April 9, 2021

AMENDMENT TO ADVERTISED CONTRACT

CONTRACT I.D. NUMBER: B3TIA2101432-0

GEORGIA PROJECT NUMBER: 222160-

PCN: 222160-

COUNTY: JEFFERSON

AMENDMENT NUMBER: 3

LETTING DATE: April 16, 2021

LETTING NUMBER: 021

THE FOLLOWING CHANGES ARE HEREBY MADE TO THIS CONTRACT. THE BIDDER IS RESPONSIBLE FOR MAKING ANY NECESSARY CHANGES IN INK IN THE PROPOSAL. BIDDER SHALL ACKNOWLEDGE THIS AMENDMENT BY CHECKING THE APPROPRIATE SPACE ON THE PROPOSAL SIGNATURE PAGE.

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DELETE:

LINE NO.		DESCRIPTION	QUANTITY
0235	400-3131	ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL POLYMER-MODIFIED BITUM MATL & H LIME	24165 TN

ADD:

LINE NO.		DESCRIPTION	QUANTITY
0011	154-1000	CONSTRUCTION VIBRATION MONITORING	LUMP SUM
0261	402-4510	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL POLYMER-MODIFIED BITUM MATL & H LIME	24165 TN

1.**Delete** Special Provision Section 665-Gas Distribution System, 9 pages, dated October 18, 2019, from the proposal, **and Substitute** the attached revised Special Provision Section 665-Gas Distribution System, 9 pages, dated November 25, 2019, in the proposal.

2.**Add** City of Louisville, Georgia Gas System Standards and Specifications, 19 pages, to the proposal.

NICHOLAS FIELDS
STATE TRANSPORTATION OFFICE ADMINISTRATOR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

PROJECT: WIDENING AND RECONSTRUCTION OF U.S. 1/S.R. 4 FROM C.R. 325/CLARKS MILL RD. TO C.R. 138/MONNONITE CHURCH ROAD

COUNTY: JEFFERSON

P.I.: 222160

Section 665—Gas Distribution System

Add the following:

665.1 General Description

This Work consists of furnishing materials, labor, tools, equipment, and other items necessary for the complete installation abandonment, removal, relocation, and adjustment of gas distribution systems in accordance to the plans and Specifications.

665.1.01 Definitions

General Provisions 101 through 150

Whenever the terms "Company" or City of Louisville are used in this Special provision and its related documents, it shall be understood to mean City of Louisville its subsidiaries, successors and/or assigns.

The term "Project Coordinator" shall mean the Company's authorized individual having the authority to give instructions pertaining to the work, to approve or reject the work, and otherwise represent the Company. The "Project Coordinator" shall not however be authorized to revoke, alter, enlarge, relax, or release any requirements of the Contract, Plans, and Specifications nor will they act as an agent for the Contractor.

Blast/Hammer Rock: Any formation requiring blasting or means other than a backhoe or ditching machine.

665.1.02 Related References

General Provisions 101 through 150.

A. Standard Specifications

Section 104—Scope of Work

Section 107—Legal Regulations and Responsibility to the Public

Section 108—Prosecution and Progress

Section 205—Roadway Excavation

Section 207—Excavation and Backfill for Minor Structures

Section 210—Grading Complete

Section 400—Hot Mix Asphaltic Concrete Construction

Section 444—Sawed Joints in Existing Pavements

Section 500—Concrete Structures

Section 611—Relaying, Reconstructing or Adjusting to Grade of Miscellaneous Roadway Structures

Section 615—Jacking or Boring Pipe
Section 810—Roadway Materials

B. Related Documents

Refer to the following document for additional specifications

CITY OF LOUISVILLE, GEORGIA
GAS SYSTEM STANDARDS AND SPECIFICATIONS
NOVEMBER 2019

665.1.03 Submittals

A. General Provisions 101 through 150.

B. Refer to Plans and Special Provisions, current published edition, for water utility submittal requirements. Copies of all submittals and documentation shall be submitted to GDOT, who shall distribute to the Utility Owner.

C. Shop Drawings / Product Data

1. Submit [6] copies of the following submittals to the GDOT Project Manager for review by the Facility Owner:
   a. Product data, including size, dimension, capacity, pressure rating, accessories, and special features, installation instructions, and operating characteristics for all proposed materials to show compliance with the requirements of this Special Provision.
   b. Test reports specified in the Quality Acceptance section of this Special Provision. c. Pipe manufacturer certification of compliance with specifications.
   d. Operation and maintenance literature, warranties, and other specified information.

D. Construction Record Documentation

1. Record Drawings shall be signed and sealed by a professional engineer or land surveyor registered in the State of Georgia.
2. Record Drawings shall also be submitted in digital format as indicated in accordance with the Department's current Electronic Utility File Guidelines.
3. Except for standard bound materials, bind all 8.5"x11" (A4) documentation, including 11" x 17" (A3) drawings folded to 8.5"x11" (A4), in logical groupings in loose-leaf binders of either the 3-ring or plastic slide-ring type. Permanently and appropriately label each such bound grouping of documentation.

665.2 Materials

A. Gas Main and Service Line Pipes, Fittings, and Appurtenances

Ensure all materials provided are in conformance with the requirements and standards set forth in the City of Louisville Gas System Standards and Specifications, current published edition.

B. Gas Regulator Station

Ensure all materials provided are in conformance with the requirements and standards set forth in the City of Louisville Gas System Standards and Specifications, current published edition.

665.2.01 Materials Certification

For certain products, assemblies, and materials, in lieu of normal sampling and testing procedures by the Contractor, the Company, and the Department, the Engineer and Project Coordinator may accept from the Contractor the manufacturer's certification with respect to the product involved, under the conditions set forth in the following paragraphs:

1. Ensure certification states/specifies the named product conforms to the City of Louisville Gas System Standards and Specifications and representative samples thereof have been sampled and tested as specified.
2. The certification shall either:
   a. Is accompanied with a certified copy of the test results, or
   b. Certify such test results are on file with the manufacturer and will be furnished to the Engineer and Project Coordinator upon demand.

