

**ADDENDUM NUMBER THREE
TO
OAK RIDGE FINISHED WATER TRANSMISSION LINE
CITY OF OAK RIDGE, TENNESSEE**

Addendum Number Three (3) is issued the 11th day of August 2022 to all parties who hold a set of Bid Documents for the above-named project. Each Bidder shall acknowledge receipt of this Addendum on the Bid and shall incorporate all changes in the Bid. This addendum consists of five (5) pages and six (6) attachments.

CLARIFICATIONS

1. BABA (Buy American) requirements have been removed from the project (See Addendum No. 3 – MODIFICATIONS – CONTRACT DOCUMENTS). Note that American Iron and Steel (AIS) purchasing requirements remain in the project.

QUESTIONS:

1. **Question:** Sheet 21 of the plans, Key Note 1 specifies the installation of an internal drop connection, see detail. Detail could not be located within the documents provided. Can you please add this detail?
Response: See Addendum No. 3 – MODIFICATIONS - DRAWINGS.
2. **Question:** What are the requirements for the force main pipe and installation? There does not appear to be specifications included for this scope of work within the contract documents for the Oak Ridge Water Transmission Line.
Response: See Addendum No. 3 – MODIFICATIONS - SPECIFICATIONS.
3. **Question:** Is 3rd party compaction testing required?
Response: No, the project does not have a specific requirement for 3rd party compaction testing. Compaction requirements are specified in Section 31 23 23.15 and in other standards. Testing may be required of the Contractor in the case of defective compaction of trench backfill.
4. **Question:** Supplemental Condition SC-7.02.C stipulates that the Contractor is responsible for the cost of any overtime pay or other expenses incurred by the Owner for Engineer’s services. Please provide the rates for these services.
Response: See Addendum No. 3 – MODIFICATIONS – CONTRACT DOCUMENTS.
5. **Question:** Please confirm that pavement restoration of Scarboro Road will completed per detail 3212-212 with 6” aggregate base course, 3 inches of binder mix asphalt, and 2 inches of surface mix asphalt.
Response: See Addendum No. 3 – MODIFICATIONS – SPECIFICATIONS and DRAWINGS.
6. **Question:** I see in the plans there is a detail for “Road Cut Typical Section. We were thinking that might be for Pump House Road and I’m assuming we would do a Mill and full width overlay. When we get onto Scarboro Road, we figured there would be a different paving detail. Will we be paving the entire lane on Scarboro?
Response: See Addendum No. 3 – MODIFICATIONS – SPECIFICATIONS and DRAWINGS.

MODIFICATIONS:

CONTRACT DOCUMENTS

The following contract document modifications are hereby made a part of the above referenced Project Contract Documents:

ADVERTISEMENT FOR BIDS

2nd Paragraph, 2nd Sentence - Change allotted time for construction to 660 calendar days.

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ADD Sections 01 50 00 Temporary Facilities and Controls and 33 05 09.01 Polyvinyl Chloride (PVC) Pressure Pipe and Fittings.

SUPPLEMENTARY CONDITIONS

ADD the following paragraphs to the Supplementary Conditions:

SC-15.01.E Add the following new paragraph immediately after Paragraph 15.01.E.1.1:

15.01.E.1.m. Overtime worked by Contractor necessitating Engineer, and their officers, directors, members, partners, employees, agents, and other consultants and subcontractors of each, Resident Project Representative or Resident Project Representative’s Site staff, if any, to work extraordinary overtime in accordance with Paragraph 7.02.C. of these Supplementary Conditions. For purposes of administering this requirement, additional extraordinary overtime costs are defined as labor in excess of 40 hours per week, labor for work on holidays, and associated expenses.

15.01.E.1.m.1 Applicable Rates:

| Rate Category | Rate |
|-----------------------------------|---------------|
| Project Manager | 205 |
| Engineer/Consultant 5 | 180 |
| Engineer/Consultant 3 | 145 |
| Project Admin Staff 1 | 100 |
| Construction Manager | 190 |
| Resident Project Representative 6 | 145 |
| Designer/Technician 7 4 | 155 |
| Expenses | Expenses + 5% |

SC 15.04. Add the following new sub-paragraphs immediately after Paragraph 15.04.A.2:

15.04.A.2.a. Any part of the Work must be fully operational and placed in continuous service to be considered substantially complete. Supporting elements of the Work (e.g. electrical and instrumentation and controls systems) must be complete and placed in continuous service for the part Work which is considered substantially complete.

15.04.A.2.b For equipment or treatment processes to be considered substantially complete all successful start-up activities must be completed to include trainings and approved O&M manuals.

15.04.A.2.c For any treatment process to be considered substantially complete, all supporting equipment and processes must be in substantially complete and placed in

OAK RIDGE FINISHED WATER LINE

continuous service. Partial substantial completion will not be granted for individual equipment components of a treatment process for which the equipment is a part.

SC-15.06. Add the following new paragraph immediately after Paragraph 15.06.A.3:

15.06.A.4. In accordance with TCA 4-15-102, before final payment may be made by Owner, Contractor shall furnish evidence that Subcontractors and Suppliers have been fully paid.

SC-15.08 Add the following new paragraph immediately after Paragraph 15.08.E:

15.08.E.1 Warranties for equipment will not start prior to the date of substantial completion as defined by paragraphs 15.03 and 15.04.

DELETE Paragraph SC-19.14 Required Use of American Iron, Steel Manufactured Products, and Construction Materials in its entirety.

BID FORM

REPLACE the Section in its entirety with the attached.

AGREEMENT

Paragraph 4.02.A. Contract Times: Dates: CHANGE the substantial completion days to 630 and the final completion days to 660.

SPECIFICATIONS

The following specification modifications are hereby made a part of the above referenced Project Contract Documents:

Section 01 20 00 Measurement and Payment

REPLACE the Section in its entirety with the attached.

Section 01 50 00 Temporary Facilities and Controls

ADD the attached Section to the Project Documents.

Section 32 12 16 Asphalt Paving

Paragraph 1.05. A. ADD the following:

3. Milling and overlay paving shall be performed by TDOT approved contractors.

Section 33 05 01.02 Ductile Iron Pipe and Fittings

Paragraph 2.01.C.2.b.3). ADD "HDSS" to the list of acceptable restrained joint products.

Section 33 05 09.01 Polyvinyl Chloride (PVC) Pressure Pipe and Fittings

ADD the attached Section to the Project Documents.

DRAWINGS

The following drawing modifications are hereby made a part of the above referenced Project Contract Documents:

OAK RIDGE FINISHED WATER LINE

100-C-2015 and 100-C-2016

ADD the following note to the 4" PVC Forcemain callouts: "See Detail 3123-110".

950-C-5002

ADD the attached Typical Trench Detail 3123-110.

ADD the attached Typical Pavement Repairs – Overlay Detail 3212-215.

