

November 16, 2009

Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40602-0615

RE: PSC Case # 2009-00439

Kentucky Public Service Commission,

Please find the following transmitted herewith:

1. Three copies of the Plans and Specifications for the above referenced PSC Case Number.

Please do not hesitate to contact us with any questions or comments you might have concerning this transmittal.

Sincerely,

A handwritten signature in black ink that reads "Stephen Caudill". The signature is written in a cursive, flowing style.

Stephen Caudill
Project Manager

cc: Tim Reed, LCWSD Superintendant
Jamie Hatton, LCWSD Attorney
Randy Jones, Rubin and Hays

RECEIVED

NOV 19 2009

**PUBLIC SERVICE
COMMISSION**

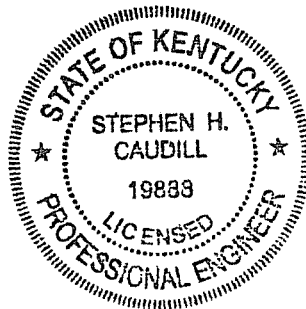
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NOV 19 2009

PUBLIC SERVICE
COMMISSION

SPECIFICATIONS FOR
CONTRACT 519-08-04
WATER SYSTEM IMPROVEMENTS
INTERCOUNTY CONNECTION
KY 1410 AND KY 7
LETCHER COUNTY WATER AND SEWER DISTRICT
LETCHER COUNTY, KENTUCKY

October 2008



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519-08-04 (10/08)

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END

TC-3

SECTION 00010

ADVERTISEMENT FOR BIDS
CONTRACT 519-08-04
WATER SYSTEM IMPROVEMENTS
INTERCOUNTY CONNECTION
KY 1410 AND KY 7
LETCHER COUNTY WATER AND SEWER DISTRICT
LETCHER COUNTY, KENTUCKY

Sealed proposals for the following work will be received by the Letcher County Water and Sewer District, Letcher County, Kentucky at the district's office, 178 Main Street, Suite 4, Whitesburg, Kentucky 41858, until 1:00 p.m., local time, Tuesday, September 22, 2009, for furnishing labor and materials and performing all work as set forth by the Advertisement, General Conditions, Specifications and/or Drawings prepared by Bell Engineering. Immediately following the scheduled closing time for the reception of bids, all proposals which have been submitted in accordance with the above conditions will be publicly opened and read aloud.

The work to be bid is described as follows:

Contract 519-08-04, Water Line Improvements, Intercounty Connection, KY 1410 and KY 7 - Approximately 44,177 feet of 3-inch through 12-inch water main, and related appurtenances.

Drawings, Specifications and Contract Documents may be examined at the following places:

- Letcher County Water and Sewer District
178 Main Street, Suite 4
Whitesburg, Kentucky 41858
- McGraw-Hill Construction Dodge
950 Contract Street
Lexington, Kentucky 40505
- Associated General Contractors
311 Barbourville Street
(2nd Floor)
Corbin, Kentucky 40702
- Bell Engineering
354 Waller Avenue
Lexington, Kentucky 40504
- Associated General Contractors
2321 Fortune Drive, Suite 112
Lexington, Kentucky 40509

or may be obtained from Lynn Imaging, Inc., 328 E. Vine Street, Lexington, Kentucky 40507, phone 859/255-1021, upon receipt of non-refundable deposit of:

Contract 519-08-04 - \$200.00

E. agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents;

F. become 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;

G. correlate 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;

H. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder; and

I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.

4.03 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

ARTICLE 5 - PRE-BID CONFERENCE

5.01 A pre-bid conference will not be held for this Project.

ARTICLE 6 - SITE AND OTHER AREAS

6.01 The Site is identified in the Bidding Documents. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by Owner unless otherwise provided in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor.

ARTICLE 7 - INTERPRETATIONS AND ADDENDA

7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than ten days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

7.02 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner or Engineer.

ARTICLE 8 - BID SECURITY

8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 10 percent of Bidder's maximum Bid price and in the form of a certified check or bank money order or a Bid bond (on the form attached) issued by a surety meeting the requirements of Paragraphs 5.01 and 5.02 of the General Conditions.

8.02 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may annul the Notice of Award and the Bid security of that Bidder will be forfeited. The Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Agreement or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be returned.

8.03 Bid security of other Bidders whom Owner believes do not have a reasonable chance of receiving the award will be returned within seven days after the Bid opening.

ARTICLE 9 - CONTRACT TIMES

9.01 The number of days within which, or the dates by which, [Milestones are to be achieved and] the Work is to be substantially completed and ready for final payment are set forth in the Agreement.

ARTICLE 10 - LIQUIDATED DAMAGES

10.01 Provisions for liquidated damages, if any, are set forth in the Agreement.

ARTICLE 11 - SUBSTITUTE AND "OR-EQUAL" ITEMS

11.01 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration of possible substitute or "or-equal" items. Whenever it is specified or described in the Bidding Documents that a substitute or "or-equal" item of material or equipment may be furnished or used by Contractor if acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the Effective Date of the Agreement.

ARTICLE 12 - SUBCONTRACTORS, SUPPLIERS, AND OTHERS

12.01 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, individuals, or entities to be submitted to Owner in advance of a specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of all such Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, individual, or entity if requested by Owner. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit a substitute, without an increase in the Bid.

12.02 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, individuals, or entities. Declining to make

12.03 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 6.06 of the General Conditions.

Contractor has reasonable objection.

ARTICLE 13 - PREPARATION OF BID

13.01 The Bid Form is included with the Bidding Documents.

13.02 All blanks on the Bid Form shall be completed by printing in ink or by typewriter and the Bid signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each [section, Bid item, alternative, adjustment unit price item, and unit price item] listed therein.

13.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown below the signature.

13.04 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown below the signature.

13.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown below the signature.

13.06 A Bid by an individual shall show the Bidder's name and official address.

13.07 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown below the signature.

13.08 All names shall be typed or printed in ink below the signatures.

13.09 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.

13.10 The address and telephone number for communications regarding the Bid shall be shown.

13.11 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located or covenant to obtain such qualification prior to award of the Contract. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 14 - BASIS OF BID; COMPARISON OF BIDS

14.01 Lump Sum

A. Bidders shall submit a Bid on a lump sum section as set forth in the Bid Form.

A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the Bid schedule.

B. The total of all estimated prices will be the sum of the products of the estimated quantity of each item and the corresponding unit price. The final quantities and Contract Price will be determined in accordance with Paragraph 11.03 of the General Conditions.

C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.

14.03 The Bid price shall include such amounts as the Bidder deems proper for overhead and profit on account of cash allowances, if any, named in the Contract Documents as provided in Paragraph 11.02 of the General Conditions.

14.04 Bid prices will be compared after the resolution of discrepancies, if any, as described above.

ARTICLE 15 - SUBMITTAL OF BID

15.01 A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the Advertisement or Invitation to Bid and shall be enclosed in an opaque sealed envelope plainly marked with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate envelope plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid shall be addressed to Letcher County Water and Sewer District, 178 Main Street, Suite 4, Whitesburg, Kentucky 41858.

ARTICLE 16 - MODIFICATION AND WITHDRAWAL OF BID

16.01 A Bid may be modified or withdrawn by an appropriate document duly executed in the manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.

16.02 If within 24 hours after Bids are opened, any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned.

ARTICLE 17 - OPENING OF BIDS

17.01 Bids will be opened at the time and place indicated in the Advertisement or Invitation to Bid and read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 18 - BIDS TO REMAIN SUBJECT TO ACCEPTANCE

18.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 19 - EVALUATION OF BIDS AND AWARD OF CONTRACT

19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.

19.02 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

19.03 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.

19.04 In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted as provided in the Supplementary Conditions.

19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities to perform the Work in accordance with the Contract Documents.

19.06 If the Contract is to be awarded, it will be awarded to the lowest responsive, responsible Bidder whose evaluation by the Owner indicates to the Owner that the award will be in the best interests of the Project.

ARTICLE 20 - CONTRACT SECURITY AND INSURANCE

20.01 Article 5 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it shall be accompanied by such bonds.

ARTICLE 21 - SIGNING OF AGREEMENT

21.01 When Owner gives a Notice of Award to the Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement with the other Contract Documents which are identified in the Agreement as attached thereto. Within 10 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner. Within ten days thereafter, Owner shall deliver one fully signed counterpart to Successful Bidder with a complete set of the Drawings with appropriate identification.

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

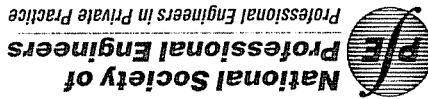
BID FORM FOR CONSTRUCTION CONTRACTS

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly By



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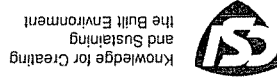
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BID FORM

**CONTRACT 519-08-04
WATER SYSTEM IMPROVEMENTS
INTERCOUNTY CONNECTION
KY 1410 AND KY 7
LETCHER COUNTY WATER AND SEWER DISTRICT
LETCHER COUNTY, KENTUCKY**

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ARTICLE 1 – BID RECEIPT

1.01 This Bid is submitted to:

Lecher County Water and Sewer District
178 Main Street, Suite 4
Whitesburg, Kentucky 41858

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 this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER'S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This 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 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.

E. 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.

F. 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.

ARTICLE 4 – FURTHER REPRESENTATIONS

4.01 Bidder further represents that:

A. this Bid is genuine and not made in the interest of or on 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;

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

ARTICLE 8 – DEFINED TERMS

- D. Required Bidder Qualifications Statement with Supporting Data.
- C. List of Project References for last 5 years.
- B. List of Proposed Subcontractors.
- A. Required Bid security in the form of 10%.

7.01 The following documents are attached to and made a part of this Bid:

ARTICLE 7 – ATTACHMENTS TO THIS BID

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.

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 within the number of calendar days indicated in the Agreement.

ARTICLE 6 – TIME OF COMPLETION

5.03 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.

5.02 Unit prices have been computed in accordance with Paragraph 11.03.B of the General Conditions.

5.01 Bidder will complete the Work in accordance with the Contract Documents for the price(s) as shown on the Form of Proposal following Article 9.01 of this Section C-410 of these Specifications.

ARTICLE 5 – BASIS OF BID

- D. Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over Owner.
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.

BID SUBMITTAL

8.01 This Bid submitted by:

If Bidder is:

An Individual

Name (typed or printed): _____

By: _____

(Individual's signature)

(SEAL)

Doing business as: _____

A Partnership

Partnership Name: _____

By: _____

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

(SEAL)

Name (typed or printed): _____

A Corporation

Corporation Name: _____

State of Incorporation: _____

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

By: _____

(Signature – attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

(CORPORATE SEAL)

Attest: _____

(Signature of Corporate Secretary)

Date of Qualification to do business in _____

[State Where Project is Located] is _____

A Joint Venture

Name of Joint Venturer: _____

First Joint Venturer Name: _____

By: _____

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

Name (typed or printed): _____

Title: _____

Second Joint Venturer Name: _____ (SEAL)

By: _____
(Signature of second 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 a party to the joint venture should be in the manner indicated above.)

Bidder's Business address: _____

Phone: _____
Facsimile: _____

Submitted on _____, 20____.

State Contractor License No. _____ (If applicable)

**FORM OF PROPOSAL
 CONTRACT 519-08-04
 WATER SYSTEM IMPROVEMENTS
 INTERCOUNTY CONNECTION
 KY 1410 AND KY 7
 LETCHER COUNTY WATER AND SEWER DISTRICT
 LETCHER COUNTY, KENTUCKY**

Note: The following Form of Proposal shall be followed exactly in submitting a proposal for this work. This copy, properly filled in, shall be used in submitting a proposal.

_____ This proposal is submitted by _____

 (Name and Address of Bidding Contractor) Zip Code

Date: _____
 Phone No.: _____

Area Code _____

To: _____
 Lecher County Water and Sewer District
 178 Main Street, Suite 4
 Whitesburg, Kentucky 41858

Having carefully examined the complete contract documents, including all general and technical specifications and drawings, special requirements, as well as the project site, the undersigned, hereinafter known as the CONTRACTOR, proposes

to furnish all labor, materials, tools, machinery, appliances, supplies, equipment, and services as called for by the applicable

contract documents, as well as by all Addenda heretofore issued. We agree to enter into a contract and to complete all work

required by and under the terms and conditions of the contract documents for the amounts shown in this proposal form.

We acknowledge receipt of the following Addenda:

No. _____	, dated _____	No. _____	, dated _____
No. _____	, dated _____	No. _____	, dated _____
No. _____	, dated _____	No. _____	, dated _____
No. _____	, dated _____	No. _____	, dated _____

If none received, write "none" here: _____

ITEM NO.	ITEM	QUANTITY	UNIT	PRICE	TOTAL
----------	------	----------	------	-------	-------

DIVISION "A" - HIGHWAY 1410 CONNECTOR

1	12-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying, Backfilling, Fittings and Copper Tracer Wire, Unclassified Excavation, Complete	8,317	L.F.	\$	
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2	6-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying, Backfilling, Fittings and Copper Tracer Wire, Unclassified Excavation, Complete	120	L.F.	\$	
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3	12-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	9	Each	\$	
---	---	---	------	----	--

3a	8-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	1	Each	\$	
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4	6-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	3	Each	\$	
---	--	---	------	----	--

5	5/8-inch x 3/4-inch Meter Setting, Including PRV, Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	15	Each	\$	
---	--	----	------	----	--

6	5/8-inch x 3/4-inch Meter Setting, Including Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	2	Each	\$	
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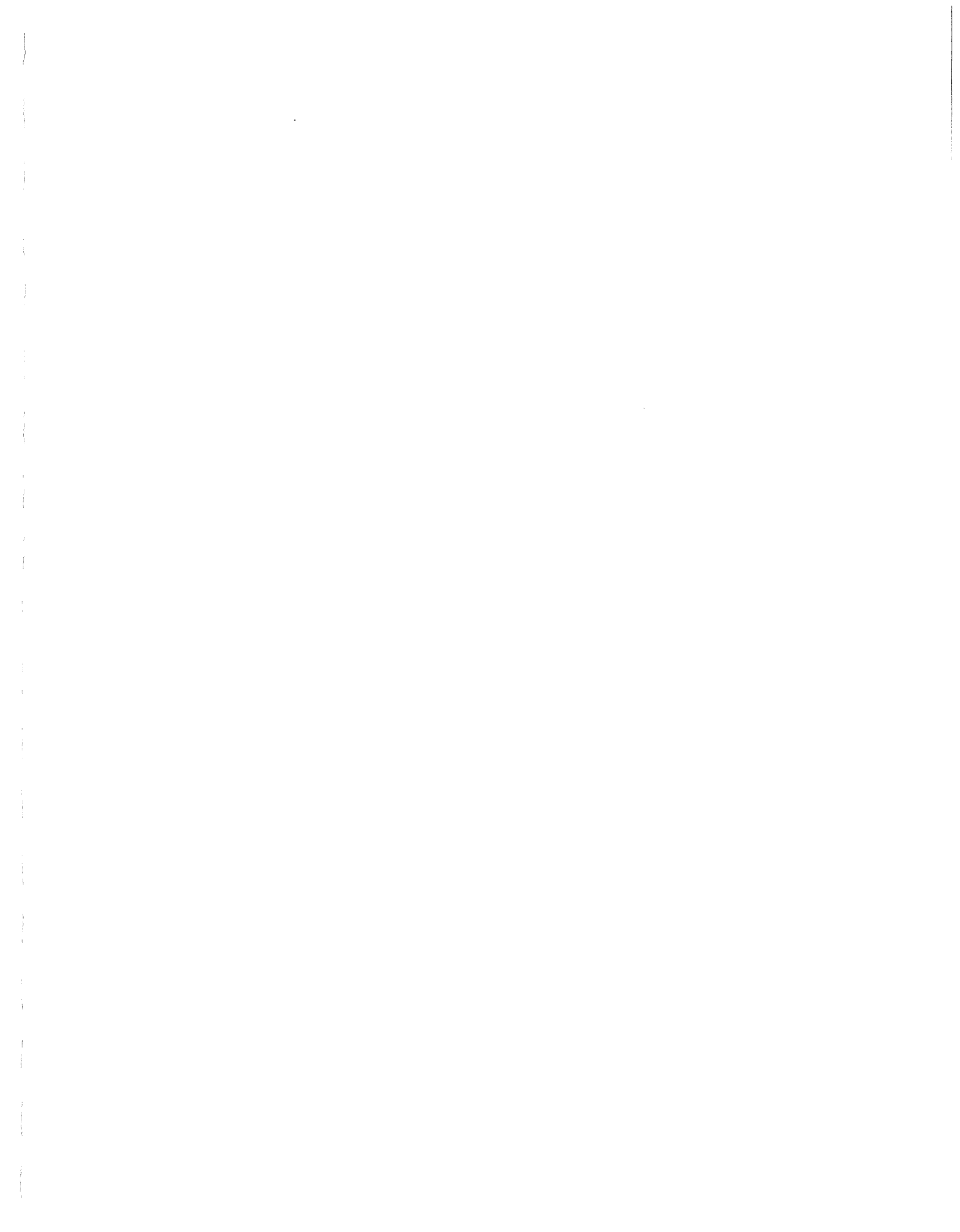
7	3/4-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	1,200	L.F.	\$	
---	--	-------	------	----	--

8	16-inch x 0.281-inch Steel Cover Pipe, Including Casing Spacers and End Seals, Furnish and Install, Complete (by open cut or boring)	66	L.F.	\$	
---	--	----	------	----	--

9	Boring or Jacking for 16-inch Steel Cover Pipe, Unclassified Excavation	66	L.F.	\$	
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10	Fiberglass Line Marker, Furnish and Install, Complete	8	Each	\$	
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11	Test Meter/Tap Assembly, Furnish and Install, Per Detail, Complete	2	Each	\$	
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ITEM NO.	ITEM	QUANTITY	UNIT	PRICE	TOTAL
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12	Cut-in to Existing 8-inch Main, Complete	1	Each	\$	\$
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13	Crushed Rock on Trench Surface, In Place	40	Ton	\$	\$
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14	6-inch Flushing Hydrant Assembly, with Tee, Pipe, Valve, Valve Box and Blocking, Complete	1	L.F.	\$	\$
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15	2-inch Thickness Bituminous Surface Replacement, Trench Width, On Drives and Roads, Complete	40	L.F.	\$	\$
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16	Master Meter Vault, Complete	1	L.S.	L.S.	\$
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17	Main Line Pilot Operated Pressure Reducing Station, Complete	1	L.S.	L.S.	\$
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Subtotal - Division "A" \$

DIVISION "B" - CAMP FORK ROAD AND SALTED CREEK ROAD

1	3-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying, Backfilling, Fittings and Copper Tracer Wire, Unclassified Excavation, Complete	10,697	L.F.	\$	\$
---	---	--------	------	----	----

2	3-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	8	Each	\$	\$
---	--	---	------	----	----

3	5/8-inch x 3/4-inch Meter Setting, Including PRV, Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	36	Each	\$	\$
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4	3/4-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	2,340	L.F.	\$	\$
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5	Fiberglass Line Marker, Furnish and Install, Complete	14	Each	\$	\$
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6	Crushed Rock on Trench Surface, In Place	150	Ton	\$	\$
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7	8-inch x 0.250-inch Steel Cover Pipe, Including Casing Spacers and End Seals, Furnish and Install, Complete (by open cut or boring)	22	L.F.	\$	\$
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8	Boring or Jacking for 8-inch Steel Cover Pipe, Unclassified Excavation	22	L.F.	\$	\$
---	--	----	------	----	----

ITEM NO.	ITEM	QUANTITY	UNIT	PRICE	TOTAL
9	3" Blowoff Assembly, Furnish and Install, Complete	5	Each	\$	\$
10	2-inch Thickness Bituminous Surface Replacement, Trench Width, On Drives and Roads, Complete	120	L.F.	\$	\$
11	6-inch Thickness Concrete Surface Replacement, Trench Width, on Drives, Complete	20	L.F.	\$	\$
Subtotal - Division "B"					
\$					

DIVISION "C" - ALONG KY 7, LOW GAP ROAD, MACK ROAD, EARL C DRIVE AND TANGO DRIVE

1	8-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying, Backfilling, Fittings and Copper Tracer Wire, Unclassified Excavation, Complete	20,302	L.F.	\$	\$
2	3-inch Class 250 (SDR 17) PVC Pipe, Furnishing, Trenching, Bedding, Laying, Backfilling, Fittings and Copper Tracer Wire, Unclassified Excavation, Complete	4,741	L.F.	\$	\$
3	8-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	14	Each	\$	\$
4	3-inch Mechanical Joint Resilient Seated Gate Valve And Box, Including Concrete Valve Box Collar, Complete	3	Each	\$	\$
5	5/8-inch x 3/4-inch Meter Setting, Including PRV, Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	56	Each	\$	\$
6	5/8-inch x 3/4-inch Meter Setting, Including Meter, Meter Box, Cover, Corporation Stop, Saddle, Tap, and Touch Read Assembly, Furnish and Install, Complete	7	Each	\$	\$
7	3/4-inch Polyethylene Service Pipe, Furnishing, Trenching, Bedding, Laying and Backfilling, or by Jacking, Copper Tracer Wire, Unclassified Excavation, Complete	4,100	L.F.	\$	\$
8	8-inch x 0.250-inch Steel Cover Pipe, Including Casing Spacers and End Seals, Furnish and Install, Complete (by open cut or boring)	40	L.F.	\$	\$
9	Boring or Jacking for 8-inch Steel Cover Pipe, Unclassified Excavation	40	L.F.	\$	\$

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL
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10	12-Inch x 0.250-Inch Steel Cover Pipe, Including Casing Spacers and End Seals, Furnish and Install, Complete (by open cut or boring)	80	L.F.	\$	
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11	Boring or Jacking for 12-Inch Steel Cover Pipe, Unclassified Excavation	80	L.F.	\$	
----	---	----	------	----	--

12	14-Inch x 0.281-Inch Steel Cover Pipe, Including Casing Spacers and End Seals, Furnish and Install, Complete (by open cut or boring)	150	L.F.	\$	
----	--	-----	------	----	--

13	Boring or Jacking for 14-Inch Steel Cover Pipe, Unclassified Excavation	150	L.F.	\$	
----	---	-----	------	----	--

14	Fiberglass Line Marker, Furnish and Install, Complete	12	Each	\$	
----	---	----	------	----	--

15	Test Meter/Tap Assembly, Furnish and Install, Per Detail, Complete	2	Each	\$	
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16	Crushed Rock on Trench Surface, In Place	160	Ton	\$	
----	--	-----	-----	----	--

17	Automatic Air Release Assembly	1	Each	\$	
----	--------------------------------	---	------	----	--

18	6-Inch Flushing Hydrant Assembly, with Tee, Pipe, Valve, Valve Box and Blocking, Complete	2	L.F.	\$	
----	---	---	------	----	--

19	Tie-In to Existing 6- or 8-Inch Main, Complete	3	Each	\$	
----	--	---	------	----	--

20	3" Blowoff Assembly, furnish and Install, Complete	3	Each	\$	
----	--	---	------	----	--

21	2-Inch Thickness Bituminous Surface Replacement, Trench Width, On Streets, Drives and Roads, Complete	230	L.F.	\$	
----	---	-----	------	----	--

22	6-Inch Thickness Concrete Surface Replacement, Trench Width, On Drives, Complete	20	L.F.	\$	
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Subtotal - Division "C" \$

DIVISION "D" - EXTRA TO DIVISIONS "A," "B," AND "C"

1	Extra for Mechanical Removal of Solid Rock, Only On Order of the Engineer	5	C.Y.	\$	
---	---	---	------	----	--

2	Extra for Mechanical Tamping of Trench Backfill, When Not Required by Plans and/or Specifications, Only On Order of the Engineer	5	C.Y.	\$	
---	--	---	------	----	--

ITEM NO.	ITEM	QUANTITY	UNIT	PRICE	TOTAL
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3	Extra for Crushed Rock for Trench Stabilization, Only on Order of the Engineer	5	Ton	\$	\$
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4	Extra for Crushed Rock for Pipe Bedding, Only on Order of the Engineer	5	Ton	\$	\$
---	--	---	-----	----	----

Subtotal - Division "D" \$

SUMMARY

DIVISION "A" - HIGHWAY 1410 CONNECTOR \$

DIVISION "B" - CAMP FORK ROAD AND SALUTED CREEK ROAD \$

DIVISION "C" - ALONG KY 7, LOW GAP ROAD, MACK ROAD, EARL C DRIVE AND TANGO DRIVE \$

DIVISION "D" - EXTRA TO DIVISIONS "A," "B," AND "C" \$

TOTAL - CONTRACT 519-08-04 \$

SECTION 00420

**BIDDER'S QUALIFICATION STATEMENT
(TO BE ATTACHED TO THE BID)**

Submitted by:

Name of Organization _____

Name of Individual _____

Title _____

Address _____

Telephone _____

Submitted to:

Name _____

Address _____

Telephone _____

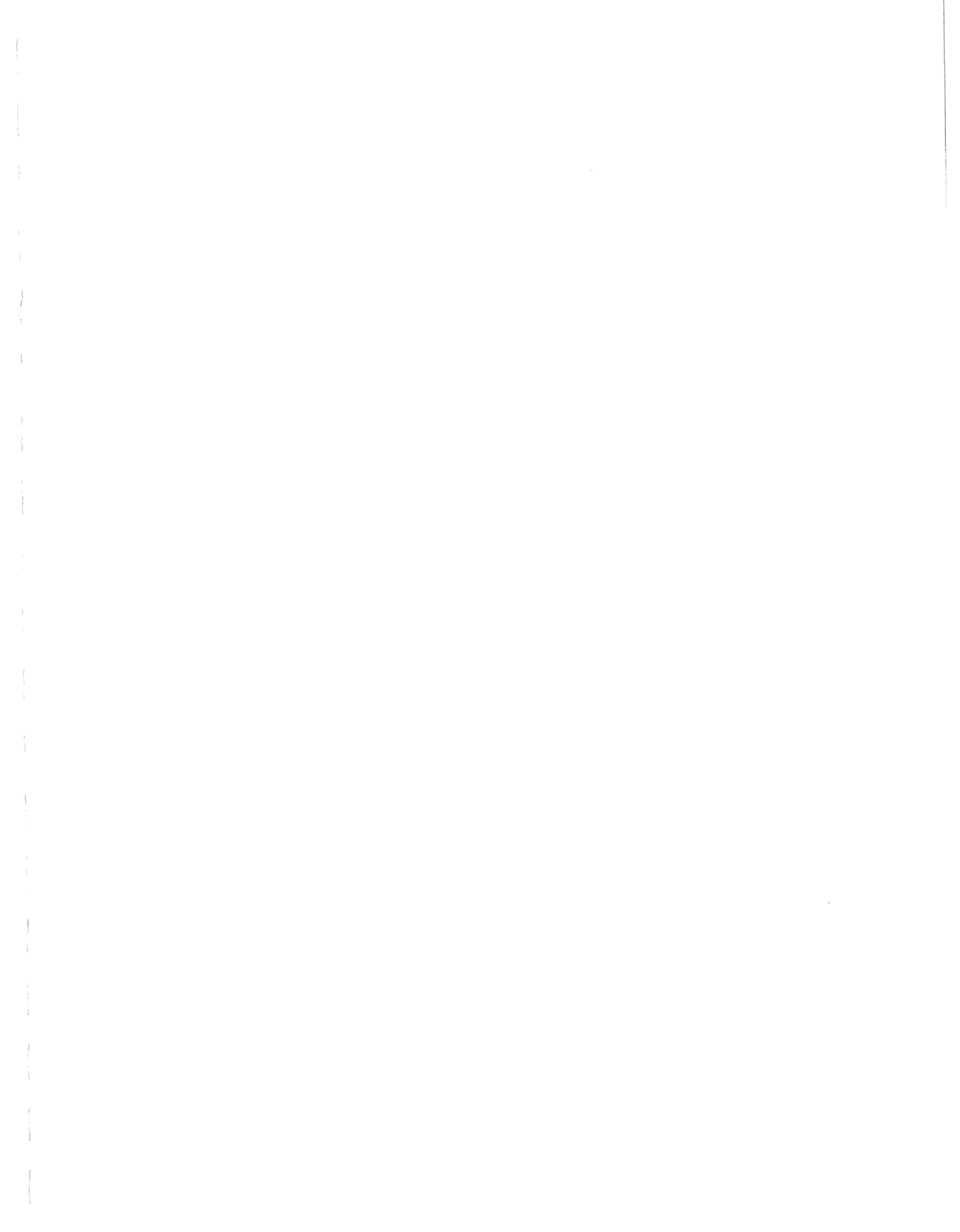
Project Name and Description (if applicable)

Contractor's General Business Information

Corporation Partnership Joint Venture Sole Proprietorship

If Corporation:

a. Date and State of Incorporation



If Sole Proprietorship:

a. Date and State of Organization

b. Name, Address and Form of Organization of Joint Venture Partners:
(Indicate managing partner by an asterisk*)

If Joint Venture:

a. Date and State of Organization

General Limited
 Publicly Traded Other (describe): _____

c. Type of Partnership

b. Names of Current General Partners

If Partnership:

a. Date and State of Organization

b. List of Executive Officers

Name Title

b. Name and Address of Owner or Owners

1. On Schedule A, attached, list major engineered construction projects completed by this organization in the past five (5) years. (If joint venture list each participant's project separately.)
2. On Schedule B, attached, list current projects under construction by this organization. (If joint venture, list each participant's projects separately.)
3. Name of surety company and name, address, and telephone number of agent.

4. Is your organization a member of a controlled group of corporations as defined in I.R.C. Sect. 1563? Yes No

5. Furnish on Schedule C, attached, details of the construction experience of the principal individuals of your organization directly involved in construction operations.

6. Has your organization ever failed to complete any construction contract awarded to it? Yes No

If yes, describe circumstances on attachment.

7. Has a Corporate officer, partner, joint venture participant, or proprietor ever failed to complete a construction contract awarded to him or her in their own name or when acting as a principal of another organization? Yes No

8. In the last five years, has your organization ever failed to substantially complete a project in a timely manner? Yes No

If yes, describe circumstances on attachment.

9. Indicate general types of work performed with your own work force.

10. Furnish the following information with respect to an accredited institution familiar with your organization

Name of Bank

Address

Account Manager

Telephone

I hereby certify that the information submitted herewith, including any attachment is true to the best of my knowledge and belief.

By:

Title:

Dated:

SCHEDULE A - PREVIOUS 5 YEARS PROJECTS

Name, Location and Description of Project Owner Design Engineer Date Complete Contract Price Reference/Contact Include Address and Phone

HKB CO-30 (7-92)

00420-5

SCHEDULE B - CURRENT PROJECTS

HKB CO-30 (7-92)

Name, Location and
Description of Project

Owner

Design Engineer

Date Complete

Contract Price

Reference/Contact
Include Address and Phone

00420-6

SCHEDULE C - PERSONNEL

Name _____ Position _____ Date started with this organization _____ Date started in construction _____ Prior positions and experience in construction _____

HKB GO-30 (7-92)

00420-7



BID BOND

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

BIDDER (Name and Address):

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

OWNER (Name and Address):

Lecher County Water and Sewer District
178 Main Street, Suite 4
Whitesburg, Kentucky 41858

BID

Bid Due Date:

Project (Brief Description Including Location):

BOND

Bond Number:

Date (Not later than Bid due date):

Penal sum

(Words)

(Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

BIDDER

SURETY

(Seal)

(Seal)

Bidder's Name and Corporate Seal

Surety's Name and Corporate Seal

By:

Signature and Title

By:

Signature and Title

(Attach Power of Attorney)

Attest:

Signature and Title

Attest:

Signature and Title

Note: Above addresses are to be used for giving required notice.



7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Surety's liability.

2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or

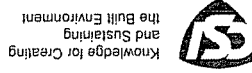
3.2. All Bids are rejected by Owner, or

3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon default by Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.

6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.



Construction Specifications Institute

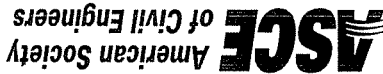


The Associated General Contractors of America
This document has been approved and endorsed by

AMERICAN SOCIETY OF CIVIL ENGINEERS

AMERICAN COUNCIL OF ENGINEERING COMPANIES

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
a practice division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS



Issued and Published Jointly By

and

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

Prepared by

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

American Society of Civil Engineers
1801 Alexander Bell Drive, Reston, VA 20191-4400

American Council of Engineering Companies
1015 15th Street, N.W., Washington, DC 20005

National Society of Professional Engineers
1420 King Street, Alexandria, VA 22314-2715

This Form of Agreement has been prepared for use with the Standard General Conditions of the Construction Contract (C-700, 2002 Edition). Their provisions are interrelated, and a change in one may necessitate a change in the other. The language contained in the Suggested Instructions to Bidders (C-200, 2002 Edition) is also carefully interrelated with the language of this Agreement. Their usage is discussed in the Commentary on EJCDC Construction Documents. See also Guide to the Preparation of Supplementary (C-800, 2002 Edition).

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

THIS AGREEMENT is by and between _____
Letcher County Water and Sewer District, 178 Main Street, Suite 4

Whitesburg, Kentucky 41858

(Owner) and

(Contractor):

Owner and Contractor, in consideration of the mutual covenants set forth herein, 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:

Water System Improvements – Intercounty Connection, KY 1410 and KY 7
Approximately 44,177 feet of 3-inch through 8-inch water main and related 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:

Contract 519-08-04 Water System Improvements

Intercounty Connection

KY 1410 and KY 7

Letcher County Water and Sewer District

Letcher County, Kentucky

ARTICLE 3 - ENGINEER

3.01 The Project has been designed by

Bell Engineering

354 Waller Avenue

Lexington, Kentucky 40504

(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 _____ days after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions within _____ days after the date when the Contract Times commence to run.

4.03 Liquidated Damages

A. Contractor and Owner recognize that time is of the essence 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 as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner \$500.00 for each day that expires after the time specified in Paragraph 4.02 for Substantial Completion until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner actual cost for delays up to \$500.00 for each day that expires after the time specified in Paragraph 4.02 for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 5 - CONTRACT PRICE

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

ARTICLE 6 - PAYMENT PROCEDURES

6.01 Submittal and Processing of Payments

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

6.02 Progress Payments; Retainage

A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment during performance of the Work as provided in Paragraphs 6.02.A.1 and 6.02.A.2 below. All such payments will be measured by the schedule of values established as provided in Paragraph 2.07.A of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements:

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 14.02 of the General Conditions:

a. 90 percent of Work completed (with the balance being retained). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, Owner, on recommendation of Engineer, may determine that as long as the character and progress of the Work remain satisfactory to them, there will be no additional retainage; and

b. 90 percent of cost of materials and equipment not incorporated in the Work (with the balance being retained).



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

ARTICLE 7 - INTEREST

Not used.

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. 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 5, inclusive).

2. Performance bond (pages 1 to 2, inclusive).

3. Payment bond (pages 1 to 2, inclusive).

4. General Conditions (pages _____ to _____, inclusive).

5. Supplementary Conditions (pages _____ to _____, inclusive).

6. Specifications as listed in the table of contents of the Project Manual.

7. Drawings consisting of _____ sheets with each sheet bearing the following general title: _____ [or] the Drawings listed on attached sheet index.