3. Ensure certification states/specifies the name and address of the manufacturer and the testing agency and the date of tests; and sets forth the means of identification which will permit field determination of the product delivered to the project as being the product covered by the certification.
4. Submit certification in duplicate with one copy to be sent with the shipment of the covered product to the Department's Project Engineer, and with one copy sent to the Department's State Materials and Research Engineer at 15 Kennedy Drive, Forest Park, Georgia. Ensure certification specifies the project number and contract ID number.

   No Certificate will be required for Portland Cement when furnished from a manufacturer approved by the Department.
5. The Department or the Company will not be responsible for any costs of certification or for any costs of the sampling and testing of products in connection therewith.
6. The Department and the Company reserves the right to require samples and to test products for compliance with pertinent requirements irrespective of prior certification of the products by the manufacturer. Any materials that fail to meet specification requirements will be rejected.

665.2.02 Delivery, Storage, and Handling

General Provisions 101 through 150.

Follow all delivery, storage and handling procedures set forth in the City of Louisville Gas System Standards and Specifications, current published edition.

665.3 Construction Requirements

665.3.01 Personnel

General Provisions 101 through 150.

Ensure that the construction and installation of all gas utilities is performed by a contractor prequalified/registered by City of Louisville. Below is a list of the City of Louisville Gas Department prequalified contractors.

Company Name	Company Phone	Address	City	State	Zip
Benton-Ga	**770-942-8180**	**7760 Bankhead Hwy.**	**Douglasville**	**GA**	**30134**
D. Lance Souther	**478-742-2292**	**P.O. Box 6538**	**Macon**	**GA**	**31208**
Harrison & Harrison, Inc.	**706-549-2555**	**P.O. Box 5635**	**Athens**	**GA**	**30604**

665.3.02 Equipment

General Provisions 101 through 150.

Ensure all equipment used is in conformance with the requirements and standards set forth in the City of Louisville Gas System Standards and Specifications, current published edition.

665.3.03 Preparation

General Provisions 101 through 150.

Follow all preparation procedures set forth in the City of Louisville Gas System Standards and Specifications, current published edition.

665.3.04 Fabrication

General Provisions 101 through 150.

Ensure fabrication procedures and requirements conform to those set forth in the City of Louisville Gas System Standards and Specifications, current published edition.

665.3.05 Construction

A. Permission to Enter Private Property

Comply with Section 107—Legal Regulations and Responsibility to the Public

Through an agreement between the Department and the Company; the Contractor is given the permission to enter upon private properties found outside the project's construction limits. This permission is granted for the sole purpose of installing gas service lines only and is limited to the area of existing easements obtained by the company. Such

permission to enter upon private properties is temporary and such rights shall commence upon project award and automatically expire upon completion and project final acceptance by the Department.

In all cases where it is necessary to enter upon private property; it is the Contractors sole responsibility to minimize any disruptions to personal property in the commencement of such work thereof. Additionally the following restrictions and requirements shall apply:

1. All work is limited to the installation, relocation, or replacement of gas service lines, including the work necessary to restore each private property as required in number 6 of this subsection.
2. Notify the Engineer and the private property owner, and resident 72 hours before commencing work on said private property.
3. No vehicles or equipment shall be allowed on any private property except for that which is normally required for the installation of said gas service lines.
4. Do not store any materials, vehicles, or equipment on any private property longer than the duration required to perform the said gas service line installation.
5. Do not use any private property as an on-site detour or vehicle path.
6. Immediately following any construction located on private property the contractor at its sole expense shall restore all areas of the same parcel to a condition substantially the same as existed immediately prior to any such disturbances, including without limitation, any and all necessary repairs, and replacement of grassing, landscaping and pavement which may be removed and excavated by the Contractor. Additionally, the Contractor shall be responsible for all necessary repairs to restore the original contours and re-establish the ground cover to control erosion.

B. Finding Existing Underground Utilities and Obstructions

Comply with Subsection 107.13 and Subsection 107.21.

When unforeseen conflicts require Plan changes, perform the work as altered according to Subsection 104.03 and Subsection 104.04.

Follow all customer notification requirements and obtain approval from the Project Coordinator prior to disrupting existing any gas services required for the installation of the gas facilities shown on the project plans.

C. Excavating Trenches

Excavate trenches to the proper grade, depth, and width as follows:

1. Trench to Grade

   Ensure excavated trench bottoms are firm, free from boulders, and conform to the established grade.

   a. Backfill, according to Subsection 665.3.05.G, any part of the trench excavated below the established grade. Use Class I or Class II Soils (Section 810), and firmly compact the soil.

   b. Where the established grade of a trench is in rock, undercut the bottom of the trench by at least 6 in (150 mm), then backfill and compact according to Subsection 665.3.05.G.

      Conduct blasting operations strictly according to Subsection 107.12.

   c. Excavate trenches under pavement to grade as follows:

      1) To remove the pavement, cut it at least 24 in (600 mm) wider than each trench edge to provide solid bearing for the pavement edges when replaced. Remove the pavement according to Section 444, except no separate payment will be made for sawed joints.

      2) Directional Bore under existing sidewalks, curbs, gutters, and pavements according to Section 555.

      3) Where possible, jack pipe under an existing pavement according to Section 615, except no separate payment will be made for jacking and boring pipe.

2. Minimum Trench Depth

   Excavate trenches to provide at least 48 in (1.2 m) cover depth from the pipe to the finished pavement surface, sidewalk, grass plot, etc. unless indicated otherwise on the Plans or by the Engineer.

   If any part of a gas main is to be placed in or under a new embankment, finish the embankment to at least a 2 ft (600 mm) plane above the pipe barrel before excavating the trench.

3. Trench Width

Excavate trenches wide enough to allow proper installation of pipe, fittings, and other materials.