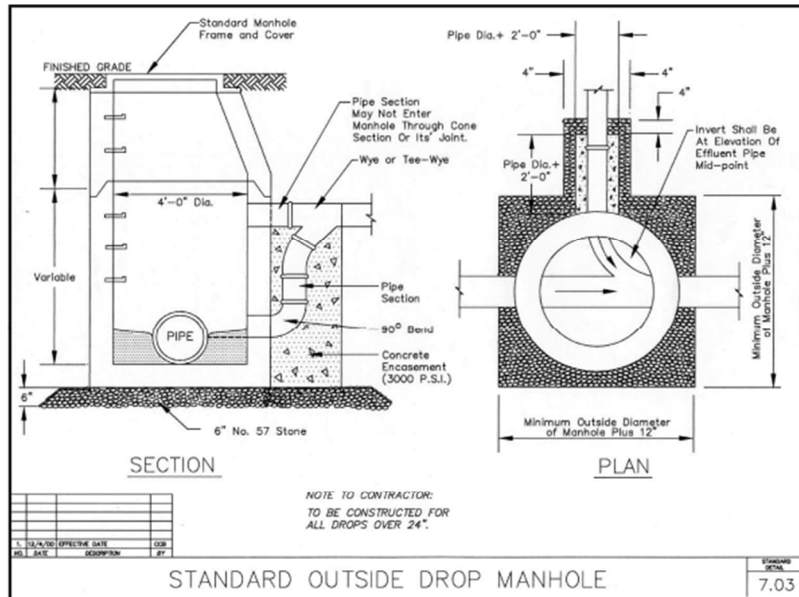
ADD the following Overlay Paving Schedule to Detail 3212-215:

| <u>Milling and Overlay Paving Schedule</u> | | | |
|---------------------------------------------------|------------------------------|--------------------|---------------------|
| <u>Starting Station</u> | <u>Ending Station</u> | <u>Road</u> | <u>Notes</u> |
| 12+25 | 19+00 | Pumphouse | 1, 3 |
| 19+00 | 31+50 | Pumphouse | 1, 2 |
| 36+75 | 75+00 | Scarboro | 1,2 |
| 82+00 | 107+00 | Scarboro | 1,2 |
| 107+00 | 109+75 | Bear Creek | 1,2 |

Notes:

- Road sections shall be milled and asphalt overlaid after water line testing is completed.
- Single Lane Overlay
- Full Road Overlay

ADD the following Exterior Drop Connection as Detail 3305-728:



EXTERIOR DROP CONNECTION

NTS

3305-728

OAK RIDGE FINISHED WATER LINE

This Addendum Number Three (3) is issued this the 11th day of August 2022.

Ben Simerl, P.E.

Jacobs

2095 Lakeside Centre Way, Suite 200

Knoxville, Tennessee 37922

ben.simerl@jacobs.com

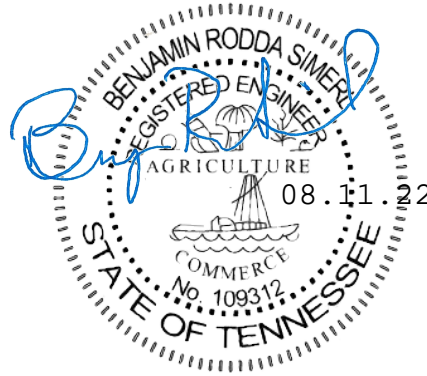


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ARTICLE 1 – BID RECIPIENT

1.01 *This Bid is submitted to:*

*City of Oak Ridge, Tennessee
Attn: Lyn Majeski, Purchasing Manager
100 Woodbury Lane
Oak Ridge, Tennessee 37830*

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, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

| <u>Addendum No.</u> | <u>Addendum, Date</u> |
|---------------------|-----------------------|
| <u>1</u> | <u>07.28.22</u> |
| <u>2</u> | <u>08.05.22</u> |
| <u>3</u> | <u>08.11.22</u> |
| <u> </u> | <u> </u> |
| <u> </u> | <u> </u> |

B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

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

- E. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
- F. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- G. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.
- H. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.
- I. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 4 – BIDDER’S CERTIFICATION

4.01 Bidder certifies 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 collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
 - 1. “corrupt practice” means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;
 - 2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 - 3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
 - 4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.
- E. No Boycott of Israel - Pursuant to Tennessee Code Annotated § 12-4-119, by signing and submitting the attached Bid Form, Bidder certifies that it is not engaged in a boycott of the State of Israel and shall not boycott the State of Israel through the term of any Contract based on this Bid. For purposes of this certification, “boycott of Israel” shall be statutorily

defined by Tennessee Code Annotated § 12-4-119(a). If the value of any contract based on this Bid is less than \$250,000.00 or Bidder employs less than ten (10) employees, then this certification shall not apply.

ARTICLE 5 – BASIS OF BID

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

| Item No. | Description | Estimated Quantity | Unit | Bid Unit Price | Bid Price |
|----------|-------------------------------------------------------------------|--------------------|--------|----------------|-----------|
| 1 | Mobilization (maximum 3% of total base bid) | 1 | LS | \$ | \$ |
| 2 | 36" Dia. Class 350 Restrained Joint DIP Water Line | 3,600 | LF | \$ | \$ |
| 3 | 30" Dia. Class 350 Restrained Joint DIP Water Line | 10,175 | LF | \$ | \$ |
| 4 | 60" Dia. Bored Roadway Crossings Steel Casing Pipe | 85 | LF | \$ | \$ |
| 5 | 48" Dia. Bored Roadway Crossings Steel Casing Pipe | 127 | LF | \$ | \$ |
| 6 | 36" Butterfly Valves | 3 | EA | \$ | \$ |
| 7 | 30" Butterfly Valves | 5 | EA | \$ | \$ |
| 8 | 4" Combination ARVs | 9 | EA | \$ | \$ |
| 9 | Asphalt Roadway Overlay | 12,300 | SQ YD | \$ | \$ |
| 10 | Asphalt Driveway | 500 | SQ YD | \$ | \$ |
| 11 | Concrete Driveway | 500 | SQ YD | \$ | \$ |
| 12 | #57 Stone Trench Backfill | 100 | CU. YD | \$ | \$ |
| 13 | Concrete Encasement | 10 | LF | \$ | \$ |
| 14 | Sta 0+00 - Connection to new 36" finished water line at new water | 1 | LS | \$ | \$ |
| 15 | Sta 36+09 – 36x24 Future Connection | 1 | LS | \$ | \$ |
| 16 | Sta 34+25 – 36x10 Future Connection | 1 | LS | \$ | \$ |
| 17 | Sta 65+00 - 30x10 Future Connection | 1 | LS | \$ | \$ |
| 18 | Sta 71+00 - 30x10 Future Connection | 1 | LS | \$ | \$ |
| 19 | Sta 81+00 - 30x6 Future Connection | 1 | LS | \$ | \$ |
| 20 | Sta 94+50 – 30x10 Future Connection | 1 | LS | \$ | \$ |
| 21 | Sta 95+00 – 30x6 Future Connection | 1 | LS | \$ | \$ |

| Item No. | Description | Estimated Quantity | Unit | Bid Unit Price | Bid Price |
|--------------------------------|--------------------------------------------------------------------------|--------------------|------|----------------|-----------|
| 22 | Sta 136+96 (EOL) - Connection to existing 24" finished water line at | 1 | LS | \$ | \$ |
| 23 | 4" PVC Sewer Restrained Joint Forcemain | 2,050 | LF | \$ | \$ |
| 24 | 1" ARV and MH | 1 | EA | \$ | \$ |
| 25 | Sta 0+00 - Connection to new 4" FM at new water treatment plant. | 1 | LS | \$ | \$ |
| 26 | Sta 20+50 (EOL) - Connection to existing sewer MH | 1 | LS | \$ | \$ |
| 27 | 2 x 3-inch Fiber Optic Conduit | 4,725 | LF | \$ | \$ |
| Total – Base Bid | | | | | \$ |
| Alternative A | | | | | |
| A1 | Open Cut Road Crossing Alignment - STA 31+16 to STA 36+59 | 1 | LS | \$ | \$ |
| A2 | Deletion of Base Bid Item No. 4 - 60" Steel Casing | (85) | LS | \$ | \$ |
| A3 | 36" Dia. Class 350 Restrained Joint DIP Water Line - (Shorter Alignment) | (35) | LF | \$ | \$ |
| Total – Alternative A | | | | | \$ |
| Total of All Bid Prices | | | | | \$ |

- 5.02 Unit Prices have been computed in accordance with Paragraph 13.01 of the General Conditions.
- 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.
- 5.04 Bidder acknowledges that (1) each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and (2) 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.
- 5.05 All specified cash allowances are included in the price(s) set forth above, and have been computed in accordance with Paragraph 13.02 of the General Conditions.
- 5.06 Steel Scrap Index:
- A. Ductile iron pipe (DIP) manufacturers have implemented a charge to address scrap iron cost fluctuation. Provisions for managing the cost fluctuation are made in this contract based on a verified published monthly scrap index [i.e., Steel Scrap No. 1 Busheling (MB-STE-0422) from www.fastmarkets.com].