8. Addenda (numbers _____ to _____, inclusive).



9. 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).

10. 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 duplicate. One counterpart each has been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or identified by Owner and Contractor or on their behalf.

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

OWNER:

Letcher County Water and Sewer District

By: _____

Title: _____

[CORPORATE SEAL]

Attest: _____

Title: _____

Address for giving notices: _____

Title: _____

CONTRACTOR:

By: _____

Title: _____

[CORPORATE SEAL]

Attest: _____

Title: _____

Address for giving notices: _____

License No.: _____

(Where applicable)

Agent for service or process: _____

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

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

PERFORMANCE BOND

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

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

OWNER (Name and Address):

Letcher County Water and Sewer District
178 Main Street, Suite 4
Whitesburg, Kentucky 41858

CONTRACT

Date:
Amount:
Description (Name and Location):

BOND

Bond Number:
Date (Not earlier than Contract Date):
Amount:
Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL
Company:

Signature: _____ (Seal)
Name and Title:

SURETY

Surety's Name and Corporate Seal
_____ (Seal)

By:

Signature and Title
_____ (Attach Power of Attorney)

Attest:

Signature and Title

SURETY

Surety's Name and Corporate Seal
_____ (Seal)

Company:

CONTRACTOR AS PRINCIPAL

Signature: _____ (Seal)
Name and Title:

Attest:

Signature and Title
_____ (Attach Power of Attorney)

By:

Signature and Title

EJCDC No. C-610 (2002 Edition)

Originally prepared through the joint efforts of the Surety Association of America, Engineers Joint Contract Documents Committee, the Associated General Contractors of America, and the American Institute of Architects.

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

2. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 3.1.

3. If there is no Owner Default, Surety's obligation under this Bond shall arise after:

3.1. Owner has notified Contractor and Surety, at the addresses described in Paragraph 10 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and

3.2. Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 3.1; and

3.3. Owner has agreed to pay the Balance of the Contract Price to:

1. Surety in accordance with the terms of the Contract;

2. Another contractor selected pursuant to Paragraph 4.3 to perform the Contract.

4. When Owner has satisfied the conditions of Paragraph 3, Surety shall promptly and at Surety's expense take one of the following actions:

4.1. Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or

4.2. Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or

4.3. Obtain bids or negotiated proposals from qualified contractors acceptable for a contract for performance and completion of the Contract, Contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or

4.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or

2. Deny liability in whole or in part and notify Owner citing reasons therefor.

5. If Surety does not proceed as provided in Paragraph 4 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 4.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.

6. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 4.1, 4.2, or 4.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To a limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

6.1. The responsibilities of Contractor for correction of defective Work and completion of the Contract;

6.2. Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions or failure to act of Surety under Paragraph 4; and

6.3. Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor

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

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

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

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

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

12. Definitions

12.1. Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.

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

12.3. Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.

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

FOR INFORMATION ONLY – Name, Address and Telephone
Surety Agency or Broker
Owner's Representative (engineer or other party)

PAYMENT BOND

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

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

OWNER (Name and Address): _____

Lecher County Water and Sewer District
178 Main Street, Suite 4
Whitesburg, Kentucky 41858

CONTRACT

Date: _____
Amount: _____
Description (Name and Location): _____

BOND

Bond Number: _____
Date (Not earlier than Contract Date): _____
Amount: _____
Modifications to this Bond Form: _____

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Payment Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

Company: _____

Signature: _____ (Seal)
Name and Title: _____

SURETY

Surety's Name and Corporate Seal _____ (Seal)
By: _____
Signature and Title _____
(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required.)

CONTRACTOR AS PRINCIPAL

Company: _____

Signature: _____ (Seal)
Name and Title: _____

SURETY

Surety's Name and Corporate Seal _____ (Seal)
By: _____
Signature and Title _____
(Attach Power of Attorney)

Attest: _____
Signature and Title: _____

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.

2.1. With respect to Owner, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due Claimants, and

2.2. Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.

3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.

4. Surety shall have no obligation to Claimants under this Bond until:

4.1. Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the addresses described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.

4.2. Claimants who do not have a direct contract with Contractor: Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and

2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and

3. Not having been paid within the above 30 days, have sent a written notice to Surety and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.

5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.

6. When a Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at Surety's expense take the following actions:

6.1. Send an answer to that Claimant, with a copy to Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.

6.2. Pay or arrange for payment of any undisputed amounts

7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.

8. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.

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

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

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

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

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

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

15. DEFINITIONS

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

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

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

FOR INFORMATION ONLY - Name, Address and Telephone
Surety Agency or Broker:
Owner's Representative (engineer or other party):

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

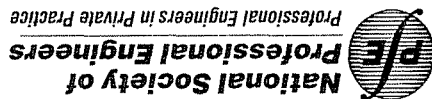
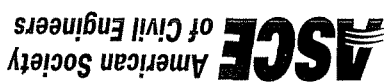
STANDARD OF THE GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

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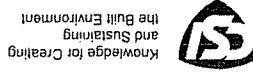


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These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor Nos. C-520 or C-525 (2002 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the EJCDC Construction Documents, General and Instructions (No. C-001) (2002 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (No. C-800) (2002 Edition).

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(unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

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

3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

A. Contractor and any Subcontractor or Supplier or other individual or entity performing or furnishing all of the Work under a direct or indirect contract with Contractor, shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or Engineer's consultants, including electronic media editions; or

2. reuse any 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.

B. The prohibition of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

A. Copies of data furnished by Owner or Engineer to Contractor or Contractor to Owner or Engineer that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's

sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.

C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

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

4.01 *Availability of Lands*

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

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

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

4. 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:

b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

A. Reports and Drawings: The Supplementary Conditions identify:

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

2. those drawings of physical conditions in or relating to existing surface or subsurface 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 in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities 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

c. Contractor failed to give the written notice as required by Paragraph 4.03.A.

3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, Owner and Engineer, and any of their Related Entities 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 relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings*. 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 or Engineer, or any of their Related Entities with respect to:

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

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

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

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

D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any.

E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered to Contractor written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to

entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.

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

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

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

ARTICLE 5 - BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified

in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the 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 the 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 promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

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

5.03 *Certificates of Insurance*

A. Contractor shall deliver to Owner, with copies to each additional insured in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

B. Owner shall deliver to Contractor, with copies to each additional insured 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 or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or

b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance required by this Paragraph 5.04 shall:

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

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include completed operations insurance; Paragraphs 6.11 and 6.20;

4. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 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 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

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 claim-made basis, remain in effect for at least two years after final payment.

8. 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, Subcontractor, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;

2. be written on a 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, (other than caused by flood) and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

5. allow for partial utilization of the Work by Owner;

6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other 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, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as 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. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and the officers, directors, partners, employees, agents, consultants and Subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insureds 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, consultants and Subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and Subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants and Subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insureds will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, partners, employees, agents, consultants and Subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

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

B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement among the parties in interest as 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

Contractor.
received from the superintendent shall be binding on

6.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

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

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.

Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

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

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

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

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 Substitutes and "Or-Equals"

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

1. "Or-Equal" Items: If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

- 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
- 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole,
- 3) it has a proven record of performance and availability of responsive service; and
- b. Contractor certifies that, if approved and incorporated into the Work:
- 1) there will be no increase in cost to the Owner or increase in Contract Times; and

2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. Substitute Items

a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. Contractor shall submit sufficient information as provided below to allow Engineer to determine 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 requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented in the General Requirements and circumstances.

d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

1) shall certify that the proposed substitute item will:

a) perform adequately the functions and achieve the results called for by the general design,

b) be similar in substance to that specified, and

c) be suited to the same use as that specified;

2) will state:

a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time;

b) whether 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 other work on the Project) to adapt the design to the proposed substitute item; and

(c) 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;

3) will identify:
a) all variations of the proposed substitute item from that specified, and

b) available engineering, sales, maintenance, repair, and replacement services;

4) and shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change,

B. Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. Engineer's Evaluation: Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by 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 Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute item so proposed or submitted by Contractor, Contractor shall reimburse Owner for the charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the charges of Engineer for making changes in the Contract

Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

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

6.06 *Concerning Subcontractors, Suppliers, and Others*

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

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity, nor

2. shall anything in the Contract Documents create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual

or entity except as may otherwise be required by Laws and Regulations.

D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the 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, and Engineer, 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, consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 Patent Fees and Royalties

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of Owner or Engineer its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 Permits

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

6.09 Laws and Regulations

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

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

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

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. 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 Draw-

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, Field Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*
A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

ings or Specifications or to the acts or omissions of Owner or Engineer or, 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).

D. 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 notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 Shop Drawings and Samples

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

1. Shop Drawings

a. Submit number of copies specified in the General Requirements.

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

2. Samples: Contractor shall also submit Samples to Engineer for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals.

a. Submit number of Samples specified in the Specifications.

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

C. Submittal Procedures

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

a. all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

b. the suitability of 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 Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;

d. 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 certification that Contractor has satisfied Contractor's obligations under the Contract Documents

disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its Related Entities shall be entitled to rely on representation of Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Sub-contractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample Submittal or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; or

7. any correction of defective Work by Owner.

6.20 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or

with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations, that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample Submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submittal to Engineer for review and approval of each such variation.

D. *Engineer's Review*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submittals, as required, 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

arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.

B. In any and all claims against Owner or Engineer or any of their 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 officers, directors, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal

shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

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

ARTICLE 7 - OTHER WORK AT THE SITE

7.01 Related Work at Site

A. Owner may perform other work related to the Project at the Site with Owner's employees, or via other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and

2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.

B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and shall properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and

ARTICLE 8 - OWNER'S RESPONSIBILITIES

<p>8.01 <i>Communications to Contractor</i></p> <p>A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.</p> <p>8.02 <i>Replacement of Engineer</i></p> <p>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.</p> <p>8.03 <i>Furnish Data</i></p> <p>A. Owner shall promptly furnish the data required of Owner under the Contract Documents.</p> <p>8.04 <i>Pay When Due</i></p> <p>A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.</p> <p>8.05 <i>Lands and Easements, Reports and Tests</i></p> <p>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.</p> <p>8.06 <i>Insurance</i></p> <p>A. Owner's responsibilities, if any, in respect to purchasing and maintaining liability and property insurance are set forth in Article 5.</p> <p>8.07 <i>Change Orders</i></p> <p>A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.</p> <p>8.08 <i>Inspections, Tests, and Approvals</i></p> <p>A. Owner's responsibility in respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.</p>	<p>7.02 <i>Coordination</i></p> <p>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:</p> <ol style="list-style-type: none"> 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. <p>B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.</p> <p>7.03 <i>Legal Relationships</i></p> <p>A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.</p> <p>B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's actions or inactions.</p> <p>C. Contractor shall be liable to Owner and any other contractor for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's action or inactions.</p>
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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, 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 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 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

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

9.04 *Authorized Variations in Work*

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

9.05 *Rejecting Defective Work*

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

A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.

B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.

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

9.07 *Determinations for Unit Price Work*

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

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

A. Engineer will be the initial interpreter of the requirements of the Contract Documents and Judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.

B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believe that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.

C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

D. When functioning as interpreter and Judge under this Paragraph 9.08, Engineer will not show

partially to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to, the Resident Project Representative, if any, and assistants, if any.

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall

promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

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

10.02 *Unauthorized Changes in the Work*

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

10.03 *Execution of Change Orders*

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

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

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

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*

A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

B. *Notice:* Written notice stating the general nature of each Claim, shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract 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 submittal (unless Engineer allows additional time).

C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:

1. deny the Claim in whole or in part,
2. approve the Claim, or
3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.

D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.

F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

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

11.01 *Cost of the Work*

A. *Costs Included*: The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall 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, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable hereto. 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 Contractor shall obtain competitive bids from subcontractors acceptable to Owner and

Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

4. Costs of special consultants (including but not limited to Engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have

be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. Documentation: Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 Allowances

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. Cash Allowances

1. Contractor agrees that:

a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. Contingency Allowance

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

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

11.03 Unit Price Work

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

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, expresses, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

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

1. Payroll costs and other compensation of Contractor's officers, executives, principals (or partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

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

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

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

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

C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

2. there is no corresponding adjustment with respect any other item of Work; and

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

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

12.01 Change of Contract Price

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an

allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

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

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraph 12.01.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 may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted

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, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, 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.C; and

3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to

by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.

D. Owner, Engineer and the Related Entities of each of them shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of Engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

E. If any Work (or the work of others) that is to be inspected, tested, or approved 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 and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

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

B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

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

D. If, the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

2. correct such defective Work; or

1. repair such defective land or areas; or

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, any Work 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:

13.07 *Correction Period*

B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

C. Promptly after receipt of notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

13.06 *Correction or Removal of Defective 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.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

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

13.08 Acceptance of Defective Work

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

13.09 Owner May Correct Defective Work

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06-A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 Schedule of Values

A. The Schedule of Values established as provided in Paragraph 2.07-A will serve as the basis for progress

payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 Progress Payments

A. Applications for Payments

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. Review of Applications

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations 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 9.07, and to any other qualifications stated in the recommendation); and

c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or

b. 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:

a. to supervise, direct, or control the Work, or

b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or

e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent

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 of payment free and clear of all Liens.

14.04 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

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

D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial

inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;

b. the Contract Price has been reduced by Change Orders;

c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or

d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. *Payment Becomes Due*

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

D. *Reduction in Payment*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:

a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;

b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

c. there are other items entitling Owner to a set-off against the amount recommended; or

d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.

2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor corrects to Owner's satisfaction the reasons for such action.

Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to complete or correct items on the tentative list.

14.05 Partial Utilization

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions.

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor 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.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

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

14.06 Final Inspection

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals

that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 Final Payment

A. Application for Payment

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

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.7;

b. consent of the surety, if any, to final payment;

c. a list of all Claims against Owner that Contractor believes are unsettled; and

d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and other 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. Engineer's Review of Application and Acceptance

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations

with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

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

15.02 *Owner May Terminate for Cause*

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

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
3. Contractor's disregard of the authority of Engineer; or
4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);
2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and

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

C. *Payment Becomes Due*

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

14.08 *Final Completion Delayed*

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

14.09 *Waiver of Claims*

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

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance

3. complete the Work as Owner may deem expedient.

C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph Owner shall not be required to obtain the lowest price for the Work performed.

D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B, and 15.02.C.

15.03 *Owner May Terminate For Convenience*

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

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

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

15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

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

ARTICLE 16 - DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be

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

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

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

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

17.02 *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.

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or

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

17.01 *Giving Notice*

ARTICLE 17 - MISCELLANEOUS

3. gives written notice to the other party of their intent to submit the Claim to a court of competent jurisdiction;

2. agrees with the other party to submit the Claim to another dispute resolution process, or

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions, or

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

Effect of Paragraph 10.05.E.
Arbitration shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.
governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

SUPPLEMENTARY CONDITIONS

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

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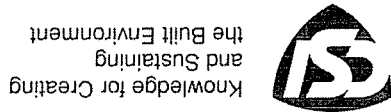
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A. These Supplementary Conditions amend or supplement the Standard General Conditions (or Standard General Conditions-Funding Agency) of the Construction Contract and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemental remain in full force and effect.

B. The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

ARTICLE I - DEFINITIONS AND TERMINOLOGY

1. Section 00700 (00710), following Article 1.01.A.52 (1.01.A.53), add the following paragraph:

53.(54.) Bonds - Bid, performance and Payment Bonds and/or other instruments of security.

2. Section 00700 (00710) - Article 1.01.A.28 (1.01.A.29), change the first sentence to read: "A written notice given by Owner to Contractor (with copy to Engineer) . . ."

3. Section 00700 (00710), following Article 1.01.A.53 (1.01.A.54), add the following paragraph:

54.(55.) Partial Utilization - Placing a portion of the Work in service for the purpose for which it is intended (or a related purpose) before reaching completion for all the Work.

4. Section 00700 (00710), following Article 1.01.A.54 (1.01.A.55), add the following paragraph:
55.(56.) Special Conditions - Additional instructions to the Bidder/Contractor denoting special construction or other requirements applicable to this Contract.

5. Section 00700 (00710), Article 1.01.A.34 (1.01.A.35), delete this paragraph in its entirety.

6. Section 00700 (00710), Article 1.01.A.42 (1.01.A.43), revise the paragraph to read "Lands or areas indicated in the Contract Documents as being furnished by the Owner upon which the work is to be performed, including fee simple property, rights-of-way, permanent and temporary construction easements, encroachment permits from governmental and private entities, and such other lands furnished by the Owner which are designated for the use of the Contractor in the completion of the Work."

7. Section 00700 (00710), following Article 1.01.A.55 (1.01.A.56), add the following paragraph:

56.(57.) Written Notice - Any notice to any party of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or his authorized representative on the Work.

ARTICLE 2 - PRELIMINARY MATTERS

1. Section 00700 (00710), Article 2.02, revise the paragraph to read as follows:

A. Owner shall furnish to Contractor up to 5 printed or hard copies of the Drawings and Specifications. Additional copies will be furnished upon request at the cost of reproduction.

2. Section 00700 (00710), Article 2.03, revise paragraph A to read as follows:

"The Contract Times will commence to run on the tenth day after the Notice to Proceed is given and executed by the Contractor. The Notice to Proceed may be given at anytime within 30 days after the effective date of the Agreement. In no event will the Contract Times commence to run later than the nineteenth day after the day of Bid Opening."

3. Section 00700 (00710), Article 2.03, add paragraph B to read as follows:

B. Should the Notice to Proceed not be issued within 90 days of Bid Opening, the Contractor may withdraw his bid from consideration or negotiate with the Owner for extension of the bid, as may be applicable and agreeable.

4. Section 00700 (00710), Article 2.05, delete paragraph A and replace with the following paragraph A:

A. Preliminary Schedules

The Contractor shall, within 5 days after the Work commences on the Contract or another period of time determined by the Owner/Engineer, prepare and submit to the Owner/Engineer:

1. Three copies of a practicable schedule showing the order in which the Contractor proposes to perform the Work, and the dates on which the Contractor contemplates starting and completing the several salient features of the Work (including acquiring materials, plant, and equipment). The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of Work scheduled for completion by any given date during the period. If the Contractor fails to submit a schedule within the time prescribed, the Owner/Engineer may withhold approval of progress payments until the Contractor submits the required schedule.

equipment, such words shall be interpreted in accordance with that meaning.”

3. Section 00700 (00710), Article 3.01, add the following paragraph D:

D. In case of conflict between the Drawings and Specifications, the specifications shall govern unless specifically noted to the contrary in the Drawings. Figure dimensions on Drawings shall govern over scale dimensions, and detailed drawings shall govern over General Drawings.”

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

1. Section 00700 (00710), Article 4.01, delete the first sentence of paragraph A and replace it with the following sentence:

A. All land required for this Project is presently owned by the Owner or is under condemnation. The limits of ownership are shown on the Drawings. Easements for pipelines have been obtained by the Owner or are under condemnation. Easement widths are shown on the Drawings.

The remaining wording in the paragraph remains unchanged.

2. Section 00700 (00710), Article 4.01, delete paragraph C and replace with the following paragraph:

C. The Contractor shall provide at his own expense and without liability to the Owner any additional land and access thereto that the Contractor may desire for temporary construction facilities, or for storage of materials.

3. Section 00700 (00710), Article 4.02, paragraph A - Reports and Drawings, delete the words “The Supplementary Conditions” and replace with the words “The Special Conditions and/or Bid Proposal Addendums identify”

4. Section 00700 (00710), Article 4.05, following paragraph A, add the following paragraph B:

B. The layout of the work shall be the responsibility of the Contractor and shall be subject to checking by the Engineer. The Engineer shall establish base lines and a system of bench levels for the Contractor's use as required. All instruments, stakes, barricades, traffic signs, flags, and other materials necessary, and personnel needed for establishing and marking lines, grades, and structure

2. The Contractor shall enter the actual progress on the chart at the end of each month during the construction period and upon doing so shall immediately deliver 3 copies of the annotated schedule to the Owner/Engineer.

3. If the Contractor falls behind the progress schedule, the Contractor shall take such steps as may be necessary to improve the progress. Such steps may include increasing the number of shifts, overtime operations, days of work, amount of construction plant, or all of them, and to submit for review any supplementary schedule or schedules in chart form necessary to demonstrate the manner in which the agreed rate of progress will be regained, all without additional cost to the Owner.

4. Failure of the Contractor to prosecute the Work with sufficient diligence to ensure completion within the time specified in the Contract, or failure of the Contractor to take necessary steps to improve the Contractor's progress should it fall behind the Contractor's schedule shall be grounds for the Owner to terminate the Contractor's right to proceed with the Work, or any separate part of it, in accordance with the terms of the Contract.

5. A schedule of Shop Drawing submissions acceptable to the Engineer as providing a workable arrangement for processing the submissions.

6. A schedule of values for all of the Work which will include quantities and prices of items aggregating the Contract Price and will subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. The schedule of values must be acceptable to the Engineer as to form and substance.

7. The Contractor shall also submit a schedule of payments that the Contractor anticipates the Contractor will earn during the course of the Work.

ARTICLE 3 - CONTRACT DOCUMENTS, INTENT,
AMENDING, REUSE

1. Section 00700 (00710), Article 3.01, delete paragraph A and insert the following paragraph:

A. The contract Documents comprise the entire Agreement between the Owner and the Contractor concerning the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.

2. Section 00700 (00710), Article 3.01.B, at the end of the paragraph, add the following wording:

“When words which have a well-known technical or trade meaning are used to describe the Work, materials or

location during construction, shall be the responsibility of the Contractor.

The Contractor's personnel engaged in the layout work described herein and the aides furnished to the Engineer shall be fully capable of performing the duties set out herein and shall be fully qualified for the work required.

1. Sewer Lines

The Engineer will mark the locations of all manholes on the ground. The contractor shall set line and grade stakes for all gravity sewers, offset from the center line of the trench or the axis of the pipelines. The Contractor shall also prepare "cut sheets" showing the elevation of the offset stake, depth of cut from the top of the offset stake to the invert of the sewer, elevation of invert of the sewer, the offset distance of the stake from the centerline of the pipe, elevation of the existing ground over the sewer, the depth of cut from the surface of the existing ground to the invert of the pipe, grade of the sewer, and length of sewer between manholes.

The "cut sheets" shall be prepared in at least 3 copies on forms provided by the Engineer. The Contractor shall submit the "cut sheets" to the Engineer for his approval prior to trenching and laying of pipe. When approved, the Engineer will retain the original and 1 copy of the "cut sheet" for his files.

Where gravity sewer lines are being constructed, the Contractor shall be required to obtain to original ground elevation along the centerline at each 25 foot station or break in grade of ground surface for the purpose of calculation of the average trench depth.

Where paving or curbs and gutters are existing or where line and grade stakes have been established for same, the Contractor shall determine the elevation of and construct the manholes to the height of the adjacent facilities either existing or proposed. Where paving curbs and gutters or stakes are not existing, the Contractor shall construct the manholes to the height determined by the Engineer.

The Contractor shall furnish all materials required for layout either by the Engineer or by the Contractor's forces. The Contractor shall furnish all labor and equipment for clearing underbrush, weeds, etc., prior to staking of the sewers. The Contractor shall also furnish any aides required by the Engineer in marking the location of the various facilities on the ground and establishing bench levels.

2. Water, Gas and Sewage Force Mains

Trench line stations will be set by the Contractor ahead of trenching. These will be set at least every 100 feet of pipeline and at the locations of all pipeline accessories.

5. Section 00700 (00710), Article 4.06, paragraph A - Remove the words "Supplementary Conditions" and Replace with the words "Special Conditions and/or Bid Proposal Addendums"

ARTICLE 5 - BONDS AND INSURANCE

1. Section 00700 (00710), Article 5.01, paragraph C - Change the notification time from 20 days to 5 days.

2. Section 00700 (00710), Article 5.01, paragraph C - Add the following words at the end of the paragraph: ". . . . and both of which must be acceptable to the Owner."

3. Section 00700 (00710), Article 5.03, paragraph A - Revise the first sentence to read "Contractor shall deliver to Owner, prior to Commencement of the Work,"

4. Section 00700 (00710), Article 5.03 - Delete paragraph B.

5. Section 00700 (00710), Article 5.04, following paragraph A 6 - Add the following paragraphs 7, 8, and 9:

7. The Contractor shall purchase and maintain at the Contractor's expense for the full Contract Period Builder's Risk (or Installation Floater) Insurance providing "All Risk" physical damage type coverage for the Work to be performed at the site in an amount equal to the Contract Price. This insurance shall include the interests of the Owner, Contractor, Subcontractors, Engineer and Engineer's consultants in the Work, all of whom shall be listed as insureds or additional insured parties, shall insure against the perils of fire and extended coverage and shall include "all risk" insurance for physical loss and damage including theft, vandalism and malicious mischief, collapse and water damage, and such other perils as may be provided for by the Insurance Service Office form MLB-103, and shall include damages, losses and expenses arising out of or resulting from any insured loss or incurred in the repair or replacement of any insured property. If no covered under the "all risk" insurance or otherwise provided in the Special Conditions, the Contractor shall purchase and maintain similar property insurance on portions of the Work stored on and off the site or in transit when such portions of the Work are to be included in an Application for Payment. Such insurance may have a deductible not to exceed \$1,000.00 per loss.

8. Where work involves railroad rights-of-way, the Contractor shall purchase and maintain at the Contractor's expense for the full Contract Period or as required, Railroad

Protective Insurance in an amount acceptable to the railroad company.

9. On Federally funded projects, the Contractor shall purchase and maintain at the Contractor's expense for the full Contract Period or as required, flood insurance where the project is in a designated flood hazard area in which Federal flood insurance is available.

6. Section 00700 (00710), Article 5.04, paragraph B.2, in the third sentence, change "Supplementary Conditions" to "Special Conditions."

7. Section 00700, Article 5.06.A, in the first sentence, change "Owner" to "Contractor."

8. Section 00700, Article 5.06.B, first word of first sentence, change "Owner" to "Contractor."

9. Section 00700, Article 5.06.E, delete this paragraph.

10. Section 00700, Article 5.07.A, last sentence, change "Owner" to "Contractor."

11. Section 00700, Article 5.08.A, all instances where it appears, change "Owner" to "Contractor."

12. Section 00700, Article 5.08.B, all instances where it appears, change "Owner" to "Contractor."

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

1. Section 00700 (00710), Article 6.01, following paragraph B, add a new paragraph C as follows:

C. The Contractor shall at all times be responsible for the conduct and discipline of his employees and/or any Subcontractor or persons employed by the Subcontractor. All workmen must have sufficient knowledge and skill and experience to perform properly the work assigned to them. Any superintendent, foreman or workman employed by the Contractor or Subcontractor who does not perform his work in a skillful manner or acts in an incompetent, disorderly or intemperate manner shall, at the written request of the Owner, be discharged immediately.

2. Section 00700 (00710), Article 6.03, following paragraph C, add the following paragraphs D, E, F and G:

D. Any equipment damaged or which has been subjected to possible damage by reason of inundation, improper storage and/or protection during the construction period of a project, shall be handled only as follows:

Be replaced with new equipment.

With approval of the Engineer, be returned to the manufacturer of the equipment, or his authorized repair agency, for inspection and repair provided; however, that such repair after inspection will place the equipment in new condition, and restore the manufacturer's guarantee the same as for new equipment.

This is particularly applicable to, but not limited to, electric motors, motor controls, meter and gauges, and equipment with bearings.

E. Materials, supplies and equipment shall be in accordance with samples submitted by the Contractor and accepted by the Engineer.

F. Materials, supplies or equipment to be incorporated into the Work shall not be purchased by the Contractor or the Subcontractor subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

G. The use of second hand and/or salvaged materials will not be permitted unless specifically provided for in the detailed Specifications. Materials and equipment shall be new when turned over to the Owner.

All materials and/or equipment to be removed from existing structures and not specifically specified to be re-used shall remain the property of the Owner. Such materials and/or equipment shall be stored by the Contractor on sites as directed by the Owner.

3. Section 00700 (00710), Article 6.17.A.1.a, revise the paragraph to read:

a. Submit six (6) copies of each shop drawing required. Upon review and acceptance of shop drawing material or equipment submitted, two (2) copies will be returned to Contractor noting approval or approval with notations.

4. Section 00700 (00710), Article 6.17.A.2.a, revise paragraph to read:

a. Submit six (6) units of each sample required.

5. Section 00700 (00710), Article 6.17.C, add the following paragraph:

4. No portion of the work requiring a shop drawing, working drawing, sample, or catalog data shall be started nor shall any materials be fabricated or installed prior to the review or qualified review of such item. Fabrication performed, materials purchased, or on-site construction accomplished which does not conform to reviewed shop drawings and data shall be at the Contractor's risk. The Owner will not be liable for any

expense or delay due to corrections or remedies required to accomplish conformity.

6. Section 00700 (00710), Article 6.17.E, add the following paragraph:

2. The Contractor shall bear the cost for review and processing of shop drawings after the second resubmittal.

ARTICLE 7 - OTHER WORK AT THE SITE

Revisions not required.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

Revisions not required.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

1. Section 00700 (00710), following Article 9.01.A, add a new paragraph B as follows:

B. Limit of Liability of Public Officials and Owner's Agents.

In carrying out any of the provisions of the Contract or in exercising any power or authority to him thereby, there shall be no personal liability upon the engineer or the Owner's other authorized assistants or employees, it being understood that in such matters they act as the agents and representatives of the Owner.

2. Section 00700 (00710), following Article 9.03.A, add a new paragraph B:

B. Resident Project Representative

The Resident Project Representative assigned to the construction project is a representative of the Engineer whose function is to assist the Engineer in observing performance of the Work of the Contractor.

Through more extensive on-site observations of the Work in progress and field checks of materials and equipment by the Resident Project Representative, the Engineer shall endeavor to provide further protection for the Owner against defects and deficiencies in the Work; but, the furnishing of such services will not make the Engineer responsible for or give the Engineer control over construction means, methods, techniques, sequences or procedures or for safety precautions or programs, or

responsibility for the Contractor's failure to perform the Work in accordance with the Contract Documents.

The Resident Project Representative is the Engineer's agent at the site, will act as directed by and under the supervision of the Engineer, and will confer with Representatives regarding the Resident Project Representative's actions. The Resident Project Representative's dealings in matters pertaining to the on-site work shall in general be with the Engineer and the Contractor keeping the Owner advised as necessary. The Resident Project Representative's dealings with Subcontractors shall only be through or with the full knowledge and approval of the Contractor. The Resident Project Representative shall generally communicate with the Owner with the knowledge of and under the direction of the Engineer.

The duties and responsibilities of the Resident Project Representative are limited to those of the Engineer as described in the Engineer's agreement with the Owner and in the construction Contract Documents, and are further limited and described as follows:

Conduct on-site observations of the Work in progress to assist the Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.

Report to the Engineer whenever the Resident Project Representative believes that any Work is unsatisfactory, faulty or defective or does not conform to the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise the Engineer of Work that the Resident Project Representative believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.

Shall not authorize any deviation from the Contract Documents or substitution of materials or equipment, unless authorized by the Engineer.

Shall not advise on, issue directions relative to or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction unless such advice or directions are specifically required by the Contract Documents.

Shall not advise on, issue directions regarding or assume control over safety precautions and programs in connection with the Work.

The Resident Project Representative shall receive a copy of all correspondence from the Contractor, and shall be kept fully informed of all the Contractor's transactions

F. On Federally funded projects, weekly payroll data for all the CONTRACTOR and Subcontractor employees must be furnished monthly to the Federal agency designee or as may be prescribed by the agency at a preconstruction conference. While weekly wage data reports are not required to be filed with the Kentucky Department of Labor on Federally assisted projects, one copy of the report must be filed with the OWNER and be available at the Public Authority's (OWNER) office for inspection by the Kentucky Department of Labor. The prime CONTRACTOR is responsible for payroll reporting compliance by all his Subcontractors.

G. Federal labor regulations applicable to the Project for which these Specifications are applicable shall be those established by the Federal agency involved (if any). The CONTRACTOR and Subcontractor performing the Work under this Project must fulfill all requirements of the presently effective labor legislation and Executive Orders as listed below and any other Federal labor regulations which may be or may become applicable.

1. Minimum Wages - Davis-Bacon Act
2. "Anti-Kickback" Act, Copeland Act
3. Contract Work Hours Standard Act - Overtime Compensation
4. Non Discrimination - Civil Rights Act
5. Equal Employment Opportunity - Executive Orders 11246 and 11375
6. Elimination of segregated facilities
7. Certification of nonsegregated facilities

END OF SECTION

SECTION 00820

SPECIAL CONDITIONS

1. DESCRIPTION OF THE WORK; DESIGNATION OF OWNER AND ENGINEER

1.1 These Specifications and the accompanying Drawings describe the work to be done and the materials to be furnished for the construction of Contract 519-07-03, Water System Improvements, Thornton Area.

1.2 All references to the OWNER in these Specifications, Contract Documents and Drawings shall mean the Letcher County Water and Sewer District.

1.3 All references to the ENGINEER in these Specifications, Contract Documents and Drawings shall mean Bell Engineering.

2. AVAILABLE FUNDS

2.1 The attention of all Bidders is directed to the fact that funds will be made available for the award of this Contract from the following source:

Rural Development and local funds

3. TIME OF COMPLETION

3.1 The time allowed for completion of this Contract and/or portions thereof is as follows:

Contract 519-08-04 - ----- Calendar Days

3.2 The time allowed for completion shall begin at midnight, local time, 10 calendar days from the date on which the OWNER, or his authorized representative, the ENGINEER, shall instruct the CONTRACTOR in writing to start work. In case of awarding more than one Contract to a CONTRACTOR, periods of construction are not additive, but will run concurrently. The same applies to divisions within a Contract.

4. LIQUIDATED DAMAGES

4.1 It is understood that time is of the essence of this Contract, and that the OWNER will sustain damages, monetary and otherwise, in the event of delay in completion of the work hereby contracted.