D. Directional Boring

1. Install gas mains and services by means of directional boring at locations shown on the plans or where approved by the Engineer.
2. Ensure the trench width of the excavation conforms to the outside diameter of the pipe as closely as possible.
3. Remove and replace pipe damaged in boring operations at no additional expense to the Department.
4. Use an approved mix to pressure grout voids developed during the installation operation and the Engineer determines are detrimental to the Work.
5. In unconsolidated soil formations, use a gel-forming collodial drilling fluid with at least 10 percent of high grade carefully processed bentonite to consolidate excavated material, seal the walls of the hole, and lubricate subsequent removal of material and immediate pipe installation.
6. Follow all relevant procedures set forth in the City of Louisville Gas System Standards and Specifications, current published edition.
7. Ensure the total installation includes a locatable conduit system, with identification markers on each DOT right-of-way fence line where applicable.
8. Continuously monitor the location and alignment of the pilot drill progress to ensure compliance with the proposed installation alignment and to verify depth of the bore. Ensure Monitoring is accomplished by computer generated bore logs which map the bore path based on information provided by the locating/tracking system. Ensure readings or plots are obtained on every drill rod, and are provided to the Inspector on a daily basis. Upon completion of the bore the Contractor will furnish the Engineer an As-built drawing along with a report of the Monitoring of the drilling fluids during the pilot hole and back reamed hole.
9. Ensure excess drilling fluids are contained at the entry and exit points until recycled or removed from the site as directed by the Engineer at no additional cost to the Department. Ensure that all drilling fluids are disposed of in a manner acceptable to the appropriate local, state and federal regulations. The Contractor's work will be immediately suspended by the Engineer whenever drilling fluids seep to the surface other than in the boring entrance or exit pit, or when a paved surface is displaced. The Contractor shall then propose a method to prevent further seepage and/or displacement, and shall remove and dispose of any drilling fluid, slurry and soil from the paved surface prior to resuming the boring operation.
10. Ensure surfaces damaged by the work are restored to their preconstruction conditions at no additional cost to the Department, and with no increase in contract time.

E. Connecting to Existing Gas Mains

Connect to existing gas mains at locations shown on the Plans or where approved by the Engineer or Project Coordinator.

Follow all relevant procedures set forth in the City of Louisville Gas System Standards and Specifications, current published edition.

F. Laying Gas Mains and Appurtenances

Follow all relevant procedures set forth in the City of Louisville Gas System Standards and Specifications, current published edition.

G. Installing Gas Mains

Install gas mains at locations shown on the Plans or where approved by the Engineer or Project Coordinator.

Follow all relevant procedures set forth in the City of Louisville Gas System Standards and Specifications, current published edition.

1. Backfilling

   Furnish equipment, labor, and when necessary material required for backfilling the pipe line trenches according to Section 207.

   a. When testing for leaks in open trenches, do not backfill until testing is complete and leaks are eliminated.

b. When retaining pavement adjacent to trenches, replace removed pavement with the same or better material when approved.

c. After backfilling, maintain a smooth riding surface until the repaving is complete. No separate payment will be made for replaced pavement unless a bid Item for this work is contained in the Proposal.

H. Laying Service Lines and Appurtenances

Install service lines at locations shown on the Plans or where approved by the Engineer or Project Coordinator. Install new pipe from the gas main to the final location of the meter or to points approved by the Engineer to connect with existing or future service lines on abutting property.

Follow all relevant procedures set forth in the City of Louisville Gas System Standards and Specifications, current published edition.

I. Lowering Existing Gas Lines

Lower existing gas mains and services at locations shown on the plans or where approved by the Engineer or Project Coordinator.

Follow all relevant procedures set forth in the City of Louisville Gas System Standards and Specifications, current published edition.

J. Service Line Tie-Over

Tie existing service line to new service line as shown on the plans or where approved by the Engineer or Project Coordinator. Install new pipe from the gas main to the final location of the Service Line Tie-Over or to points approved by the Engineer or Project Coordinator to connect with existing service lines on abutting property.

Follow all relevant procedures set forth in the City of Louisville Gas System Standards and Specifications, current published edition.

K. Regulator Station

Install new gas regulator station at locations shown on the plans or where designated by the Engineer or Project Coordinator.

Construct all piping, valves, and regulator in accordance with the following detail.

L. Raising/Lower Existing Gas Valves

Raise/lower existing gas valves at locations shown on the plans or where approved by the Engineer or Project Coordinator.

Follow all relevant procedures set forth in the City of Louisville Gas System Standards and Specifications, current published edition.

665.3.06 Quality Acceptance

A. Testing Gas Mains and Service Connections

Follow all relevant procedures set forth in the City of Louisville Gas System Standards and Specifications, current published edition.

B. Semi-Final Utility Inspection

When the contractor has finished the Gas Distribution System Work, the Contractor may, by written notice, request that a semi-final utility inspection be made. The Engineer, along with the Project Coordinator, will determine if the Gas Distribution System Work is ready for semi-final utility inspection. The Engineer, in agreement with the Project Coordinator, will have the final decision on when the Gas Distribution System Work is complete and thereby ready for semi-final utility inspection. If all the Gas Distribution System Work provided for and contemplated by the Contract is found to be complete to the Engineer's satisfaction and all documents required in connection with the Gas Distribution System Work has been submitted and accepted then, the Contractor may request transfer of the completed Gas Distribution System Work to City of Louisville.

Once the new facilities are in service and accepted by the Company, provide written correspondence notifying the Engineer and Owner that utility location services will be the responsibility of City of Louisville.

Such partial acceptance shall in no way relieve the Contractor of the responsibility for satisfactory completion of the Contract, or for failure of any portion of the Gas Distribution System Work prior to Final Acceptance of the Project.

665.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

665.4 Measurement

Gas mains, service lines, and other items of work in this Specification, complete, in place, and accepted, are measured for payment as follows:

A. Gas Mains

Gas mains are measured in linear feet (meter) for each size installed. The mains are measured along the center, parallel to the slope of the pipe, from end of each installation through all valves and fittings, and shall include the installation of valves, anodes, test wires, gas marker post, and test stations as dictated by the City of Louisville Gas System Standards and Specifications, current published edition.

B. Fittings

Pipe fittings are considered incidental to the gas line in which they are used and are not measured for separate payment.

C. Tie-ins and Valves Installations

All tie-ins and valve installations associated with tie-ins and regulator stations are not measured for separate payment and shall be included in the per foot price of installed gas main.

D. Service Line Tie-Over

Service line Tie-Overs are measured by the number of each size, material, and type installed. The types specified will either be short side service tie-over for those that do not require the crossing of a street or roadway; and long side service tie-over when the installation will span a roadway.

E. Service Lines

Service lines are measured by the number of each size, material, and type installed. The types specified will either be short side service for those that do not require the crossing of a street or roadway; and long side service when the installation will span a roadway.