- B. The unit prices for the Work in Paragraph 5.01 shall reflect ductile iron pipe pricing based, in part, on the verified published monthly scrap index in effect on the date of the Bid.
 - 1. Scrap index charge in effect on date of Bid (cost/ton): \$_____
 - 2. Bidder shall submit with its Bid a certified statement of the scrap index in effect on the date of the Bid.
- C. Refer to Section 01 20 00, Measurement and Payment, for information regarding the measurement and payment related to the cost fluctuations in ductile iron pipe pricing as a result of scrap iron cost fluctuations.

ARTICLE 6 – TIME OF COMPLETION

- 6.01 Bidder agrees that the Work will be substantially complete within 630 calendar days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within 660 calendar days after the date when the Contract Times commence to run.
- 6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 – ATTACHMENTS TO THIS BID

- 7.01 The following documents are submitted with and made a condition of this Bid:
 - A. Required Bid security;
 - B. List of Proposed Subcontractors;
 - C. List of Proposed Suppliers;
 - D. List of Project References;
 - E. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids;
 - F. Contractor's License No.: _____ [or] Evidence of Bidder's ability to obtain a State Contractor's License and a covenant by Bidder to obtain said license within the time for acceptance of Bids;
 - G. Required Bidder Qualification Statement with supporting data; and
 - H. Contractor Questionnaires and Certificates including DBE forms, Drug-Free Affidavit, Compliance Statement, Certification Regarding Debarment, and Certificates for Contracts, Grants and Loans.

ARTICLE 8 – DEFINED TERMS

- 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 9 – BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

By: _____
[Signature]

[Printed name] _____
(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: _____
[Signature]

[Printed name] _____

Title: _____

Submittal Date: _____

Address for giving notices:

Telephone Number: _____

Email Address: _____

Contact Name, Title: _____

Bidder's License No.: _____
(where applicable)

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

**SECTION 01 20 00
MEASUREMENT AND PAYMENT**

PART 1 GENERAL

1.01 SCOPE

- A. This section covers the method of measurement and payment for items of work under this contract.

1.02 GENERAL

- A. The total Bid Price for each section of the contract shall cover all work required by the Contract Documents. All costs in connection with the proper and successful completion of the Work including furnishing all materials, equipment, supplies, and appurtenances; providing all construction plant, equipment, and tools; and performing all necessary labor and supervision to fully complete the Work, shall be included in the unit and lump sum prices bid. All work not specifically set forth as a pay item in the Bid Form shall be considered a subsidiary obligation of the Contractor and all costs in connection therewith shall be included in the prices bid.

1.03 ESTIMATED QUANTITIES

- A. All estimated quantities stipulated in the Bid Form or other Contract Documents are approximate and are to be used only a) as a basis for estimating the probable cost of the Work and b) for the purpose of comparing the bids submitted for the Work. The actual amounts of work done and materials furnished under unit price items may differ from the estimated quantities. In some cases a unit price item has been added to the bid schedule for the purpose of establishing a cost basis in the event work associated with that item is required. No guarantee is expressed or implied that the quantities shown in the bid schedule shall be required to fulfill the Contract.
- B. The basis of payment for work and materials will be the actual amount of work done and materials furnished. The Contractor agrees that they will make no claim for damages, anticipated profits, or otherwise on account of any difference between the amounts of work actually performed and materials actually furnished and the estimated amounts thereof.

FINISHED WATER TRANSMISSION LINE

1.04 WORK ITEMS

- A. The following describes the method of measurement and payment for the bid items shown in the Bid Schedule.

BID ITEM NO. 1: MOBILIZATION

Partial payments for the item "Mobilization" will be made with the first and second partial pay estimates paid on the contract, and will be made at the rate of 50 percent of the lump sum price for "Mobilization" on each of these partial pay estimates. The amount for "Mobilization" in the approved schedule of values shall not exceed 3 percent of the total project bid. Mobilization shall include all costs for Contractor's bonds, insurance, temporary office facilities, sanitary and power, and all other miscellaneous costs.

BID ITEM NOS. 2-3: RESTRAINED JOINT DIP PIPE

Payment shall constitute full compensation for furnishing all equipment, tools, labor and incidentals and performance of all work necessary to install the restrained joint DIP water line as specified. The quantities of pipe for which payment will be allowed shall be expressed in linear feet for each size and type of pipe listed in the bid form in terms of the horizontal lengths of pipe installed in place as measured along the centerline, with no deductions for fittings, valves or temporary blow-offs or tracer wire.

Such payment shall be full compensation for the furnishing and installing of pipe including pipe bedding, excavation, backfill, (full #57 stone backfill if less than 2 feet from edge of pavement or if under pavement), testing, and all other work necessary for and incidental to completion of the Work. Pressure and leakage testing, cleaning and disinfection, and asphalt pavement patching or final grading and seeding where applicable, shall be included in the unit prices bid for pipelines.

BID ITEM NOS. 4-5: WATER LINE BORED ROADWAY CROSSINGS STEEL ENCASEMENT PIPE (NO PIPING)

This item of work is a per linear foot unit price pay item and shall include furnishing and installing steel encasement pipe of the sizes at the locations shown on the Plans. Measurement for payment shall be made horizontally along the longitudinal center line of the casing from end to end of the casing. The unit price bid for the casing shall include all costs in connection with excavation and backfilling, boring and jacking of casing, smooth steel casing pipe, all restrained support assemblies, jointing materials, end closures, pits, blasting monitoring, and all other work for and in connection with the casing and the pipeline placed in the casing which is not included under another bid item. The carrier pipe shall be paid for under other Bid Items.

FINISHED WATER TRANSMISSION LINE

Separate payment will not be made for smooth steel casing pipe or supports which may be needed by Contractor at locations other than where the boring is indicated on the Drawings; all such items shall be considered a subsidiary obligation of the Contractor.

Bores attempted, but in the Engineer's opinion that cannot be completed due to obstacles, will be paid for at one-half the unit price.

BID ITEM NOS. 6 AND 7: WATER LINE VALVES

Water line valve installations are per each unit price pay items. Unit price bids for each shall be full compensation for these items and for all labor, materials including crushed stone bedding, valve boxes, valve markers, pipe, backfill, surface restoration as required, cleanup, testing, and disinfection, and all necessary equipment required to complete the item. The Contractor will furnish all water line materials required for the water valve installation.

BID ITEM NO. 8: 4-INCH COMBINATION AIR VALVES

The unit price bid for each combination air valve shall include the cost of labor and materials for all piping, rodding, fittings, isolation valve and accessories, the valve assembly, discharge piping, drain line, stone, gravel pit, manhole or vault, vault cover, excavation and backfill, the additional cost of the welded-on boss over and above that of the pipeline, bollards as indicated on the Drawings to be provided at selected locations, and all other appurtenances as described in the Specifications and shown on the Drawings for a complete installation.

BID ITEM NO. 9: ASPHALT ROADWAY OVERLAY

This item of work shall include the milling and overlay of pavement per the Contract Plans and Specifications. Contractor shall be responsible for replacement of any pavement markings disturbed or covered by overlay. Typical pavement repair shall be paid for at the unit price per square yard in place for pavement repair. Quantities of pavement repair in accordance with the requirements of this Section shall be verified in the field by the Engineer.

