacteriological report:

Date issued, project name, and testing laboratory name, address, and telephone number.

Time and date of water sample collection.

Name of person collecting samples.

Test locations.

Initial and 24-hour disinfectant residuals in ppm for each outlet tested.

Coliform bacteria test results for each outlet tested.

END OF SECTION