F. Gas Facilities to be Abandoned or Removed

The abandonment or removal of all deactivated facilities is not measured for separate payment and shall be included in the per foot price of installed gas main. Abandoned or removal of facilities include: main, valves, service, service risers and regulator stations and pits.

G. Blast/Hammer Rock

Blast/Hammer Rock is not measured for payment separately.

H. Gas Main and Service Testing

There is no separate measurement for payment on the testing of gas mains and services, as required by the Company and addressed in the City of Louisville Gas System Standards and Specifications.

I. Steel Casing

Steel casing pipe of the wall thickness and diameter specified shall be measured by the linear foot for each size and thickness of steel casing pipe installed. Measurement shall be horizontally above the centerline of the casing.

J. Regulator Station

This will be measured per each for each size of regulator installed.

K. Excavation for Trenches or Directional Boring

Excavation or Directional Boring is not measured for payment separately, but their costs are included in the amount bid for the Item to which it pertains.

L. Incidentals

Backfilling, pavement removed, pavement replaced, and other incidentals are not measured for separate payment.

M. Raise/Lower Gas Valves

This will be measured per each for gas valves raised or lowered.

665.4.01 Limits

General Provisions 101 through 150.

665.5 Payment

The Contract Unit Price for each Item, complete and accepted, will include all costs incidental to the construction of the Item according to the Plans and as specified in this Section.

The Unit Prices bid will include due allowance for the salvage value of all materials removed from existing or temporary lines, and not installed in the completed work. All such surplus items will become the property of the Contractor unless otherwise specified.

Payment for any Item listed below is full compensation for the Item or Items, complete in place. When placing gas mains or service lines in casings, receive separate payment for the cost of furnishing and installing the casings.

A. Gas Mains

Gas Mains will be paid for at the Contract Unit Price per linear foot (meter) for each size of pipe installed. Payment is full compensation for furnishing all materials including fittings, excavating, backfilling, removing, and replacing pavement, testing and sterilizing, gas marker post, and providing other incidentals necessary to complete the Item. Payment will also include the cost of laying pipe in casing when required.

B. Service Line Tie-Over

Service Line Tie-Overs will be paid for at the Contract Unit Price per each for each type (Long Side, or Short Side), size and material installed. Payment is full compensation for excavating, erosion control, backfilling, removing, and replacing pavement, testing and placing fittings, jointing, and connecting to the main, and providing other incidentals necessary to complete the Item. Payment will also include all work referenced in Section 665.3.05.A.6 of this specification and laying pipe in casing when required.

C. Service Lines

Service Lines will be paid for at the Contract Unit Price per each for each type (Long Side, or Short Side), size and material installed. Payment is full compensation for excavating, erosion control, backfilling, removing, and replacing pavement, testing and placing fittings, jointing, and connecting to the main, and providing other incidentals necessary to complete the Item. Payment will also include all work referenced in Section 665.3.05.A.6 of this specification and laying pipe in casing when required.

D. Excavation for Trenches or Directional Boring

No separate payment will be made for excavation or directional boring.

E. Blast/Hammer Rock

No separate payment will be made for Blast/Hammer Rock, but its costs are included in the project's total amount bid for earthwork.

F. Steel Casing by Jack and Bore

Steel casing pipe shall be paid for at the unit price per linear foot according to the diameter and thickness of the steel casing installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, protection of existing utilities, steel casing pipe, skid, steel straps, coatings, casing spacers, end seals, vent pipe, boring and jacking pits, backfilling, backfill materials, disposal of unsuitable backfill material,

tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install the steel casing except where such items are shown to be paid for under a separate Item. The carrier pipe shall be paid from other applicable Pay Item.

G. Steel Casing by Open Cut

Steel casing pipe shall be paid for at the unit price per linear foot according to the diameter and thickness of the steel casing installed and shall cover the cost for all materials, transportation, labor, equipment, excavation, sheeting and shoring, protection of existing utilities, steel casing pipe, skid, steel straps, coatings, casing spacers, end seals, vent pipe, backfilling, backfill materials, disposal of unsuitable backfill material, tamping, testing, densities, dewatering, trench stabilization, clean-up, restoration, and all work and materials necessary to install the steel casing except where such items are shown to be paid for under a separate Item. The carrier pipe shall be paid from other applicable Pay Item.

H. Regulator Station

This will be paid for at the Contract Unit Price per each for each size of regulator installed. Payment is full compensation for furnishing all materials, excavating, backfilling, removing and replacing pavement, and providing other incidentals necessary to complete the Item.

I. Raising/Lowering Gas Valves

This will be paid for at the Contract Unit Price per each for gas valve raised or lowered. Payment is full compensation for furnishing all materials, excavating, backfilling, removing and replacing pavement, and providing other incidentals necessary to complete the Item.

Payment will be made under:

Item No. 665	Plastic Gas Main_____ in (mm)	Per linear foot (meter)
Item No. 665	Steel Gas Main _____ in. (mm)	Per linear foot (meter)
Item No. 665	Steel Casing_____ in (mm)	Per linear foot (meter)
Item No. 665	Long Side Service ___in (mm),(material)	Per each
Item No. 665	Short Side Service ___in (mm),(material)	Per each
Item No. 665	Long Side Service Tie-Over ___in (mm),(material)	Per each
Item No. 665	Short Side Service Tie-Over ___in (mm),(material)	Per each
Item No. 665	Regulator Station _____in. (mm)	Per each
Item No. 665	Raise/Lower Gas Valve	Per each

5.01 Scope: The work described by this Section consists of furnishing all materials and equipment and performing all labor necessary to put in complete working order the pipe lines and appurtenances shown on the Drawings and/or specified. All Work shall be done in accordance with requirements of CFR Title 49 Part 192 "Transportation of Natural and Other Gas By Pipeline: Minimum Federal Safety Standards," as amended, and any applicable Standards which are hereby incorporated in these specifications by reference.

All standard test designations refer to the revision of those standards in effect on the date of issue of the Contract Documents, except when a specific revision is specified.

The work shall include all clearing, trenching and excavation, pumping, bailing and draining, sheeting, pipe laying, backfilling and testing of lines and all provisions necessary to protect and maintain buildings, fences, water and gas lines, power and telephone lines and cables, drainage and other structures, the furnishing and maintenance of suitable bridges and footways across intercepted streets, the cleaning away of all rubbish and surplus excavated material, and all such other work as may be necessary to complete the project.