BID ITEM NO. 10: ASPHALT DRIVEWAY REPAIR

This item of work shall include the repair of pavement per the Contract Plans and Specifications. Contractor shall be responsible for replacement of any pavement markings disturbed or covered by overlay. Typical pavement repair shall be paid for at the unit price per square yard in place for pavement repair. Quantities of pavement repair in accordance with the requirements of this Section shall be verified in the field by the Engineer.

BID ITEM NO. 11: CONCRETE DRIVEWAY REPAIR

This item of work shall include the repair of concrete driveways per the Contract Plans and Specifications. Typical concrete repair shall be paid for at

FINISHED WATER TRANSMISSION LINE

the unit price per square yard for concrete repair as measured along the installed pipe length per plan details. Quantities of concrete repair in accordance with the requirements of this Section shall be verified in the field by the Engineer. Contractor shall match existing concrete.

BID ITEM NO. 12: #57 STONE BACKFILL

This item of work shall include the placement of full trench stone backfill in areas other than those detailed under other pay items (i.e. pipelines under pavement or within 2 feet of edge of pavement). Typical stone placement shall be paid for at the unit price per cu yard for stone placement as measured along the installed pipe length per plan details. Quantities of stone in accordance with the requirements of this Section shall be directed by and verified in the field by the Engineer.

BID ITEM NO. 13: CONCRETE ENCASEMENT

This item of work shall include furnishing and installing concrete encasement around pipe of the sizes and the locations shown on the Plans. The unit price bid for concrete encasement shall include excavation, concrete, reinforcing steel, forms, finishing, curing, backfill and compaction, site restoration, and all other work or materials required to complete the concrete work.

Concrete encasement pipe shall be paid for at the linear feet bid for each size encasement pipe as measured in place from end to end of completed encasement installed to grade and alignment per plan details.

Unless otherwise authorized by Engineer, all additional concrete for encasement required outside the specified pay limits will be considered a subsidiary obligation of Contractor and no direct payment shall be made therefor.

All concrete which is required in connection with manholes or structures, and other pay items shall be included in the lump sum or unit price bid for the pay item.

WATER LINE CONNECTIONS

BID ITEM NO. 14: CONNECTION TO 36-INCH TRANSMISSION LINE (STA 0+00)

The lump sum price bid shall include excavation and backfilling over and above that required for the new piping; removal of existing pipe and plug as required; installation of new joint materials and adapters in the line; and all related work and appurtenances required for the connection. Payment for new valves and piping will be made under other bid items.

BID ITEM NOS. 15-21: FUTURE CONNECTIONS

The lump sum price bid shall include excavation and backfilling over and above that required for the new main line piping; removal of existing pipe as required; installation of new joint materials and adapters in the line; and all related work and appurtenances required for the connection. Payment for the mainline tee or tapping saddle, sideline restrained joint pipe and valve, RJ plug and other incidentals shall be made under each of the bid items listed below:

15. Sta 36+09 – 36x24 Tee, 24” BFV, RJ Plug
16. Sta 34+25 – 36x10 Tee, 10” BFV, RJ Plug
17. Sta 65+00 - 30x10 Tee, 40 LF of 10” RJ DIP, 10” BFV, RJ Plug
18. Sta 71+00 - 30x10 Tee, 40 LF of 10” RJ, 10” BFV, RJ Plug
19. Sta 81+00 - 30x6 Tapping Saddle, 40 LF of 6” RJ DIP, 6” Gate Valve, RJ Plug
20. Sta 94+50 – 30x10 Tee, 40 LF of 10” RJ DIP, 10” BFV, RJ Plug
21. Sta 95+00 – 30x6 Tapping Saddle, 6” Gate Valve, RJ Plug

BID ITEM NO. 22: CONNECTION TO 24-INCH FINISHED WATER LINE (STA 136+96 – END OF LINE)

The lump sum price bid shall include excavation and backfilling over and above that required for the new piping; removal of existing pipe as required; installation of new joint materials, fittings, mainline and sideline valves and adapters; and all related work and appurtenances required for the connection. Payment for mainline piping will be made under other bid items.

SANITARY SEWER

BID ITEM NO. 23: 4” PVC SEWER FORCEMAIN

Payment shall constitute full compensation for furnishing all equipment, tools, labor and incidentals and performance of all work necessary to install the restrained joint PVC sewer force main as specified. The quantities of pipe for which payment will be allowed shall be expressed in linear feet for each size and type of pipe listed in the bid form in terms of the horizontal lengths of pipe installed in place as measured along the centerline, with no deductions for fittings, valves or temporary blow-offs or tracer wire.

Such payment shall be full compensation for the furnishing and installing of pipe including pipe bedding, excavation, backfill, (full stone backfill if less than 2 feet from edge of pavement or if under pavement), testing, and all other work necessary for and incidental to completion of the Work. Pressure and leakage testing, cleaning and disinfection, and asphalt pavement patching or final grading and seeding where applicable, shall be included in the unit prices bid for pipelines.

FINISHED WATER TRANSMISSION LINE

BID ITEM NO. 24: 1" ARV AND MANHOLE

The unit price bid for each combination air valve shall include the cost of labor and materials for all piping, rodding, fittings, isolation valve and accessories, the valve assembly, discharge piping, drain line, stone, gravel pit, manhole or vault, vault cover, excavation and backfill, the additional cost of the welded-on boss over and above that of the pipeline, bollards as indicated on the Drawings to be provided at selected locations, and all other appurtenances as described in the Specifications and shown on the Drawings for a complete installation.

SEWER FORCE MAIN CONNECTIONS

BID ITEM NO. 25: CONNECTION TO 4-INCH FM (STA 0+00)

The lump sum price bid shall include excavation and backfilling over and above that required for the new piping; removal of existing pipe and plug as required; installation of new joint materials and adapters in the line; and all related work and appurtenances required for the connection. Payment for FM piping will be made under other bid items.

BID ITEM NO. 26: FM CONNECTION TO EXISINTG MH (STA 20+50 – END OF LINE)

The lump sum price bid shall include excavation and backfilling over and above that required for the new piping; coring and connection to existing manhole, removal of existing pipe as required; installation of new joint materials, fittings, and adapters; and all related work and appurtenances required for the connection. Payment for mainline piping will be made under other bid items.

FIBER OPTIC CONDUIT

BID ITEM NO. 27: 2X3-INCH FIBER OPTIC CONDUIT

Payment shall constitute full compensation for furnishing all equipment, tools, labor and incidentals and performance of all work necessary to install dual (2x)3-inch buried fiber optic conduits as specified. The quantities of conduit for which payment will be allowed shall be expressed in linear feet installed in place as measured along the centerline, with no deductions or additions for fittings, pull boxes or tracer wire.

Such payment shall be full compensation for the furnishing and installing of conduit including bedding, excavation, backfill, (full stone backfill if less than 2 feet from edge of pavement or if under pavement), testing, and all other work necessary for and incidental to completion of the Work. Final grading and seeding shall be included in the unit prices bid for the conduit if not covered elsewhere (pipeline).

BID ITEM NOS. A1-A3: ALTERNATIVE NO. A- STA 31+16 TO STA 36+59 - OPEN CUT ROAD CROSSING ALIGNMENT

This alternative consists of the removal of the 60-inch auger bored casing pipe from the project scope and the addition of an open cut road crossing of Bethel Valley Road as shown on the plans as Alternative A.

The lump sum price bid shall include any additional excavation, backfilling or installation requirements over and above that required for the Base Bid piping alignment between STA 31+16 and STA 36+59. The auger bore installation of 60-inch casing across Bethel Valley Road (Bid Item No. 4) will be deleted from the project scope as part of Alternative A.

WATER AND SEWER LINE FITTINGS

Fittings are considered incidental to the pipeline installation and no separate payment will be made for these items.