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

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

4.4 Liquidated damages are fixed at the following amounts per calendar day of overrun beyond the date set for completion or authorized extension thereof for each of the Contracts, divisions, sections, or combinations thereof:

Contract 519-08-04 - \$500.00 per calendar day

5. INSURANCE

5.1 The minimum amounts of insurance coverage to be furnished by the CONTRACTOR under this Contract in accordance with the provisions of Articles 21 and 24 of the General Conditions of these Specifications are:

- a. Workmen's Compensation Statutory \$100,000
- b. Comprehensive General Liability Including Coverage for the Explosion, Collapse, and Underground Hazards, Contractual Liability (See Section 00700, Article 24), Products and/or Completed Operations, Personal Injury (Employment Exclusion waived), Broad Form Property Damage (No deductible clauses are acceptable for these coverages), and Independent Contractors (Subcontractors)
 - Bodily Injury Liability \$500,000 Each Occurrence
 - Personal Injury Liability \$500,000 Each Occurrence
 - Property Damage Liability \$100,000 Each Occurrence
 - Property Damage Liability \$300,000 Each Policy Period
- c. Comprehensive Automobile Liability, Including Hired Car and Employer's Non-Ownership Liability Coverage
 - Bodily Injury Liability \$200,000 Each Person
 - Property Damage Liability \$500,000 Each Occurrence
 - Property Damage Liability \$100,000 Each Occurrence
- d. All Risk Type Builder's Risk or Installation Floater (See Section 00700, Article 21.5) 100% of Contract Price
- e. All policies written for, and applicable to, the Contract of which this Specification is a part shall provide for a minimum of 30 days advance written notice of cancellation or any material change. Notice to be given to both the OWNER and the ENGINEER.
- f. Umbrella Excess Liability \$2,000,000 Per Occurrence

- g. OWNER'S Protective Liability
OWNER to be named insured (no deductible)\$500,000 Each Occurrence
Bodily Injury\$500,000 Each Occurrence
Personal Injury\$500,000 Each Occurrence
Property Damage.....\$250,000 Each Occurrence
Flood Insurance (where required)Insurable Amount

5.2 All policies written for and applicable to the Contract of which this Specification is part shall provide for a minimum of 30 days advance written notice of cancellation or any material change. Notice to be given both to the OWNER and the ENGINEER.

5.3 Certificates of Insurance for all coverages required under this Contract shall be included at the time of the execution of the Contract Documents by the CONTRACTOR. The minimum policy period for the initial insurance submittal shall be for the length of the Contract or 1 year, whichever is the lesser.

6. PERFORMANCE AND PAYMENT BONDS

6.1 The CONTRACTOR shall furnish separate performance and payment bonds (forms included elsewhere in these Specifications) issued by an approved bonding company in an amount at least equal to 100 percent of the Contract price, as security for the faithful performance of this Contract and for the payment of persons performing labor and furnishing materials in connection with this Contract. These bonds shall be executed by a company authorized to do business in the State of Kentucky and shall be signed or countersigned by a Kentucky resident agent.

7. METHOD OF BIDDING

7.1 The work under this Contract shall be bid by unit price and/or lump sum as provided for in the Form of Proposal. This Contract shall be bid in full on the form provided.

7.2 The CONTRACTOR must bid all divisions and all listed unit price items and/or lump sums to complete a Contract. The OWNER will not award the work on divisions or sections within a Contract separately. Each Contract shall be bid separately and in full on the Form of Proposal provided.

7.3 The OWNER reserves the right to delete divisions, sections, unit price items, or any combination thereof, in making award of Contract, without invalidating the CONTRACTOR'S bid on other divisions.

7.4 The OWNER reserves the right, should financing considerations require or allow, to delete or add physical units to the unit price items bid. However, the monetary value of such deletions or additions shall not exceed 25 percent of the total amount bid for the Contract without specific approval of the CONTRACTOR.

7.5 If deletions or additions are made, comparison of bids will be made on the basis of portions of the Contract to be awarded and not on the total of the base bid made by the CONTRACTOR.

8. VIDEO TAPING

8.1 Continuous video taping of preconstruction surface conditions is required for this Contract. All taping and reproduction must be completed before any construction activity will be allowed. Taping must be performed by persons experienced with this type equipment and must be acceptable to the ENGINEER. Taping equipment used shall utilize standard VHS format tapes.

8.2 The video taping shall be supplemented with continuous audio description of the area traversed. Verbal description of problem areas and items of special interest shall be elaborated upon.

8.3 All locations, streets and/or easements on or in which construction activity will occur shall be taped for the complete length or boundary of the construction area.

8.4 An index shall be furnished for each tape coordinating the location of the taped area with the location of the proposed facilities as shown on the Drawings.

8.5 The CONTRACTOR shall be responsible for providing access to all areas to be taped. All tapes shall be viewed by the ENGINEER before any construction is started. The CONTRACTOR shall provide tape viewing equipment for the duration of the project.

8.6 The cost of preconstruction audio/video taping shall be at no additional cost to the OWNER, the cost being incorporated into the CONTRACTOR'S unit price or lump sum bid for the items of work as listed on the Form of Proposal.

8.7 The CONTRACTOR is also urged to video tape any structure within a reasonable distance of his blasting or other work operations for reference and file.

8.8 Color print still photographs shall be used as needed to supplement the continuous video taping of preconstruction conditions and/or pertinent construction items.

8.9 Any photographs or audio/video tapes required by governing agencies will be the responsibility of the OWNER.

9. MINIMUM WAGE RATES

9.1 The prevailing minimum wage rates have not at this time been determined by the governing agencies. However, before bids are received, applicable rates will be determined and issued in the form of an addendum to these Specifications.

10. EXCAVATION

10.1 It is to be specifically noted that no separate payment for solid rock excavation will be made under this Contract. All excavation shall be considered unclassified, and payment for same included in the appropriate furnishing and laying or other items containing excavation.

11. PERMISSION TO USE PROPERTY OTHER THAN THAT PROVIDED BY OWNER

11.1 Should the CONTRACTOR desire or elect to use, pass over and/or encroach on private property other than that provided by the OWNER, either by fee simple title or right-of-way for a specific purpose, he shall obtain such rights and permission from the individual property owner at his own expense and risk.

12. TIE-IN TO EXISTING WATER MAINS

12.1 As far as possible, the locations and sizes of existing mains are indicated on the Drawings; however, exact locations, pipe materials and sizes cannot be guaranteed. It shall be the responsibility of the CONTRACTOR to locate and uncover existing lines, to which new mains are to be connected, and provide all connecting fittings of the correct size and type for each connection. Payment for the above shall be included in the unit price bid for each item used for the connection as indicated on the Drawings or as specified.

13. EXTRA FILL MATERIAL

13.1 Extra fill material required to complete the finished grading to the line and grade shown on the Drawings shall be obtained by the CONTRACTOR at no extra cost to the OWNER above that included in his lump sum bid.

14. SURFACE RESTORATION RETAINAGE

14.1 In the case of water mains, there will be retained from the unit price for "Furnishing, Laying, Trenching and Backfilling" an amount of \$5.00 per foot for clean-up operations. Upon completion of clean-up work satisfactory to the ENGINEER, this retainage will be paid on the following periodic payment estimate.

15. USE OF SPECIALS IN VERTICAL PLANE OPTIONAL

15.1 Where specials (fittings) are shown at change in grade of pipeline, the CONTRACTOR, at his option, may use fittings as shown with blocking, or he may, where possible without exceeding maximum allowable deflection in pipe joints, avoid the use of specials at grade changes, by increasing the trench depth, provided the pipe installed to such extra depth is designed to withstand the extra depth cover and the maximum internal pressure specified. No additional compensation will be given for installing the pipe at an extra depth to avoid the use of fittings and thrust blocking.

16. ACCESS TO THE WORK

16.1 The representatives of the OWNER, the ENGINEER, and the Kentucky Division of Water shall have access to the work wherever it is in preparation or progress, and the CONTRACTOR shall provide proper facilities for such access and inspection.

17. BLASTING AND PREBLAST SURVEYS

17.1 The CONTRACTOR will be held liable for all damages caused by blasting operations required for the construction of this project. All blasting operations shall be performed in accordance with local municipal ordinances and state laws governing such operations, including the storage of explosives.

17.2 Special precautions are required when blasting near natural gas pipelines. The CONTRACTOR shall notify the OWNER of the gas line at or near the area of blasting prior to beginning the blasting operation. The CONTRACTOR shall, with or without assistance from the gas company, develop emergency procedures, planned in advance of each blast.

17.3 Preblast surveys are required on this project for the protection of all parties concerned. These surveys shall be conducted by independent firms specializing in blasting damage control safety.

17.4 Preblast surveys shall be detailed studies of all commercial, industrial, residential or other structures within the areas subject to damage as a result of the blasting operations. The surveys shall include the exterior and/or interior of the building and other improvements on the property such as concrete, brick or bituminous paved drives, parking areas, sidewalks, retaining walls or pillars subject to damage as a result of blasting operations. In rural areas, the surveys shall also include water sources such as wells, springs and dams for farm ponds.

17.5 Individual reports shall be prepared for each parcel of property surveyed within the given radius of the blasting area. Each report shall indicate the type and location of existing structural damage, or the fact that none exists, shown in detail by sketch supplemented by color photo, audio cassette tape supplemented by color photo or video tape, as the CONTRACTOR may elect. Should the video tape method be provided, a video projector shall be furnished for the project duration.

17.6 Preblast survey reports shall also include recommended blasting methods and techniques to preclude damage.

17.7 One copy of each individual report shall be filed with the OWNER for his file and reference prior to the start of blasting operations.

17.8 The cost for preblast surveys shall be considered incidental to the work and shall be included in the bid price for the work.

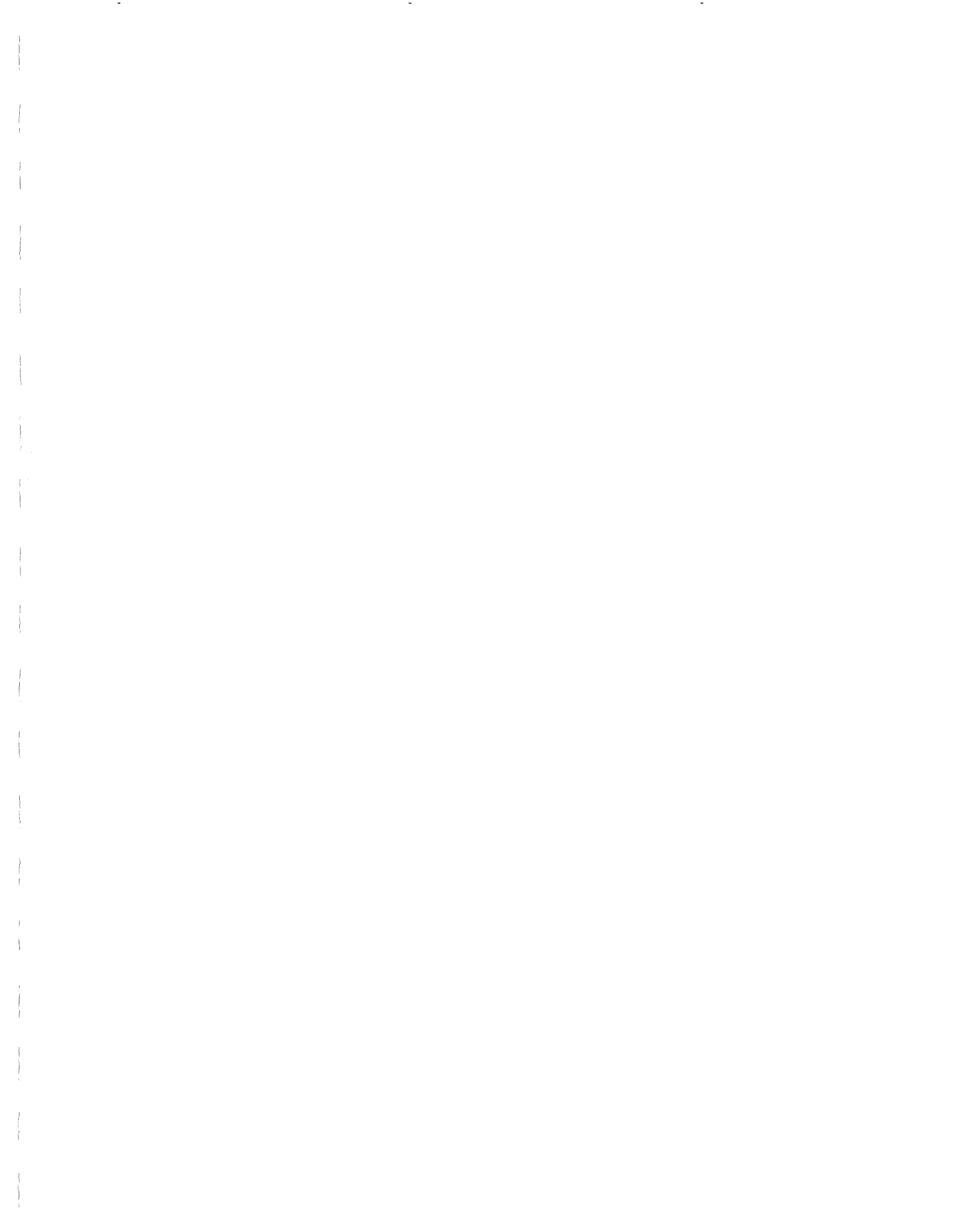
00820-7

END OF SECTION

18.1 The obtaining of all utilities for construction, including on-site power, and water, shall be the responsibility of the CONTRACTOR, and he shall bear the cost of all utilities used for construction. Cost of all connections and facilities for use of utilities shall be borne by the CONTRACTOR.

18. FUNDING AGENCY CONDITIONS

519-08-04 (10/08)



SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 SCOPE OF WORK COVERED BY THE CONTRACT

A. These Specifications and the accompanying Drawings describe the work to be done and materials to be furnished for the construction of Contract 519-08-04, Water System Improvements, Intercounty Connection, KY 1410 and KY 7, for the Letcher County Water and Sewer District.

B. The Work is located in north central Letcher County.

C. Major work items in this Contract include:

- 1. Approximately 44,177 feet of 3-inch through 8-inch water line and associated accessories.
- 2. Residential meters and service lines.
- 3. Highway bores/casing pipe (8, 12 and 14-inch).

1.02 WORK SEQUENCE

A. No priorities are assigned to this work.

1.03 HIGHWAY BOND

A. Prior to beginning work, the CONTRACTOR shall post a bond in the OWNER'S name with the Kentucky Department of Highways for the Encroachment Permit. The bond amount to be posted is \$120,000.00. The cost of this bond shall be considered incidental to pipe laying activities and there will be no additional payment for posting the bond.

PART 2 MATERIALS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION



01020-1

END OF SECTION

A. No cash allowances are included in this Project.

1.01 CASH ALLOWANCES

PART 1 GENERAL

ALLOWANCES

SECTION 01020

519-08-04 (10/08)

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

A. This section specifies the general methods and requirements of submissions applicable to the construction schedule and shop drawings, product data, and samples. Additional general submission requirements are contained in paragraphs 5.1 through 5.7 of the General Conditions. Detailed submittal requirements are specified in the technical Specifications sections.

1.02 CONSTRUCTION SCHEDULE

A. In addition to the progress schedule requirements specified in Article 3 of the General Conditions, the CONTRACTOR shall, within 10 days after the Notice to Proceed, provide and submit to the ENGINEER for review the schedule the CONTRACTOR plans to maintain in order to successfully construct the work within the time allotted. The schedule shall account for all work of the CONTRACTOR and the Subcontractors.

B. The CONTRACTOR shall update the schedule information monthly and submit the updated information to the ENGINEER at the same time the pay estimate is prepared. The schedule shall contain all of the items of the periodic estimate and pay schedule.

C. The CONTRACTOR bears full responsibility for scheduling all phases and stages of the work including all Subcontractors' work to insure its successful prosecution and completion within the time specified in accordance with all provisions of the Contract Documents.

1.03 SHOP DRAWINGS, PRODUCT DATA, SAMPLES, O&M INSTRUCTIONS

A. Submittal of these items shall comply with Section 00700, The General Conditions, in addition to the more detailed requirements listed in this section and in the technical Specifications.

B. Shop Drawings

1. Shop drawings, as defined in the General Conditions, and as specified in the technical Specifications include, but are not necessarily limited to, custom-prepared data such as fabrication and erection/installation drawings, scheduled information, setting diagrams, actual shopwork manufacturing instructions, custom templates, special wiring diagrams, coordination drawings, individual system of equipment inspection and test reports including performance curves and certifications, as applicable to the work.

2. All details on shop drawings submitted for review shall show clearly the relation of the various parts to the main members and lines of the structure, and where correct fabrication of the Work depends upon field measurements, such measurements shall be made and noted on the shop drawings before being submitted for review.

C. Product Data

1. Product data as specified in individual sections include, but are not necessarily limited to, standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliance and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing, and printed product warranties, as applicable to the Work.

D. Samples

1. Samples specified in individual sections include, but are not necessarily limited to, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols, and units of work to be used by the ENGINEER or OWNER for independent inspection and testing, as applicable to the Work.

E. Operation and Maintenance Instructions

1. O&M instructions shall conform to Article 5 of the General Conditions (Section 00700) and the particular requirements of the individual sections.
2. Refer to Section 01600 for additional requirements for O&M instructions.

1.04 CONTRACTOR'S RESPONSIBILITY

- A. The CONTRACTOR shall review shop drawings, product data and samples prior to submission to determine and verify the following:

1. Field measurements
2. Field construction criteria
3. Catalog numbers and similar data
4. Conformance with the Specifications

B. All shop drawings submitted by subcontractors for review shall be sent directly to the CONTRACTOR for preliminary checking. The CONTRACTOR shall be responsible for their submission at the proper time so as to prevent delays in delivery of materials.

C. The CONTRACTOR shall check all Subcontractors' shop drawings regarding measurements, size of members, materials, and details to satisfy the CONTRACTOR that they conform to the intent of the Drawings and Specifications. Drawings found to be inaccurate or otherwise in error shall be returned to the Subcontractors for correction before submission thereof.

D. Each shop drawing, working drawing, sample and catalog data submitted by the CONTRACTOR shall have affixed to it the following certification statement, signed (not initialed) by the CONTRACTOR: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data; and I have checked and coordinated each item with other applicable reviewed shop drawings and all Contract requirements.

E. The CONTRACTOR shall notify the ENGINEER and OWNER in writing, at the time of submittal, of any deviations in the submittals from the requirements of the Contract Documents.

F. The CONTRACTOR should include the notation "Critical Path" on critical path submittals.

G. The review of shop drawings, samples or catalog data by the ENGINEER shall not relieve the CONTRACTOR from his responsibility with regard to the fulfillment of the terms of the Contract.

H. No portion of the work requiring a shop drawing, working drawing, sample, or catalog data shall be started nor shall any materials be fabricated or installed prior to the review or qualified review of such item. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to reviewed shop drawings and data shall be at the CONTRACTOR'S risk. The OWNER will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.

I. Project work, materials, fabrication, and installation shall conform with reviewed shop drawings, working drawings, applicable samples, and catalog data.

1.05 SUBMISSION REQUIREMENTS

A. The CONTRACTOR shall make submittals in such sequence as to cause no delay in the work or in the Work of any other Contractor.

B. Number of submittals required:

- 1. Shop Drawings: Submit 7 copies.
- 2. Product Data: Submit 7 copies.
- 3. Samples: Submit number stated in the respective Specification sections.
- 4. O&M Instructions: Submit 7 copies in accordance with Section 01600 of the Specifications.

C. Submittals shall contain:

- 1. The date of submission and the dates of any previous submissions.
- 2. The Project title, Contract number, and submittal number.
- 3. Contractor identification.
- 4. The names of:
 - a. CONTRACTOR
 - b. Supplier
 - c. Manufacturer

5. Identification of the product, with the Specification section number.

6. Field dimensions, clearly identified as such.

7. Relation to adjacent or critical features of the work or materials.

8. Applicable standards, such as ASTM or Federal Specification numbers.

9. Identification of deviations from Contract Documents.

10. Identification of revisions on resubmittals.

11. An 8-in. x 3-in. blank space for CONTRACTOR's and ENGINEER's stamps.

12. Critical path notation as required.

1.06 RESUBMISSION REQUIREMENTS

A. The CONTRACTOR shall make any corrections or changes in the submittals required by the ENGINEER and resubmit until accepted, in accordance with the following:

1. Shop drawings and product data:

- a. Revise initial drawings or data, and resubmit as specified for the initial submittal.
- b. Indicate any changes which have been made other than those requested by the ENGINEER.

2. Samples: Submit new samples as required for initial submittal.

B. The CONTRACTOR shall bear the cost for all review and processing after the second resubmittal.

1.07 GENERAL PROCEDURES FOR SUBMITTALS

A. Coordination of Submittal Times: The CONTRACTOR shall prepare and transmit each submittal sufficiently in advance of performing the related Work or other applicable activities, or within the time specified in the individual Work section of the Specifications, so that the installation will not be delayed by processing times including disapproval and resubmittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery and similar sequenced activities.

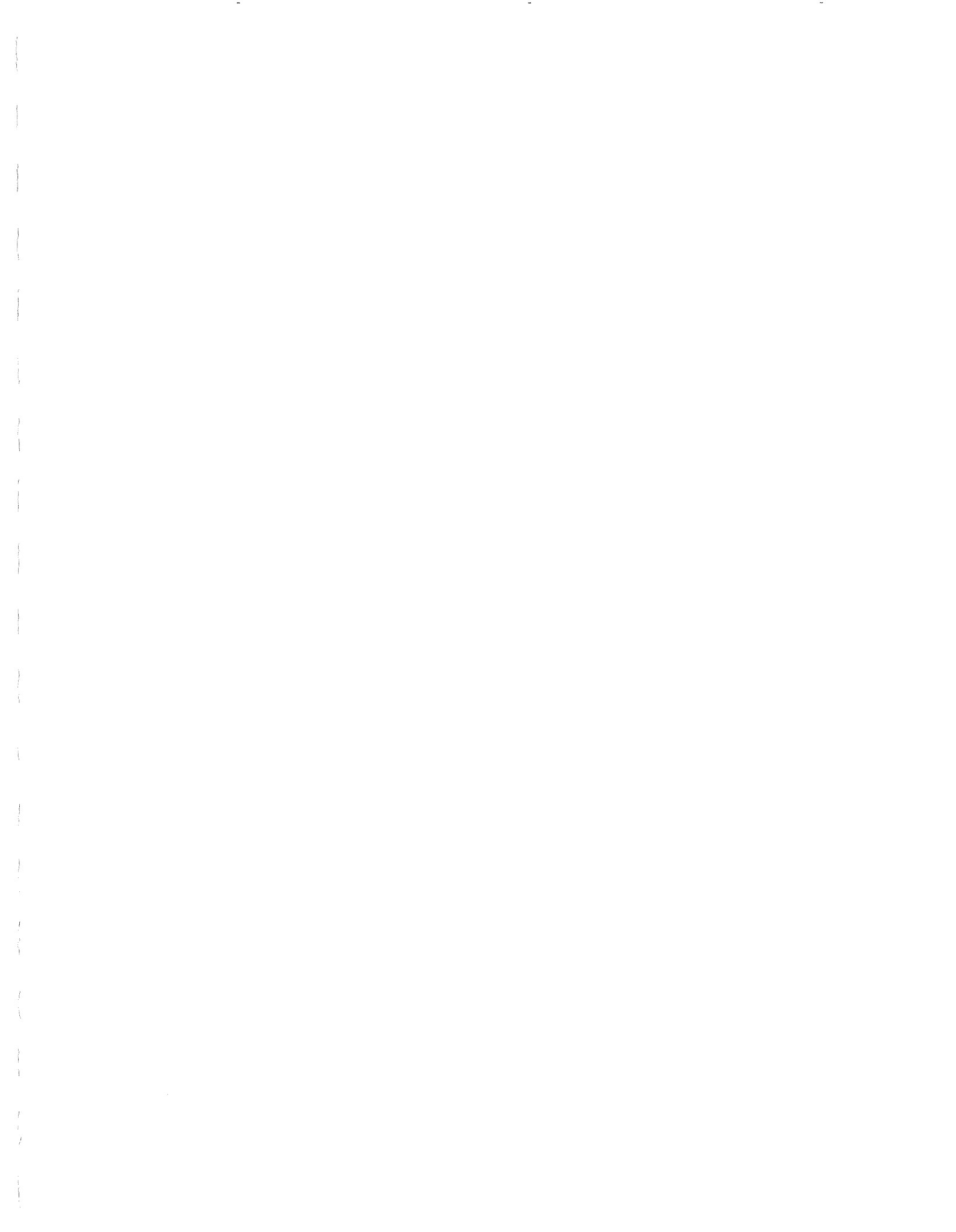
PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION



SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.01 SANITARY FACILITIES

A. The CONTRACTOR shall construct and maintain, in a sanitary condition, sanitary facilities for the CONTRACTOR'S employees and also employees of the subcontractors. The CONTRACTOR shall, at completion of the Contract Work, properly dispose of these sanitary facilities.

1.02 UTILITIES

A. The obtaining of all utilities for construction, including power and water, shall be the responsibility of the CONTRACTOR, and he shall bear the cost of all utilities used for construction. Cost of all connections and facilities for use of utilities shall be borne by the CONTRACTOR.

1.03 MAINTENANCE OF SERVICE IN EXISTING UTILITIES

A. Where the existing utilities, including in-plant process piping and plant water piping, must be disturbed during construction under this Contract, their operation and function shall be maintained by the CONTRACTOR to such a degree that service to customers will be interrupted for minimum time periods only. Such disturbances and any maintenance use of these lines shall constitute no cost to the OWNER. The OWNER shall be notified of interruptions in sufficient time to prepare for them and shall agree to the hour, date, and duration of them before they are undertaken.

B. Should shutdowns in service be in excess of the time of duration agreed upon, and such excessive shutdown time be due to the CONTRACTOR'S negligence, faulty Work and/or inability to perform, then and in that event, the CONTRACTOR shall be held liable to the OWNER for any and all damages that may accrue to the OWNER, by reason of such excessive shutdown periods.

C. Digging through services with trenching machines will not be permitted. Upon damage to utility services, such services shall be repaired immediately and tested to the satisfaction of the ENGINEER. The CONTRACTOR shall notify all utility users of impending interruption of service and shall be responsible for all damage resulting from same. Payment for necessary disconnection and reconnection of utility services shall be included as a part of the CONTRACTOR'S bid and no extra compensation will be made for same.

D. The CONTRACTOR shall at all times maintain on hand an adequate supply of repair materials and tools with which to make repair to damaged water, gas and sewer lines. Should the CONTRACTOR inadvertently damage existing utilities, he shall make immediate repair thereto and in no event shall he leave the site before such repair has been made and proven to be successful.

- E. As far as possible, the locations and sizes of existing mains are indicated on the Drawings; however, exact locations, pipe materials and sizes cannot be guaranteed. It shall be the responsibility of the CONTRACTOR to locate and uncover existing lines, to which new mains are to be connected, and provide all connecting fittings of the correct size and type for each connection. Payment for the above shall be included in the unit price bid for each item used for the connection as indicated on the Drawings or as specified.
- 1.04 PROPERTY PROTECTION
- A. Care is to be exercised by the CONTRACTOR in all phases of construction, to prevent damage and/or injury to the OWNER's and/or other property. Payments for the repair and restoration are limited as set forth in "Conflict With or Damage to Underground Facilities" of the Supplementary General Conditions.
- B. The CONTRACTOR shall avoid unnecessary injury to trees and shall remove only those **authorized** to be removed by written consent of the OWNER. Fences, gates, and terrain damaged or disarranged by the CONTRACTOR's forces shall be immediately restored in their original condition or better.
- 1.05 CONSTRUCTION WARNING SIGNS
- A. The CONTRACTOR shall provide construction warning signs for each location where he is working in the State highway right-of-way or in City streets. He will further provide flagmen as required and shall abide by all Kentucky Transportation Cabinet, Department of Highways safety rules, including size, type and placement of construction signs. All signs shall be of professional quality.
- 1.06 RESIDENT PROJECT REPRESENTATIVE OFFICE
- A. The CONTRACTOR shall provide at the beginning of construction and remove at the completion of construction, an office with storage room for the exclusive use of the Resident Project Representative, at least 10 feet by 24 feet with at least 3 windows, inside door and outside door with lock. The storage room shall occupy a space approximately 10 feet by 5 feet within the above dimensions. This office shall be at least 100 feet from the CONTRACTOR'S offices and storage buildings.
- B. The office shall be furnished with a desk, 2 chairs, stool, plan rack, and a built-in sloped plans table at least 10 feet long and 3 feet wide with a drawer 42 inches by 27 inches by 4 inches deep inside dimensions. The office shall be equipped with a 4-drawer steel filing cabinet, printing calculator, telephone, air conditioner of adequate size, 3 electric ceiling lights, and at least 3 electric plug-in duplex receptacles.
- C. During occupancy, the office shall be supplied with telephone, electric and janitor services, and shall be supplied with adequate, safe, dependable heat.

- D. Subject to approval of the ENGINEER, the CONTRACTOR may furnish office space in an existing building or a trailer equal to 35 feet by 8 feet "Field Office Trailer" of the Contractor's Trailer Company, Williamstown, Massachusetts.
- E. At completion of the Contract, this temporary structure and all other temporary structures erected by the CONTRACTOR shall become the property of the CONTRACTOR, and he shall remove them from the site at no expense to the OWNER. The CONTRACTOR shall restore the site to a condition equal to that which existed before placement of the office.

1.07 ACCESS ROADWAYS

- A. The CONTRACTOR shall construct all access roadways needed during construction, and the planned access roadways for the completed project. The CONTRACTOR shall maintain access roadways continuously during the construction period.

- B. The CONTRACTOR shall maintain all existing roadways within the project site which are used for any purpose by his construction operations. The degree and frequency of maintenance shall be adequate to keep existing roadways in a condition at least equal to their condition prior to construction. Road maintenance shall include dust control and grading as necessary.

1.08 RESPONSIBILITY FOR TRENCH SETTLEMENT

- A. The CONTRACTOR shall be responsible for any settlement caused by the construction, that occurs within 1 year after the final acceptance of this Contract by the OWNER. Repair of any damage caused by settlement shall meet the approval of the OWNER.

1.09 DAMAGE TO CROPS, LIVESTOCK AND VEGETATION

- A. The CONTRACTOR shall protect crops, livestock and vegetation against damage or injury from construction operations at all times. Crops damaged or equipment access obtained outside of the easements provided shall be the responsibility of the CONTRACTOR. Temporary fences shall be provided at no extra cost to the OWNER wherever necessary to keep livestock away from the construction area. Ornamental shrubbery and tree branches shall be temporarily tied back, where appropriate, to minimize damage. Damaged limbs shall be trimmed and damaged tree trunks shall be treated with wound dressing.

1.10 WASTE DISPOSAL

- A. The CONTRACTOR shall dispose of waste, including any hazardous waste, off-site in accordance with all applicable laws and regulations.

1.11 CONTRACTOR'S TRAILERS AND MATERIAL STORAGE

- A. The location of the CONTRACTOR'S and Subcontractors' office and work trailers and parking areas on the project site shall be subject to the OWNER'S approval.

B. The location of the CONTRACTOR'S and Subcontractors' material storage yards on the project site shall be subject to the OWNER'S approval.

1.12 CONSTRUCTION IDENTIFICATION SIGNS

A. The CONTRACTOR shall furnish and erect project identification signs if such are required by the funding agency.

B. The CONTRACTOR shall obtain the OWNER'S permission before erecting any construction signs not specifically required by the Contract.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01600

SPECIAL PROVISIONS FOR MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 SERVICES OF MANUFACTURERS' REPRESENTATIVE AND OPERATING MANUALS

- A. Bid prices for equipment furnished under Division 15 shall include the cost of written operation and maintenance instructions and the cost of a competent representative of the manufacturer of all equipment to supervise the installation, adjustment, and testing of the equipment and to instruct the OWNER'S operating personnel and the ENGINEER'S representative on operation and maintenance. This supervision and instruction may be divided into two or more time periods as required by the installation program, and shall be scheduled at the convenience of the OWNER.
- B. Unless otherwise specified with the equipment, equipment manufacturers shall provide a minimum of 2 separate repeated training sessions for the OWNER'S staff. Each session shall be at least 2 hours in length, but not more than 4 hours. Manufacturer's agenda and schedule for the training shall be submitted to and approved by the OWNER prior to conducting the training. No training will be scheduled until the equipment has been installed, satisfactorily tested, and is ready for operation.
- C. The manufacturer's representative shall have complete knowledge of the proper installation, lubrication, operation and maintenance of the equipment provided and shall be capable of instructing the representatives of the OWNER and ENGINEER on proper start-up, shut-down, on-line operations, lubrication and preventive maintenance of the equipment. Outlines of lesson plans and proposed training schedule shall be submitted to the ENGINEER for review 30 days prior to the desired instructional period. Specific requirements for furnishing the services of manufacturer's representatives are indicated under detailed Specifications. This work may be conducted in conjunction with Inspection and Testing, whenever possible, as provided under Part 3 of EXECUTION of detailed specification. Should difficulties in operation of the equipment arise due to the manufacturer's design or fabrication, additional services shall be provided at no cost to the OWNER.
- D. A certificate from the manufacturer stating that the installation of the equipment is satisfactory, that the unit has been satisfactorily tested, is ready for operation, and that the operating personnel have been suitably instructed in the operation, lubrication, and care of the unit shall be submitted to the ENGINEER.
- E. For equipment furnished under other Divisions, the CONTRACTOR, unless otherwise specified, shall furnish the services of accredited representatives of the manufacturer only when some evident malfunction or over-heating makes such services necessary.

F. Four complete sets of operation and maintenance instructions covering all equipment furnished under Divisions 11, 13, 15 and 16, shall be delivered directly to the ENGINEER.

1. The manual for each piece of equipment shall be a separate document with the following specific requirements:

a. Contents:

Table of contents and index

Brief description of each system and components

Starting and stopping procedures

Special operating instructions

Routine maintenance procedures

Manufacturer's printed operating and maintenance instructions, parts list, illustrations, and diagrams. These shall be specific to the material supplied under the Contract, and not a manufacturer general brochure.

One copy of each wiring diagram

One final accepted copy of each shop drawing and each CONTRACTOR'S coordination and layout drawing

List of spare parts, manufacturer's price, and recommended quantity

Manufacturer's name, address, and telephone number

Name, address, and telephone number of manufacturer's local representative

1.02 INSTALLATION OF EQUIPMENT

A. Special care shall be taken to ensure proper alignment of all equipment with particular reference to the pumps, blowers and electric drives. The units shall be carefully aligned on their foundations by qualified millwrights after their sole plates have been shimmed to true alignment at the anchor bolts. The anchor bolts shall be set in place and the nuts tightened against the shims. After the foundation alignments have been reviewed by the ENGINEER, the bedplates or wing feet of the equipment shall be securely bolted in place. The alignment of equipment shall be further checked after securing to the foundations, and after conformation of all alignments, the sole plates shall be finally grouted in place. The CONTRACTOR shall be responsible for the exact alignment of equipment

with associated piping, and under no circumstances, will "pipe springing" be allowed.

B. All wedges, shims, filling pieces, keys, packing, red or white lead grout, or other materials necessary to properly align, level, and secure apparatus in place shall be furnished by the CONTRACTOR. All parts intended to be plumbed or level must be proven exactly so. Any grinding necessary to bring parts to proper bearing after erection shall be done at the expense of the CONTRACTOR.

1.03 GREASE, OIL AND FUEL

A. All grease, oil, and fuel required for testing of equipment shall be furnished with the respective equipment. The OWNER shall be furnished with a 1 year's supply of required lubricants including grease and oil of the type recommended by the manufacturer with each item of equipment supplied under Divisions 11, 13, 14, 15 and 16.

B. All lubricants and fuels shall be properly labeled, using an indelible marker and writing on the lubricant container or drum, specifying the type and brand name of the lubricant supplied.

1.04 TOOLS AND SPARE PARTS

A. Any special tools (including grease guns or other lubricating devices) which may be necessary for the adjustment, operation, and maintenance of any equipment shall be furnished with the respective equipment.