5.02 Drawings: The Contractor shall furnish six (6) copies of pipe fabrication details and dimensional layouts for all piping systems for checking and approval by the Engineer. Each joint of pipe and fittings shall be marked and dimensioned to ensure proper installation. No fabrication, manufacture, nor installation shall commence until those drawings have been approved.

5.03 Qualifications: All of the Contractor's employees or subcontractors that perform any work under this contract must possess, prior to performing any work, the proper Operator Qualifications (OQ) from SCRS for performing any and all tasks requiring OQ. Upon request contractor shall supply documentation to show that his employees are qualified as required in CFR Title 49 Part 192 "Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards", Subpart N. In order for the Contractor to connect the new construction to the Owner's system, the employees of the Contractor who will physically make the tie-in welds/fusion joints are required by CFR 49 Part 199, Part 40 to be a participant in an anti-drug/drug testing program. Upon request by the Owner the Contractor must furnish documentation of the participation in a qualified anti-drug testing program for those employees to the Owner.

5.04 Steel Pipe and Fittings: The Contractor shall furnish steel pipe and fittings as follows:

A. Steel Pipe: Steel pipe shall be Electric Resistance Welded, Grade X52, meeting the requirements of API 5L, PSL-2, Specifications for Line Pipe, and shall be new and unused. Steel pipe shall be manufactured in the United States and shall bear the mark of the manufacturer. Steel line pipe shall have diameters and wall thicknesses as specified below, shall be double random (42') lengths and beveled

for welding. Steel line pipe shall have a plant-applied coating of fusion bonded epoxy applied electrostatically to an average mill thickness of 14 mils with a minimum thickness at any point of 12 mils. Coating shall terminate six inches from the ends of the pipe. Plant applied coating shall be equal to Scotchkote 206N epoxy coating as manufactured by 3M Electrical Products Division of St. Paul, Minnesota. Pipe to be used for Directional Boring shall be coated with an additional 30-mil thick two-part epoxy coating (POWERCRETE or equal).

Minimum pipe wall thickness shall yield less than 20% SMYS according to the following formula:

%SMYS Calculation: D*Pa/(2*wt)/Y*100=%SMYS

D= Outside Diameter of Pipe in inches

Pa= MAOP in psia

Wt= Wall Thickness in inches

Y= Yield Strength in pounds

Welded joints, fittings and damaged areas of the coating shall be wrapped with a tape coating having a minimum thickness of 35 mils and shall be compatible with the specified coating. Tape coating shall be supplied with the necessary primer and of the type and grade recommended by the tape manufacturer and installed according to the manufacturer's instructions. The tape coating shall be cold applied tape equal to Protecto Wrap 320-35 manufactured by Protecto Wrap Company, Denver, CO.

Welded joints on pipe used for directional boring shall be coated with an additional 30-mil coating of field applied epoxy POWERCRETE F1 or R95, or equal.

B. Markings: Pipe and fittings shall bear the following minimum information stenciled to the exterior of the plant applied coatings:

Name of Coating Applier

Name of Pipe Manufacturer

Pipe O.D. in inches

Pipe Wall Thickness in Inches

Type of Pipe Manufacture and Grade

Coating Specification Symbol

C. Fittings: Welding fittings shall be butt weld, ASTM A234 WP-Y52, seamless or ERW steel with a minimum yield strength equal or greater than the line pipe. Welding fittings shall be Standard Weight, Schedule 40 in accordance with ANSI B36.10, 3R radius.

5.05 Steel Line Valves: Steel line valves six (6") inch and smaller shall be floating ball type as manufactured by Cameron, Balon, Ballomax, Kerotest or approved equal, CL300, std SS trim. Steel line valves larger than six (6") inches shall be Cameron T31 fully welded

trunion mounted ball valves, CL300, Std. SS trim or equal. Buried valves shall be equipped with geared operator, 2-inch nut and suitable for buried service with Coal Tar Coating or equal, stub up vent and sealant ports. Valve shall be weld × weld with wall thickness to match pipe unless shown otherwise on the Drawings.

A. Operation: All valves shall open left. Valves shall be operated by nut. Operating nuts shall conform to the present standard of the Owner, and shall have an arrow cast on them, indicating the direction for opening the valve.

B. Marking: Each valve shall be plainly marked with the manufacturer's name or particular mark, the year of manufacturer, the size of the valve, and designation indicating working pressure or class rating.

C. Installation: Line valves shall be installed in a horizontal, upright position. Buried valves shall be furnished with a valve box.

D. Testing: All line valves shall meet or exceed ASME/ANSI Class 300 standards as amended to date. Internal test is required in field.

E. Pinion Extension: Provide factory installed pinion extension such that operating nut, vent and sealant parts are 8”-16" below grade.

5.06 Polyethylene Pipe and Fittings: The Contractor shall furnish polyethylene pipe and fittings as follows:

A. Polyethylene Pipe: Polyethylene pipe shall be for gas distribution and conform to requirements of ASTM D 2513, “Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing, and Fittings.” The PE pipe shall have a minimum working pressure rating of 60-psi PE2406 Yellow. Polyethylene Fittings shall conform to ASTM D 3261, “Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for PE Plastic Pipe and Tubing.” All pipe and tubing shall be jointed by butt fusion. Pipe shall be furnished in standard 40-foot lengths or 500-foot coils and fused on site.

B. Markings: Pipe and fittings shall bear identification markings in accordance with ASTM D 2513 or ASTM D 3261, as amended to date, that will remain legible during normal handling, storage and installation and which have been applied in a manner that will not reduce the strength of the pipe or coupling or otherwise damage them.

C. Tracer Wire Installation: Contractor shall install wire on top of the polyethylene gas line for the full length of pipe. Locating wire shall be 12-gauge copper wire.

D. Testing and Inspection: All pipe shall be tested and inspected at the place of manufacturer for all requirements of the ASTM D 2513 and ASTM D 3261 standards. Certified copies of the test reports covering each shipment shall be submitted to the Engineer prior to laying.