ROCK EXCAVATION

Rock excavation shall be considered unclassified and incidental to the pipeline installation. No separate payment will be made for this item.

B. Measurement of the scrap iron cost fluctuations:

1. Contractor shall provide documentation from the ductile iron pipe manufacturer indicating shipping date, tonnage shipped, invoice showing scrap index charge in effect at that time shipping, and certified statement of the scrap index in affect at the time of shipment.
2. The difference between this scrap index charge at the time of shipment and the one shown on the Bid Form, as substantiated by the certified statement of the scrap index submitted with the Bid, will be calculated, and result in a cost increase or decrease.

1.05 ALL OTHER WORK ITEMS

- A. All other work items not covered in Article 1.04 shall be considered incidental to other work items that have unit or lump sum prices. Therefore, no separate payment shall be made for these work items.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

**SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS**

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Association of Nurserymen (AAN): American Standards for Nursery Stock.
 2. Federal Emergency Management Agency (FEMA).
 3. National Fire Prevention Association (NFPA): 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations.
 4. Telecommunications Industry Association (TIA); Electronic Industries Alliance (EIA): 568B, Commercial Building Telecommunications Cabling Standard.
 5. U.S. Department of Agriculture (USDA): Urban Hydrology for Small Watersheds.
 6. U.S. Weather Bureau: Rainfall-Frequency Atlas of the U.S. for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years.

1.02 SUBMITTALS

- A. Informational Submittals: Copies of permits and approvals for construction as required by Laws and Regulations and governing agencies.

1.03 MOBILIZATION

- A. Mobilization includes, but is not limited to, these principal items:
1. Obtaining required permits.
 2. Moving Contractor's field office and equipment required for first month operations onto Site.
 3. Installing temporary construction power, wiring, and lighting facilities.
 4. Providing onsite sanitary facilities and potable water facilities as specified and as required by Laws and Regulations, and governing agencies.
 5. Arranging for and erection of Contractor's work and storage yard.
 6. Posting OSHA required notices and establishing safety programs and procedures.
 7. Having Contractor's superintendent at Site full time.

OAK RIDGE FINISHED WATER LINE

- B. Use area designated for Contractor's temporary facilities as shown on the Drawings and Contractor shall obtain additional areas as needed.

1.04 PROTECTION OF WORK AND PROPERTY

- A. Comply with Owner's and Department of Energy (DOE) – Y12 safety rules while on Owner and DOE-Y12 property.
- B. Keep Owner informed of serious onsite accidents and related claims.
- C. Use of Explosives: Blasting is not allowed.

1.05 VEHICULAR TRAFFIC

- A. Traffic Control Plan: Adhere to traffic control plan reviewed and accepted by Engineer. Changes to this plan shall be made only by written approval of appropriate public authority. Secure approvals for necessary changes so as not to delay progress of the Work.
- B. Traffic Routing Plan: Show sequences of construction affecting use of roadways, time required for each phase of the Work, provisions for decking over excavations and phasing of operations to provide necessary access, and plans for signing, barricading, and striping to provide passages for pedestrians and vehicles.

PART 2 PRODUCTS

2.01 PROJECT SIGN

- A. Refer to Project Sign Detail in Specifications.

PART 3 EXECUTION

3.01 TEMPORARY UTILITIES

- A. Power:
 - 1. Electric power will be available at or near Site. Determine type and amount available and make arrangements for obtaining temporary electric power service.
 - 2. Cost of electric power will be borne by Contractor.
- B. Lighting: Provide temporary lighting to meet applicable safety requirements to allow erection, application, or installation of materials and equipment, and observation or inspection of the Work.

C. Water:

1. Owner will furnish construction and drinking water required at no cost to Contractor at Sta 139+96 for flushing and disinfection. Furnish and install temporary piping and facilities to transport water to the Work.
2. Provide means to prevent water used for testing from flowing back into source pipeline.

D. Sanitary and Personnel Facilities:

1. Provide and maintain facilities for Contractor's employees, Subcontractors, and other onsite employers' employees. Service, clean, and maintain facilities and enclosures.
2. Use of Owner's existing sanitary facilities by construction personnel will not be allowed.
3. Temporary sanitary facilities may be placed at the following locations:
 - a. City of Oak Ridge – Raw Water PS Site ~ Sta 0+00.
 - b. City of Oak Ridge – Pumhouse Road Lift Station ~ Sta 20+50.
 - c. City of Oak Ridge – Water Treatment Plant ~ EOL Sta 139+96.

- E. Fire Protection: Furnish and maintain on Site adequate firefighting equipment capable of extinguishing incipient fires. Comply with applicable parts of NFPA 241.

3.02 PROTECTION OF WORK AND PROPERTY

A. General:

1. Perform Work within right-of-way and easements in a systematic manner that minimizes inconvenience to property owners and the public.
2. No residence or business shall be cut off from vehicular traffic for a period exceeding 4 hours, unless special arrangements have been made.
3. Maintain in continuous service existing oil and gas pipelines, underground power, telephone or communication cable, water mains, irrigation lines, sewers, poles and overhead power, and other utilities encountered along line of the Work, unless other arrangements satisfactory to owners of said utilities have been made.
4. Where completion of the Work requires temporary or permanent removal or relocation of existing utility, coordinate activities with owner of said utility and perform work to their satisfaction.
5. Protect, shore, brace, support, and maintain underground pipes, conduits, drains, and other underground utility construction uncovered or otherwise affected by construction operations.
6. Keep fire hydrants and water control valves free from obstruction and available for use at all times.

OAK RIDGE FINISHED WATER LINE

7. In areas where Contractor's operations are adjacent to or near a utility, such as gas, telephone, television, electric power, water, sewer, or irrigation system, and such operations may cause damage or inconvenience, suspend operations until arrangements necessary for protection have been made by Contractor.
 8. Notify property owners and utility offices that may be affected by construction operation at least 2 days in advance: Before exposing a utility, obtain utility owner's permission. Should service of utility be interrupted due to Contractor's operation, notify proper authority immediately. Cooperate with said authority in restoring service as promptly as possible and bear costs incurred.
 9. Do not impair operation of existing sewer system. Prevent construction material, pavement, concrete, earth, volatile and corrosive wastes, and other debris from entering sewers, pump stations, or other sewer structures.
 10. Maintain original Site drainage wherever possible.
- B. Site Security: Provide and maintain additional temporary security fences as necessary to protect the Work and Contractor-furnished products not yet installed.
- C. Barricades and Lights:
1. Provide as required by the Vehicle Code and in sufficient quantity to safeguard public and the Work.
 2. Provide as necessary to prevent unauthorized entry to construction areas and affected roads, streets, and alleyways, inside and outside of fenced area, and as required to ensure public safety and the safety of Contractor's employees, other employer's employees, and others who may be affected by the Work.
 3. Provide to protect existing facilities and adjacent properties from potential damage.
 4. Locate to enable access by facility operators and property owners.
 5. Protect streets, roads, highways, and other public thoroughfares that are closed to traffic by effective barricades with acceptable warning signs.
 6. Locate barricades at the nearest intersecting public thoroughfare on each side of blocked section.
 7. Illuminate barricades and obstructions with warning lights from sunset to sunrise.
- D. Signs and Equipment:
1. Conform to requirements of manual published by the Tennessee Department of Transportation.