B. All spare parts shall be properly protected for long periods of storage (contained in plastic bags or cardboard containers) and labeled for easy identification without opening. The labels shall be written with an indelible marker, in the following example format:

1.05 MAINTENANCE AND LUBRICATION SCHEDULES

A. The CONTRACTOR'S attention is directed to the General Conditions and Section 01300 for all requirements relative to the submission of shop drawings for the mechanical equipment. For all mechanical and electrical equipment furnished, the CONTRACTOR shall provide a list including the equipment name, and address and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained. In addition, a maintenance and lubrication schedule for each piece of equipment shall be submitted along with shop drawings. Submission shall be in 3 copies.

1.06 STORAGE AND HANDLING OF EQUIPMENT

A. Special attention shall be given to the storage and handling of equipment. As a minimum, the procedure outlined below shall be followed:

1. Equipment shall not be shipped until all pertinent shop drawings are reviewed by the ENGINEER.

2. All equipment having moving parts such as gears, electric motors, etc., and/or instruments shall be properly stored until such time as the equipment is to be installed.
3. All equipment shall be stored fully lubricated with oil, grease, etc. unless otherwise instructed by the manufacturer.
4. Manufacturer's storage instructions shall be carefully studied by the CONTRACTOR and reviewed with the ENGINEER. These instructions shall be followed and a written record of this kept by the CONTRACTOR.
5. Moving parts shall be rotated a minimum of once weekly to ensure proper lubrication and to avoid metal-to-metal "welding." Upon installation of the equipment, the CONTRACTOR shall start the equipment, at least half load, once weekly for an adequate period of time to ensure that the equipment does not deteriorate from lack of use.
6. Lubricants shall be changed upon completion of installation and as frequently as required thereafter during the period between installation and acceptance. New lubricants shall be put into the equipment at the time of acceptance.
7. Prior to acceptance of the equipment, the CONTRACTOR shall have the manufacturer inspect the equipment and certify in writing that its condition has not been detrimentally affected by the shipment or long storage period. Such certifications by the manufacturer shall be deemed to mean that the equipment is judged by the manufacturer to be in a condition equal to that of equipment that has been shipped, installed, tested and accepted in a minimum time period. As such, the manufacturer will guarantee the equipment equally in both instances. If such a written certification is not given, the equipment shall be judged to be defective. It shall be removed and replaced at the CONTRACTOR'S expense.
- B. The OWNER reserves the right to withhold all payment for any foreign materials entering the equipment materials improperly stored, maintained, damaged during shipment, and equipment that does not meet or exceed contract specifications.

1.07 PARTIAL UTILIZATION

- A. During the course of construction partial occupation and utilization of completed portions of the work may be required.
- B. When deemed necessary, the OWNER or the CONTRACTOR may request use of completed work.
- C. Partial utilization shall be practiced in accordance with the Supplementary General Conditions (Section 00810).

1.08 EQUIPMENT WARRANTY

A. The CONTRACTOR shall provide the OWNER a minimum 1 year warranty on all equipment, in accordance with the General Conditions, Section 00700, Article 29. The warranty period for each item of equipment shall be a minimum of 1 year, or as specified otherwise, from the date of the OWNER'S acceptance of the equipment item.

1.09 ADJUSTMENTS AND CORRECTIONS OF EQUIPMENT AND APPURTENANCES DURING OPERATION

A. Some items of functional nature included in this Contract cannot be tested as to performance and quality at the time of completion of their installation. They must wait for necessary testing and proper performance until such functions are possible during later portions of this Contract. Such testing, specified performance and proper instructions to the OWNER'S operators (as to their maintenance and operation) is deemed a portion of this Contract, and payment shall be retained by the OWNER for equipment delivered to the site and for Work completed to cover such service. Such service replacements and performance shall take precedence over expiration of the 1 year guarantee period.

B. The CONTRACTOR shall expedite the completion of such service by all Suppliers and Subcontractors and shall render competent supervision of such service. The CONTRACTOR shall also expedite the replacement of defective and unaccepted parts and equipment. Unnecessary delay in delivery and installation of corrective parts and equipment may constitute additional retainage being withheld for damage to the OWNER for which the CONTRACTOR can be held liable.

END OF SECTION

SECTION 02110

SITE CLEARING AND GRUBBING

PART 1 GENERAL

1.01 WORK INCLUDED

A. Furnish all labor and equipment required and perform all clearing, grubbing and stripping of topsoil complete as shown on the Drawings and as specified herein.

1.02 RELATED WORK

A. Earth and rock work are included in Section 02200.

1.03 SUBMITTALS

None required for this Section.

PART 2 PRODUCTS

None in this Section.

PART 3 EXECUTION

3.01 GENERAL

A. The proposed building sites, paved areas, areas designated for ditches and channel changes, borrow pits, etc., (except any portions thereof that may be reserved) shall be cleared of all trees, timber, brush, stumps, rubbish and other debris. All this material, unless otherwise specified, shall be removed and disposed of away from the site.

B. Open burning of cleared and grubbed material from this Project will not be allowed.

C. Where clearing is to be done, stumps shall be grubbed where embankments are less than 5 feet in height, where the profile indicates excavation, in all areas designated for the construction of other facilities and in borrow areas. In all other areas the stumps may be cut off even with the ground. In areas to be grubbed, all stumps and roots must be removed.

D. No debris will be allowed to be left under or in the embankments.

E. In felling trees near tracks, structures and wire lines, necessary precaution must be exercised in order to prevent damage to wire lines, structures, the facilities of others or obstruct tracks.

F. Payment for all clearing and grubbing shall be included in the bid item requiring the action.

3.02 TREES

A. Trees (3" caliper and larger) shall not be disturbed by construction without written permission from the property OWNER, except in those areas to be cleared. Trees disturbed by construction shall be replaced by the CONTRACTOR with same size and type at no additional cost to the OWNER.

END OF SECTION

SECTION 02140

DEWATERING

PART 1 GENERAL

1.01 WORK INCLUDED

A. Furnish all labor and equipment required to dewater all excavations. Dewatering of all excavations shall be the responsibility of the CONTRACTOR, and no additional compensation will be allowed for same unless specifically included as a bid item.

B. Leaking pipes and structures are to be anticipated on this project. For this reason, no additional payment will be made for dewatering associated with leakage from any existing facility.

1.02 RELATED WORK

A. Earthwork is included in Section 02200.

B. Crushed stone and DGA are included in Section 02235.

1.03 SUBMITTALS

None.

PART 2 PRODUCTS

None in this Section.

PART 3 EXECUTION

1.01 GENERAL

A. Dewatering equipment shall be of adequate size and quantity to assure maintaining proper conditions for installing pipe, concrete, backfill or other material or structure in the excavation. Dewatering shall include proper removal of any and all liquid, regardless of source, from the excavation and the use of all practical means available to prevent surface runoff from entering any excavation.

END OF SECTION

SECTION 02200

EARTH AND ROCK WORK

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Extent of earthwork is indicated on the Drawings.
- 1. Preparation of subgrade for tanks, basins, building slabs, walks and pavements is included as part of this work.
- 2. Engineered fill course for support of building or basin slabs is included as part of this work.
- 3. Backfilling of tanks, basins, basements, and trenches within building lines is included as part of this work.
- B. Excavation for Mechanical/Electrical Work
 - 1. Excavation and backfill required in conjunction with underground mechanical and electrical utilities, and buried mechanical and electrical appurtenances is included as work of this Section.

1.02 RELATED WORK

- A. Dewatering is included in Section 02140.
 - B. Crushed Stone and DGA is included in Section 02235.
 - C. Pressure Pipe is included in Section 02610.
 - D. Sodding and Seeding is included in Section 02930.
- 1.03 QUALITY ASSURANCE
- A. Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

1.04 JOB CONDITIONS

A. Site Information

- 1. Data on indicated subsurface conditions are not intended as representations or warranties of accuracy or continuity between soil borings. It is expressly understood that OWNER will not be responsible for interpretation or conclusions drawn therefrom by CONTRACTOR. Data are made available for convenience of CONTRACTOR.

- 2. Additional test borings and other exploratory operations may be made by CONTRACTOR at no cost to OWNER.

B. Existing Utilities

- 1. Prior to commencement of work, the CONTRACTOR shall locate existing underground utilities in areas of the work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.

C. Use of Explosives

- 1. The CONTRACTOR (or any of his subcontractors) shall not bring explosives onto site or use in work without prior written permission from the OWNER. All activities involving explosives shall be in compliance with the rules and regulations of the Kentucky Department of Mines and Minerals, Division of Explosives and Blasting. CONTRACTOR is solely responsible for handling, storage, and use of explosive materials when their use is permitted.

D. Protection of Persons and Property

- 1. Barricade open excavations occurring as part of this work and post with warning lights.
- 2. Operate warning lights as recommended by authorities having jurisdiction.
- 3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

PART 2 PRODUCTS

2.01 SOIL MATERIALS

A. Definitions

- 1. Satisfactory soil materials are defined as those complying with ASTM D2487-85 soil classification groups GW, GP, GM, SM, SW, SP, GC, SC, ML, and CL.
- 2. Unsatisfactory soil materials are defined as those complying with ASTM D2487-85 soil classification groups MH, CH, OL, OH and PT.
- 3. Subbase material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed slag, natural or crushed sand.

PART 3 EXECUTION

3.01 STRIPPING AND TOPSOILING

- 4. Drainage fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, with 100 percent passing a 1-1/2 inch sieve and not more than 5 percent passing a No. 4 sieve.
- 5. Backfill and fill materials: Satisfactory soil materials free of debris, waste, frozen materials, vegetable, and other deleterious matter.

- A. Before excavation and grading is commenced for buildings, structures or other work described hereinafter (except pipelines and manholes) or before material is removed from borrow pits, the material meeting the topsoil specification in Section 02930 of these Specifications shall be removed from the areas affected and stockpiled.
- B. When final grading is accomplished, particularly around buildings and other structures, the topsoil shall be spread evenly over the excavated area. Rough grading above excavated areas shall have been carried approximately 6 inches below finished grade (except solid rock, where it shall be carried 12 inches below finished grade) and brought back up to grade with topsoil as set out herein.

3.02 EXCAVATION

- A. Excavation includes excavation to subgrade elevations indicated including excavation of earth, rock, bricks, wood, cinders, and other debris. All excavation of materials in the lump sum portion of the work will be unclassified and no additional payment will be made regardless of type material encountered.
- B. Differing Site Conditions
 - 1. Refer to Section 00700, paragraph 17.
- C. Excavation Classifications
 - 1. The following classifications of excavation will be made when unanticipated material is encountered in work:
 - a. Earth excavation includes excavation of pavements and other obstructions visible on ground surface; underground structures, utilities, and other items indicated to be demolished and removed; together with earth and other materials encountered that are not classified as rock or unauthorized excavation.
 - b. Rock excavation in trenches and pits includes removal and disposal of materials and obstructions encountered which cannot be excavated with a 1.0 cubic yard (heaped) capacity, 42 inch wide bucket on track-mounted power excavator equivalent to Caterpillar

Model 215, rated at not less than 90 Hp flywheel power and 30,000 pound drawbar pull. Trenches in excess of 10 feet in width and pits in excess of 30 feet in either length or width are classified as open excavation.

c. Rock excavation in open excavation includes removal and disposal of materials and obstructions encountered which cannot be dislodged and excavated with modern track-mounted, heavy-duty excavating equipment without drilling, blasting, or ripping. Rock excavation equipment is defined as Caterpillar Model 973 or No. 977K, or equivalent track-mounted loader, rated at not less than 170 Hp flywheel power and developing 40,000 pound break-out force (measured in accordance with SAE J732C).

(1) Typical of materials classified as rock are boulders 1/2 cubic yard or more in volume, solid rock, rock in ledges and hard cementitious aggregate deposits. Rock material encountered will be classified as rock excavation.

(2) Intermittent drilling, blasting, or ripping performed to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation.

D. Unauthorized excavation consists of removal of materials beyond subgrade elevations or dimensions without specific direction of ENGINEER. Unauthorized excavation, as well as remedial work directed by ENGINEER, shall be at CONTRACTOR'S expense.

1. Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position, when acceptable to the ENGINEER.

2. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations of same classification.

E. Additional Excavation

1. When excavation has reached required subgrade elevations, notify the ENGINEER who will make an inspection of conditions.

a. If unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material as directed in writing by the ENGINEER.

b. Removal of unsuitable material and its replacement as directed will be paid on basis of Contract conditions relative to changes in work.

- F. Stability of Excavations
 - 1. Slope sides of excavations to comply with codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.
 - 2. Maintain sides and slopes of excavations in safe condition until completion of backfilling.
- G. Shoring and Bracing
 - 1. Provide materials for shoring and bracing, such as sheet piling, uprights, stringers, and cross-braces, in good serviceable condition.
 - 2. Establish requirements for trench shoring and bracing to comply with codes and authorities having jurisdiction.
 - 3. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.
 - 4. Provide permanent steel sheet piling or pressure creosoted timber sheet piling wherever subsequent removal of sheet piling might permit lateral movement of soil under adjacent structures. Cut off tops as required and leave permanently in place. In the event the OWNER directs the CONTRACTOR to leave shoring materials in place, the OWNER will reimburse the CONTRACTOR for the reasonable cost of leaving such materials in place.
- H. Dewatering
 - 1. Refer to Section 02140 for dewatering requirements.
- I. Material Storage
 - 1. Stockpile satisfactory excavated materials where directed, until required for backfill or fill. Place, grade, and shape stockpiles for proper drainage.
 - 2. Dispose of excess soil material and waste materials as herein specified.
- J. Excavation for Structures
 - 1. Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 feet and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.

- 2. In excavating for footings and foundations, take care not to disturb bottom of excavation. All loose material shall be removed from the excavation just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive other work.

K. Excavation for Pavements

- 1. Cut surface under pavements to comply with cross-sections, elevations, and grades as shown.

L. Trench Excavation

- 1. Refer to Section 02610 for trench excavation requirements.

M. Cold Weather Protection

- 1. Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees Fahrenheit (1 degree Celsius).

3.03 COMPACTION

A. General

- 1. Control soil compaction during construction providing minimum percentage of density specified for each area classification indicated below:
 - a. Percentage of maximum density requirements: Compact soil to not less than the following percentages of maximum density for soils which exhibit a well-defined moisture density relationship (cohesive soils) determined in accordance with ASTM D698; and not less than the following percentages of relative density, determined in accordance with ASTM D4253 and D4254, for soils which will not exhibit a well-defined moisture density relationship (cohesionless soils).
 - b. Structures, building slabs and steps, pavements: Compact top 12 inches of subgrade and each layer of backfill or fill material at 95 percent standard proctor density.
 - c. Lawn or unpaved areas: Compact top 6 inches of subgrade and each layer of backfill or fill material at 90 percent standard proctor density.
 - d. Walkways: Compact top 6 inches of subgrade and each layer of backfill or fill material at 95 percent standard proctor density.

B. Moisture Control

1. Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface or subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations.
2. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
3. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value.

3.04 BACKFILL AND FILL

A. General

1. Place acceptable soil material in layers to required subgrade elevations, for each area classification listed below. Backfill material shall be no larger than the specified depth of the layer to be placed and/or compacted.
 - a. In excavations, use satisfactory excavated or borrow material.
 - b. Under grassed areas, use satisfactory excavated or borrow material.
 - c. Under walks and pavements, use subbase material, or satisfactory excavated or borrow material, or combination of both.
 - d. Under steps, use subbase material.
 - e. Under building slabs, use subbase material for a minimum depth of 6 inches.
- B. Backfill excavations as promptly as work permits, but not until completion of the following:
 1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
 2. Inspection, testing, approval, and recording locations of underground utilities.
 3. Removal of concrete formwork.

4. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities, or leave in place if required.
5. Removal of trash and debris.
6. Permanent or temporary horizontal bracing is in place on horizontally supported walls.

C. Ground Surface Preparation

1. Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.
2. When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture condition to optimum moisture content, and compact to required depth and percentage of maximum density.

D. Placement and Compaction

1. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers. Crushed stone shall be installed in accordance with Section 02235.

2. Before compaction, add moisture or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

3. Place backfill and fill materials evenly adjacent to structures, piping, or conduit to required elevations. Take care to prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping, or conduit to approximately same elevation in each lift.

E. Backfilling Trenches

1. Refer to Section 02610 for trench backfill requirements.

3.05 GRADING

A. General

- 1. Uniformly grade areas within limits of grading under this Section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades.

B. Grading Outside Building Lines

- 1. All materials used for backfill around structures shall be of a quality acceptable to the ENGINEER and shall be free from large or frozen lumps, wood and other extraneous material. All spaces excavated and not occupied by footings, foundations, walls or other permanent work shall be refilled with earth up to the surface of the surrounding ground, unless otherwise specified, with sufficient allowance for settlement.
- 2. In making the fills and terraces around the structures, the fill shall be placed in layers not exceeding 12 inches in depth and shall be kept smooth as the work progresses. Each layer of the fill shall be rolled with an approved type roller and/or be compacted. When it is not practicable to compact sections of the fill immediately adjacent to buildings or structures by rolling, then such sections shall be thoroughly compacted by means of mechanical tamping or hand tamping as may be required by the conditions encountered.

- 3. All fills shall be placed so as to load structures symmetrically.
- 4. As set out hereinbefore, rough grading shall be held below finished grade and then the topsoil which has been stockpiled shall be evenly spread over the surface. The grading shall be brought to the levels shown on the Drawings or to the elevations established by the ENGINEER. Final dressing shall be accomplished by hand work or machine work, or a combination of these methods as may be necessary to produce a uniform and smooth finish to all parts of the regrade. The surface shall be free from clods greater than 2 inches in diameter. Excavated rock may be placed in the fills, but it shall be thoroughly covered. Rock placed in fills shall not be closer than 12 inches from finished grade.

- 5. Grade areas adjacent to building lines to drain away from structures and to prevent ponding.

- a. Finish surfaces to be free from irregular surface changes, and as follows:

- (1) Lawn or unpaved areas: Finish areas to receive topsoil to within not more than 0.10 feet above or below required subgrade elevations.

- (2) Walks: Shape surface of areas under walks to line, grade, and cross-section, with finish surface not more than 0.0 inch above or 1.0 inch below required subgrade elevation.
- (3) Pavements: Shape surface of areas under pavement to line, grade, and cross-section, with finish surface not more than 0.0 inch above or 1 inch below required subgrade elevation.

C. Grading Surface of Fill Under Building Slabs

- 1. Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 0.0 inch above or 1 inch below required subgrade elevation when tested with a 10 foot straightedge.

D. Compaction

- 1. After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or standard proctor density for each area classification.

3.06 PAVEMENT SUBBASE COURSE

A. General

- 1. Subbase course consists of placing subbase material, in layers of specified thickness, over subgrade surface to support a pavement base course.

B. Grade Control

- 1. During construction, maintain lines and grades including crown and cross-slope of subbase course.

C. Shoulders

- 1. Place shoulders along edges of subbase course to prevent lateral movement. Construct shoulders of acceptable soil materials, placed in such quantity to compact to thickness of each subbase course layer. Compact and roll at least a 12 inch width of shoulder simultaneously with compacting and rolling of each layer of subbase course.

D. Placing

- 1. Place subbase course material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting subbase material during placement operations.

2. When a compacted subbase course is shown to be 6 inches thick or less, place material in a single layer. When shown to be more than 6 inches thick, place material in equal layers, except no single layer more than 6 inches or less than 3 inches in thickness when compacted.

3.07 FIELD QUALITY CONTROL

A. Quality Control Testing During Construction

1. Allow testing service to inspect and report to the ENGINEER on findings and approve subgrades and fill layers before further construction work is performed.
2. Perform field density tests in accordance with ASTM D1 556 (sand cone method), ASTM D21 67-84 (rubber balloon method), or ASTM D2992-87 (nuclear density method), as applicable.
3. Footing subgrade: For each strata of soil on which footings will be placed, conduct at least one test to verify required design bearing capacities. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested strata, when acceptable to ENGINEER.
4. Paved areas and building slab subgrade: Make at least one field density test of subgrade for every 2,000 square feet of paved area or building slab, but in no case less than 3 tests. In each compacted fill layer, make one field density test for every 2,000 square feet of overlaying building slab or paved area, but in no case less than three tests.
5. Foundation wall backfill: Take at least 2 field density tests, at locations and elevations as directed.

- B. If in opinion of the ENGINEER, based on testing service reports and inspection, subgrade or fills which have been placed are below specified density, provide additional compaction and testing at no additional cost to the OWNER.

3.08 MAINTENANCE

A. Protection of Graded Areas

1. Protect newly graded areas from traffic and erosion. Keep free of trash and debris. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

B. Reconditioning Compacted Areas

1. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.

C. Settling

- 1. Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.09 DISPOSAL OF EXCESS NON-ORGANIC SOIL AND ROCK

A. General

- 1. The OWNER'S property as designated on the Drawings and/or specified herein shall be used for disposal of all acceptable excess excavated material, including acceptable demolition materials. The CONTRACTOR shall place and compact all acceptable excess excavated and/or demolition material at this location, with the cost of hauling, placing, compacting and covering, included in the CONTRACTOR'S bid.

B. Material Classification and Description

- 1. Acceptable fill material shall consist of all excess non-organic soil and rock available at the site. The non-organic soil and rock may be composed of earth, shale, limestone, weathered rock, waste crushed aggregate or other approved materials. Excess non-organic soil and rock shall contain no particle whose largest dimension exceeds 12 inches.

C. Foundation Preparation

- 1. The CONTRACTOR shall proof roll the fill area a minimum of 2 passes. Any soft spots found shall be removed prior to fill placement.

D. Placement

- 1. The distribution and gradation of material throughout the fill shall be such that the fill will be free from lenses, pockets, streaks or layers of material differing substantially in texture or gradation from the surrounding material. The combined excavation and placing operations shall be such that the materials when compacted in fill will be blended sufficiently to secure the best practicable degree of compaction and stability. Successive loads of material shall be placed on the fill so as to produce the best practicable distribution of the material.

- 2. The material shall not be dumped into final position but shall be distributed by blading or dozing in a manner that will ensure proper placement in the embankment so that voids, pockets and bridging will not occur.

- 3. No fills shall be placed upon a frozen surface, nor shall snow, ice or frozen materials be incorporated in the fill.

E. Spreading and Compacting

1. The material shall be spread in uncompacted lifts 12 to 16 inches in thickness, depending on the amount of earth, over the entire length and width of the specified area. The material shall then be compacted by a minimum of 6 passes of a smooth drum vibratory roller. The roller shall have a total static weight of not less than 20,000 pounds. The diameter of the drum shall be between 5.0 and 5.5 feet and the width between 6.0 and 6.5 feet. The frequency of vibration during operation shall be between 1,200 and 1,500 vibrations per minute and the dynamic force at 1,400 vibrations per minute shall not be less than 16,000 pounds. Rollers shall be operated at speeds not to exceed 1.5 miles per hour.

F. Earth Cover

1. The surface of the waste area shall be covered with a minimum of 12 inches of material suitable for growing grass, trees, shrubs, etc., and shall be relatively free of rocks and other debris, satisfactory to the OWNER. The material shall be placed and spread in accordance with this Specification.

END OF SECTION

SECTION 02235

CRUSHED STONE AND DENSE GRADED AGGREGATE (DGA)

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish and install crushed stone aggregates and DGA as indicated on the Drawings and/or required in the Specifications for such uses as surfaces and/or bases of roads, parking areas and walkways; temporary and permanent traffic bound surfacing over trenches; permanent traffic bound roadway surface maintenance; replacement of unsuitable material; and other miscellaneous applications required in the work.

- B. Various sizes, types and quality of crushed stone aggregates are specified in this Section depending on applicability which may be specified in detail in other sections of these Specifications.

- C. The ENGINEER may require the use of crushed stone aggregates for purposes other than those specified in this or other Specification sections if such use is advisable in his opinion. Payment for crushed stone aggregate shall be by negotiation unless agreed pricing has been previously established.

1.02 RELATED WORK

- A. Dewatering is included in Section 02140.
- B. Earthwork is included in Section 02200.

1.03 SUBMITTALS

- A. Testing Service shall submit required test reports directly to the ENGINEER with copy to CONTRACTOR.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Crushed stone aggregate shall meet the applicable requirements for the intended use in accordance with Section 805 of the Kentucky Transportation Cabinet, Department of Highways, Standard Specifications for Road and Bridge Construction.
- B. Unless otherwise referred to on the Drawings or in these Specifications, crushed stone aggregate shall be graded size No. 57 according to the table below.
- C. When referred to on the Drawings or in these Specifications, dense graded aggregate (DGA) shall have a sand equivalent value of not less than 25 and shall be graded according to the table below.

D. Coarse aggregate gradations referred to by number size on the Drawings or in these Specifications shall conform to the following table (as copied from the above Kentucky Transportation Cabinet Specifications, Table 805.07, 1994 Edition):

TABLE 1 - SIZES OF COARSE AGGREGATES - KENTUCKY

Size	Max Size	AMOUNTS FINER THAN EACH LABORATORY SIEVE (SQUARE OPENINGS) PERCENTAGE BY WEIGHT																		
		100	90	75	63	50	37.5	25	19	12.5	9.5	4.75	2.36	2	1.18	600	425	150	75	
Openings (1)	(4)	(3)	(2)	(1)	(1-1/2)	(1)	(3/4)	(1/2)	(3/8)	(No 4)	(No 8)	(No 10)	(No 16)	(No 30)	(No 40)	(No 100)	(No 200)			
1	90 (3 1/2)	100	90-100	25-60	0-15	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
2	63 (2 1/2)	100	90-100	35-70	0-15	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
23	63 (2 1/2)	100	100	40-90	0-15	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
3	50 (2)	100	90-100	35-70	0-15	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
357	50 (2)	100	95-100	35-70	0-15	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
4	37.5 (1-1/2)	100	90-100	20-55	0-15	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
467	37.5 (1-1/2)	100	95-100	35-70	0-15	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
5	25 (1)	100	90-100	20-55	0-10	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
57	25 (1)	100	95-100	25-60	0-10	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
610	25 (1)	100	85-100	40-75	0-10	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
67	19 (3/4)	100	90-100	20-55	0-10	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
68	19 (3/4)	100	90-100	30-65	0-10	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
710	19 (3/4)	100	80-100	30-75	0-30	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
78	12.5 (1/2)	100	90-100	40-75	5-25	0-10	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
8	9.5 (3/8)	100	100	85-100	10-30	0-10	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
9-M	9.5 (3/8)	100	100	75-100	0-25	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
10	4.75 (No 4)	100	100	85-100	10-40	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
11	4.75 (No 4)	100	100	40-90	10-40	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
DGA(2)	19 (3/4)	100	70-100	50-80	30-65	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
GRAVEL	37.5 (1-1/2)	100	100	25-65	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
BASE(2)	50 (2)	100	100	15-55	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5
CSB(2)	50 (2)	100	100	30-70	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5	0-5

E. Testing

1. Unless otherwise required in this Section, the ENGINEER shall determine the tests required for crushed stone aggregates according to Section 805. The CONTRACTOR shall be responsible, initially and periodically at no cost to the OWNER, to deliver materials proposed for use or being used in the work to a testing laboratory selected by the OWNER. This provision shall apply to any other aggregate tests required in this Section.
2. The OWNER shall be responsible to pay the laboratory testing costs. However, once a material has been tested and accepted for use, the CONTRACTOR shall be responsible throughout the job to use materials which are equal in all respects and from the same source as that accepted material delivered to the testing laboratory.

- 3. The CONTRACTOR shall pay for additional tests ordered by the ENGINEER after acceptance of tested materials when such tests show the quality of materials has become deficient or when the CONTRACTOR requests a change of material supplier and/or source.
- 4. The ENGINEER shall request tests on Form HKB DE-16 "Requisition for Material and Design Mix Tests."

PART 3 EXECUTION

3.01 INSTALLATION

A. Compacted Crushed Stone Aggregate

- 1. Crushed stone shall be placed in uniform layers not greater than 6 inches deep and shaped by power equipment to required lines, grades, cross connections, and depths. No minimum compacted density, method of compaction, or compaction effort with vibration can establish the desired amount of compaction locking of the aggregate under controlled placement depth. Acceptable compaction can be achieved with pneumatic-tired and tracked equipment and rollers.
- 2. All compaction operations shall be performed to the satisfaction of the ENGINEER.
- 3. Crushed stone shall be placed in those areas as shown on the Drawings and as may be directed by the ENGINEER.

B. Compacted Dense Graded Aggregate (DGA)

- 1. Dense graded aggregate shall be plant mixed with water, transported in such a manner as to deliver the mix to the project without loss or segregation, spread, and compacted to produce a density throughout not less than 84 percent of solid volume. Minimum dry density for compacted limestone DGA shall be 139 pounds per cubic foot when S.G. of limestone is 2.65. Construction requirements shall be in accordance with Section 303 of Kentucky Transportation Cabinet, Department of Highways, Standard Specifications for Road and Bridge Construction.
- 2. Density tests shall be required in such number as determined by the ENGINEER. Density tests shall be made by the sand cone method or by nuclear gauges. The CONTRACTOR shall furnish all necessary labor, equipment and materials for making the density tests under observations of the ENGINEER.
- 3. In the event compacted material does not meet the required density of an area, the CONTRACTOR shall either continue compaction efforts or rework the entire area until the required density is obtained. If material

- has to be removed and reworked, the ENGINEER shall determine if removed material can be remixed and used again for fill.
4. All compacted DGA fill shall be included in the bid item requiring the action.

END OF SECTION

SECTION 02326

STEEL COVER PIPE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Steel cover pipe shall be furnished and installed as shown on the Drawings and specified herein.

1.02 RELATED WORK

A. Pressure pipe is specified in Section 02610.

PART 2 PRODUCTS

2.01 STEEL COVER PIPE

A. Steel cover or jack pipe shall be plain end steel pipe with minimum yield strength of 35,000 psi and tensile strength of 60,000 psi per API-5L Grade B material. The steel pipe supplied shall be manufactured by the seamless, electric-weld, submerged-arc weld or gas metal-arc weld process as specified in API-5L. Certification of 35,000 psi minimum yield strength shall be furnished by the supplier through the CONTRACTOR to the ENGINEER in sufficient copies before pipe is shipped to job to permit the ENGINEER to retain three copies.

B. Used pipe shall be acceptable if it meets the minimum requirements for size, thickness and strength for new pipe. Supplier shall furnish through the CONTRACTOR to the ENGINEER 3 copies of certification of test results of strength tests conducted on the used pipe prior to shipment to job site. Used pipe with excessive corrosion and pitting present shall not be supplied.

C. The inside diameter of steel cover pipe shall be at least 2 inches greater than the largest outside diameter of the carrier pipe, joints or couplings, except for carrier pipe 6 inches or greater in diameter under railroads, the difference shall be 4 inches instead of 2 inches.

D. Cover pipe shall have a **minimum** wall thickness as shown in the following table:

Nominal Diameter	Nominal Thickness
Under 10	0.188
10 & 12	0.250
14 & 16	0.281

PART 3 EXECUTION

3.01 TUNNELING, BORING OR JACKING

- A. Boring or jacking as specified herein will be allowed at locations other than those noted on the Drawings, where advantageous to lay pipe under streets, driveways, and sidewalks, without their monolithic structure being destroyed.
- B. Should the CONTRACTOR elect and receive permission to tunnel or bore, other than at locations designated on the Drawings or required by the ENGINEER to be tunneled or bored, the entire compensation therefore shall be the same as the unit prices bid for installation in open trench, including paving replacement, but not including bore or tunnel unit prices.
- C. At locations where boring or jacking is called for on the Drawings, payment will be made for furnishing and laying water lines inside the cover pipe. No payment will be made for separate trench and backfill unit price items where boring or jacking and/or cover pipe unit prices are paid.

- D. Boring or jacking under highways, railroads, sidewalks, pipelines, etc., shall be done at the locations shown on the Drawings. It shall be performed by mechanical means and accurate vertical and horizontal alignment must be maintained. When shown on the Drawings, cover pipe shall be used and shall be installed inside bored holes concurrently with boring, or jacking.

3.02 STEEL COVER PIPE INSTALLATION

- A. Steel cover pipe shall be of the size and wall thickness as shown on the Drawings.
- B. When cover pipe is jacked, concurrent with boring, all joints shall be solidly welded. The weld shall be such that the joint shall be of such strength to withstand the forces exerted from the boring and jacking operation as well as the vertical loading imposed on the pipe after installation. The weld shall also be such that it provides a smooth, nonobstructing joint in the interior of the pipe which will allow easy installation of the carrier pipe without hanging or abrasion to the carrier pipe upon installation.

3.03 CARRIER PIPE IN COVER PIPE INSTALLATION

A. Pipeline Spacers

1. Pipes installed inside cover pipes shall be centered throughout the length of cover pipe. Centering shall be accomplished by the installation of bolt on style spacers with a 2 piece solid shell made from T-304 stainless steel of a minimum 1/4 gauge thickness. The shell shall be lined with a ribbed PVC sheet of a 0.090 inch thickness that overlaps the edges. Runners, made from UHMW polymer, shall be attached to the pipe in such a manner as to prevent the dislodgement of the spacers as the carrier pipe is pulled or pushed through the cover pipe. Risers shall be made from T-

304 stainless steel of a minimum 1/4 gauge thickness and shall be attached to the shell by MIG welding. All welds shall be fully passivated. All fasteners shall be made from T-304 stainless steel.

2. Spacers shall be of such dimensions to provide 1) full supportive load capacity of the pipe and contents; 2) of such thickness to allow installation and/or removal of the pipe; and 3) to allow no greater than 1/2 inch movement of the carrier pipe within the cover pipe after the carrier pipe is installed.

3. Spacers shall be located immediately behind each bell and at a maximum spacing distance as shown below unless a lesser maximum spacing distance is recommended by the pipe manufacturer:

<u>Pipeline Diameter (in.)</u>	<u>Maximum Spacing (ft.)</u>
--------------------------------	------------------------------

2 - 2-1/2	4
3 - 8	7

The materials and spacing to be used shall be accepted by the ENGINEER prior to installation. The pipeline spacers shall be manufactured by Cascade Waterworks Manufacturing Co., of Yorkville, Illinois, Pipeline Seal and Insulator, Inc., of Houston, Texas, or equal. Installation shall be in accordance with manufacturer's recommendations.

- B. Upon completion of installation of the carrier pipe, the annular space at the ends of the cover pipe shall be sealed to prevent the entrance of groundwater, silt, etc., into the cover pipe. The seal shall be a manufactured product specially made for this purpose. The seal shall be Link Seal - Model 5 with stainless steel bolts and nuts as manufactured by the Thunderline Corporation, Wayne, Michigan, or equal.

END OF SECTION

SECTION 02400

STREETS, ROADS AND PARKING AREAS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Provide all labor, materials, equipment, and services required to construct all replacements as shown on the Contract Drawings and as specified herein.

1.02 RELATED WORK

A. Crushed stone, DGA, paving and concrete are specified in other sections of Divisions 2 and 3.

1.03 SUBMITTALS

A. Shop drawings, manufacturer's data and other items needed to establish compliance with the Drawings and these Specifications shall be submitted to the ENGINEER in accordance with Section 01300 - Submittals.