5.07 Polyethylene Shut-off Valve: The Contractor shall furnish polyethylene shut-off valves (PSV) as indicated on the Drawings, and specified herein. Shut-off valves shall be available from ½-inch to 8-inch, molded from pipe grade PE material. The PSV shall be rated equivalent to the maximum allowable working pressure of the PE pipe, which it is

joining. The plastic resin used to manufacture the polyethylene valves shall be the same resin used to manufacture the polyethylene pipe. The PSV shall operate with low torque, one-quarter turn actuator for on-off operation.

A. Operation: All valves shall open left. Valves shall be operated by nut. Operating nuts shall conform to the present standard of the Owner, and shall have an arrow cast on them, indicating the direction for opening the valve.

B. Marking: Each valve shall be plainly marked with the manufacturer's name or particular mark, the year of manufacturer, the size of the valve, and designation indicating working pressure.

C. Installation: Shut-off valves shall be installed in a horizontal, upright position. Valve boxes shall be installed on all underground valve installations and shall be supported independently of the valve or gas main. Buried valves shall be furnished with a valve box.

D. Testing: All shut-off valves shall meet or exceed ASTM D 2513, US DOT Title 49 Part 192, and ANSI B16.40 as amended to date. Internal test is required in field.

E. Jointing: The smaller sizes (½ to 2) shall be available with couplings or fusion outlets whereas larger sizes (3, 4, 6, and 8) shall be equipped with fusion outlets only. Butt fusion fittings shall comply with ASTM D3261; socket type fittings shall comply with ASTM F1924.

F. Manufacture: Valves shall be furnished as manufactured by Elster Perfection, Rockwell or approved equal.

5.08 Tapping Saddle: The Contractor shall furnish and install tapping saddles and shut-off valves for connections into existing pipe lines as indicated on the Drawings and/or specified. Tapping saddles shall be split-sleeve, mechanical joint type with socket fusion end connection or butt, socket, or electrofusion welded joint type as shown and/or indicated on drawings. Tapping saddles shall molded from ASTM D 2513 grade PE material as manufactured by Perfection's or equal. Steel tapping saddles shall conform be mechanical joint or welded as shown and/or indicated on drawings.

A. Tapping Machine: The Contractor shall furnish the tapping machine and all other equipment required for installation of the tapping saddle and shut-off valve.

5.09 Hot Tie-Ins: Contractor shall have available the appropriate T. D. Williamson or equal drilling, tapping, and stopping equipment necessary for the various fittings shown on the Drawings and trained and experienced personnel to operate same.

For hot tie-ins in polyethylene pipe the Contractor shall have available the appropriate squeeze-off tools for polyethylene pipe. All points on the polyethylene pipe where the squeeze-off is applied shall have installed a full encirclement clamp to mark the point and reinforce the line.

After the new main has been cleaned and satisfactorily tested and approved by the Engineer for gas service, the Contractor will proceed to tie-in the new main to the

existing gas system. Tie-ins will be made at locations indicated on the Drawings or otherwise designated by the Engineer.

The Contractor shall give forty-eight (48) hours advance notice to the Engineer prior to starting the Work of making a tie-in. All cost for making a completed tie-in shall be included in the bid item.

Stopper fittings and other hot tap fittings necessary for completing the tie-in shall be manufactured by T. D. Williamson or equal.

5.10 Valve Boxes: The Contractor shall furnish and install valve boxes for shut-off and line valves. A gas line valve marker shall be installed adjacent to each valve box.

Valve boxes shall be heavy roadway type. The valve boxes shall be cast iron two-piece slide type with drop covers. The word "gas" shall be cast in raised letters on the covers. The valve boxes shall be adjustable to 6-inches up or down from the nominal required cover over the pipe. A concrete protecting slab shall be required when valve box is not located on a paved area. Installation shall be so that the top is flush with the protecting slab. Concrete protecting slabs shall not be smaller than 18-inches square by 6-inches thick.

Valve boxes shall be equal to the adjustable valve box manufactured by Ametek or equal.

5.11 Pipeline Markers: Contractor shall install all flexible warning markers along the alignment of the gas line. A marker shall be placed above the pipe at all intersections and where the pipe changes direction. Additional markers shall generally be placed above the pipe measured along the pipe at a maximum of five hundred (500') feet intervals or as directed by the Engineer. Tracer wire per these specifications shall be installed to the markers and connected to terminals. Each marker should contain the following information:

- **Warning**
- **Buried High Pressure Gas Line**
- The **Call Before You Dig** logo.
- **Owner contact information**

The flexible markers shall be a minimum of 68-inches in length and 3 ½ inches wide. A yellow top marker should be provided. Contractor shall submit shop drawings with information layout for review and approval.

5.12 Low Pressure Customer Service Connections: Contractor shall furnish all equipment, labor and material necessary to install service connections as detailed on the Drawings and as specified herein. Connections shall include a fusion tapping saddle, and excess flow valve. Location of services shall be as directed by the Engineer. Connections shall be made after testing of gas main has been completed. Connection shall be made with a fusion tapping tee at the gas main and 5/8-inch polyethylene tubing run to the excess flow valve.

A. Fusion Tapping Tee: Saddle fusion tapping tees for medium density PE pipe shall be molded from PE2406/PE2708 polyethylene. Pull-out strength shall be greater than the connected PE piping. Saddle fusion tapping tees shall meet or exceed the

requirements of the US DOT. Saddle fusion tees shall be Permasert Saddle Fusion Tapping Tees manufactured by Elster Perfection or an approved equal.

B. Service Tubing: Service tubing shall be 5/8-inch polyethylene as called for in the Proposal. Fittings shall be polyethylene socket fusion type.

C. Excess Flow Valve: Shall have socket fusion ends for easily connecting to the 5/8-inch polyethylene tubing or incorporated within the mechanical tapping tee. The valve shall consist of a stamped stainless steel body, stainless steel spring, and nylon ball. Trip Flow Rate shall be determined by the Engineer. Automatic Reset shall be achieved at a pressure differential as low as 1.5-psi.

PVC service lines encountered shall be replaced to customer's meter

Steel service lines may be reconnected to the steel main. Isolated steel services are not allowed and must be replaced with polyethylene from the main to the customer's meter.