2. Portable TOW-AWAY-NO STOPPING Signs: Place where approved by police department and Owner.
3. Traffic Cones: Provide to delineate traffic lanes to guide and separate traffic movements.
4. High-Level Warning Flag Units: Provide two in advance of traffic approaching the Work, each displaying three flags mounted at a height of 9 feet.
5. ROAD CONSTRUCTION AHEAD Signs: Provide four, size 48 inches by 48 inches. Place in conspicuous locations, approximately 200 feet in advance of the Work, and facing approaching traffic.
6. DETOUR Signs: Provide two, right arrow or left arrow, placed as approved by Engineer.
7. RIGHT or LEFT LANE CLOSED AHEAD Signs: Provide two, place in advance of lane to be closed.
8. Provide at obstructions, such as material piles and equipment.
9. Use to alert general public of construction hazards, which would include surface irregularities, unramped walkways, grade changes, and trenches or excavations in roadways and in other public access areas.

E. Trees and Plantings:

1. Protect from damage and preserve trees, shrubs, and other plants outside limits of the Work and within limits of the Work, which are designated on the Drawings to remain undisturbed.
 - a. Where practical, tunnel beneath trees when on or near line of trench.
 - b. Employ hand excavation as necessary to prevent tree injury.
 - c. Do not stockpile materials or permit traffic within drip lines of trees.
 - d. Provide and maintain temporary barricades around trees.
 - e. Water vegetation as necessary to maintain health.
 - f. Cover temporarily exposed roots with wet burlap, and keep burlap moist until soil is replaced around roots.
 - g. No trees, except those specifically shown on the Drawings to be removed, shall be removed without written approval of Engineer.
 - h. Dispose of removed trees in a legal manner off the Site.
2. Balling and burlapping of trees indicated for replacement shall conform to recommended specifications set forth in the American Standards for Nursery Stock, published by American Association of Nurserymen. Balls shall be firm and intact and made-balls will not be accepted. Handle ball and burlap trees by ball and not by top.
3. In event of damage to bark, trunks, limbs, or roots of plants that are not designated for removal, treat damage by corrective pruning, bark tracing, application of a heavy coating of tree paint, and other accepted horticultural and tree surgery practices.

OAK RIDGE FINISHED WATER LINE

4. Replace each plant that dies as a result of construction activities.
- F. Existing Structures:
1. Where Contractor contemplates removal of small structures such as mailboxes, signposts, and culverts that interfere with Contractor's operations, obtain approval of property owner and Engineer.
 2. Move mailboxes to temporary locations accessible to postal service.
 3. Replace items removed in their original location and a condition equal to or better than original.
- G. Finished Construction: Protect finished floors and concrete floors exposed as well as those covered with composition tile or other applied surfacing.
- H. Waterways: Keep ditches, culverts, and natural drainages continuously free of construction materials and debris.
- I. Dewatering: Construct, maintain, and operate cofferdams, channels, flume drains, sumps, pumps, or other temporary diversion and protection works. Furnish materials required, install, maintain, and operate necessary pumping and other equipment for the environmentally safe removal and disposal of water from the various parts of the Work. Maintain foundations and parts of the Work free from water.
- J. Archaeological Finds:
1. General: Should finds of an archaeological or paleontological nature be made within Site limits, immediately notify Owner and Engineer and proceed in accordance with General Conditions. Continue the Work in other areas without interruption.
- K. Endangered and Threatened Species:
1. Take precautions necessary and prudent to protect native endangered and threatened flora and fauna.
 2. Notify Engineer of construction activities that might threaten endangered and threatened species or their habitats.
 3. Engineer will mark areas known as habitats of endangered and threatened species prior to commencement of onsite activities.
 4. Additional areas will be marked by Engineer as other habitats of endangered and threatened species become known during construction.

3.03 TEMPORARY CONTROLS

A. Air Pollution Control:

1. Minimize air pollution from construction operations.
2. Burning:
 - a. Of waste materials, rubbish, or other debris will not be permitted on or adjacent to Site.
3. Conduct operations of dumping rock and of carrying rock away in trucks to cause a minimum of dust. Give unpaved streets, roads, detours, or haul roads used in construction area a dust-preventive treatment or periodically water to prevent dust. Strictly adhere to applicable environmental regulations for dust prevention.
4. Provide and maintain temporary dust-tight partitions, bulkheads, or other protective devices during construction to permit normal operation of existing facilities. Construct partitions of plywood, insulating board, plastic sheets, or similar material. Construct partitions in such a manner that dust and dirt from demolition and cutting will not enter other parts of existing building or facilities. Remove temporary partitions as soon as need no longer exists.

B. Noise Control:

1. Provide acoustical barriers so noise emanating from tools or equipment will not exceed legal noise levels.
2. Noise Control Plan: Propose plan to mitigate construction noise and to comply with noise control ordinances, including method of construction, equipment to be used, and acoustical treatments.

C. Water Pollution Control:

1. Divert sanitary sewage and nonstorm waste flow interfering with construction and requiring diversion to sanitary sewers. Do not cause or permit action to occur which would cause an overflow to existing waterway.
2. Prior to commencing excavation and construction, obtain Engineer's agreement with detailed plans showing procedures intended to handle and dispose of sewage, groundwater, and dewatering pump discharges.
3. Comply with Section 01 57 13, Temporary Erosion and Sedimentation Control, for stormwater flow and surface runoff.
4. Do not dispose of volatile wastes such as mineral spirits, oil, chemicals, or paint thinner in storm or sanitary drains. Disposal of wastes into streams or waterways is prohibited. Provide acceptable containers for collection and disposal of waste materials, debris, and rubbish.

OAK RIDGE FINISHED WATER LINE

- D. Erosion, Sediment, and Flood Control: Provide, maintain, and operate temporary facilities as specified in Section 01 57 13, Temporary Erosion and Sedimentation Control, to control erosion and sediment releases, and to protect the Work and existing facilities from flooding during construction period.

3.04 STORAGE YARDS AND BUILDINGS

- A. Coordinate requirements with Section 01 61 00, Common Product Requirements.
- B. Temporary Storage Yards: Construct temporary storage yards for storage of products that are not subject to damage by weather conditions.
- C. Temporary Storage Buildings:
 - 1. Provide environmental control systems that meet recommendations of manufacturers of equipment and materials stored.
 - 2. Arrange or partition to provide security of contents and ready access for inspection and inventory.
 - 3. Store combustible materials (paints, solvents, fuels) in a well-ventilated and remote building meeting safety standards.

3.05 ACCESS ROADS

- A. Construct access roads as shown and within easements, rights-of-way, or Project limits. Use existing roads where shown.
- B. Maintain drainage ways. Install and maintain culverts to allow water to flow beneath access roads. Provide corrosion-resistant culvert pipe of adequate strength to resist construction loads.
- C. Provide gravel, crushed rock, or other stabilization material to permit access by all motor vehicles at all times.
- D. Maintain road grade and crown to eliminate potholes, rutting, and other irregularities that restrict access.
- E. Coordinate with Engineer detours and other operations affecting traffic and access. Provide at least 72 hours' notice to Engineer of operations that will alter access to Site.
- F. Upon completion of construction, restore ground surface disturbed by access road construction to original grade. Replace damaged or broken culverts with new culvert pipe of same diameter and material.

3.06 PARKING AREAS

- A. Control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, Owner's operations, or construction operations.
- B. Provide parking facilities for personnel working on Project.

3.07 VEHICULAR TRAFFIC

- A. Comply with Laws and Regulations regarding closing or restricting use of public streets or highways. No public or private road shall be closed, except by written permission of proper authority. Ensure the least possible obstruction to traffic and normal commercial pursuits.
- B. Conduct the Work to interfere as little as possible with public travel, whether vehicular or pedestrian.
- C. Whenever it is necessary to cross, close, or obstruct roads, driveways, and walks, whether public or private, provide and maintain suitable and safe bridges, detours, or other temporary expedients for accommodation of public and private travel.
- D. Road Closures: Maintain satisfactory means of exit for persons residing or having occasion to transact business along route of the Work. If it is necessary to close off roadway or alley providing sole vehicular access to property for periods greater than 2 hours, provide written notice to each owner so affected 3 days prior to such closure. In such cases, closings of up to 4 hours may be allowed. Closures of up to 10 hours may be allowed if a week's written notice is given and undue hardship does not result.
- E. Maintenance of traffic is not required if Contractor obtains written permission from Owner and tenant of private property, or from authority having jurisdiction over public property involved, to obstruct traffic at designated point.
- F. In making street crossings, do not block more than one-half the street at a time. Whenever possible, widen shoulder on opposite side to facilitate traffic flow. Provide temporary surfacing on shoulders as necessary.
- G. Maintain top of backfilled trenches before they are paved, to allow normal vehicular traffic to pass over. Provide temporary access driveways where required. Cleanup operations shall follow immediately behind backfilling.