1.04 WARRANTY

A. Refer to Section 00700 for general warranty requirements.

PART 2 PRODUCTS

2.01 CONSTRUCTION MATERIALS

- A. Concrete materials and methods of installation are specified in Section 03300.
- B. Crushed stone and dense graded aggregate materials are specified in Section 02235.
- C. Bituminous paving materials and methods of placement are specified in Section 02500.
- D. Concrete paving materials and methods of placement are specified in Section 02510.
- E. Sodding and seeding materials and methods of construction are specified in Section 02930.

PART 3 EXECUTION

3.01 DELIVERY, STORAGE AND HANDLING

- A. Clearing and Grubbing
 - 1. Clearing and grubbing requirements shall be as stated in Section 202 of KTCSSRBC except that the method of payment as stated therein shall not apply.
- B. Removal of Structures and Obstructions
- C. Roadway and Drainage Excavation
 - 1. Removal of structures and obstructions requirements shall be as stated in Section 203 - KTCSSRBC.
- D. Ditching and Shouldering
 - 1. The requirements for ditching and shouldering shall be as stated in KTCSSRBC Section 210.
- E. Erosion Control
 - 1. Requirements for erosion control shall be as delineated in Section 02930 - Sodding and Seeding of these Specifications. When work is located within Department of Highways rights-of-way, the requirements for erosion control shall be as delineated in KTCSSRBC - Section 212.
- F. Water Pollution Control
 - 1. The requirements for water pollution control shall be per KTCSSRBC Section 213.
- G. Aggregate Surfaces and Base Courses for Paved Surface
 - 1. The requirements for crushed stone aggregate and base courses for paved surfaces is specified in Section 02235.
- H. Paved Surfaces
 - 1. Bituminous Pavements
 - a. The requirements for bituminous paving are as shown in Section 02500 of these Specifications.

2. Concrete Pavements

- a. The requirements for concrete pavements are as shown in Section 02510 of these Specifications.

END OF SECTION



SECTION 02500

BITUMINOUS PAVING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The CONTRACTOR shall be required to supply all materials and equipment and perform all work for the placement of the base, binder, or surface course for restoring to the preconstruction condition the surface of the existing streets, roads, drives and parking areas to the depths as shown in the detailed Drawings and as specified herein.

1.02 REFERENCES

A. Unless noted, all Specifications designations denoted KTCSSRBC refer to the Kentucky Transportation Cabinet Department of Highways Standard Specifications for Road and Bridge Construction. Appropriate technical portions of the referenced sections of the Specifications shall apply, but all work shall be as described herein unless otherwise specified or shown on the Drawings.

1.03 RELATED WORK

A. Special sequence or schedule requirements (if any) are specified in Section 01010 - Summary of Work.
 B. Special requirements for materials and equipment are given in Sections 01300 and 01600.
 C. Crushed stone surfacing requirements, temporary and permanent replacement, are specified in Section 02235 of these Specifications.
 D. Streets, roads and parking area material and construction are specified in Section 02400.

1.04 WORK DESCRIPTION

A. Bituminous concrete shall be used for surfacing new roads and parking areas, for replacement of city streets, drives, parking areas and state highways of bituminous construction and for resurfacing existing roads and state highways at locations shown on the Drawings or specified.

1.05 QUALIFICATIONS

A. The pavement design mixture shall be used as determined by local plant mix availability. The design mixture shall have been approved recently by the Kentucky Transportation Cabinet Department of Highways and used recently on a state paving project.

B. The design mix shall be submitted to the ENGINEER for review and acceptance. The submittal shall include the following:

1. The last date the mixture was approved by the Kentucky Transportation Cabinet Department of Highways for use on a state road project.
2. The location where the mixture was recently used, and the name and address of the paving contractor.

1.06 SUBMITTALS

A. Prebid submittals, when required, are specified in Section 00820 - Special Conditions of these specifications.

B. Shop Drawings, manufacturers data and other items needed to establish compliance with the Drawings and Specifications shall be submitted to the ENGINEER in accordance with Section 01300 - Submittals.

1.07 WARRANTY

A. Refer to Section 00700 for warranty requirements.

PART 2 PRODUCTS

2.01 BITUMINOUS CONCRETE PAVING

A. Mixture

1. Bituminous concrete mixture shall conform to the applicable requirements of KTCSSRBC Section 401, Bituminous Plant Mixed Pavements-General, and Section 402, Bituminous Concrete Surface and Binder. The pavement mixture shall meet the requirements of Sections 401.02 through 401.05 and conform to the requirements below when tested in accordance with ASTM D 1559-76:

Stability, minimum pounds	750
Flow, 0.01 inch	Min. 8; Max. 16
Percent air voids	Min. 3; Max. 5
Minimum voids in mineral aggregate, percent:	14
3/4 in.	13
1 in.	Min. 75; Max. 85

B. Fine aggregates shall meet the requirements of KTCSSRBC Section 804.

C. Coarse aggregates shall meet the requirements of KTCSSRBC Section 805.

D. Bituminous materials shall meet the requirements of KTCSSRBC Section 806.

E. Bituminous materials for tack coat shall be one of the following: SS-1, SS-1h, CSS-1, CSS-1h, AE-60, RS-1, CRS-1, RC-70, or RC-250.

PART 3 EXECUTION

3.01 GENERAL

A. Construction requirements shall conform to applicable requirements of Section 401, 402 and 407 of KTCSSRBC.

B. A tack coat shall be required to bond new paving to the surface of concrete or brick pavements and bases or existing bituminous surfaces. It shall be applied at the rate of 0.8 pound (0.1 gallon) per square yard at the following range of application temperatures:

SS-1, SS-1h, CSS-1, CSS-1h, AE-60	21-70°C (70-160°F)
RS-1, CRS-1	21-60°C (70-140°F)

C. When SS1, SS1h, CSS1, CSS1h, or AE60 is furnished for tack material, it shall be diluted with an equal quantity of water conforming to Section 803, shall be thoroughly mixed prior to application, and shall be applied a sufficient time in advance of the paver to ensure that all water has evaporated before the bituminous concrete mixture is placed. The application rate shall be 0.8 pound (0.1 gallon) per square yard of the diluted SS1, SS1h, CSS1, CSS1h, or AE60.

D. Where bituminous paving is placed against vertical surfaces such as curbs, gutters, manhole frames, valve boxes, etc., the vertical face shall be tack coated in order to seal the surface. Where these surfaces are inaccessible to pressure distributor, the tack coat may be brushed or broomed into place. The tack coat shall not be allowed to spill over onto any horizontal surface outside the area to be paved.

E. Unless otherwise indicated on the Drawings or in these Specifications, the compacted thickness of the bituminous concrete paving shall be a minimum of 2 inches and the minimum ambient temperature for placing shall be 40° Fahrenheit. Mixing and laying temperatures shall be as follows:

Aggregates	Min. 116°C (240°F) - Max. 163°C (325°F)
Asphalt Cement	Min. 107°C (225°F) - Max. 163°C (325°F)
Mixture at Plant (measured in truck)	Min. 116°C (240°F) - Max. 163°C (325°F)
Mixture When Placed (measured in truck when discharging)	Min. 107°C (225°F)

F. Trucks for hauling bituminous mixtures shall have tight, clean, and smooth metal beds that have been sprayed with a minimum amount of soap emulsion, paraffin oil, or other approved material which is not detrimental to the mixture to prevent the mixture from adhering to the beds. All trucks shall be equipped with covers of sufficient size to completely cover the loaded material, and all covers shall be securely fastened in place before the truck leaves the plant.

Truck beds shall be insulated, when necessary, to maintain the specified temperature to the point of delivery. Any truck causing excessive segregation of material by its spring suspension or other contributing factors, shall be discharged from the work, until such conditions are corrected.

G. The CONTRACTOR shall have an accurate thermometer on the job at all times for verifying all temperature requirements and for taking temperature measurements whenever requested by the ENGINEER or OWNER. The CONTRACTOR shall closely control temperature and compaction requirements in order to achieve quality bituminous paving and related work.

H. Bituminous paving which fails as the result of not meeting the requirements of these Specifications shall be removed and replaced as directed by the ENGINEER at the CONTRACTOR'S expense.

3.02 FULL WIDTH PAVING OF EXISTING STREETS, U.S. HIGHWAYS, KENTUCKY STATE ROADS, COUNTY ROADS AND PARKING AREAS

A. Where the entire width of the bituminous street damaged by construction is to be resurfaced, the existing pavement shall be cleaned and tack coated, and bituminous paving shall be hot applied as previously described.

B. The preparation of the base shall include removal of unstable material from the trench, removal of excess crushed rock from the trench to same level as the existing bituminous pavement and addition of compacted crushed rock (DGA) to the trench where needed. No cutting of edges of existing paving will be required.

C. The ENGINEER will determine if and where bituminous leveling courses are required before application of surface courses. The leveling course shall be hot applied and rolled similarly to the surface course.

D. The surface course shall be 1-1/2 inches thick applied to the entire width of the street, unless otherwise directed by the ENGINEER. The surface course shall be feathered out to a thickness of 1/2 inch at the front of existing gutters. The point where feathering shall begin and the amount of feathering shall be controlled by the ENGINEER. Where there are no gutters, feathering of edges will not be done unless otherwise directed by the ENGINEER in order to conform to existing features, such as driveways.

E. Payment for the surface course shall be by the ton of bituminous concrete actually placed, limited by a maximum allowable weight of 100 lbs. per square yard of surface area per inch of depth. Payment for the leveling course, when ordered by the ENGINEER, shall be by the ton of bituminous concrete actually placed, limited by a maximum allowance of 25 percent of the weight of the surface course.

- F. No extra payment will be allowed for tack coat, removal of unstable material from the trench, compacted dense graded aggregate (DGA) used to replace unstable material, removal of excess crushed rock from the trench to the grade of existing bituminous pavement, and cleaning of the surface.

3.03 TRENCH WIDTH REPAVING - CITY, STATE AND COUNTY STREETS, ROADS AND PARKING AREAS

- A. The cut edges of the existing paving surface shall be trimmed a depth of at least 2 inches to straight lines for uniform appearance and clean surface at joints. The area between the cut edges of the paving shall be removed to a depth of 2 inches (minimum) or to the bottom of the existing paving. All unstable material in the trench shall be removed and replaced with compacted dense graded aggregate and dense graded aggregate added as needed to bring the base surface to the bottom of existing paving or 2 inches below the existing surface, whichever is the lower. Dense graded aggregate required for stabilizing the subgrade will be paid for as an extra, but no extra payment will be allowed for removal of unstable backfill.

- B. The paving subgrade shall be compacted under the wheel of a roller, until there is no observed settlement of the subgrade.
- C. The sides of existing pavement shall be covered with a tack coat and bituminous paving shall be hot applied as previously described. Final surface shall be finished to 1/4 inch above existing paving surface at edges and crowned to 1/2 inch above existing surface at the center.

- D. Payment for bituminous repaving shall be per linear foot of pipeline covered to any width the CONTRACTOR shall find necessary to remove plus width of cut back to secure clean straight edges, and shall include excavation to subgrade, preparation of subgrade, cleaning edges of existing paving, tack coat, and all operations and materials planned and specified for this type of repaving. The CONTRACTOR shall maintain such repaving up to grade of existing street surface until final completion and acceptance of work under his Contract. During the guarantee period of one year, the CONTRACTOR will be responsible for defective materials or workmanship, and natural settlement.
- E. In case additional bituminous paving is to be added due to settlement, surface to be built up shall have all dirt removed and such surface swept clean with a stiff wire brush or broom. A tack coat shall be applied to clean surface and additional paving placed in quantity required. Traffic shall be prevented from passing over the treated surface before the additional paving materials are placed. No payment will be allowed for this tack coat or additional paving.

3.04 TRENCH WIDTH REPAVING - STATE MAINTAINED STREETS AND HIGHWAYS

- A. Streets, roads and highways maintained by the Kentucky Transportation Cabinet Department of Highways shall be repaved in accordance with details shown on the attached Department of Highways Drawing No. TD 99-13, latest revision.

B. Concrete base slab shall be cleaned and tack coated, and bituminous paving shall be hot applied as previously described.

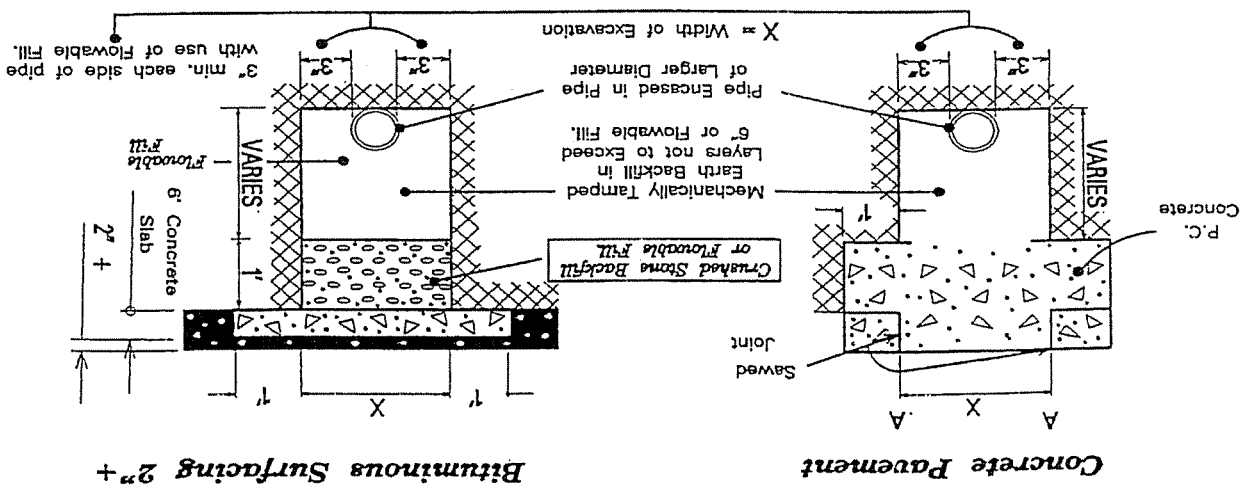
C. Payment for replacement of bituminous paving on state maintained streets and roads, where concrete base slab and bituminous surface are required, shall be per foot of pipeline covered, and shall include excavation, crushed rock backfill, base courses, concrete base slab, tack coat, and bituminous surfacing. Widths, depths, and other details and methods of application shall be as shown on attached drawing and as required by the Kentucky Transportation Cabinet Department of Highways.

D. The CONTRACTOR shall maintain the bituminous surface of all state highways and state maintained streets to grade during the entire guarantee period of the Contract.

END OF SECTION

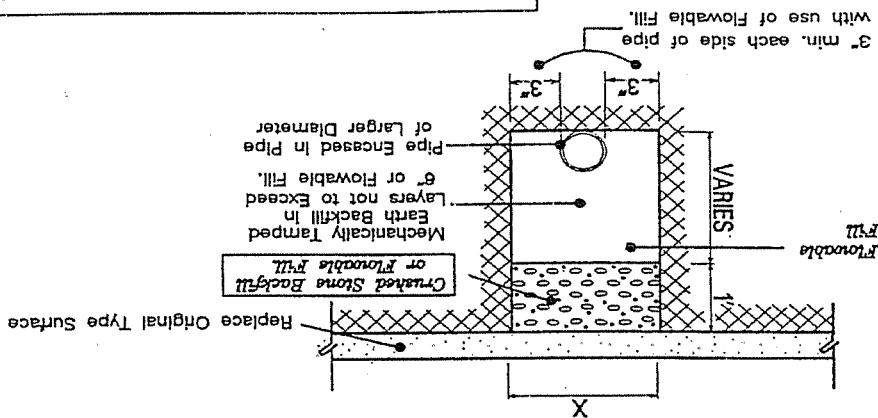
Attachment: Kentucky Department of Highways drawing No. TC 99-13.

SURFACE RESTORATION METHODS



Replace Concrete Pavement with new pavement same thickness of existing pavement.
 Repace Bituminous Pavement with same type and depth as existing pavement.

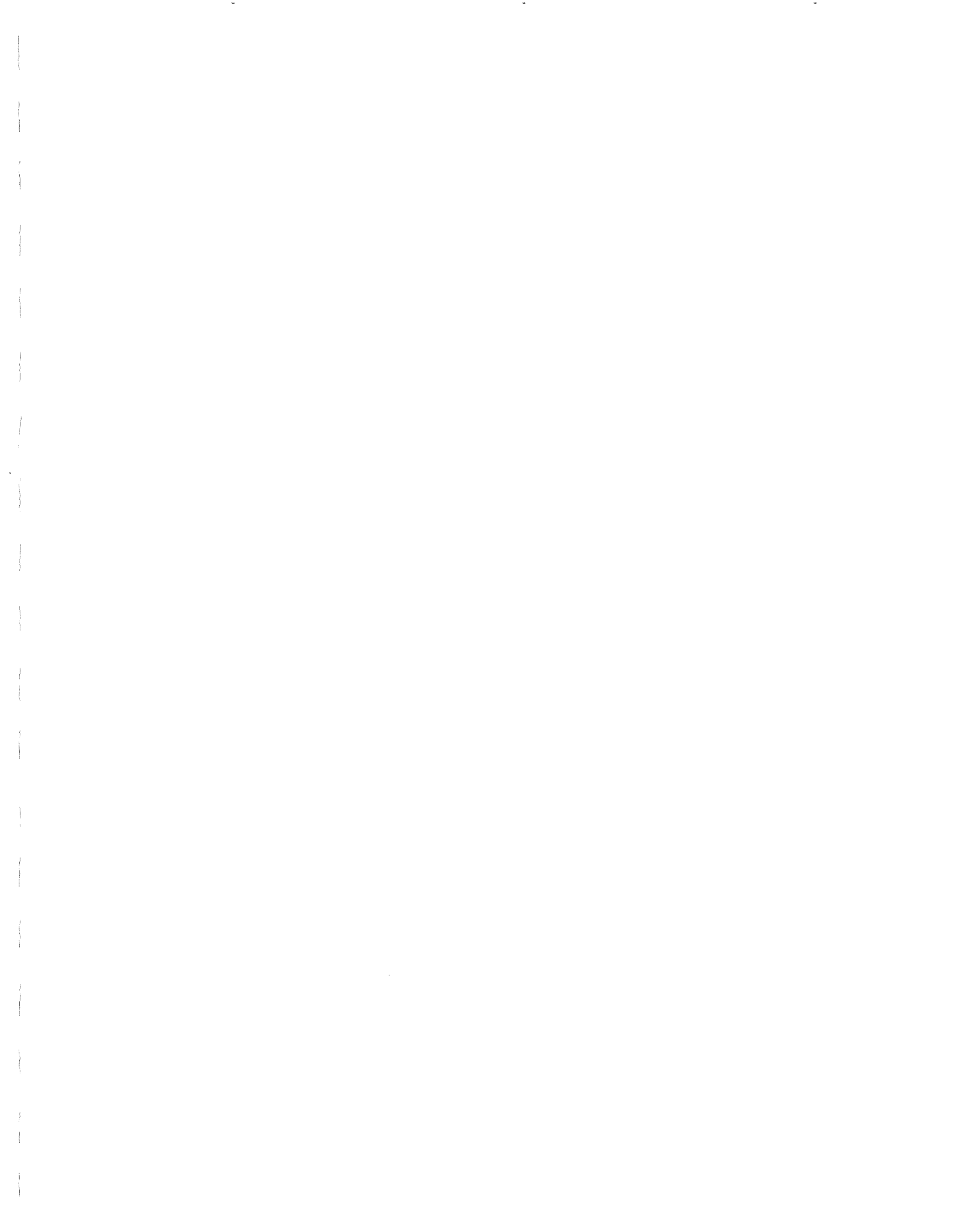
Bituminous Surface Less Than 2" & Traffic Bound Macadam



NOTE:

1. Distance from points "A" (Concrete Pavement) to nearest joint or break in pavement must be six (6) feet or more. If less than six (6) feet, remove pavement to joint or break and replace entire slab.
2. Concrete slab under Bituminous Surface to extend twelve (12) inches on each side of trench.
3. An approved joint sealer to be applied between new and existing pavement.

Methods of Surface Restoration Due to Open trench Pipe Installation



SECTION 02510

CONCRETE PAVING

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Provide all labor, materials, equipment and services required to construct concrete street pavement or concrete sidewalks as shown on the Contract Drawings and as specified herein.

1.02 RELATED WORK

- A. Special sequence or schedule requirements (if any) are specified in Section 01010 - Summary of Work.

- B. Special requirements for materials and equipment are given in Sections 01300 and 01600.

- C. Crushed stone bases, if required, are as specified in Section 02235.

- D. Castings are specified in Section 05540.

1.03 SUBMITTALS

- A. Prebid submittals, if required, are specified in Section 00820 - Special Conditions.

- B. Shop drawings and other items needed to establish compliance with the Drawings and these Specifications shall be submitted to the ENGINEER in accordance with Section 01300 - Submittals.

1.04 WARRANTY

- A. Refer to Section 00700 for warranty requirements.

PART 2 PRODUCTS

2.01 CONCRETE MATERIALS

- A. Concrete and related materials are specified in Section 03300.

PART 3 EXECUTION

3.01 CONCRETE ROADWAY PAVING

- A. Concrete surface paving shall meet the requirements of Section 501 of the Kentucky Transportation Cabinet, Department of Highways Standard Specifications for Road and Bridge Construction.

B. Concrete base paving shall meet the requirements of Section 502 of the Kentucky Transportation Cabinet, Department of Highways Standard Specifications for Road and Bridge Construction.

3.02 CONCRETE SIDEWALKS AND STEPS

A. New Construction

1. Concrete sidewalks and steps shall be dimensioned and reinforced as shown on the Drawings.
2. Sidewalks and steps shall be constructed on a prepared, compacted, smooth subgrade of uniform density formed by trenching or filling to the required elevation. Large boulders and ledge rock found in the subgrade shall be removed to a minimum depth of 6 inches below the subgrade elevation and the space shall be backfilled with suitable material which shall be thoroughly compacted by rolling or tamping. A 3-inch thick course of No. 68 or No. 78 coarse aggregate shall be placed on prepared subgrade prior to placing concrete walks. The CONTRACTOR shall furnish a template and shall check the finished subgrade prior to depositing concrete. The subgrade shall be moistened immediately prior to placement of concrete. Sidewalks may be placed by use of side forms or by use of an acceptable slip-form method.

3. All exposed edges and corners for sidewalks and steps shall be rounded to a 1/4 inch radius.

4. The surfaces of sidewalks shall be divided into rectangular areas by means of a jointer having a radius of 1/4 inch and forming a groove no less than 1 inch in depth for the full width of the walk, or the joints may be sawed if acceptable to the ENGINEER. The length of the rectangles formed shall not exceed the width of the sidewalk being constructed, unless otherwise directed.

5. The CONTRACTOR shall install 1/2 inch preformed expansion joints, specified in Section 03300, extending entirely through the sidewalk at intervals not to exceed 40 feet, unless the sidewalk is constructed integral with the curb, in which case the width of joints and spacing shall conform to that in the curb, or as otherwise directed. The edges of the sidewalk at all expansion joints shall be rounded with an acceptable edging tool to a 1/4 inch radius. One-half inch preformed expansion joint material shall be installed to the full depth of the sidewalk where the walk abuts any rigid structure or fixture such as curbs, columns, castings, buildings, light standard, etc.

B. Replacement Construction

1. Replacement construction shall be the same as required above for new construction except as hereinafter set forth.

2. Sidewalks shall be replaced to the same width, grade and thickness (3-1/2 inches minimum) as the original sidewalk, unless otherwise directed by the ENGINEER. In replacing concrete walks against edge of existing walks, the existing edges shall be sawed to straight edges and thoroughly cleaned. The new and existing walks shall be separated by 1/2 inch preformed expansion joint material cemented to the existing walk.

3. Concrete curb and gutter shall be protected by the CONTRACTOR and shall not be removed except in the event of solid rock excavation and/or conflict with existing utilities. Grass strips between sidewalks and curbs shall be reseeded in accordance with Section 02930 of these Specifications.

4. For unit price contracts, sidewalk replacement, including reinforcing and forms, will be paid for by the linear foot measured along the centerline of pipe so covered. The unit price bid shall include excavation to subgrade; preparation of subgrade; required base course, if any, as shown on the Drawings; expansion joints; marking and reseeding of grass strips when required; and replacing concrete to any width which the CONTRACTOR should find necessary to remove.

5. At the unit price bid for sidewalk replacement for unit price contracts, the CONTRACTOR will not be required to replace greater than 4 foot width, 4 inches thick. However, where a 4 foot or less width walk is cut longitudinally, the whole walk shall be replaced. If replacement over 4 foot width is required, the unit price per linear foot shall be increased, the increased width's proportion to 4 feet.

END OF SECTION

SECTION 02610

PRESSURE PIPE

PART 1 GENERAL

1.01 SUMMARY

A. For Cover Pipe and Boring and/or Jacking see Section 02326.

B. The CONTRACTOR is to provide full crushed stone, as specified, in all traffic areas, roadway and driveway crossings for both PVC and ductile iron pipe. The cost of the stone in these areas shall be considered incidental to the cost of the pipe and shall not be measured for payment.

1.02 SUBMITTALS

A. Prior to the shipment of any pressure pipe to the project site, the CONTRACTOR shall submit to the ENGINEER a bill of materials and shop drawings for all interior and exterior piping, in the number of copies listed in Special Conditions.
B. Supplemental Submittal Requirements

1. Shop drawings are not required.

2. All testing and certification requirements for descriptive literature remain as described.

PART 2 PRODUCTS

2.01 MATERIALS - PRESSURE PIPE

A. Ductile Iron Pipe - Mechanical and Rubber Slip Joint Type

1. Pipe

a. General

(1) Ductile iron pipe shall be furnished for all piping 3 inches and over in size designated "D.I." on Drawings and shall be designed in accordance with ANSI/AWWA C150/A21.50-96 and ANSI/AWWA C151/A21.51-96 specifications and supplements thereto, and for pressures and conditions as stated in Article b.(1) below.

b. Design Conditions

(1) Pressure: Minimum 200 to 350 psi operating pressure, as shown in Table 50.14 below, plus 100 psi water hammer allowance.

(2) Trench Loading: Laying Condition Type 3, depth of cover as shown on Drawings.

c. Metal Design Strength PSI (Minimum)

Tensile Strength	60,000
Yield Strength	42,000
Percent Elongation	10

d. Minimum Nominal Thickness

(1) Minimum design thicknesses for 200 through 350 psi operating pressures, depths of cover, trench loading and other conditions per ANSI/AWWA C150/A21.50-96 specifications shall be as shown in the following table:

TABLE OF THICKNESSES
FOR DUCTILE IRON PIPE
(TABLE 50.14)

Size	Pressure Class (psi)	Nominal Thickness (in.)	Laying Thickness Type 3 Trench Maximum Depth of Cover (ft.)
3"	350	0.25	99
4"	350	0.25	69
6"	350	0.25	37
8"	350	0.25	25

(2) For depths of cover or pressures exceeding those in the above table, refer to ANSI/AWWA C150/A21.50-96 and the thickness class shown on the Drawings.

e. Lengths

(1) Pipe may be furnished in 18 or 20 foot nominal laying lengths.

f. Marking

(1) The net weight, class or nominal thickness, and casting period shall be shown on each pipe. The manufacturer's mark, the year in which the pipe was produced, and the letters "DI" or "DUCTILE" shall be cast or stamped on the pipe.

- g. Weighing
 - (1) Each pipe shall be weighed before application of lining or coating other than standard coating and the weight shown on the outside or inside of the bell or spigot end.
- h. Spigot End of Pipe
 - (1) The spigot end of the pipe shall be free of blemishes and defects which, in the opinion of the ENGINEER, might be responsible for a poor fit with the rubber ring gasket and result in leakage.
- 2. Fittings
 - a. General
 - (1) Ductile iron and gray iron mechanical joint, locked mechanical joint and fittings shall conform to ANSI/AWWA C110/A21.10-93 Standard for Gray Iron and Ductile Iron Fittings - 3 inch through 8 inch. Mechanical joints and push on joints shall also conform in all respects to ANSI/AWWA C111/A21.11-95.
 - (2) Ductile iron compact fittings, meeting the requirements of ANSI/AWWA C153/A21.53-94, will also be accepted through 8 inch diameter.
 - (3) Fittings shall be gray iron or ductile iron meeting the above requirements and shall be furnished complete with all joint accessories.
 - b. Lining and Coating
 - (1) All fittings shall be lined and coated the same as adjacent pipe.
- 3. Joints
 - a. General
 - (1) Pipe joints shall be mechanical joint, rubber ring slip joint or locked mechanical joint as shown on the Drawings.
 - (2) All items used for jointing pipe shall be furnished with the pipe. The joints shall be made with tools and lubricant in strict conformity with the manufacturer's instructions. Copies of the instructions shall be delivered to the ENGINEER at start of construction in sufficient numbers that will permit the ENGINEER to retain 3 copies.

- b. Mechanical Joints
 - (1) Mechanical joints are to be furnished according to ANSI/AWWA C111/A21.11-95. All pipe joints must be furnished complete with all accessories. Mechanical joint bolts and nuts shall be of alloy cast iron or alloy steel (Corten type such as U.S. Alloy) or equal. Rubber gaskets shall be made of plain first grade rubber, free of imperfections and porosity. Hardness shall be 75 ± 5 durometer.
 - c. Rubber Ring Slip Joint (Push On)
 - (1) Rubber ring slip joint shall be equal to ANSI/AWWA C111/A21.11-95. The joints shall be of the following materials and assembled in the sequence outlined below:
 - (a) Rubber ring gasket compressed in groove in bell of pipe.
 - (b) Beveled spigot end of pipe for initial centering into rubber gasket in bell.
 - d. Locked Mechanical Joints
 - (1) Locked mechanical joints shall be equal to American Cast Iron Pipe Company's; U.S. Pipe Company's, or Clow Corporation's locked mechanical joint.
 - e. Restrained Joints
 - (1) Restrained joints, where called for on the Drawings, shall be American's Fastite joint with Fast-Grip gasket, U.S. Pipe's Tyton joint with Field-Lok gasket, or equal.
 - 4. Lining and Coating
 - a. Water Service
 - (1) All ductile iron pipe for water service shall have manufacturer's standard outside bituminous or asphaltic base coating and a cement lining and bituminous seal coat on the inside. Cement mortar lining and bituminous seal coat inside shall conform to ANSI/AWWA C104/A21.4-95.
 - b. Bitumastic Finish Coat
 - (1) Only a coal tar outside coating, or other compatible coating, shall be applied to pipe which is to receive a bitumastic finish coat.

- B. Copper Pipe and Fittings
 - 1. Outside, Underground Tubing with Compression Joints
 - a. Small piping in the ground shall be of standard soft copper tubing for water service pipe, ASTM Specifications B 88-81, Type "K," with bronze fittings, stops, and valves having compression connections for flared copper tubing.

C. Polyvinyl Chloride (PVC) Pipe (ASTM)

- 1. Pipe
 - a. This Specification covers rigid polyvinyl chloride pipe and fittings, hereinafter called PVC pipe and PVC fittings, for sizes 3/4 inch through 8 inch.
 - b. PVC pipe shall be extruded from Class 12454-B polyvinyl chloride material with a hydrostatic design stress of 2000 psi for water at 73.4 degrees Fahrenheit, designated as PVC 1120, meeting ASTM Specifications D 1784-81 for material. Three-fourths inch through 1-1/2 inch water service piping shall be PVC Schedule 40 as specified in ASTM D 1785-76. Two inch through 8 inch pipe for water service shall be SDR 17 for 250 psi allowable working pressure at 73.4 degrees Fahrenheit and a safety factor of 2.0, as specified in ASTM D 2241-80.

- c. The pipe shall be homogeneous throughout and free from cracks, holes, foreign inclusions or other defects. The pipe shall be as uniform as commercially practical in color.
- d. The workmanship, pipe dimensions and tolerances, outside diameters, wall thickness, eccentricity, sustained pressure, burst pressures, flattening, extrusion quality, marking and all other requirements of ASTM D 2241-80 shall be conformed with in all respects.

- e. Pipe shall be furnished in 20 foot lengths. The pipe may be double plain end or with bell on one end. Male ends of pipe must be beveled on the outside.

- f. Pipe shall have a ring painted around the male end or ends in such a manner as to allow field checking of setting depth of pipe in the socket. This requirement is made to assist construction superintendents and inspectors in visual inspection of pipe installation.

- g. Pipe must be delivered to job site by means which will adequately support it, and not subject it to undue stresses. In particular, the

load shall be so supported that the bottom rows of pipe are not damaged by crushing. Pipe shall be unloaded carefully and strung or stored as close to the final point of placement as is practical.
h. Pipe must not be exposed to the direct rays of the sun for an extended period of time. If pipe is not to be installed shortly after delivery to the job site, it must be stored in a shaded location.

2. Fittings

a. PVC

(1) Fittings shall be of the same material and type joint as the pipe. Fittings shall have a minimum rating of 250 psi for continuous operation at 73.4 degrees Fahrenheit. Fittings shall be either extruded or molded. All fittings shall be approved by the pipe manufacturer and complete data sent to the ENGINEER, including the review. All fittings must be made of NSF approved material. A sample of each type fitting must be submitted for the ENGINEER'S review along with the above listed material before delivery of fittings to the job.

b. Cast Iron

(1) Cast iron mechanical joint or push-in type fittings with appropriate adapters may be used with exterior PVC pipe. All such fittings shall be approved by the pipe manufacturer, and complete data sent to the ENGINEER, including the manufacturer's approval, for review. Use of transition gaskets will not be allowed unless specifically approved by the pipe manufacturer.

3. Joints

a. Exterior Buried Pipe - Slip Joint Type

(1) Exterior buried pipe shall be jointed with slip-type joints with rubber gaskets.
(2) Pipe with bells shall have all parts of the bell, including the gasket groove, made from the same extruded piece, integral with the pipe, and shall be thickened to meet standard dimension ratios of wall thickness to outside diameter. The gasket groove shall be constructed such that gasket rollout will not occur. Rubber gasketing shall conform to ASTM D 3139-77.

b. Couplings

- (1) Couplings shall be of the same material as the pipe and may be of the molded, or extruded type. They shall have a beveled entrance to prevent the wiping off of the lubricant from the male end of the pipe.
- (2) PVC couplings shall have a minimum rating of 250 psi for continuous operation at 73.4 degrees Fahrenheit.
- (3) The couplings shall have a positive pipe stop that will automatically and accurately position the pipe ends within the couplings. The pipe stop shall also permit the thermal expansion or contraction of the pipe ends.

4. Service Connections

- a. All service connections shall be made by means of tees, factory tapped couplings, or bronze service clamps manufactured specifically for use with PVC pipe, with Mueller threads, Mueller Catalog No. H-134, or equal. The use of Dresser Style 294 plastic saddles or equal, will be permitted. Whenever possible, corporation stops shall be placed in plastic lines before conducting hydrostatic tests.