5.13 Unloading, Hauling, Distributing, and Storing Steel Pipe and Related Materials: The Contractor shall unload, haul, distribute and store steel pipe and related materials as follows:

A. Unloading: Equipment and facilities for unloading, hauling, distributing and storing materials shall be furnished by the Contractor and shall at all times be available for use in unloading materials. Delays in unloading railroad cars, unloading trucks, or hauling from freight terminal which incur demurrage, truck waiting charges or terminal charges shall be at the expense of the Contractor.

B. Handling: Pipe, fittings and other material shall be carefully handled so as to prevent breaking. Pipe may be unloaded individually by hand but shall not be unloaded by rolling or dropping off of trucks or cars. Preferred unloading is in units using mechanical equipment, such as forklifts, cherry pickers, or front-end loaders with forks. If fork lift equipment is not available units may be unloaded with use of spreader bar on top and nylon strips or cables (cushioned with rubber hose sleeve) approximately eight feet (8') apart looped under the unit.

Coated steel pipe shall be lifted, rolled or otherwise handled so as not to damage the coating. All damaged coating shall be repaired and acceptance of same shall be contingent upon approval of the Engineer or Owner.

C. Distributing: Materials shall be distributed and placed so as to least interfere with traffic. No street or roadway may be closed without first obtaining permission of the proper authorities. The Contractor shall furnish and maintain proper warning signs and obstruction lights for the protection of traffic along highways, streets and roadways upon which material is distributed. No distributed materials shall be placed in drainage ditches.

D. Storage: All pipe, fittings and other materials which cannot be distributed along the route of the work shall be stored for subsequent use when needed. Pipe must be stockpiled on level ground. If pipe is unloaded individually by hand, timbers must be used under the pipe for a base, spaced the same as factory load, with stop blocks nailed at either end. Stockpile must be built up the same manner as it was

stocked for shipment, transferring dunnage, and chock-blocks from load to stockpile. Individual lengths of pipe shall not be stacked any higher than five-feet.

If pipe is unloaded in units, the units must be placed on level ground and shall not be stacked more than two (2) units high. Units must be protected by dunnage in the same way they were protected while loaded on the truck or car. The dunnage must support the weight of all units so that pipe lengths do not carry the weight of the unit loaded above.

If pipe is to be stored outside and exposed to sunlight for a number of months, the pipe must be protected by covering with canvas or other opaque material. The cover shall be loose enough to allow for air circulation around the pipe. The use of clear plastic sheets will not be permitted. The Contractor shall make his own arrangements for the use of storage areas.

E. Payment: No separate payment will be made for the above work. The cost of such work and all cost incidentals thereto, shall be included in the unit prices bid for the item to which the work pertains.

5.14 Unloading, Hauling, Distributing, and Storing Polyethylene Pipe and Related Materials: The Contractor shall unload, haul, distribute and store PE pipe and related materials as follows:

A. Unloading: Equipment and facilities for unloading, hauling, distributing and storing materials shall be furnished by the Contractor and shall at all times be available for use in unloading materials. Delays in unloading railroad cars, unloading trucks, or hauling from freight terminal which incur demurrage, truck waiting charges or terminal charges shall be at the expense of the Contractor. When loading or unloading plastic pipe, the Contractor shall avoid dropping the pipe. Chains shall not be used for handling.

B. Handling: Plastic pipe shall be protected from fire, excessive heat, harmful chemicals, and long term exposure to direct sunlight. The Contractor shall exercise care during handling to prevent gouges, scratches, cuts, kinks, or punctures in the pipe. Such damages shall be cut out and replaced. Pipe, fittings and other material shall be carefully handled so as to prevent damage. Pipe may be unloaded individually by hand but shall not be unloaded by rolling or dropping off of trucks or cars. Preferred unloading is in units using mechanical equipment, such as forklifts, cherry pickers, or front-end loaders with forks. If fork lift equipment is not available units may be unloaded with use of spreader bar on top and nylon strips or cables (cushioned with rubber hose sleeve) approximately eight feet (8') apart looped under the unit.

C. Distributing: Materials shall be distributed and placed so as to least interfere with traffic. No street or roadway may be closed without first obtaining permission of the proper authorities. The Contractor shall furnish and maintain proper warning signs and obstruction lights for the protection of traffic along highways, streets and roadways upon which material is distributed. No distributed materials shall be placed in drainage ditches.

D. Storage: All pipe, fittings and other materials which cannot be distributed along the route of the work shall be stored for subsequent use when needed. Pipe must be stockpiled on level ground. If pipe is unloaded individually by hand, timbers must be used under the pipe for a base, spaced the same as factory load, with stop blocks nailed at either end. Stockpile must be built up the same manner as it was stocked for shipment, transferring dunnage, and chock-blocks from load to stockpile. Individual lengths of pipe shall not be stacked any higher than five-feet.

If pipe is unloaded in units, the units must be placed on level ground and shall not be stacked more than two (2) units high. Units must be protected by dunnage in the same way they were protected while loaded on the truck or car. The dunnage must support the weight of all units so that pipe lengths do not carry the weight of the unit loaded above.

If pipe is to be stored outside and exposed to sunlight for a number of months, the pipe must be protected by covering with canvas or other opaque material. The cover shall be loose enough to allow for air circulation around the pipe. The use of clear plastic sheets will not be permitted. The Contractor shall make his own arrangements for the use of storage areas.

E. Payment: No separate payment will be made for the above work. The cost of such work and all cost incidentals thereto, shall be included in the unit prices bid for the item to which the work pertains.

5.15 Highway and Railroad Crossing: The Contractor shall install pipe lines across highways and railroads in accordance with the applicable regulations of the State Department of Transportation, the Railroad and as shown on the Drawings. All work shall conform to the "Construction Along Highways, Streets and Roadways" section of these Specifications. Permits for highway crossings and railroad crossings will be obtained by the Owner.

5.16 Railroad Crossing Signs: All pipelines crossing Railroad right-of-way shall be prominently marked at right-of-way lines by durable, weatherproof signs located over the centerline of the pipe installed. Information on the sign shall include:

- Name and address of Owner
- Contents of pipe
- Pressure in pipe
- Pipe depth below grade at point of a sign
- Emergency telephone number in event of pipe rupture

Prior to installing any facilities within the railroad right of way, Contractor shall obtain from the Engineer a copy of the installation drawing approved by the Railroad.