OAK RIDGE FINISHED WATER LINE

- H. When flaggers and guards are required by regulation or when deemed necessary for safety, furnish them with approved orange wearing apparel and other regulation traffic control devices.
- I. Notify fire department and police department before closing street or portion thereof. Notify said departments when streets are again passable for emergency vehicles. Do not block off emergency vehicle access to consecutive arterial crossings or dead-end streets, in excess of 300 linear feet, without written permission from fire department. Conduct operations with the least interference to fire equipment access, and at no time prevent such access. Furnish Contractor's night emergency telephone numbers to police department.
- J. Coordinate traffic routing with that of others working in same or adjacent areas.

3.08 CLEANING DURING CONSTRUCTION

- A. In accordance with General Conditions, as may be specified in other Specification sections, and as required herein.
- B. Wet down exterior surfaces prior to sweeping to prevent blowing of dust and debris. At least weekly, sweep floors (basins, tunnels, platforms, walkways, roof surfaces), and pick up and dispose of debris.
- C. Provide approved containers for collection and disposal of waste materials, debris, and rubbish. At least weekly, dispose of such waste materials, debris, and rubbish offsite.
- D. At least weekly, brush sweep entry drive, roadways, and other streets and walkways affected by the Work and where adjacent to the Work.

END OF SECTION

SECTION 33 05 01.09
POLYVINYL CHLORIDE (PVC) PRESSURE PIPE AND FITTINGS

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Water Works Association (AWWA):
 - a. C110, Ductile-Iron and Gray-Iron Fittings.
 - b. C153, Ductile-Iron Compact Fittings, for Water Service.
 - c. C605, Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings.
 2. ASTM International (ASTM):
 - a. D2241, Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).
 - b. D2321, Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
 - c. D2466, Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
 - d. D2467, Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
 - e. D2672, Standard Specification for Joints for IPS PVC Pipe Using Solvent Cement.
 - f. D2855, Standard Practice for Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings.
 - g. D3139, Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
 3. NSF International (NSF).

1.02 SUBMITTALS

- A. Action Submittals: Drawings showing pipe diameter, pipe class, dimension ratio (DR) and fitting details.
- B. Informational Submittals:
1. Manufacturer's Certificate of Compliance, in accordance with Section 01 61 00, Common Product Requirements.

OAK RIDGE FINISHED WATER LINE

2. Hydrostatic Testing Plan: Submit at least 15 days prior to testing and at minimum, include the following:
 - a. Testing dates.
 - b. Piping systems and section(s) to be tested.
 - c. Method of isolation.
 - d. Method of conveying water from source to system being tested.
 - e. Method of disposing of test water.
 - f. Calculation of maximum allowable leakage for piping section(s) to be tested.
3. Certification of Calibration: Approved testing laboratory certificate if pressure gauge for hydrostatic test has been previously used. If pressure gauge is new, no certificate is required.
4. Test report documentation.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Solvent Cement: Store in accordance with ASTM D2855.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Pipe:
 1. PVC, conforming to requirements of ASTM D2241.
 2. DR shall be 32.5.
- B. Joints:
 1. Rubber gasketed.
 2. Conform to AWWA C900.
- C. Fittings: Ductile iron, conforming to AWWA C153 or AWWA C110.
- D. Restrained Joints:
 1. Provide pipe restraint, where indicated on the Drawings, by system designed specifically for use with PVC pipe using wedges. Do not use systems with set screws, gripper rings, or gripper gaskets.
 2. Minimum Pressure Rating: 125 psi.

PART 3 EXECUTION

3.01 INSTALLATION

- A. In accordance with AWWA Manual 23.

- B. Solvent cement used for joints as recommended by pipe manufacturer.
- C. Joints:
 - 1. Rubber Gasketed: In accordance with manufacturer's written instructions.
 - 2. Solvent Cemented: In accordance with ASTM D2855.
 - 3. Restrained Joint Systems: In accordance with manufacturer's written instructions.
- D. Pipe Bending for Horizontal or Vertical Curves:
 - 1. Bending of pipe barrels larger than 12 inches in diameter is not allowed.
 - 2. Radius of curves shall not exceed 75 percent of manufacturer's recommended values.
 - 3. Use blocks or braces at pipe joints to ensure axial deflection in gasketed or mechanical joints does not exceed allowable deflection.
- E. Maximum Joint Deflection: 75 percent of manufacturer's recommended values.

3.02 INSPECTION AND HYDROSTATIC TESTING

- A. General:
 - 1. Notify Engineer in writing at least 5 days in advance of testing. Perform testing in presence of Engineer.
 - 2. Using water as test medium, all newly installed pipelines must successfully pass hydrostatic leakage test prior to acceptance.
 - 3. Conduct field hydrostatic test on buried piping after trench has been completely backfilled and compacted. Testing may, as approved by Engineer, be done prior to placement of asphaltic concrete or roadway structural section.
 - 4. Contractor may, if field conditions permit and as approved by Engineer, partially backfill trench and leave joints open for inspection and conduct an initial informal service leak test. Final field hydrostatic test shall not, however, be conducted until backfilling has been completed as specified above.
 - 5. Supply of Temporary Water: In accordance with Section 01 50 00, Temporary Facilities and Controls.
 - 6. Dispose of water used in testing in accordance with federal, state, and local requirements.
 - 7. Install temporary thrust blocking or other restraint as necessary to prevent movement of pipe and protect adjacent piping or equipment. Make necessary taps in piping prior to testing.

OAK RIDGE FINISHED WATER LINE

8. Wait a minimum of 5 days after concrete thrust blocking is installed to perform pressure tests. If high-early strength cement is used for thrust blocking, wait may be reduced to 2 days.
9. Prior to test, remove or suitably isolate appurtenant instruments or devices that could be damaged by pressure testing.
10. New Piping Connected to Existing Piping:
 - a. Isolate new piping with grooved-end pipe caps, blind flanges, or other means as acceptable to Engineer.
 - b. Provide appropriate thrust blocking.

B. Hydrostatic Testing Procedure:

1. Furnish testing equipment, as approved by Engineer, which provides observable and accurate measurements of leakage under specified conditions.
2. Maximum Filling Velocity: 0.25 foot per second calculated based on full area of pipe.
3. Expel air from piping system during filling.
4. Test Pressure: 100 psi as measured at low point of pipeline.
5. Apply and maintain specified test pressure with hydraulic force pump. Valve off piping system when test pressure is reached.
6. Maintain hydrostatic test pressure continuously for 2 hours minimum, adding make-up water only as necessary to restore test pressure to within 5 psi of specified hydrostatic test pressure.
7. Determine actual leakage by measuring quantity of water necessary to maintain specified test pressure for duration of test.