D. Polyethylene Pipe for Water Service

1. Pipe

- a. Polyethylene flexible pipe for sizes 1/2 inch through 3 inch water service piping shall be PE 3408, Type III, Grade P34 Class C, DR-11, OD Based for 200 psi working pressure at 73.4 degrees Fahrenheit, meeting ASTM Specification D 1248-81a for material, D 3350-84 for cell classification and AWWA C901-88 Specification for pipe.
- b. Pipe shall meet all applicable provisions of the Commercial Standards and shall bear the National Sanitation Foundation (NSF) seal of approval.

2. Fittings

- a. Fittings shall be standard bronze fittings as specified for copper tubing in this Section of these Specifications.

2.02 SOURCE QUALITY CONTROL

A. Ductile Iron Pipe (Mechanical Joint and Rubber Slip Joint Type)

- 1. Hydrostatic and physical properties acceptance tests shall be in accordance with ANSI/AWWA Specification C151/A21.51-81 for ductile iron pipe centrifugally cast in metal molds or sand lined molds for water or other liquids.
- 2. The ENGINEER shall be provided with sufficient copies of each of the tests for each Contract to permit the ENGINEER to retain 3 copies.
- 3. All items used for jointing pipe shall be tested before shipment.

B. Polyvinyl Chloride (PVC) Pipe (ASTM)

- 1. Samples of pipe and physical and chemical data sheets shall be submitted to the ENGINEER for review and acceptance before pipe is delivered to job.
- 2. Samples of solvents and the recommended instruction for their use must be submitted for the ENGINEER'S review and acceptance before delivery of solvent to the job.

PART 3 EXECUTION

3.01 TRENCH EXCAVATION - PRESSURE PIPE

A. General

- 1. Trenching shall include all clearing and grubbing, including all weeds, briars, trees and stumps encountered in the trenching, regardless of size. The CONTRACTOR shall dispose of any such material by burning, burial or hauling away or as noted on the Drawings, at no extra cost to the OWNER. Ornamental shrubs, hedges and small trees (3 inches in diameter or less) shall be removed, protected and replanted, at no extra cost to the OWNER.
- 2. Trenching also includes such items as railroad, street, road, sidewalk, pipe and small creek crossings; cutting, moving or repairing damage to fences, poles or gates and other surface structures, regardless of whether shown on the Drawings. The CONTRACTOR shall protect existing facilities against danger or damage while pipeline is being constructed and backfilled or from damage due to settlement of the backfill.
- 3. Materials encountered in excavation will be divided into only 2 classes: solid rock excavation and other materials. The price bid shall include earth, loose rock, street or road surfacing and base concrete and boulders less than one-third cubic yard in one piece. Pipe must not be laid upon rock or other unyielding surface. Solid rock excavation shall be

paid for at an extra unit price for extra cost over that for excavating earth, etc., unless otherwise specified.

4. In case of unclassified excavation, as designated in the Drawings and/or Specifications, the price bid shall include earth, solid rock, roots, street or road surfacing and base concrete and boulders.
5. All excavation shall be open trenches, except where the Drawings call for tunneling, boring or jacking under structures, railroads, sidewalks, roads or highways.

B. Trees and Shrubs

1. Where pipelines run through wooded terrain, cutting of trees within limits of maximum permissible trench widths, as set forth in this article, will be permitted. However, cutting of additional trees on sides of trench to accommodate operating of trenching machine will not be permitted. The CONTRACTOR shall obtain specific permission of the OWNER before cutting any tree larger than 4 inches in diameter.

C. Highways and Streets

1. Construction equipment injurious to paving encountered shall not be used. Curbs, sidewalks, and other structures shall be protected by the CONTRACTOR from damage by his construction equipment.
2. Where trenching is cut through paving which does not crumble on edges, trench edge shall be cut to at least 2 inches deep to straight and neat edges, before excavation is started, and care taken to preserve the edge to facilitate neat repaving.

3. The CONTRACTOR shall so coordinate his work as to produce a minimum of interference with normal traffic on highways and streets. He may, with the approval of the governing agency, close a street to traffic for such length of time considered necessary, provided persons occupying property abutting the street have an alternate route of access to the property which is suitable for their needs during the time of closure. It shall be the responsibility of the CONTRACTOR to give 24 hours advance notice to fire and police departments and to occupants of a street which will be closed, in a manner approved by the governing body.

4. The CONTRACTOR shall maintain road crossings in a passable condition for traffic until the final acceptance of the work, being paid only by unit price for crushed rock used, within limitations as hereinafter specified, except that additional payment for crushed rock, after initial payment, will be allowed only where wheel compacted backfill is specified.

5. The amount of crushed stone placed shall be paid for at the unit price per ton up to the maximum limits of 225 pounds per linear foot of trench over which it is placed for pipe sizes through 8 inches. The ENGINEER

shall have control of thickness and width to be placed and paid for, and may order changes in depth and width as conditions dictate. No payment will be made for crushed rock surfacing required as a result of unnecessarily wide trenches, omission of sheeting and shoring, or damage by the CONTRACTOR'S equipment, or for maintenance of surface level.

6. Highway Department requirements in regard to trenching, boring and jacking shall take precedence over the foregoing general specifications and the following boring or jacking specifications, where they are involved.

7. Uneven surfaces or humps in the ground encountered and high driveways and road crossings shall be dug through to such depth that pipe may be laid to a reasonably even grade and have minimum cover at the low places. Such places requiring extra depths shall be included in the bid and no extra payment will be made for such extra depths required, which are evident from an examination of the ground before bidding, as required for 1 foot cover over valve nuts, or are indicated on the Drawings.

D. Existing Utilities

1. The CONTRACTOR shall determine, as far as possible in advance, the location of all existing sewer, culvert, drain, water, electric, telephone conduits, and gas pipes, and other subsurface structures and avoid disturbing same in opening his trenches. In case of sewer, water and gas services and other facilities easily damaged by machine trenching, same shall be uncovered without damage ahead of trenching machine and left intact or removed without permanent damage ahead of trenching and restored immediately after trenching machine has passed, without extra cost to the OWNER. The CONTRACTOR shall protect such existing facilities, including power and telephone poles and guy wires, against danger or damage while pipeline is being constructed and backfilled, or from damage due to settlement of his backfill. It shall be the responsibility of the CONTRACTOR to inform the customers of utilities of disruption of any utility service as soon as it is known that it has been or will be cut off.

2. The CONTRACTOR shall, at all times during trenching operations, carry a stock of pipe and fittings likely to be needed for replacement of pipelines to facilitate immediate repair.

E. Pipelines in Same Trench

1. Pipelines laid in same trench shall, in all cases, be bedded on original earth, or other specified bedding materials, regardless of divergence in their elevations, unless otherwise specified. They shall never be laid in unsupported backfill or one above the other. The CONTRACTOR shall receive full trenching and backfilling unit prices for each pipeline so laid, the same as if laid in widely separated trenches.

F. Location of Proposed Pipelines

1. The location of pipelines and their appurtenances as shown are those intended for the final construction. However, conditions may present themselves before construction on any line is started that would indicate desirable changes in location. Also, development of property traversed may require location changes. In such cases, the OWNER reserves the right to make reasonable changes in line and structure locations without extra cost, except as may be determined by the application of the unit prices bid to the quantities actually involved. The OWNER is under no obligation to locate pipelines so that they may be excavated by machine.

G. Trench Requirements

1. All trenches must be dug neatly to lines and grades.
2. The opening of more than 500 feet of trench ahead of pipe laying and more than 500 feet of open ditch left behind pipe laying, before backfilling, will not be permitted, except upon written consent of the OWNER. No trench shall be left open or work stopped on same for a considerable length of time. In case of objectionable delay trench shall be refilled according to backfill specifications.
3. Where subgrade of trench has insufficient stability to support the pipeline and hold it to its original grade, the ENGINEER may order stabilization by various means. Exclusive of dewatering normally required for construction and instability caused by neglect of the CONTRACTOR, it shall be paid for at unit prices set up in the Contract, such as extra excavation, crushed rock for pipe bedding, concrete cradle or piling. In the event that no particular bid price is applicable, then the payment for stabilization shall be negotiated.
4. Excavation for pipe laying must be made of sufficient width to allow for proper jointing and alignment of the pipe, but not greater than the maximums permitted in the following table:

MAXIMUM TRENCH WIDTH AT TOP OF PIPE

Nominal Pipe Size (Ins.)	Trench Width (Ins.)
4	28
6	30
8	32

5. Trenches in earth or rock shall be dug as shown on the Drawings and be sufficiently deep to insure a 30 inch or 36 inch minimum cover over water lines and force mains, as noted on the Drawings. Depths of trenching

- shall also be adequate for at least 1 foot minimum cover over valve nuts. In order to eliminate the necessity for digging bell holes into the trench upgrade by hand and to insure an earth cushion under the pipe for uniform bearing, trench depth shall be the cover requirement plus outside diameter of barrel of pipe plus the required bedding cushion.
6. Wherever it is deemed necessary by the ENGINEER to lay the pipes to an extra depth exceeding the depths required by the Drawings and Specifications and not apparent from unevenness of ground, the CONTRACTOR will be paid for such excavation under extra excavation in earth at the price bid per cubic yard, computed on the basis of maximum trench widths in the preceding table. In unclassified excavation contracts the same width limitations will apply.
7. Trench line stations and locations of accessories will be set ahead of the trenching. These will be set at least each 100 feet of pipeline. Trenches must be dug true to alignment of stakes. Alignment of trenches or pipes in trench must not be changed to pass around obstacles such as poles, fences and other evident obstructions without the permission of the ENGINEER. Lines will be laid out to avoid obstacles as far as possible, contingent with maintenance of alignment necessary to finding pipeline in the future and avoiding obstruction to future utilities.
- H. Damage to Existing Structures
1. Hand trenching is required, at no extra payment, where undue damage would be caused to existing structures and facilities by machine trenching.
2. In case of damage to any existing structures, repair and restoration shall be made at once and backfill shall not be replaced until this is done. In all cases, restoration and repair shall be such that the damaged structure will be in as good condition and serve its purpose as completely as before, and such restoration and repair shall be done without extra charge, except as set forth under the applicable provisions of the General and Special Conditions. Where there is the possibility of damage to existing utility lines by trenching machine, the CONTRACTOR shall make hand search excavation ahead of machine trenching, to uncover same, at no extra cost to the OWNER.
- I. Excavation Unclassified
1. Excavation for pipelines shall be unclassified and the cost of all excavation of whatever nature and state, including solid rock, shall be included in the CONTRACTOR'S unit price bid for furnishing, trenching, laying and backfilling the pipe.
2. Excavation for structures such as manholes, pump stations, and vaults is likewise unclassified and the cost of all excavation of whatever nature and

state, including solid rock, shall be included in the CONTRACTOR'S lump sum or unit price bid, as the case may be.

J. Dewatering of Trenches

1. Dewatering of trenches shall be considered a part of trenching, at no extra cost to the OWNER. Dewatering of trenches shall include ground-water and storm or sanitary sewage. Suitable pumping and other dewatering equipment is to be provided by the CONTRACTOR, to insure the installation of the pipeline structure in a dewatered trench and under the proper conditions. Dewatering shall include all practical means available for prevention of surface runoff into trenches and scouring against newly laid pipe.
2. Piles of excavated materials shall be trenched or temporarily piped to prevent, as far as practical, blockage of drainage ditches and gutters, and water carriage of excavated materials over street and highway surfaces.

3.02 LAYING PRESSURE PIPE

A. General

1. Inspection of Materials
 - a. All pipe, fittings and accessories shall be subject to an inspection by the OWNER at the job site. Any damaged materials shall be repaired or replaced to the satisfaction of the OWNER. Should repairs to the piping materials be necessary, then same shall be made in the presence of the ENGINEER using proven methods prescribed by the pipe manufacturer.
 - b. The OWNER'S inspection of materials shall in no way relieve the CONTRACTOR of his responsibility.
2. Laying Requirements
 - a. Pressure pipe shall be laid to lines, cover or grades shown on the Drawings.
 - b. Pipes must be swabbed out before lowering into trench. In the case of pipelines 3-inch through 8-inch, a swab must also be dragged through the pipe after it is in place. Larger size pipe shall be visually inspected for cleanliness and proper jointing.
 - c. The points insisted upon in the laying of pipe will be: Proper alignment, evenness of width and depth of joints, perfection in jointing, and care of the pipe in handling.
 - d. Precautions must be taken to prevent flotation of the pipe should water enter the trench prior to putting the pipeline into operation.

- e. In wet, yielding and mucky locations where pipe is in danger of sinking below grade or floating out of grade or alignment, or where the backfill materials are of such a fluid nature that such movements of the pipe might take place during the placing of the backfill, the pipe must be weighted or secured permanently in place by such means as will prove effective. If crushed rock fill beneath the pipe is necessary for stability, it will be paid for at the unit price bid per ton of such material in place except in cases where instability is caused by neglect of the CONTRACTOR.
- f. Whenever pipe laying is stopped, the end of the pipe shall be securely plugged with plywood or the manufacturer's standard plug held in place by jute packing, caulked into place.
- g. Elbows, plugs, dead end valves, and tees shall be firmly blocked, as shown on the Drawings, to prevent internal pressure from springing the pipe from the intended alignment, with permanent materials solidly placed without covering pipe joints. Restrained type pipe joints may be substituted for thrust blocks with the ENGINEER'S permission. Pipe shall be free of all structures, other than manholes.
- h. No pipe shall be laid resting on solid rock, blocking or other unyielding objects. Jointing before placing in the trench and subsequent lowering of more than one section jointed together may be allowed, subject to the ENGINEER'S permission.
3. Installing Water Pipe in Cover Pipe
- a. Installation of water pipe in cover pipe is covered in Section 02326 of these specifications.
- B. Laying Ductile Iron Pipe
1. Bedding and Backfilling
- a. The laying condition shall be Type 3 specified in ANSI/AWWA C600-82. The pipe shall be bedded in 6 inches minimum loose soil and the hand placed loose soil backfill lightly consolidated to the top of the pipe. "Loose soil" or "select material" is defined as native soil excavated from the trench, free of rocks, foreign materials and frozen earth.
- b. The selected material shall be hand placed to a point 12 inches above the barrel of the pipe. After the specified backfill is hand placed, rock may be used in machine placed backfill in pieces no larger than 8 inches in any dimension and to an extent not greater than one-half the volume of the backfill materials used.

- c. The top 12 inches of backfill shall contain no rock over 1-1/2 inches in diameter nor pockets of crushed rock.
- d. Larger rock fill will be allowed in wide trenches where side slopes are low enough to prevent rock from dropping over pipeline. If additional earth is required, it must be obtained and placed by the CONTRACTOR. Filling with rock and earth shall proceed simultaneously, in order that all voids be filled with earth.
- e. If select material is not available from the trench excavation, or if the CONTRACTOR so desires, he may use crushed stone bedding and backfill to the top of the pipe at no extra cost to the OWNER.
- f. Sufficient space, limited to a maximum of 2 feet length, shall be left out of the specified earth or crushed stone bedding to facilitate proper jointing of the pipe.
- g. No pipe shall be laid resting on solid rock, blocking or other unyielding objects. Jointing before placing in the trench and subsequent lowering of more than one section may be allowed, subject to the ENGINEER'S permission.
2. Installation of Pipe
- a. Ductile iron pipe shall first be thoroughly cleaned at joints, then joined according to instructions and with tools recommended by the pipe manufacturer. Sufficient copies of the manufacturer's installation instructions shall be furnished the ENGINEER to permit the ENGINEER to retain 3 copies. One copy shall be available at all times at the site of the work.
- b. All pipes must be forced and held together or "homed" at the joints before bolting. Pipe must be aligned as each joint is placed, so as to present as nearly true, straight lines and grades as practical, and all curves and changes in grades must be laid in such manner that one-half of the maximum allowable deflection shown in the pipe manufacturer's catalog is not exceeded.
- c. Concrete blocking of fittings shall be as specified hereinafter in this Specification Section 02610.
- d. Cutting of pipe may be done by special pipe cutters as the CONTRACTOR may elect, but the CONTRACTOR will be held responsible for breakage or damage caused by careless cutting or handling. Cut edges of the pipe shall be made smooth and a bevel formed on the exterior of the pipe barrel when using rubber gasket type pipe.

C. Laying Copper Pipe and Fittings

1. Bedding and Backfilling

- a. The pipe shall be bedded in 4 inches minimum of loose soil and the hand placed backfill lightly consolidated to a depth of 12 inches above the top of the pipe. "Loose soil" or "select material" is defined as native soil excavated from the trench, free of rocks, foreign materials and frozen earth. The machine placed backfill may contain rock no larger than 8 inches in any dimension and to an extent no greater than 1/2 the volume of backfill materials used. The top 12 inches of backfill shall contain no rocks over 1-1/2 inches in diameter nor pockets of crushed rock.

2. Installing Copper Pipe and Fittings

- a. Exterior copper pipe shall be laid of type K pipe, with brass compression fittings. Joints shall be neatly reamed and flared and joints drawn up firmly. Pipe shall have at least 36 inch cover. Joints shall be tested and all leakage stopped before backfilling the pipe trench.
- b. Interior copper pipe shall be installed of Type L pipe, with sweat joint fittings. Pipe shall be tested and all leaks stopped before the system will be accepted. The pipe shall be free of dents and bends. The sweat joints shall present a neat appearance. All pipe shall be parallel to walls and floors with unions on all runs and branches. The pipe shall be secured to the walls and ceilings by clamps and hangers manufactured for the purpose. Strap hangers are not acceptable. Unions and valves shall be placed on each outlet to facilitate dismantling and shutting off.
- c. All copper pipe shall be installed by experienced workmen.

D. Laying Plastic Pipe

1. Bedding and Backfill - General

- a. Existing earth bedding and backfill shall be used in lieu of crushed stone. In areas where rock is encountered, the CONTRACTOR shall use locally available sand for bedding and backfill. The CONTRACTOR is to provide full crushed stone, as specified, in all traffic areas, road and driveway crossings. Compaction of the earth and sand backfill materials is required and shall be in accordance with ANSI/AWWA C605.
- b. Similar material shall be used for haunching up to the spring line of the pipe and it shall be worked under the haunch of the pipe to provide adequate side support. The crushed rock meeting the requirements of Class I (ASTM D 2321-74 (1980)) shall then be

- hand placed to a point 12" above the top of the pipe. The remaining backfill, except for the top 12" which shall contain no rock over 1-1/2" diameter nor pockets of crushed rock, may be excavated material containing no rock over 8" in any dimension. Larger rock will be allowed in wide trenches where side slopes are low enough to prevent rock from dropping over pipeline. If additional earth is required, it must be obtained and placed by the CONTRACTOR. Filling with rock and earth shall proceed simultaneously, in order that all voids may be filled with earth.
- c. Sufficient space, limited to a maximum of 2 feet length, shall be left out of the bedding to facilitate proper jointing of the pipe.
- d. No pipe shall be laid resting on solid rock, blocking, or other unyielding objects. Jointing before placing in the trench and subsequent lowering of more than one section may be allowed subject to the ENGINEER'S permission.

2. Installation of Polyvinyl Chloride (PVC) Pressure Pipe

- a. Prior to laying, all PVC pipe shall be stored in a shaded place for protection from the direct rays of the sun. Pipe shall be distributed from storage as the work progresses as permitted by the ENGINEER.
- b. The pipe, fittings, and valves shall be placed in the trench with care. Under no circumstances shall pipe or other materials be dropped or dumped into the trench. The pipe shall not be dragged in a manner which would cause scratching of the pipe surface. An excessive amount of scratching on the surface of the pipe will be considered cause for rejection.
- c. Sufficient copies of the pipe manufacturer's instructions for installing the pipe and accessories shall be furnished the ENGINEER by the CONTRACTOR to permit the ENGINEER to retain 3 copies. A copy is to be available at the job site at all times.
- d. Concrete blocking of fittings, as hereinafter specified, shall be required for PVC pipe with slip joints and rubber gaskets or ductile iron mechanical joint fittings.
- e. All dirt, dust and moisture shall be removed from the bell and spigot ends of pipes to be jointed. Insert gasket in bell. Apply the lubricant to spigot and gasket being careful to keep both ends free of dirt. The joint shall be homed to stop mark on spigot end of pipe. All jointing shall be done in accordance with pipe manufacturer's recommendations.
- f. All cutting of the pipe shall be done in a neat and workmanlike manner with the least amount of waste of pipe involved and

without damage to existing or new lines. A fine tooth saw, tubing cutter or similar tool can be used to cut the pipe. Cut must be square and ragged edges removed with a cutting tool and/or file. A bevel or taper on the exterior of each spigot is required.

3. Installing Polyethylene Pipe for Water Service

- a. The pipe shall be bedded in 6 inches minimum of loose soil when in dirt and 6 inches gravel when in rock, and the hand placed backfill lightly consolidated to a depth of 12 inches above the top of the pipe. "Loose soil" or "select material" is defined as native soil excavated from the trench, free of rocks, foreign materials and frozen earth. The machine placed backfill may contain rock no larger than 8 inches in any dimension and to an extent no greater than $\frac{1}{2}$ the volume of backfill materials used. The top 12 inches of backfill shall contain no rocks over 1-1/2 inches in diameter nor pockets of crushed rock.

- b. Polyethylene pipe for water services shall have the same outside diameter as copper tubing and shall be compatible for flared compression fittings. The joints to brass fittings shall be made by cutting the pipe with a tube cutter, keeping it clean and square, thence flaring the pipe and completing the joining in accordance with the manufacturer's instructions (a copy of the instructions shall be at the job site at all times). All joints shall be tested and all leakage stopped before backfilling the pipe trench.

- c. The pipe shall be snaked into the trench, employing the natural snaking tendency of the pipe. All short radius bends shall be made with fittings rather than with the pipe alone. The pipe shall be bent to a radius of not less than 12 inches.

- d. The pipe will be rejected if it contains kinks and gouges.

E. Installation of Water Service Accessories

1. Water Service Meters

- a. Water service meters and accessories shall be installed as shown on the Drawings, with meter box centered over the meter.
- b. The location of water service connections will be determined in the field, as the work progresses, thereby necessitating the tapping, in case of cast iron or ductile iron pipe, and in the case of pressure concrete, PVC, or steel pipe alternates, the use of pipe saddles and the appropriate tapping equipment. Earth backfill shall be thoroughly tamped around meter boxes to prevent subsequent movement.

2. Air Valves and Corporation Stops

- a. The location of air valve assemblies, while being noted on the Drawings, could possibly be shifted in actual construction. For this reason, the same statements relative to the methods of installation of meters and water service connections apply to the installation of air valve assemblies. Air valve assembly boxes shall be installed in the same manner as water meter boxes except that the box will be located slightly off center of the air valve, in order to give better access to the stopcock between the valve and water main.
- b. Corporation stops, as shown on the Drawings, are required between the water main and the meter, and between the main and the air valve assembly.

F. Installation of Flushing Hydrants

- 1. Flushing hydrants shall be installed in the general location as shown on the Drawings. Exact location shall be determined in the field. Hydrants shall be set such that the lowest nozzle shall be high enough above the ground to allow the uninhibited 360° swing of a 1 1/2 inch hydrant wrench. Hydrant drainage pits shall be excavated below the hydrant to the depth shown on the Drawings. Crushed stone drainage media shall be of the size shown on the Drawings. Hydrant shall be set vertical and anchored as hereinafter specified.
- 3. Hydrants installed on this project shall be anchored to prevent the hydrant from blowing off the feeder line when suddenly opened or closed. Likewise, the hydrant pilot valve shall be anchored to prevent blow-off when the hydrant is removed. The CONTRACTOR shall anchor the hydrant and pilot valve utilizing one of the following procedures:
 - a. Where the hydrant is located immediately adjacent to the water main, install all thread rods from the main line branch tee to the valve inlet and from the valve outlet to the mechanical joint of the hydrant inlet piece.
 - b. Provide locked mechanical joint and/or restrained joint piping from the main to the hydrant including the main line tee.
 - c. Use method a or b from the water main to the pilot valve and provide a concrete thrust block on the hydrant.
 - d. Method b may not be used when the hydrant feed line is PVC pipe.
- 4. The additional cost of providing all-thread rods; 4 mil wrap of bolts, nuts, and flanges; locked mechanical joint pipe and fittings; restrained joint pipe and fittings; and/or the concrete thrust block at the hydrant shall be included in the CONTRACTOR'S unit price bid for the hydrant.

G. Blocking of Pipe at Bends and Ends

1. Horizontal Bends

- a. Concrete backing and/or blocking required at bends in the horizontal plane shall be accomplished per detail on the Drawings. The square footage of blocking area shall be obtained from Tables "A" and "B" through the following procedure:
 - Step No. 1 - From Table "A," select type soil and bearing area factor for particular fitting to be blocked.
 - Step No. 2 - From Table "B," select multiplier to be used for the size pipe being blocked and its test pressure.
 - Step No. 3 - Calculate actual bearing area required by multiplying bearing area factor from Table "A" by multiplier from Table "B" (e.g. - 16 inch tee with 250 psi test pressure in sandy clay - $9.42 \times 1.78 = 16.7$ S.F. of bearing area required). Bearing area shall in no case be less than the minimum shown in Table "B."

TABLE "A"

Type Soil	Soil Bearing Pressure (PSF)		Bearing Area Factor for Degree of Bend (Square Feet)	
	90°	Plug/Tee	45°	22 1/2°
Sandy Clay	3,000	13.33	9.42	7.21
Hard Clay	6,000	6.66	4.71	3.61
Shale	12,000	3.33	2.36	1.80
Solid Rock	16,000	2.50	1.77	1.35
				0.69
				0.35

TABLE "B"

Pipe Dia. (In.)	Min. Bearing Area (S.F.)	Multiplier for Pipe Test Pressure (TP)				
		350 psi (TP)	300 psi (TP)	250 psi (TP)	200 psi (TP)	150 psi (TP)
8	1.0	0.62	0.53	0.44	0.36	0.27
6	1.0	0.35	0.30	0.25	0.20	0.15
4	1.0	0.16	0.13	0.11	0.09	0.07
						0.04
						0.10
						0.18
						0.02
						0.05
						0.09

b. Consideration will be given to the use of restrained type mechanical joint pipe and fittings in lieu of concrete blocking. Use of the restrained joint pipe and fittings is subject to review and acceptance by the ENGINEER of the locking-method and adequacy of design for pressures involved.

2. Vertical Bends

a. The use of vertical bends in lieu of extra depth trenching shall be subject to permission by the ENGINEER.

b. Where the CONTRACTOR elects to use vertical bends, or where vertical bends are called for on the Drawings, the CONTRACTOR shall submit the blocking design, including calculations, to the ENGINEER for review and acceptance. Anchorages shall be designed to resist thrusts caused by the internal test pressure in the pipe. Protection against corrosion shall be inherent in the design.

H. Supplemental Backfilling Information

1. General

a. Excavated materials from trenches and tunnels, in excess of quantity required for trench backfill, shall be disposed of by the CONTRACTOR. It shall be the responsibility of the CONTRACTOR to obtain location or permits for its disposal. Unit prices for trench excavation, tunneling, and backfill shall include the cost of disposal of excess excavated materials, as set forth herein, with no additional compensation being allowed for hauling.

b. Where sod is destroyed in areas maintained equivalent to residence yards, the area shall be restored and revegetated by seeding as specified herein.

c. Where pastures, thin grass or cover crops are destroyed by trenching, laying, backfilling, or tunneling operations, surface shall be prepared by disking, fertilizing, and seeding, as specified in Section 02930. Seeding and fertilizing shall be included in the price for trenching and backfilling. The timing of this operation shall be controlled by the ENGINEER. Requirements of the Department of Highways for reseeding shall take precedence over these Specifications on Kentucky Department of Highways rights-of-way.

d. No extra charge shall be made for backfilling of any kind, except as specified. Backfilling shall be included as a part of the price for trenching. No extra charge shall be made for supplying outside materials for backfill except where fills above existing ground are necessary and payment is designated on Drawings or in Specifications. If backfilling of the trench or surface restoration is not

properly completed, a proportionate part of the unit price for trenching shall be retained from payment estimates.

e. Before completion of the Contract, all backfills shall be reshaped, holes filled, and surplus materials hauled away and all permanent walks, street, driveways, and highway paving and sod replacement (if such surface replacement items are included in the Contract) and reseeding performed.

f. Backfill material must be uniformly ridged over trench, and excess hauled away. Ridged backfill shall be confined to the width of the trench and not allowed to overlap onto firm original earth, and its height shall not be in excess of needs for replacement of settlement of backfill.

g. All rock, including crushed rock or gravel from construction, must be removed from yards and fields. Streets and walks shall be broomed to remove all earth and loose rock immediately following backfilling.

2. Special Requirements

a. In case of street, highway, railroad, sidewalk and driveway crossings or within any roadway paving, or about manholes, valve and meter boxes located in such paving, the following backfill material and procedure is required.

b. Fill trench to within 6 inches of the surface at no additional cost with one of the following materials of limited compressibility, uniformly distributed without mechanical compaction

(1) Kentucky Department of Highways No. 78 crushed stone or other gradation acceptable to the ENGINEER. In order to accommodate compacted temporary surfacing it may be necessary to bulkhead or otherwise confine the stone fill at the open end of the trench.

(2) Locally available granular material, such as bank sand or gravel, where acceptable to the ENGINEER. For acceptance, the material must have a limited compressibility, to be free from detrimental quantities of silt and organic matter and must be durable.

c. Mechanical tamping, where required by the ENGINEER in locations other than those specifically designated herein, shall be paid for per unit price bid for mechanical tamping. Measurement, but not actual extent to the mechanical tamping, shall be limited by the numerical maximum allowable trench width (for each size pie) as set forth in 3.01.G.4 of this Section and shall not include the specified backfill below the top of the pipe.

- d. Temporary surfacing of street, highway, railroad, sidewalk and driveway crossings, or within any roadway paving, or about man-holes, valve and meter boxes located in such paving, shall consist of 6 inches compacted depth of crushed stone as specified under Section 02235 for temporary walkway or road surfacing, placed and compacted in the trench. Compaction shall be accomplished by methods which shall be sufficient to confine stone to the trench under normal traffic. Backfills shall be maintained easily passable to traffic at original paving level until acceptance of project or replacement of paving or sidewalks.
- e. Department of Highways requirements in regard to backfilling will take precedence over the above general specifications where they are involved.

1. Cut-ins, Tie-ins, and Cutting and Plugging

- 1. The OWNER shall not be responsible for extra costs of cut-ins, tie-ins, cutting and plugging, due to water not being entirely cut off by the existing water main valves.
- 2. A cut-in is defined as the removal of one section of existing pipeline (2 cuts of pipe) and insertion of one or more new pipeline connections therein.
- 3. A tie-in is defined as the removal of an existing plug or cap and the connecting of the new pipeline into the existing pipeline or fitting or valve at the joint opened by such removal.
- 4. A cutting and plugging is defined as the cutting and installation of a plug in an existing line.

3.03 FIELD QUALITY CONTROL

A. Testing Polyvinyl Chloride (PVC) Pressure Pipe During Construction Period

- 1. Prior to pressure testing the pipe shall be center loaded with backfill to prevent arching and whipping under pressure. Center loading shall be done carefully so that joints will be completely exposed for examination during testing unless conditions warrant complete backfill before testing.
- 2. During the general construction period the following pressure testing procedure shall be followed on the first 1500 L.F. of pipe (on sections that can be separately isolated). If they cannot be isolated, temporary valves will be installed to do the testing. Valves to be at no additional cost to the OWNER.
- 3. After the PVC pipe is assembled in the trench a pressure test of 4 hours will be performed on the pipe. Test pressure to be the pressure class of

pipe. After 2 consecutive tests have been performed without any failure, the CONTRACTOR at his option and with the ENGINEER'S permission may discontinue testing until the system is completed. Testing shall then be performed as outlined herein in this Section.

C. Testing Pressure Pipe for Leakage

1. The CONTRACTOR will be required to test all pipelines and appurtenances with water. The maximum test pressure, measured at the lowest elevation of the pipeline being tested, shall be the pressure class of the pipe unless a specific test pressure is shown on the Drawings.

2. Backfilling before testing will be allowed at the discretion of the ENGINEER, in the case of slip type or bolted joint pipe and at points where danger to the public or other hazards demand that such be done immediately after pipe is laid.

3. When the line or section being tested is pumped up to the required pressure, it shall be valved off from the pump and a pressure gauge placed in the line. The pressure drop in the line, if any, shall be noted. If no pressure drop is noted in 4 hours, the ENGINEER, with approval from the OWNER, at his discretion, may accept the line or section as being tested, or he may require the test run the full 24 hours.

4. At the end of the 24 hour test period, the pressure shall be recorded. If there is a drop in pressure, the CONTRACTOR will be required to pump the section being tested up to initial test pressure and maintain that pressure for 24 hours, measuring the amount of water required to accomplish this. The line will not be accepted until the leakage shall prove to be less than 10 gallons per inch diameter per mile of pipe per 24 hours.

5. Should there be leakage over the allowable amount, the CONTRACTOR will be required to locate and repair the leaks and retest the section. It is suggested, but not required, that the CONTRACTOR have a geophone (underground listening device) on the job at time of testing.

6. If the leakage of a section of pipeline being tested is below the allowable amount, but a leak is obvious, in the opinion of the ENGINEER, due to water at the surface of the ground, or by listening, the leak can be heard underground with the geophone, or any other means of determining a leak, the CONTRACTOR will be required to repair those leaks.

7. The CONTRACTOR shall furnish meter or suction tank, pipe test plugs, and bypass piping, and make all connections for conducting the above tests. The pumping equipment used shall be centrifugal pump, or other pumping equipment which will not place shock pressures on the pipeline. Power plunger or positive displacement pumps will not be permitted for use on closed pipe system for any purpose.

8. Inspection of pipe laying shall in no way relieve the CONTRACTOR of the responsibility for passing tests or correcting poor workmanship.
9. The Letcher County Water and Sewer District will furnish all water used in flushing, refilling, disinfection, and accepted testing and/or retesting the completed pipelines. The CONTRACTOR shall be billed for all water used at the wholesale water rate, until all lines are satisfactorily pressure tested and obtain satisfactory bacteriological testing results.

E. Disinfection

1. Upon completion of the work and cleaning up, and prior to final acceptance, the CONTRACTOR shall disinfect all water lines constructed which are to carry treated water.
2. Prior to starting disinfection, all water mains must be thoroughly flushed to remove mud, rocks, etc. Disinfection will then be accomplished by the adding of a chlorine solution while filling the main to obtain the initial 50 ppm of chlorine. The CONTRACTOR shall supply all equipment, labor, etc., necessary for flushing and disinfecting the mains. The CONTRACTOR shall submit, in writing, to the ENGINEER, the method he proposes to use for adding the chlorine.
3. The calcium hypochlorite granule or tablet method shall not be used.

4. Disinfection shall be accomplished by filling the new and/or repaired portions of the system with water having a chlorine content of at least 50 parts per million and at the end of a 24 hour contact time a residual of at least 25 parts per million shall remain. At the end of the 24 hour contact period, the chlorinated disinfectant water shall be thoroughly flushed from the water system. The CONTRACTOR shall use such disinfection methods necessary to meet the Kentucky Natural Resources and Environmental Protection Cabinet regulations for dechlorination prior to discharge of same to any stream.
5. For tie-ins to an existing system such as tapping valves where keeping the main out of service would restrict service to existing customers, disinfection shall, at the ENGINEER'S discretion, consist of thoroughly cleaning the new part with a solution containing not less than 200 mg/l (ppm) chlorine.