C. Maximum Allowable Leakage:

$$L = \frac{ND(P)^{1/2}}{7400}$$

where:

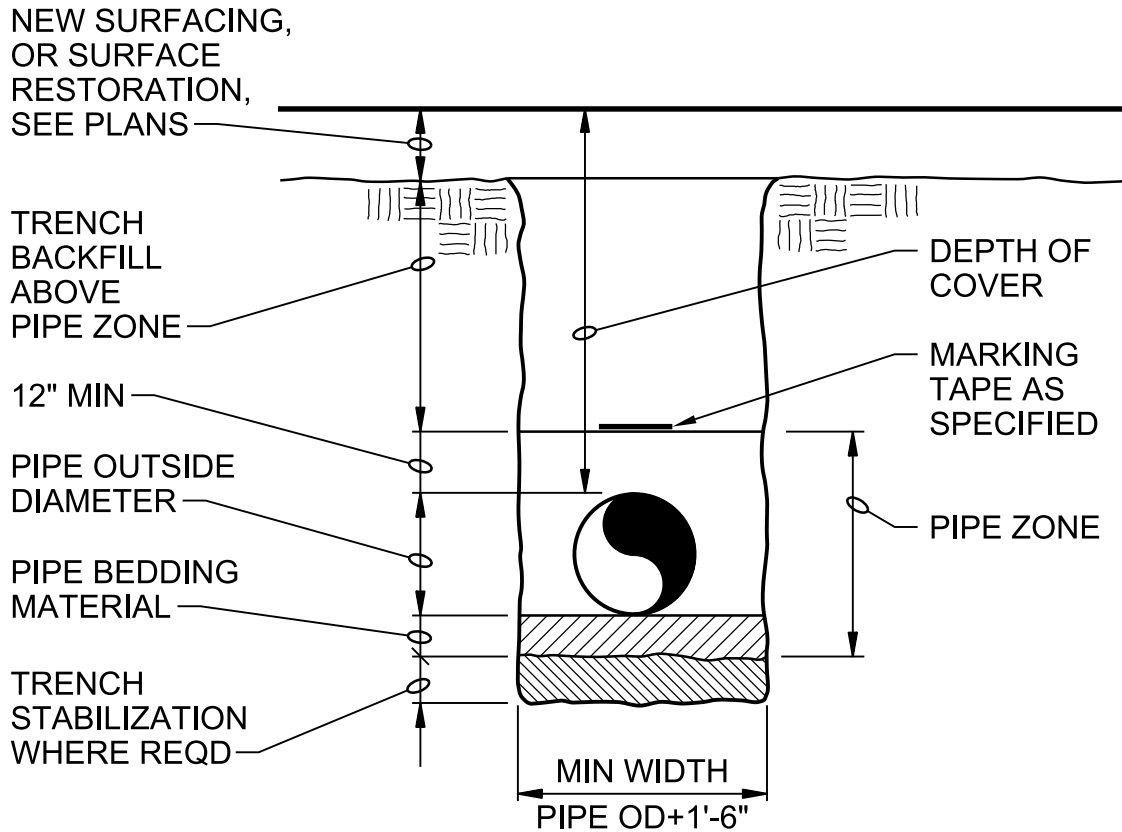
L = Allowable leakage, in gallons per hour.

N = Number of joints in tested line.

D = Nominal diameter of pipe, in inches.

P = Average test pressure during leakage test, in pounds per square inch.

END OF SECTION



TYPICAL TRENCH

NTS

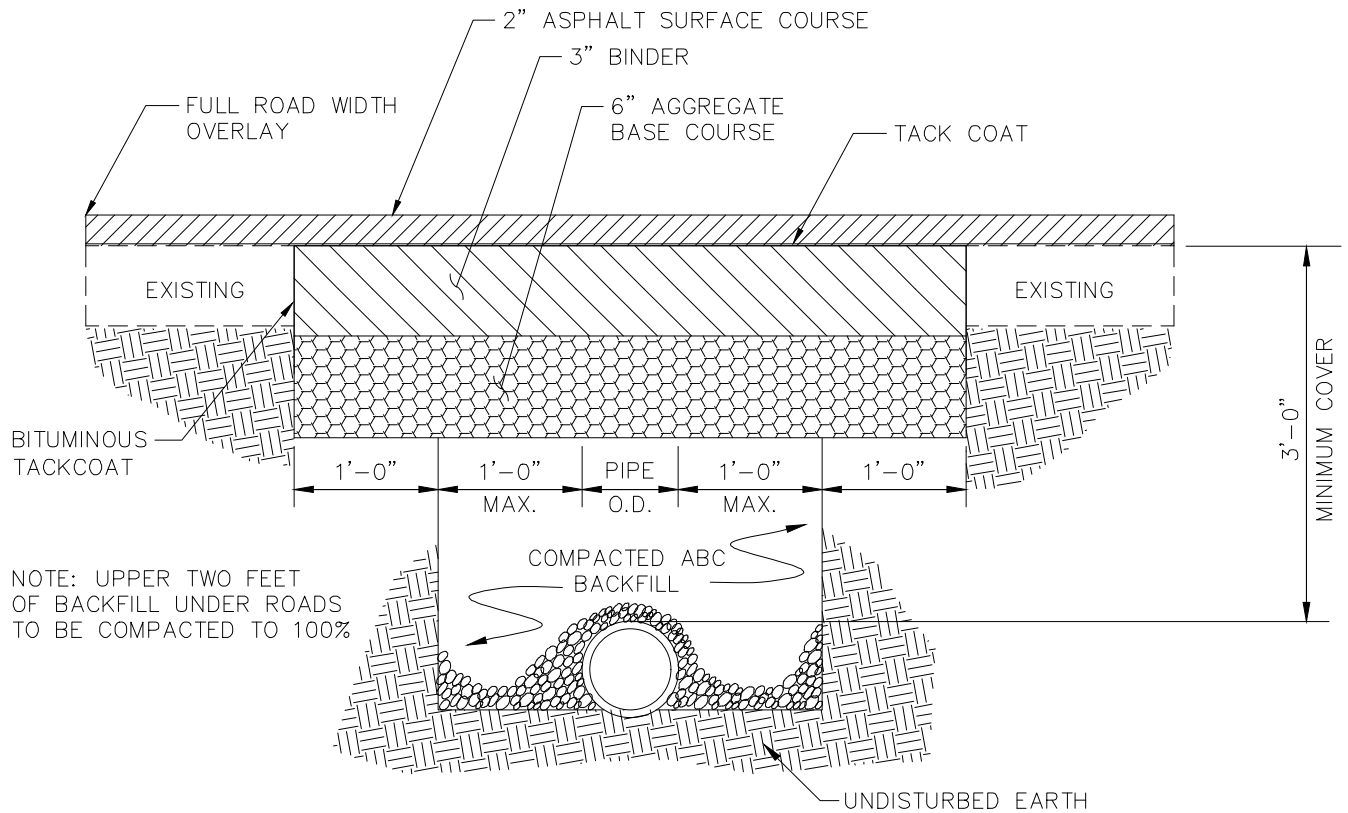
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NOTE TO DESIGNER:

COORDINATE LOCATION OF MARKING TAPE WITH SPECIFICATIONS. PROVIDE NEW SURFACING AS SHOWN ON THE DRAWINGS. WHERE TRENCHES ARE IN AREAS NOT DESIGNATED TO RECEIVE NEW SURFACING, RESTORE EXISTING SURFACE TO EQUAL OR BETTER CONDITION PER SPECIFICATION FOR NEW SURFACING.

3123-110

DATE 19-MAY-03
 TDC WAGNER
 TDR WAGNER
 LCT MCCALL



NOTE:

1. EDGE TO BE SAWED WITH A CONCRETE SAW TO A NEAT SQUARED EDGE. BROOMED CLEAN OF DUST BEFORE TACK COAT IS APPLIED.
2. EDGES TO BE TACKED WITH CRS-I OR CRS-II.
3. CONTRACTOR RESPONSIBLE FOR REPLACEMENT OF ANY PAVEMENT MARKINGS DISTURBED OR COVERED BY OVERLAY.

TYPICAL PAVEMENT REPAIRS - OVERLAY