6. After initial disinfection and flushing, the CONTRACTOR will collect water samples for bacteriological testing. A core zone, which includes up to the first 1/2 mile, shall be established. Two samples shall be taken from the core zone. Additionally, 1 sample taken from each mile of new distribution main shall be submitted to the cabinet. A new or routine replacement main shall not be placed in service until negative laboratory results are obtained on the bacteriological analyses. Sample bottles shall be clearly identified as "special" construction tests. If any of the samples are found to be positive or contain confluent growth, the CONTRACTOR

shall repeat the disinfection procedure until the required numbers of negative samples are obtained at no cost to the OWNER.

7. The cost of all water used shall be billed to the CONTRACTOR by the Letcher County Water and Sewer Commission for all water used at the wholesale rate in disinfection, flushing, and attaining satisfactory bacteriological testing for furnishing, trenching, laying, and backfilling the pipe. The cost of a testing lab, bottles, etc. shall be the responsibility of the CONTRACTOR at no additional cost to the Letcher Count Water and Sewer District.

3.04 BASIS OF PAYMENT

A. Excavation and Backfilling

1. Trenching, Laying, and Backfilling Pipelines

a. Unit Price Contracts

(1) Payment for trenching for pressure lines shall be included in the unit price bid for trenching, laying, and backfilling pipelines.

2. Solid Rock Excavation

a. Unclassified Excavation

(1) Excavation shall be unclassified and the cost of all excavation of whatever nature and state, including solid rock, shall be included in the CONTRACTOR'S unit price bid for each item of construction requiring excavation.

3. Search and Extra Depth Trench Excavation

a. "Search" trench excavation shall be the actual measured excavation within limits as acceptable to the ENGINEER.

b. "Extra Depth" trench excavation shall be the calculated yardage below the lowest point of excavation which would normally have been required for construction.

c. Trench width limitations for either condition shall be as listed in the following table:

For 6" Pipe 2'-6"

For 8" Pipe 2'-9"

d. The work of uncovering and backfilling required for locating existing sewers, water lines and other existing facilities for con-

nection of improvements or avoidance in location of proposed pipelines where such uncovering and backfilling is not within trench for improvements, shall be paid for at a price per cubic yard for such excavation actually removed and backfilled under item for "Search or Extra Depth Trench Excavation." Such payment does not include uncovering existing utility lines for their protection during or after trenching operations for the proposed pipeline.

4. Mechanical Tamping

a. Mechanical tamping is defined as backfill placed and compacted by power driven mechanical equipment to a greater density than can be achieved by natural settlement or hand tamping methods. Mechanical tamping will be required when ordered by the ENGINEER with payment by the cubic yard so compacted. Measurement, but not actual extent of the mechanical tamping, shall be limited by the numerical maximum allowable trench width (for each size pipe) as shown in the table listed under "Search and Extra Depth Trench." Payment for mechanical tamping shall not include the specified haunching or initial backfill required above and below the top of pipe.

B. Boring or Jacking

1. Boring or Jacking

a. In unit price Contracts, usable holes either bored or jacked shall be paid for per linear foot of hole actually bored or jacked, according to the diameter of the hole required, measured along the centerline from the point of entrance on one side to the point of exit on the other side. When cover pipe is installed inside the bore, boring or jacking and cover pipe shall be paid per linear foot based on the length of the cover pipe installed, according to the diameter of the cover pipe required.

C. Trench and Pipe Stabilization

1. Extra Excavation

a. Extra excavation required for trench or pipe stabilization shall be paid by the cubic yard so excavated under the item "Search and/or Extra Depth Trench Excavation" based on the limitations for that item.

2. Crushed Stone for Trench Stabilization

a. Crushed stone ordered by the ENGINEER for trench stabilization shall be as specified in Section 02235 of these Specifications and paid by the ton so placed.

3. Crushed Stone for Pipe Bedding

- a. Additional crushed stone bedding ordered by the ENGINEER for pipe stabilization shall be as specified in Section 02235 of these Specifications and paid by the ton so placed.

D. Water Lines

1. Unit Price Contracts

a. Water Lines

- (1) Payment for laying, trenching and backfilling water lines shall be included in the unit price bid per linear foot of pipe laid, including length of fittings and valves, unless same are included in lump sum portions or assemblies noted on the Drawings. However, payments will not be made for branch lengths of fittings within 2.5 feet of edge of main trench. The extra cost of trenching in difficult locations, such as stream, railroad, and highway crossings, if not covered in other contract unit prices, shall be included in unit price for trenching, laying and backfilling.
- (2) All blowoff or vent branches will be measured as pipe from center of connecting tee to end of pipe.
- (3) In the case of unit price contracts, unless otherwise stated in the Special Conditions, cast iron or ductile iron fittings, laid outside lump sum assemblies, will be paid for by the pound of body castings, without joint accessories, at the weights listed in ANSI/AWWA C110/A21.10-87 or ANSI/AWWA C153/A21.53-88 in the case of ductile iron compact fittings.

E. Excess Materials

- 1. The unit prices for trench excavation, tunneling and backfill shall include the cost of disposition of excess excavated materials.

F. Valves

- 1. The unit price bid for the installation of valves shall include valves, valve boxes, the cost of the concrete collar required around the valve boxes, extension stems if required, and all thread restraint rods.

C. Testing

- 1. The unit price bid for furnishing, trenching, laying and backfilling pressure lines shall include testing the line and the cost of all water used will be billed to the CONTRACTOR per section 3.03, required for testing/retesting.

H. Blocking of Bends and End of Pipe

- 1. The payment for blocking of bends and ends of pipes shall be included in the price bid for furnishing, trenching, laying and backfilling the pipe.

I. Disinfection and Dechlorination

- 1. The required disinfection of pipelines, including all water, followed by disposal of the chlorinated water used in the disinfection process shall be billed to the CONTRACTOR by the Letcher County Water and Sewer District, per section 3.03.

J. Tracing Wire or Tape

- 1. The cost of tracing wire or tape installed with nonmetallic pipe shall be included in the price bid for furnishing, trenching, laying and backfilling the pipe.

END OF SECTION

SECTION 02930

SEEDING

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Provide all labor, materials, equipment and services required to perform sodding and seeding as shown on the Contract Drawings and as specified herein.
- B. All areas disturbed by construction operations shall receive a protective cover of vegetation. The work shall consist of preparing the area for treatment, furnishing and placing soil amendments, fertilizer, sod, seed, inoculants, mulch and plantings as specified in the designated areas.

1.02 RELATED WORK

- A. Special requirements for materials and equipment are given in Sections 01300 and 01600.

- B. Special sequence or schedule requirements (if any) are specified in Section 01010 - Summary of Work.

1.03 QUALIFICATIONS

- A. The work shall be done by a provider who is experienced, reputable, and qualified in the tasks required.

1.04 SUBMITTALS

- A. Shop Drawings and other items needed to establish compliance with the Drawings and these Specifications shall be submitted to the ENGINEER in accordance with Section 01300 - Submittals.
- B. Where fertilizer is furnished from bulk storage, the CONTRACTOR shall furnish a supplier's certification of analysis and weight. When required by the Contract, a representative sample of the fertilizer shall be furnished the OWNER for chemical analysis.

1.05 WARRANTY

- A. Refer to Division 0 and 1 for warranty requirements.

PART 2 PRODUCTS

2.01 SEED

A. All seed shall conform to the current rules and regulations of the state where it is being used and from the latest crop available. It shall meet or exceed the standards for purity and germination listed herein.

B. Seed shall be labeled in accordance with the state laws and the U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act in effect on the date of invitations for bids. Bag tag figures will be evidence of purity and germination. No seed will be accepted with a date of test of more than 9 months prior to the date of delivery to the site.

C. The seed for use on this project shall be of the type as listed below with the listed germination and purity qualifications.

Species	% Purity	% Germination
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Tall fescue (KY-31)	98.5	80
(Festuca arundinacea)		
Ryegrass		
(Lolium multiflorum)	98.0	90
Oats (Avena sativa)	98.0	90
Rye, grain (Secale cereale)	97.0	85
Redtop (Agrostis alba)	90.0	80
Ky. Bluegrass (Poa pratensis)	81.0	70

2.02 FERTILIZER

A. Unless otherwise specified the fertilizer shall be a commercial grade fertilizer or as specified herein. The fertilizer shall meet the standard for grade and quality specified by state law.

2.03 INOCULANTS

A. The inoculant for treating legume seeds shall be a pure culture of nitrogen-fixing bacteria prepared specifically for the species and shall not be used later than the date indicated on the container or as otherwise specified. A mixing medium, as recommended by the manufacturer, shall be used to bond the inoculant to the seed. Two times the amount of the inoculant recommended by the manufacturer shall be used, except when seed is applied by use of hydraulic seeder, in which case 4 times the amount of inoculant recommended by the manufacturer shall be used. Seed shall be sown within 24 hours of treatment and shall not remain in the hydraulic seeder longer than 4 hours.

2.04 SOIL AMENDMENTS

A. Lime shall consist of standard ground agricultural limestone, or equal. Standard ground agricultural limestone is defined as ground limestone meeting current requirements of the State Department of Agriculture. Agricultural lime or other needed soil amendments will be uniformly applied at the rate specified herein.

2.05 ASPHALT EMULSION

A. Asphalt emulsion shall conform to the requirements of ASTM D 977-80, "Emulsified Asphalt." The emulsified asphalt may be rapid, medium, or slow cure materials.

2.06 STRAW MULCH MATERIALS

A. Straw mulch materials shall consist of wheat, oat, or rye straw, hay, grass clippings cut from any native grasses or other plants acceptable to the ENGINEER. The mulch material shall be air dry, reasonably light in color, and shall not be musty, moldy, caked, or otherwise of low quality. The use of mulch that contains noxious weeds will not be permitted. The CONTRACTOR shall provide a method satisfactory to the ENGINEER for determining weight of mulch furnished.

2.07 OTHER MULCH MATERIALS

A. Mulching materials, such as wood cellulose fiber mulch, emulsion type, synthetic fiber mulch, netting, mesh, and other mulching materials that may be required for specialized locations and conditions, when specified, must be accompanied by the manufacturer's recommendations for methods of application.

PART 3 EXECUTION

3.01 EXTENT

A. Unit Price Contracts

1. Sodding

a. Where sod is destroyed in areas maintained equivalent to residence yards, it shall be replaced on slightly ridged backfill on trench, and where destroyed in areas adjacent to the trench, it shall be replaced by the CONTRACTOR with fresh sod. Sodding will be required only on those Contracts where specifically shown on the Drawings or called for in the Specifications or Form of Proposal.

2. Seeding

a. Where lawns, pastures, thin grass or cover crops are destroyed by trenching, laying, backfilling, or tunneling operations, surface shall be prepared by diskking, fertilizing and seeding. Seeding, fertilizing, and mulching shall be included in the price for trench-

ing and backfilling. The timing of this operation shall be controlled by the ENGINEER. Requirements of the Department of Highways for reseeding shall take precedence over these Specifications where they are involved.

b. When the construction project is located on privately owned property on easements acquired by the OWNER and the individual landowner requires the cover grass to be the same as present at the beginning of construction, the CONTRACTOR shall supply the seed required by the landowner. Seeding and fertilizing in such instances, shall be at the rate as recommended by the seed producer with soil preparation and mulching as stated herein.

c. When the construction project encroaches within the rights-of-way of the Department of Highways, the seed mixture, application rate and method of mulching shall be as required by the Department of Highways.

3. CONTRACTOR'S Options

a. Where surface grasses and cover are similar in nature throughout the length of the project, the CONTRACTOR may provide seed of one type or mixture for the entire project provided there are no objections by individual landowners involved and with permission of the OWNER and ENGINEER. In such cases, the seed type and/or mixture shall be that specified for lawn areas. Pasture and/or cover crop mixtures shall not be used for lawn application for any reason.

b. When construction facilities or construction operations are located on or encroach on privately owned properties, the CONTRACTOR may, at his election, negotiate with the individual landowners for restoration of the surface. This negotiation and settlement may be for materials or labor or both as agreeable to the individual property owner. In such cases, the CONTRACTOR shall obtain from the individual landowner a "Release of Claims" releasing the OWNER from any further liability for surface restoration, a copy of which shall be provided for the OWNER and ENGINEER. This option shall apply to surface restoration only. The CONTRACTOR shall be responsible for cleanup and regrading work and for any settlement of the trench or graded area within the one year guarantee period.

3.02 SOIL PREPARATION

A. All areas to be seeded or sodded shall be thoroughly cleaned, removing all debris of whatever nature. After the area has been cleaned, the soil for seeding and sodding shall be prepared as follows:

1. Loosen the soil to a depth of not less than 4 inches.

2. Work the soil until it is in good condition, raking with hand rake to complete the soil preparation and make final finished grade.
3. On areas to be seeded, the raking in of fertilizer may be done concurrently with raking in of seed as hereinafter specified.

3.03 SEEDING

A. Temporary Cover (All Areas)

1. This item shall consist of seeding a temporary cover of grass, or grass and small grain, on areas disturbed on the construction site which will not be redisturbed within a 60 day period. The determination of the area to be temporarily seeded and the time of seeding shall be controlled by the ENGINEER.
2. The seed mixtures to be used for temporary cover will be governed by the time of year the seeding is accomplished. The mixtures and time of seeding shall be as follows:

a. Time of Seeding - 2/15 to 6/1
 (1) Rye 1-1/2 bushels and ryegrass 25 pounds per acre; or tall fescue 30 pounds and ryegrass 20 pounds per acre.

b. Time of Seeding - 6/2 to 8/15

(1) Tall fescue 30 pounds and ryegrass 20 pounds per acre; or, spring oats 2 bushels and ryegrass 30 pounds per acre.

c. Time of Seeding - 8/16 to 2/14

(1) Rye 2 bushels and ryegrass 20 pounds per acre; or, tall fescue 30 pounds and ryegrass 20 pounds per acre.

d. Lime will not be required for temporary seeding.

e. Fertilize at the rate of 400 pounds per acre of 10-10-10 fertilizer, or equivalent, broadcast uniformly on the area to be seeded.

f. All seed shall be broadcast evenly over the area to be seeded and cultivated or otherwise pressed into the soil. Seed and fertilizer may be mixed together and applied after the seed bed has been prepared.

g. Mulch for temporary seeding will not be required except on those areas, in the ENGINEER'S opinion, too steep to hold the seed without protective cover.

B. Seeding (Permanent Cover)

1. This item consists of seeding all areas disturbed during construction. All grading and/or filling of rills and gullies to a cross section acceptable to the ENGINEER shall be included in the seed bed preparation.

a. Pastures and Cover Crops

(1) All areas to be seeded shall be seeded with 50 pounds of tall fescue (KY-31) per acre, subject to the provisions hereinafter stated in this Specification group.

(2) Prepare seed bed as specified in Article 3.02 of this Specification Section unless instructed otherwise by the ENGINEER. Apply 2 tons of lime per acre.

(3) No mulch will be required except when seeding is done during the period October 16 through January 31, or May 2 through July 31, tall fescue straw shall be used at the rate of 2 tons per acre.

b. Lawns and Yards

(1) This item consists of seeding all areas equivalent to residence lawns or yards disturbed during construction. All grading and filling shall be accomplished in a manner acceptable to the ENGINEER prior to the placement of seed and materials. Seed shall consist of a mixture of one part Red Top and 3 parts high grade Kentucky Bluegrass seed mixed together and broadcast at the rate of 2 lbs. to each 1,000 square feet of surface, to be seeded. Apply 2 tons of lime per acre. Apply 1500 pounds of 10-20-20 fertilizer per acre. Apply mulch at the rate of 2 tons per acre. Mulch shall be applied to all lawn areas regardless of the time seeded.

3.05 MULCHING

A. Mulch materials, meeting the requirements of Part 2 of this Specification Section, shall be applied at the rate of 2 tons per acre.

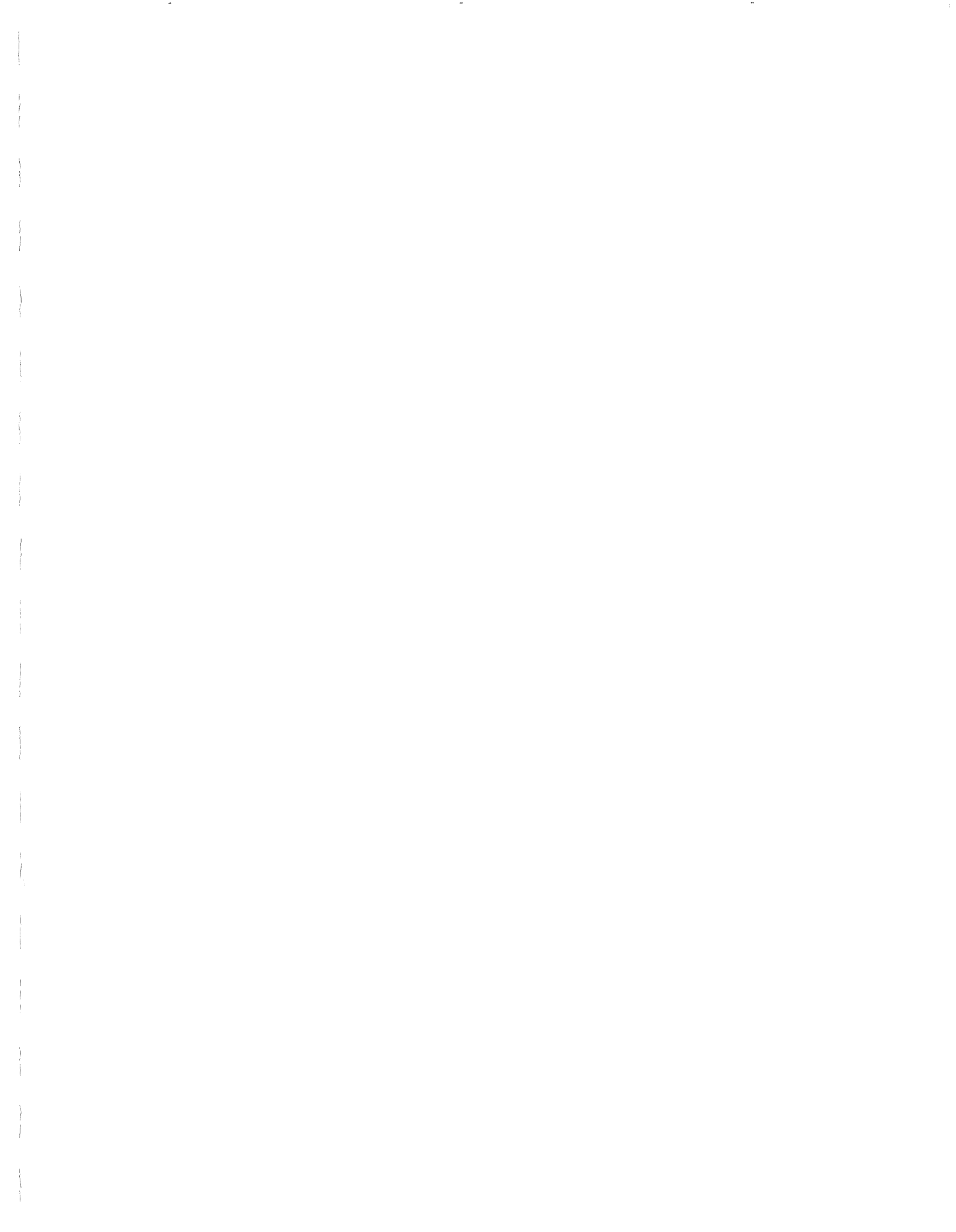
B. The mulch shall be stabilized by running a "weighted" disk harrow with disks set straight, over the area on the contour, after the mulch has been applied, so as to embed or press a part of the straw into the soil sufficiently to hold it in place. On earth embankments or areas too steep for use of mechanized equipment, the mulch shall be held in place by using small stakes and twine or other method acceptable to the ENGINEER. The blown-on bituminous-treated straw mulch method of placing the mulch, as specified in Section 212.06.03, Method 2 of the Standard Specifications for Road and Bridge Construction of the Kentucky Transportation Cabinet Department of Highways, will be an acceptable placing method.

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END OF SECTION

C. Mesh, netting or other special protective cover shall be at locations as shown on the Drawings and shall be installed according to the manufacturer's recommendations.

519-08-04 (10/08)



SECTION 03301

CAST-IN PLACE CONCRETE
(MINOR STRUCTURES)

PART 1 GENERAL

1.01 SUMMARY

A. This specification delineates the requirements for cast-in place concrete for minor structures including concrete kickers for pipe blocking, sidewalks, collars, manholes, manhole bottoms, pipe cradles, piers and other areas where small quantities of concrete are required. It shall not be used for major structures such as floor slabs, structure or basin walls, roof slabs, or other structural components.

1.02 SCOPE OF WORK

A. Provide all labor, material, equipment and services to complete all cast-in-place concrete work required by the Project as shown on the Drawings or specified herein.

1.03 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- ASTM A 185 Specification for Steel, Welded Wire, Fabric, Plain, for Concrete Reinforcement
- ASTM A 497 Specification for Welded Deformed Steel Wire Fabric for Concrete Reinforcement
- ASTM A 615/A615M Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
- ASTM A 616/A616M Specification for Rail-Steel Deformed and Plain Bars for Concrete Reinforcement
- ASTM A 617/A617M Specification for Axle-Steel Deformed and Plain End Bars for Concrete Reinforcement
- ASTM A 706/A706M Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement
- ASTM C 33 Specification for Concrete Aggregates

ASTM C 150 Specification for Portland Cement

ASTM C 260 Specification for Air-Entraining Admixtures for Concrete

ASTM C 494 Specification for Chemical Admixtures for Concrete

1.04 SUBMITTALS

A. Copies of all materials required to establish compliance with these Specifications shall be submitted in accordance with the provisions of the General Conditions.

1.05 QUALITY ASSURANCE

A. All work shall be performed to secure for the entire job homogeneous concrete having required strength, durability and weathering resistance, without planes of weakness and other structural defects and free of pronounced honeycombs, air pockets, voids, projections, offsets of plane and other defacements on exposed surfaces.

1.06 DELIVERY, STORAGE AND HANDLING

A. Do not deliver ready-mixed concrete to job site until ready for placement.
B. All materials used for on-site mixed concrete shall be kept clean and free from all foreign matter during transportation and handling and kept separate until measured and placed in the mixer.
C. Store concrete aggregates to prevent contamination or segregation. Store reinforcement of different sizes and shapes in separate piles or racks raised above the ground to avoid excessive rusting.
D. Protect from contaminants such as grease, oil and dirt. Provide for accurate identification after bundles have been broken and tags removed.

1.07 PROJECT/SITE CONDITIONS

A. Cold Weather
Provide and maintain 50 degrees F minimum concrete temperature. Do not place concrete when ambient temperature is below 40 degrees F. Cover concrete and provide with a source of heat sufficient to maintain 50 degrees F minimum while curing.
B. Hot Weather

A. Concrete temperature from initial mixing through final cure shall not exceed 90 degrees Fahrenheit. Cool ingredients before mixing, or substitute chip ice for part of required mixing water or use other suitable means to control concrete temperature to prevent rapid drying of newly

placed concrete. Shade the fresh concrete and start curing as soon as the surface is sufficiently hard to permit curing without damage.

PART 2 PRODUCTS

2.01 CONCRETE

A. Mix Design

The concrete mix shall conform to the requirements of the following table according to the class of concrete required. The number in the "Class" column refers to the 28-day compressive strength of the concrete in pounds per square inch (psi).

Class	Minimum Cement Content (lbs./Cu. Yd.)	*Maximum Slump (inches)
3000	470	3 to 4
3500	520	3 to 4
4000	550	3 to 4

* Maximum slump unless high range water reducing admixture is used.

B. Area of Application

1. Unless otherwise noted on the Drawings, concrete mixes shall be used as follows:

Class 3000 - kickers for pipe, fittings
 Class 3500 - non-reinforced portions of manholes, pipe cradles
 Class 4000 - reinforced portions of manholes, sidewalks, piers

2.02 MATERIALS

A. Cement

1. Portland cement for concrete and mortar shall conform to ASTM C 150, Type I or II.

B. Water

1. Water shall be potable.

C. Aggregates

1. Aggregates shall conform to ASTM C 33. Obtain aggregates from one source. Aggregates shall not contain any substance which may be deleteriously reactive with the alkalies in the cement.

D. Admixtures

- 1. Admixtures for air-entrained concrete shall conform to ASTM C 260, for water reducing (Type A, D or E) accelerating (Type C) and retarding (Type B or D) ASTM C 494. Calcium chloride shall not be used as an admixture. Admixtures shall not be used without prior written approval of the ENGINEER.

E. Reinforcement

- 1. Reinforcing Bars
 - Reinforcing bars shall conform to ASTM A 615/A615M Grade 60, ASTM A 616/A616M Grade 60, ASTM A 617/A617M Grade 60 or ASTM A 706/A706M Grade 60 as applicable.
 - 2. Welded Wire Fabric
 - Welded wire fabric shall conform to ASTM A 497 or ASTM A 185.

PART 3 EXECUTION

3.01 FORMS

- A. Forms shall be used to confine concrete and shape it to the required dimensions. Set forms true to line and grade and make mortar tight. Chamfer above grade exposed joints, edges and external corners 3/4 inch, unless otherwise indicated. Earth cuts may be used as forms for footing vertical surfaces, if sides are sharp and true, and not exposed in finished structure.

3.02 PLACING REINFORCEMENT AND MISCELLANEOUS MATERIALS

- A. Provide bars, wire fabric and other reinforcing materials, including wire ties, supports and other devices necessary to install and secure the reinforcement.

3.03 CONTROL AND CONSTRUCTION JOINTS

- A. For sidewalks, provide control joints spaced at an interval equal to the width of the sidewalk, the minimum spacing of 5 feet. Cut joints 1 inch deep with a jointing tool after the surface has been finished. Provide 0.5 inch thick transverse expansion joints at changes in direction, where sidewalk abuts curb, steps, rigid pavement or other similar structures; space joints not more than 40 feet apart. Limit variation in cross section to 1/4 inch in 5 feet.

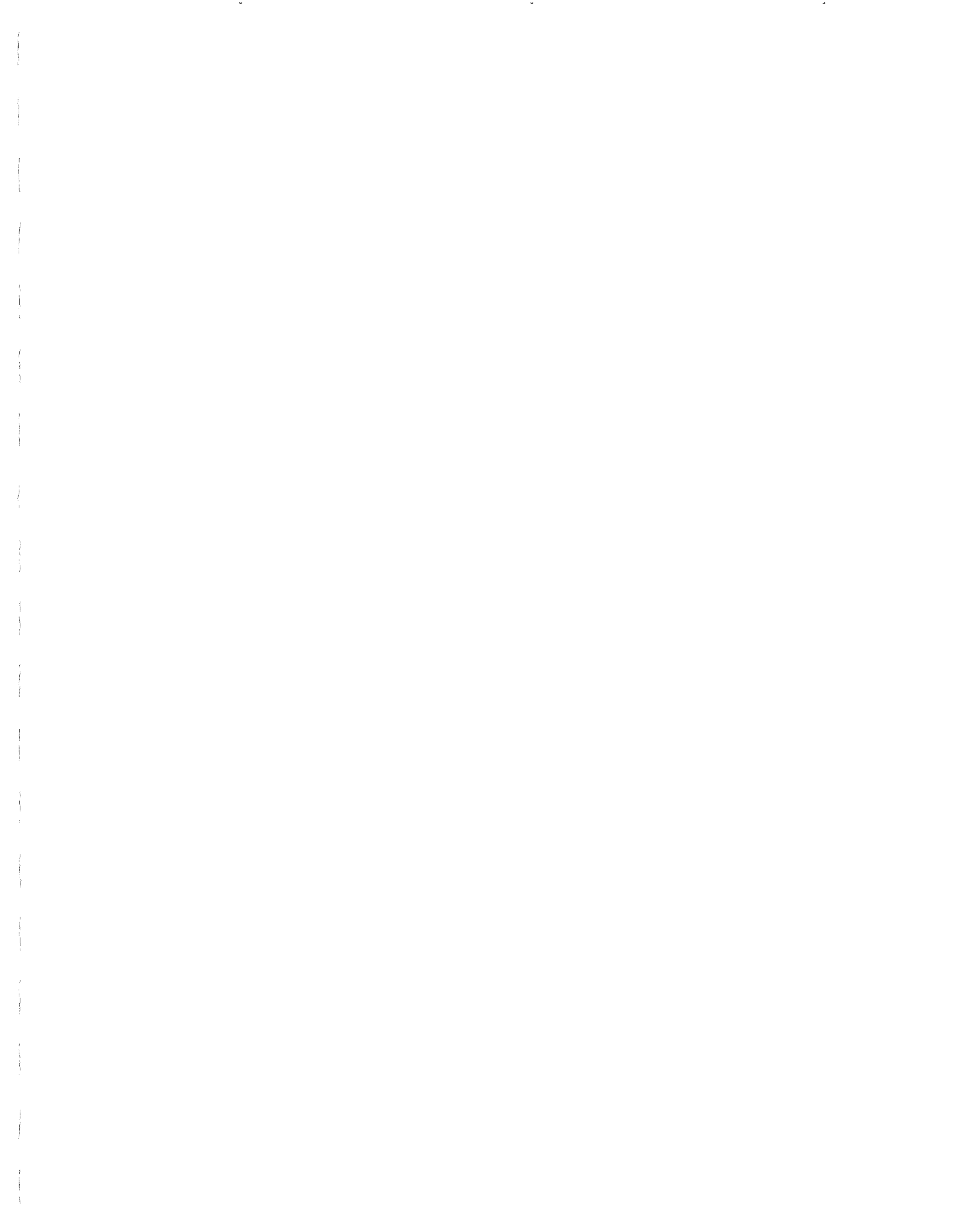
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END OF SECTION

A. Protect concrete from injurious action by sun, wind, rain, flowing water or mechanical injury. Do not allow concrete to dry out from time of placement until the expiration of the curing period. Forms may be removed 48 hours after concrete placement.

3.04 CURING AND PROTECTION

519-08-04 (10/08)



SECTION 05540

CASTINGS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Provide all labor, materials, and equipment required to install castings as shown on the Drawings and specified herein. Included in this section are manhole covers, steps, valve boxes, and hatch covers.

1.02 RELATED WORK NOT INCLUDED

A. Concrete work is included in Section 03301.

1.03 SUBMITTALS

A. The CONTRACTOR shall submit to the ENGINEER, in accordance with Division 1, Section 01300, copies of construction details of castings proposed for use.

PART 2 MATERIALS

2.01 GENERAL

A. All castings shall be gray iron, conforming to the requirements of the ASTM Standards, Designation A 48-83, Class 35-B for manhole casting and class 20 for valve boxes.

2.02 VALVE BOXES

A. Slide Type for Iron Body Gate Valves

1. Valve boxes for sizes thru 8-inch valves shall be the cast iron slide type, without screw, of sufficient length to allow for 30 inches of cover over the top of the pipe. The inner section shall have a minimum inside diameter of 5-1/4 inches with a hood type base that will cover the packing gland on valves through 8 inches in size (minimum of 8 inches inside diameter). The base of the top section shall be flanged at least 1-1/4 inches. The caps shall be circular with a corrugated surface and have pick holes in the periphery and be marked "Water." The valve boxes shall be Tyler Pipe/Utilities Division, 6855 Series, or equal.

2. Valve boxes for valves in the horizontal position shall be cast iron Tyler Pipe/Series 6855 or equal, with a base that is sized to allow covering of the bevel gear case and centering of the operating nut in the valve box.

PART 3 EXECUTION

3.01 INSTALLATION OF CASTINGS

A. Installation In or On Structures

- 1. The installation of castings is generally covered under specifications for pipe work and manholes. Castings shall be leveled, plumbed and secured before pouring concrete or attaching to masonry with solid, watertight, cement mortar joints.

B. Installation on Buried Valves

- 1. Valve box construction shall consist of the approved manufactured box and accessories. Line pipe shall not be accepted for use as valve boxes.
- 2. Mechanically tamp backfill, or backfill with crushed rock (per requirements of location - see Section 02610 of these Specifications) to the bottom of the packing gland of the operating nut. Install valve box base centered over operating nut.
- 3. Install valve box shafts, of the required height, and top section to proposed top elevation. Mechanically tamp backfill around box or backfill with crushed rock.
- 4. Place reinforced concrete collar around top section when shown on the Drawings.
- 5. Furnishing and installation of the valve box and accessories, including the concrete valve box collar, shall be included in the price bid for furnishing and installation of the valve.

END OF SECTION

SECTION 15100

SMALL PLUMBING VALVES, PLUMBING SPECIALTIES
AND SERVICE ACCESSORIES

PART 1 GENERAL

1.01 WORK INCLUDED

A. Furnish all labor, materials, equipment, and incidentals required and install complete and ready for operation all valves and appurtenances as shown on the Drawings and as specified herein.

1.02 RELATED WORK

A. Large Plumbing Valves and Appurtenances are included in this Division, Section 15102.

B. Excavation, Backfill and Grading are included in Division 2.

1.03 SYSTEM DESCRIPTION

A. All of the equipment and materials specified herein is intended to be standard for use in controlling the flow of water.

1.04 QUALITY ASSURANCE

A. All of the types of valves and appurtenances shall be products of well established firms who are fully experienced, reputable and qualified in the manufacture of the particular equipment to be furnished. All materials of construction shall be of an acceptable type and shall be designated for the pressure and temperatures at which they are to be operated, for the materials they are to handle and for the use for which they are intended. The materials shall meet established technical standards of quality and strength necessary to assure safe installations and conform to applicable standards. The equipment shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with these Specifications as applicable.

1.05 REFERENCES

A. Kentucky Building Code.
B. Kentucky State Plumbing Law, Regulations and Code.

1.06 SUBMITTALS

A. Copies of all materials required to establish compliance with these Specifications shall be submitted in accordance with the provisions of the General Conditions. Submittals shall include at least the following:

- 1. Certified drawings showing all important details of construction and dimensions.
- 2. Descriptive literature, bulletins, and/or catalogs of the equipment.

1.07 OPERATING INSTRUCTIONS

- A. Operating and maintenance instructions shall be furnished to the ENGINEER as required in the General Conditions. The instructions shall be prepared specifically for this installation and shall include all required cuts, drawings, equipment lists, descriptions, etc., that are required to instruct operating and maintenance personnel unfamiliar with such equipment.

PART 2 PRODUCTS

2.01 GENERAL

- A. All valves and appurtenances shall be of the size shown on the Drawings and as far as possible all equipment of the same type shall be from one manufacturer.
- B. All valves and appurtenances shall have the name of the maker, flow directional arrows, and the working pressure for which they are designed cast in raised letters upon some appropriate part of the body.
- C. All buried valves shall open left (counterclockwise). Insofar as possible, all valves shall open counterclockwise.

2.02 GATE VALVES

- A. Gate valves shall be used in shut-off applications and where the valves are scheduled for infrequent use.

1. Gate Valves for Water

- a. Gate valves shall be for 250 pound water working pressure, 2-1/2 inches and 3 inches for air release. Valves 3 inches and smaller shall be standard brass construction, rising stem, double disc, parallel seat, with handwheel where exposed or key operator when in the ground. The valves shall be Crane No. 440, Jenkins 62U, or equal.
- b. In copper solder joint piping, Chase Style 1334 or equal, gate valves are preferred with solder joint connections.

2.03 MISCELLANEOUS COCKS

A. Air Release Cocks

1. Air release cocks shall be for 125 pound pressure, 1/2 inch, bronze plug and body, with handle operator. Air cocks shall be Crane No. 256 Tee Head, Lunkenheimer No. 1571, or equal.

B. Gauge Cocks

1. Gauge cocks for water service shall be 316 stainless steel construction rated for safe operation at 10,000 psi at 100 degrees Fahrenheit. The valve shall be nitrogen tested for seat leakage, maximum allowable leak rate 0.1 scc./min.

2. Gauge cocks shall be Whitey Co. "BV" series bleed valves or equal.

2.04 MISCELLANEOUS STOPS

A. Corporation Stops

1. Corporation stop shall be a Mueller 300 Ballcorporation valve, or approved equal, rated to 300 psi with CTS compression fittings.

B. Curb Stops

1. Curb stops to be used with threaded pipe shall be brass inverted key round way with female threaded iron pipe connections for threaded iron pipe. Curb stops shall be Ford FB-1000, or approved equal.
2. Curb stops to be used with copper pipe, with threaded type connections, shall be Ford FB-1000, or approved equal.
3. Curb stops to be used with plastic pipe shall be brass, inverted key, round way with compression connections and rigid liner as recommended by curb stop manufacturer. Curb stops to be used with plastic pipe shall be Muller H/5/59 or equal.
4. The CONTRACTOR shall furnish 2 tee wrenches, 4 feet long, for operation of curb stops.

C. Service Clamps

1. Taps for services on PVC water main shall be made with the use of service clamps. Clamps shall be bronze construction with O-ring seal, 2 sections for water mains through 8 inches in diameter and 3 sections for water mains larger than 8 inches in diameter. Service clamps shall have Mueller thread. Clamps shall be Mueller brass 13000 Series for iron pipe size PVC pipe, or approved equal.

D. Curb Stop Boxes

1. Curb stop boxes shall be cast iron, extension type, arch pattern, Mueller H-10316, or equal.

2.05 WATER SERVICE ACCESSORIES

A. Meter Setters

1. Meter setter shall be ball type with angle ball valve inlet and angle dual check valve outlet rated to 300 psi with CTS compression fittings. Setter shall be Mueller Company B-2404, or approved equal.

2. A tandem coppersetter shall be provided when an individual pressure regulator is required, and shall include a check valve, cut off valve, and saddlenuts. The tandem coppersetter shall be Mueller Company, or approved equal.

3. Individual residential pressure regulators shall be Wilkins 600 Series, or approved equal, with bronze body and stem and stainless steel strainer, and pressure rated to 300 psi. Pressure regulators shall be provided at service meter settings where working pressure of line is in excess of 80 psi.

4. Service lines shall be polyethylene tubing, meeting ASTM 3408, SDR 9, and shall be approved for 200 psi pressure or copper as indicated on the plans. Polyethylene tubing shall be of an IPS size from meter toward service connection. Tubing from water main to meter shall be CTS size. Copper pipe shall meet requirements of ASTM B-88 for Type "K" copper, hard drawn for below ground.

B. Water Meters

1. The OWNER has standardized on one particular make and model of water meter and desires that the meters furnished under this project be that standard. Service meters shall conform to AWWA C700, latest revision. Meters shall be 5/8-inch, magnetic-drive, hermetically sealed register, Sensus SR-11 water meters equipped with "Touch-Read" system, or approved equal. Meters shall be provided with an internal strainer made of corrosion-resistant material. Main cases of meters shall be bronze with the measuring chamber constructed of corrosion-resistant material.

Meters shall be of a 5/8-inch by 3/4-inch size. Meters shall be guaranteed to operate under working pressures of 150 psi without leakage or damage to any part.

C. Meter and Valve Box

1. Meter box shall be Extrusion Technologies 24-inch inside diameter cast iron lid, equal to Russell Pipe and Foundry Co., Inc., single flat lid cover, 24-inch I.D., or approved equal, equipped with touchread technology and trace wire.

PART 3 EXECUTION

3.01 INSTALLATION

A. All valves and appurtenances shall be installed in the locations shown, true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the ENGINEER before they are installed.

B. Control valves in all locations shall be so grouped and located that they may be easily operated, through access panels, doors, or adjacent to equipment.

C. After installation, all valves and appurtenances shall be tested at least one hour at the working pressure corresponding to the class of pipe, unless a different test pressure is specified. If any joint proves to be defective, it shall be repaired to the satisfaction of the ENGINEER.

D. All materials shall be carefully inspected for defects in workmanship and materials; all debris and foreign material cleaned out of valve openings, etc.; all operating mechanisms operated to check their proper functioning, and all nuts and bolts checked for tightness. Valves and other equipment which do not operate easily, or are otherwise defective, shall be repaired or replaced at no additional cost to the OWNER.

E. Flush hydrants shall be set at the locations as shown on the Drawings and bedded on a firm foundation. A drainage pit as detailed on the Drawings shall be filled with screened gravel and satisfactorily compacted.

F. During backfilling, additional screened gravel shall be brought up around and 6 inches over the drain port. Each hydrant shall be set in true vertical alignment and properly braced. Concrete thrust blocks shall be placed between the back of the hydrant inlet and undisturbed soil at the end of the trench. Minimum bearing area shall be as shown on the Drawings. Felt roofing paper shall be placed around hydrant elbow before placing concrete. CARE SHALL BE TAKEN TO INSURE THAT CONCRETE DOES NOT PLUG THE DRAIN PORTS.

G. If directed, the hydrant shall be tied to the pipe with suitable rods or clamps, galvanized, painted, or otherwise rustproof treated. Concrete used for backing shall be no leaner than 1 part cement, 2-1/2 parts sand, and 5-1/2 parts stone. Hydrant paint shall be touched up as required after installation.

- H. Buried flanged or mechanical joints shall be made with cadmium plated bolts. All exposed bolts and nuts shall be cadmium plated. All exposed bolts and nuts shall be heavily coated with 2 coats of bituminous paint.
- J. Buried valves and valve boxes shall be set with the stem vertically aligned in the center of the gate box. Valves shall be set on a firm foundation and supported by tamping selected excavated material under the sides of the valve. The valve box shall be supported during backfilling and maintained in vertical alignment with the top flush with finish grade.

3.02 SHOP PAINTING

- A. Interior surfaces of all valves, the exterior surfaces of buried valves and miscellaneous piping appurtenances shall be given a shop finish of an asphalt varnish conforming to Federal Specification TT-V51 e for Varnish Asphalt.

3.03 INSPECTION AND TESTING

- A. The various pipelines in which the valves and appurtenances are to be installed are specified to be field tested. During these tests any defective valve or appurtenance shall be adjusted, removed and replaced, or otherwise made acceptable to the ENGINEER.

- B. Various regulating valves, strainer, or other appurtenances shall be tested to demonstrate their conformance with the specified operational capabilities and any deficiencies shall be corrected or the device replaced or otherwise made acceptable to the ENGINEER.

END OF SECTION

SECTION 15102

VALVES (WATER RELATED)

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment, and incidentals required and install complete and ready for operation all valves and appurtenances as shown on the Contract Drawings and specified herein.

B. The equipment shall include but not be limited to, the following:

1. Butterfly valves
2. Gate valves
3. Blow-off hydrants/flush hydrants

1.02 RELATED WORK

A. Excavation, backfill and grading is included in Division 2.

B. Piping is included in the respective sections of Division 2.

C. Valves and service accessories on all plumbing systems are included in Division 15.

D. Special sequence or schedule requirements (if any) are specified in Section 01010 - Summary of Work.

1.03 DESCRIPTIONS OF SYSTEMS

A. All of the equipment and materials specified herein is intended to be standard for use in controlling the flow of water.

1.04 QUALIFICATIONS

A. All of the types of valves and appurtenances shall be products of well established firms who are fully experienced, reputable and qualified in the manufacture of the particular equipment to be furnished. The equipment shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with these specifications as applicable.

B. Acceptable Manufacturers

1. Butterfly Valves - Pratt, M&H, DeZurik, or equal.
2. Gate Valves - Kennedy, Clow, Mueller or equal.
3. Check Valves - Clow, Golden Anderson, APCO-Valve and Primer Corp., or equal.
4. Air Release - APCO-Valve and Primer Corp., Golden Anderson, or equal.

1.05 SUBMITTALS

A. Complete shop drawings of all valves and appurtenances shall be submitted to the ENGINEER in accordance with the requirements of Sections 00820 and 01300.

B. The ENGINEER shall be furnished 2 certified copies of reports covering the required leakages, hydrostatic and proof-of-design tests on the valves.

C. Gate Valves

1. The manufacturer shall furnish the ENGINEER 2 copies of an affidavit stating that the valve and all materials used in its construction conform to the applicable requirements of ANSI/AWWA C509-87, and that all tests specified therein have been performed and that all test requirements have been met.

2. The ENGINEER shall be furnished 2 copies of affidavit that the "Valve Protection Testing" has been done and that all test requirements have been met.

3. The ENGINEER shall be furnished with 2 copies of affidavit that inspection, testing and rejection are in accordance with AWWA C509-87 Section 6.1 through Section 6.2.

D. Air Release Valves

1. The manufacturer shall furnish the ENGINEER 2 copies of written certification that the valves have been tested hydrostatically and tested for proper performance, and that materials of construction conform to the appropriate ASTM specifications.

1.06 OPERATING INSTRUCTIONS

A. Manufacturer's operating and maintenance instructions shall be furnished to the ENGINEER as set forth in Section 01600.

1.07 TOOLS

A. Special tools, if required for operation and maintenance, shall be supplied with the equipment.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. General

1. All valves and appurtenances shall be of the size shown on the Drawings and as far as possible all equipment of the same type shall be from one manufacturer.

2. All valves and appurtenances shall have the name of the maker, flow-directional arrows, and the working pressure for which they are designed cast in raised letters on some appropriate part of the body.

3. All valves must be provided with suitable operating devices and adapted for operation in the position in which they are shown on the Drawings.

4. All buried valves shall open by turning counterclockwise.

5. Valves shall have types of operators as shown on the Drawings.

6. All bolts and studs shall be in accordance with ASTM A-307 Grade B and nuts shall be in accordance with ASTM A-563. Bolts, studs and nuts shall be electrogalvanized according to ASTM B-633.

7. All bolts delivered to the job shall be free of rust and dirt and shall be stored in a manner to protect them from rust and dirt. All bolts shall be tightened to the proper torque. They shall be of the size recommended for the pipe and fittings they are to be used on and shall be in the recommended quantity. Tightening of bolts shall be alternated, so as to not produce undue stress on the valves and fittings.

2.02 GATE VALVES

A. Resilient-Seated Gate Valve (AWWA Type)

1. General

a. Resilient-seated gate valves shall conform in all respects to ANSI/AWWA C509-87 with non-rising or rising stems, in sizes 3, 4, 6, 8, 10, and 12 inch NPS except as otherwise noted below. They shall be designed for a working water pressure of 250 psi.

b. Valves shall have a clear unobstructed water way, without pockets or ridges in the seating area of the valve body. When fully open the water way shall be at least as large as the pipe diameter to which it is connected.

c. All future references to section and paragraph numbers shall be those of ANSI/AWWA C509-87.

2. Materials
 - a. Physical and Chemical Properties
 - (1) Physical and chemical characteristics of the valve components shall be in accordance with Section 2.2, except that carbon steel castings for valves are not acceptable. Paint shall be as hereinafter specified under "Valve Protection."
 3. Detailed Design
 - a. Valve Ends
 - (1) General
 - (a) Valve ends shall be flanged, mechanical joint, PVC or rubber ring slip-on type as shown on the Drawings.
 - (b) In resilient seated tapping valves, end connections may be a combination of flanged and mechanical joint.
 - b. Stem Seal
 - (1) Stem seals shall be O-rings in accordance with Section 4.8, paragraph 4.8.2 and subparagraph 4.8.2.1, and materials shall be in accordance with paragraph 4.8.3.
 - c. Wrench Nuts and Handwheels
 - (1) Wrench nuts and handwheels shall be in accordance with Section 4.10 and subparagraphs 4.10.1 through 4.10.5, except that all valves whether NRS or O S & Y shall open by turning counterclockwise.
 - d. Gaskets
 - (1) Gaskets where used shall be in accordance with Section 4.11. O-rings shall be of Buna-N or equal material.
 - e. Valve Seats
 - (1) Valve seats shall be in accordance with Section 4.12, except that seats applied to the valve body are not acceptable.

f. Seat Reinforcement

- (1) Seat reinforcement where used shall be in accordance with Section 4.13, except that exposed mechanical devices and hardware used shall be bronze and/or stainless steel.

4. Fabrication

a. Valve Protection (Painting and Coating)

- (1) Exterior
 - (a) Exterior painting of the valve may be in accordance with section 2.2.7.1, or it may be the same as that specified for interior painting of the valves.

(2) Interior

- (a) The interior of the valve shall be prepared for and painted in accordance with AWWA C550-90. The coating may be a fusion bonded epoxy, in 8 to 10 mil thickness or it may be a two-part thermosetting epoxy having the same mil thickness. After application the interior coating shall be visually examined and holiday tested in accordance with AWWA C550-90.

5. Valve Extension Stems

- a. All extension stems shall be connected by bolted couplings for connection to and removal from the valves and stands. Nuts and bolts in connections shall be stainless steel. All extension stem connecting pins shall be stainless steel.

2.03 FLUSHING HYDRANTS

A. General

- 1. This standard covers post-type dry barrel hydrants with compression type valves, operating against pressure. They shall meet all requirements of ANSI/AWWA Specification C502-85. Each hydrant to have brass tag and chain to read/stamped "For Flushing Purposes."

- 2. They shall have two 2 1/2 inch hose connection nozzles and one 4 1/2 inch steamer connection nozzle, all with caps and drains and have national standard threads. Provide minimum of 2 each hydrant wrenches.

- 3. Main valve opening size shall be 5 1/4 inch which must remain closed when the above ground breakable safety section of the hydrant barrel is broken off.

4. All hydrants shall have 6 inch mechanical joint bell connection designed for 200 pounds working water pressure, in accordance with ANSI/AWWA C110/A21.10. Joint accessories are to be furnished with the connecting pipe.

5. Finish paint color of the hydrant barrel above ground line shall be selected by the OWNER.

6. All hydrants shall have an automatic drain feature providing positive barrel drainage after hydrant use.

7. The lowest outlet level of the hydrant shall be located sufficiently above the indicated ground level to permit a 360° swing of a 15 inch hydrant wrench. One standard hydrant wrench is to be provided. All hydrants shall open by turning counterclockwise.

8. Where the OWNER has standardized on one particular make and model flushing hydrant and desires that the hydrants furnished under this project be such standard, that make and model hydrant, namely American Darling Model WB-67-250 or equal, will govern.

9. All further reference to section and paragraph numbers shall be those of ANSI/AWWA C502-85.

B. Affidavit of Compliance

1. The manufacturer shall furnish the OWNER, through the ENGINEER, 3 copies of an affidavit in accordance with Section 1, paragraph 1.7.

C. Materials

1. All materials used in the production of dry-barrel fire hydrants shall conform to the referenced standards for each material as set forth in Section 2 - Materials, paragraphs 2.2.1 through 2.2.5 and subparagraphs 2.2.5.1 and 2.2.5.2.

D. General Design and Detailed Design

1. General Design
 a. General design of hydrants shall be in accordance with Section 3, paragraph 3.1 and subparagraphs 3.1.1 and 3.1.2.

2. Detailed Design

a. Valves
 (1) Valves shall be in accordance with Section 3, paragraph 3.2.1 and subparagraphs 3.2.1.1 and 3.2.1.2.

- b. Valve Facings
 - (1) Valve facings shall be in accordance with Section 3, paragraph 3.2.2.
- c. Valve Seats
 - (1) Valve seats shall be in accordance with Section 3, paragraph 3.2.3.
- d. Size
 - (1) Hydrant size shall be in accordance with Section 3, paragraph 3.2.4, except that main valve opening diameter may not be less than 5 1/4 inches.
- e. Bury-length and Trench Depth
 - (1) Unless otherwise noted, depth of hydrant will be 3'-6". In the event that a hydrant is installed at a location requiring greater than the "standard bury" depth, the CONTRACTOR will be required to provide the riser sections required at no additional cost to the OWNER.
- f. Barrel Sections
 - (1) Hydrant barrel sections shall be in accordance with Section 3, paragraph 3.2.6 and subparagraphs 3.2.6.1 and 3.2.6.2 except that the flange or other joint at 2 inches above the ground line shall be a breakable joint.
- g. Hydrant Top
 - (1) Hydrant tops shall be in accordance with Section 3, paragraph 3.2.7.
- h. Outlet Nozzles
 - (1) Hydrant outlet nozzles shall be in accordance with Section 3, paragraph 3.2.8 and subparagraph 3.2.8.1 and 3.2.8.2 except that leading shall not be used in fastening nozzles to the hydrant barrel.
- i. Operating Stem and Mechanism
 - (1) The hydrant operating mechanism shall be in accordance with Section 3, subparagraphs 3.2.9.1 through 3.2.9.7.

- j. Drain Outlet
 - (1) An automatic drain outlet shall be provided. The outlet shall be located in the base or barrel or between the base and barrel. Tapping of the outlet is not required. Other features of the drain outlet shall be in accordance with Section 3, subparagraphs 3.2.10.1 and 3.2.10.2.
- k. Drain Valve Mechanism
 - (1) The hydrant drain valve shall be in accordance with Section 3, paragraph 3.2.11.
- l. O-ring Seals
 - (1) A seal that uses O-rings shall be used. O-rings and their ring grooves shall be in accordance with Section 3, subparagraphs 3.2.12.1 and 3.2.12.2.
- m. Gaskets
 - (1) Gaskets shall be in accordance with Section 3, paragraph 3.2.14.
- n. Bolts and Nuts
 - (1) With the exception of flange bolts at breakable hydrant barrel section, all bolts and nuts shall be of corrosion resistant material, in accordance with Section 3, paragraph 3.2.17. Breakable section bolts may be of steel.
- o. Hydrant Inlet
 - (1) The base of the hydrant shall have a side inlet provided with a hub end for mechanical joint connection provided with strapping lugs for strapping hydrant to water main to prevent separation of the hydrant and hydrant branch from the main line, or the hub end may be plain mechanical joint, provided locked type pipe joints are used between the hydrant and water main. Refer to Section 02610 of these Specifications for optional methods of restraint for flushing hydrants.

E. Workmanship and Painting

- 1. Workmanship shall be in accordance with Section 4, paragraph 4.1 and subparagraph 4.1.1 through 4.1.3.

- 2. Painting shall be in accordance with Section 4, paragraph 4.2 and subparagraphs 4.2.1 through 4.2.3.

F. Inspection, Testing and Rejection

1. Testing shall be in accordance with Section 5, paragraph 5.1 and sub-paragraphs 5.1.1 through 5.1.2. The ENGINEER shall be furnished 2 copies of all tests.
 2. Inspection and rejection shall be in accordance with Section 5, paragraph 5.3, with 2 copies of affidavit being supplied the ENGINEER.
- G. Marking and Shipping
1. Marking and shipping shall be in accordance with Section 6, paragraphs 6.1 and 6.2, except that hydrants having a depth of bury greater than the standard 3'-6", shall be given a tag number which corresponds to the hydrants plant location number. Tags, if required, shall be of durable materials and markings.

PART 3 EXECUTION

3.01 INSTALLATION

A. Exterior

1. Valves in ground shall be installed with operating stems vertical, unless otherwise shown on the Drawings or called for in these Specifications. Tops of operating nuts shall be not more than 30 inches below ground surface. Where valve operating nuts are more than 30 inches below tops of valve boxes, stems shall be provided to bring the operating nut to within 12 to 24 inches of box tops.
 2. Valve boxes shall be accurately centered over valve operating nuts and the backfill shall be mechanically tamped about them, to prevent subsequent movement. Tops of boxes shall be flush with ground surface, paving, walk, or road surface.
 3. The cost of the concrete collar, required about valve boxes, shall be included in the unit price for the valve and/or box.
 4. All valves, check valves, and floor boxes, on or in structures, shall be installed as shown on the Drawings.
- B. For butterfly valves, installation shall be in accordance with Appendix B., Sections B.1 through B.5 of ANSI/AWWA C504-87.
- C. For gate valves, installation shall be in accordance with Appendix A, Sections A.5.1 through A.5.7 of ANSI/AWWA C509-87.

3.02 SHOP PAINTING

- A. Interior surfaces of all valves, the exterior surfaces of buried valves and miscellaneous piping appurtenances shall be given a shop finish of an asphalt varnish conforming to Federal Specification TT-V51e for Varnish Asphalt.

- B. The exterior surface of various parts of valves, operators, floorstands and miscellaneous piping shall be thoroughly cleaned of all scale, dirt, grease, or other foreign matter and thereafter 1 shop coat of an approved rust-inhibitive primer applied in accordance with the instructions of the paint manufacturer.

3.03 INSPECTION AND TESTING

- A. The various pipelines in which the valves and appurtenances are to be installed are specified to be field tested. During these tests any defective valve or appurtenance shall be adjusted, removed and replaced, or otherwise made acceptable to the ENGINEER.

- B. Various regulating valves, strainer, or other appurtenances shall be tested to demonstrate their conformance with the specified operational capabilities any deficiencies shall be corrected or the device replaced or otherwise made acceptable to the ENGINEER.

- C. Testing shall be done in accordance with Section 02610 "TESTING" with no visible leaks allowed on valves.

3.04 TOOLS AND SPARE PARTS

- A. "All special tools required for normal operation and maintenance shall be furnished by the valve manufacturer."

3.05 METHOD OF PAYMENT

- A. Payment for the complete system shall be included in the lump sum or unit price bid for the project and shall include the furnishing of materials, equipment and parts and installation of all components to provide a completely functional and operation system.

END OF SECTION

SECTION 15104

SPECIALTY VALVES (WATER)

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment, and incidentals required and install complete and ready for operation all valves and appurtenances as shown on the Contract Drawings and as specified herein.

- B. The equipment shall include but not be limited to, the following:

- 1. Air and vacuum valves.
- 2. Air release valves.
- 3. Pressure reducing valves.

1.02 RELATED WORK

- A. Excavation, backfill and grading is included in Division 2.
- B. Piping is included in the respective sections of Divisions 2 and 15.
- C. Valves and service accessories on all plumbing systems are included in Division 15.

- D. Special sequence or schedule requirements (if any) are specified in Section 01010 - Summary of Work.

1.03 DESCRIPTIONS OF SYSTEMS

- A. All of the equipment and materials specified herein are intended to be standard for use in controlling the flow of water.
- B. See the Drawings for valve sizes, quantities, connections, class, type of actuator and location.

1.04 QUALIFICATIONS

- A. All types of valves and appurtenances shall be products of well established firms who are fully experienced, reputable, and qualified in the manufacture of the particular equipment to be furnished. The equipment shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with these Specifications as applicable.

- B. Acceptable Manufacturers

- 1. Air and Vacuum Valves - Valve and Primer Corp., APCO, Golden Anderson, or equal.

- 2. Air Release Valves - Valve and Primer Corp., APCO, Golden Anderson, or equal.
- 3. Pressure Reducing Valves - APCO, Golden Anderson, or equal.

1.05 SUBMITTALS

- A. Complete shop drawings of all valves and appurtenances shall be submitted to the ENGINEER in accordance with the requirements of Sections 00820 and 01300.

- B. The manufacturer shall furnish to the ENGINEER 2 copies of written certification that the valves have been tested hydrostatically and tested for proper performance, and that the materials of construction conform to the appropriate ASTM specifications. Refer to the Special Conditions for the number of copies of descriptive literature, catalog data sheets, and Drawings to be submitted to the ENGINEER, for review and comment.

1.06 OPERATING INSTRUCTIONS

- A. Manufacturer's operating and maintenance instructions shall be furnished to the ENGINEER as set forth in Section 01600.

1.07 EQUIPMENT OR SYSTEM WARRANTY

- A. Refer to Section 01600 for warranty requirements.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. General

- 1. All valves and appurtenances shall be of the size shown on the Drawings and as far as possible all equipment of the type shall be from one manufacturer.
- 2. All valves and appurtenances shall have the name of the maker, flow-directional arrows, and the working pressure for which they are designed cast in raised letters on some appropriate part of the body.
- 3. All buried valves shall open left (counterclockwise). Insofar as possible, all valves shall open counterclockwise.
- 4. All valves must be provided with suitable operating devices and adapted for operation in the position in which they are shown on the Drawings.

2.02 AIR AND VACUUM VALVES

A. General

1. Air and vacuum valves shall be designed to allow large quantities of air to escape out of the orifice when filling a pipeline and to close watertight when water enters the valve. To break a vacuum, the air and vacuum valve shall also permit large quantities of air to enter through the orifice, when a pump is stopped or the pipeline is being drained. The discharge orifice area shall be equal to or greater than the inlet of the valve. The valve shall consist of a body, cover, baffle, float, seat and where called for, a water diffuser. The baffle will be designed to protect the float from direct contact of the rushing air and water to prevent the float from closing prematurely in the valve. The seat shall be fastened into the valve cover without distortion and shall be easily removable. The float shall be of stainless steel designed to withstand 1,000 psi. The float shall be center guided for positive seating.

2. Air and vacuum valves for installation on pump discharge lines, where the water working pressure is 150 psi or less, in sizes 3 inch and under, shall be provided with water diffuser and throttling devices and have screw connections. In sizes 4 inch and over they shall be provided with surge check units and have flanged connections.

3. Air and vacuum valves for installation on pump discharge lines, where the water working pressure is over 150 psi, in sizes 3 inch and under, shall be provided with diffuser and throttling devices and have screw connections. In sizes 4 inch and over they shall be provided with surge check units and have flanged inlet and outlet connections.

4. Air and vacuum valves on water transmission mains, at change of downward gradient and drastic change in gradient (not peaks), in sizes 2 inch and under, shall have water diffusers and screw connections. In sizes 3 inch and over they shall be provided with surge check units and have flanged inlet connection and protection hoods on outlet.

5. Air and vacuum valves on water transmission mains at peak changes in grade (highest point between adjacent low points) with the auxiliary (small) air release valve meeting requirement of these Specifications for Air Release Valves.

B. Materials of Construction

1. Body, Cover and Baffle

- a. Valve bodies, covers and baffles shall be of cast iron, ASTM A48, Class 30.

2. Float
 - a. Valve floats shall be of stainless steel, ASTM A240.
3. Seat
 - a. Valve seats shall be of Buna-N, nitrile rubber.
4. Bushings, Screws and Float Guides
 - a. Bushings, screws and float guides shall be stainless steel or bronze, with selection being best to avoid galvanic action.
5. Water Diffuser
 - a. Water diffuser shall be bronze.
- C. Throttling Device
 1. Throttling devices shall be of cast iron or malleable iron with screw connections, Valve and Primer Corp., APCO, or equal.
- D. Surge Check Unit
 1. The surge check unit shall be iron body, bronze mounted, Valve and Primer Corp., APCO Bulletin 640, Silent Check Valve, or equal. Surge check units shall have flanged ends.
- E. Flanged Ends
 1. Unless otherwise noted on the Drawings all flanged connections (inlet and outlet) shall be ANSI B1.6.1, 125 pound standard.
- F. Drainage Provision
 1. All valve bodies shall be provided with drain plugs.
- G. Painting
 1. Valves shall receive a heavy coat of red lead TTP86, Type IV, or equal.
- H. Testing
 1. All air and vacuum valves shall be hydrostatically and shop tested for proper performance prior to shipment.

- I. Marking
 - 1. Cast markings shall appear on the valve body showing valve size, manufacturer's name or trade mark, water working pressure and model number.

2.03 AIR RELEASE VALVES (FOR PIPELINES AND PUMPS)

A. General

- 1. Air release valves shall be designed with a small orifice to serve as a venting port wherever air is entrained in water under pressure. They shall be capable of automatic intermittent release of accumulated air in the valve and closing tight when water enters the valve.

- 2. Air release valves for installation (along with air and vacuum valves) on vertical turbine and deep well pumping units, where pump operation is continuous or nearly so, and water working pressure does not exceed 150 psi, shall be simple lever type and have screw connections. If operating water pressure exceeds 150 psi, the valves shall have compound levers and screw connections.

- 3. Air release valves on water transmission mains, regardless of whether they are used in conjunction with air and vacuum valves (as custom combination air release valves) or whether they are used alone on long stretches of transmission main without a summit, shall be compound lever type with screw connections.

B. Material of Construction

- 1. Materials of construction for Air Release Valves shall be the same as specified for Air and Vacuum Valves.

C. Other Features and Requirements

- 1. Drainage and/or blowoff provisions, painting, testing and marking shall be the same as specified for Air and Vacuum Valves.

2.04 PRESSURE REDUCING VALVES

A. General

- 1. The reducing valve shall function to maintain a uniform downstream pressure preadjusted on the control pilot handwheel or adjusting screw. The control pilot shall be capable of field adjustments from near zero psi to 10 percent above the factory preset pressure. See below for valve size.
- 2. The valve shall be completely piped ready for installation.

B. Description-Pilot Controlled Valves

1. All valves shall be pilot-controlled. The main valve shall be hydraulically operated by means of a double-chambered diaphragm actuator. It shall have a wide pattern body, with low head losses and high resistance to cavitation.

a. The main valve shall incorporate 2 pressure chambers, which shall be separated and sealed from each other by means of a flexible diaphragm.

b. The valves shall provide immediate response, accurate control, and smooth drip-tight closure without pressure surge hazards.

c. The main valve shall have a single, removable stainless steel seat and resilient disc. The valve stem shall be guided solely by a central O-ring sealed bearing assembly. All necessary maintenance operations and repairs shall be possible without having to remove the main valve body from the line. The valve shall have no external packing glands or stuffing boxes. The actuator shall lend itself to easy removal from the valve body, as one unit, and to easy lifting by means of a lifting eye. The valve shall have a valve-positioning indicator.

d. The main valve body shall have a bronze "V"-port or equivalent throttling plug, which shall be fitted under the sealing disc, in order to increase the trim travel of the actuator and prevent cavitation. The valve shall have a stem indicator.

2. The valve shall maintain a constant, preset downstream pressure, regardless of fluctuations in upstream pressure or flow rate.

a. The main valve shall be controlled by a pressure reducing pilot valve. The pilot valve shall have adjustable spring load and shall be diaphragm-actuated. The upper chamber shall be normally vented (but shall be able to be fed by a remote source) and the lower chamber shall be open to downstream pressure (if the pilot is direct sensing) or isolated from downstream and fed by an external source (if the pilot is remote sensing).

b. The pilot valve shall be normally open as long as low pressures prevail, and shall start closing whenever the pressure below the diaphragm exceeds the setting of the adjustable spring.

C. Description-Pilotless Fixed Proportion Reducing Valves

1. The valve shall maintain a proportional drop in downstream pressure, regardless of fluctuations in upstream pressure or flow rate.

2. Valve shall be a pilotless pressure-reducing valve, factory pre-designed to a fixed proportion pressure reduction. Valve shall be a wide pattern body with a one-piece unit removable actuator. Valve shall have the capability of field addition of a "V" port throttling plug or equivalent.

D. Materials of Construction

1. The valve body shall be of cast iron ASTM A-126 with flanges conforming to the latest ANSI Standards. The valve shall be extra heavy construction throughout. The valve interior trim shall be bronze B-62 as well as the main valve operation.
2. The valve seats shall be easily renewable while no diaphragm shall be permitted within the main valve body.
3. All controls and piping shall be of non-corrosive construction.

E. Painting

1. After testing, the valve and parts shall be cleaned and all surfaces, except machined surfaces, shall receive 2 coats of manufacturer's standard shop coat paint. Machined surfaces shall receive a coating of water repellent, rust inhibitive compound.

F. Marking

1. Cast marking on valve bodies or covers shall show manufacturer's name or trademark, valve size and figure number.

PART 3 EXECUTION

3.01 INSTALLATION (IN STRUCTURES, VAULTS AND BASINS)

A. Interior

1. All valves and appurtenances shall be installed at the locations shown on the Drawings. All necessary materials, parts, operators and gaskets shall be furnished and installed under this Contract.
2. All valves shall be installed with their operators located in such a plane that it will not interfere with pedestrian traffic.
3. Before being installed, the valves shall be flushed and cleaned of any dirt.
4. Fitting the valves to pipes shall be carried out with due care and accuracy, but without using force. Fitting of valves by tightening bolts forcibly or by any other method that may cause internal stresses in the valve or in the flanges shall not be permitted.

- 5. Only bolts of the correct diameter shall be used. The bolts for each valve shall be of equal length, which shall be such that after the nut is tightened, not less than 1 thread and not more than 3 threads of the bolt shall protrude from the nut. Tightening of the bolts shall be crosswise, gradual and uniform.
- 6. Only one sealing gasket shall be used between each pair of flanges. The gasket shall be of the ring type, i.e. its outer rim shall just touch the bolt holes and their inside diameter shall be equal to that of the corresponding pipe. The gasket material shall be either fabric reinforced rubber or compressed asbestos sheets of a type and make approved by the ENGINEER. All gaskets shall be fabricated by cutting from sheets. Cutting gaskets by hammering on the flange will not be permitted. When being installed, the gaskets shall be absolutely clean. Each gasket shall be used only once.

3.02 SHOP PAINTING

- A. Interior surfaces of all valves, the exterior surfaces of buried valves and miscellaneous piping appurtenances shall be given a shop finish of an asphalt varnish conforming to Federal Specification TT-V51e for Varnish Asphalt.

- B. The exterior surface of various parts of valves, operators, floorstands and miscellaneous piping shall be thoroughly cleaned of all scale, dirt, grease, or other foreign matter and thereafter on shop coat of an approved rust-inhibitive primer applied in accordance with the instructions of the paint manufacturer.

- C. Ferrous surfaces obviously not to be painted shall be given a shop coat of grease or other suitable rust-resistant coating.

3.03 INSPECTION AND TESTING

- A. The various pipelines in which the valves and appurtenances are to be installed are specified to be field tested. During these tests any defective valve or appurtenance shall be adjusted, removed and replaced, or otherwise made acceptable to the ENGINEER.

- B. Various regulating valves, strainer, or other appurtenances shall be tested to demonstrate their conformance with the specified operational capabilities and any deficiencies shall be corrected or the device replaced or otherwise made acceptable to the ENGINEER.

3.04 METHOD OF PAYMENT

- A. Payment for the complete system shall be included in the lump sum or unit price bid for the project, and shall include the furnishing of materials, equipment and parts and installation of all components to provide a completely functional and operational system.

END OF SECTION