5.17 Excavation for Trenches: Excavation of pipe trenches shall include all excavation of every description and whatever substance encountered and shall include disposal of all rock excavation and shall include disposal of excess earth excavation not required for backfilling of trenches. The Contractor shall not open more trench in advance of pipe laying than is necessary to expedite the Work. The trench shall be marked and/or

barricaded where a hazard exists or might exist. Road signs with proper instructions shall be used to describe hazards and to control traffic so that accidents might be prevented. Trench openings shall be covered or filled-in prior to periods when such openings are left unattended.

A. Depth of Trenches: The minimum cover over the top of the pipe shall be four (4) feet unless otherwise directed by the Engineer. Where obstructions are encountered, minimum depth may be changed to avoid interference.

B. Width of Trenches: Trenches shall be excavated sufficiently wide to allow proper installation of pipe, fittings and other materials, and to not less than 6-inches clear of the outside barrel of the pipe on any side at any point.

C. Earth Excavation: Earth excavation shall include all excavation of whatever substance encountered, except rock excavation, as further provided for in these Specifications. In locations where pipe is to be bedded in earth excavated trenches, the bottom of such trenches shall be fine graded to allow firm bearing for the bottom of the pipe on undisturbed earth. The trench shall be completed in a manner which will offer a smooth, continuous support to the entire length of the pipeline. All sharp objects such as rocks, glass, etc., shall be removed from the trench or the trench shall be imbedded with sand. Where any part of the trench has been excavated below the grade of the trench, the part excavated below such grade shall be filled in with bank sand and compacted at the Contractor's expense.

D. Rock Excavation: Rock excavation shall comprise solid rock in the original bed, or in well defined ledges, the removal of which in the opinion of the Engineer requires drilling, blasting, or the use of jack hammers or bullpoints, and shall also include boulders or detached pieces of rock eight (8) cubic feet or more in content.

Blasting operations shall be conducted in strict accordance with all blasting ordinances and regulations; and all blasting shall be done as directed by the Engineer. All exposed structures shall be carefully protected from the effects of blast and all blasts shall be covered with heavy timbers, mats, or suitable protection. The blasting shall be done only by experienced men. Very light charges must be used to prevent damages to adjacent structures.

No blasting operation shall be started without the Engineer's approval of method and quantity of explosive to be used. Any damage done shall be promptly repaired by the Contractor at his own expense. Where there are no local ordinances governing blasting and the storage of explosives, all blasting supplies shall be stored in a manner approved by the Engineer and a watchman shall be stationed at all times at the place of storage. In no case shall caps or other explosives be kept at the place where dynamite or other explosives are stored.

1. Payment: Excavation in solid rock will be paid for at the unit price per cubic yard as stated in the Proposal, the price being in addition to that paid per foot of pipeline installed. Overburden may be removed prior to drilling and blasting or, if the Contractor elects, he may drill and blast prior to removing overburden. Measurement will be made: (a) along profile of

rock after overburden is removed prior to blasting, or (b) to rock line showing in side banks if blasted prior to removal of overburden. No payment will be made for rock blasted unless the measurement is made by the Engineer or his representative. Rock excavation will be measured for payment for a width equal to 4/3 D + 12 inches, where D is the nominal inside diameter of the pipe, the sides of the trench being considered vertical, and to a depth of six-inches below the bell of the pipe.

E. Trench Bottom Stabilization: Wherever the subgrade is by nature too soft or mucky, in the opinion of the Engineer, for the proper installation of the pipe, he may order the Contractor to under cut the trench and backfill with manufactured sand or M10 granite screenings. The media so placed shall be brought to the grade required for the particular location and compacted.

1. Payment: Payment for crushed stone stabilization, only where ordered by the Engineer, will be made in accordance with the unit price bid for the item, measured before placing, and shall include the removal of unsuitable subgrade materials.

5.18 Existing Pipelines: Where new pipeline parallels or crosses existing pipelines the Contractor shall take precautions as necessary to ensure that such existing pipelines are not disturbed. Any damage to existing pipelines shall be promptly repaired at the Contractor's expense. Pipeline crossing permits will be obtained by the Owner.

A. Payment: No separate payment will be made for the above work. The cost of such work and all costs incidental thereto shall be included in the unit prices bid for the item to which the work pertains.

5.19 Connections to Existing Pipelines: Connections to existing pipelines shall be made with the necessary fittings and valves as indicated on the Drawings.

A. Location: The Contractor shall, before opening pipeline trenches, locate the various points of connections to be made into existing pipelines and shall uncover as necessary for the Engineer to prescribe the type of connections and fittings to be installed.

B. Interruption of Service: Connections to existing pipelines shall be made only at such times and in such manner as will meet operating requirements. No cut shall be made in existing lines until the permission of the Owner's Superintendent of Utilities has been obtained as to time and manner of making the cuts and connections. All existing valves shall be operated only by authorized representatives of the Owner.

C. Payment: Payment for connections to existing lines will be paid for at the unit prices listed in the Proposal. The cost of the pipe, fittings, valves, concrete blocking, and paving removed and replaced will be paid for separately at the unit prices listed in the Proposal. The cost of connections to existing pipe lines and all costs incidental thereto, except materials listed above, shall be included in the unit price bid for the connection as listed in the Proposal.

5.20 Existing Underground Utilities and Obstructions: Certain existing utility lines, culverts and cross drains are shown on the Drawings, according to the best information available to the Engineer. The Drawings indicated the pipelines to be laid over, under or around underground utilities or obstructions where such utilities or obstructions are known to exist. Where these or unforeseen underground utilities or obstructions are encountered, minimum depth of cover, or the location and alignment, may be changed, upon written approval of the Engineer, to avoid interference. The location of the existing utilities are approximate only. The Contractor is responsible for determining the exact location of all utilities before beginning construction. The location of the pipe shall be such as to allow a minimum clearance of twelve (12) inches between all utility lines, drain lines, or other obstructions which in the opinion of the Engineer might reduce the quality of construction or damage such obstructions.

A. The Contractor shall furnish and have available at all times an Electronic Pipe and Cable Finder in working order, for the purpose of locating existing pipelines or other obstructions in the way or are along the route of the new work.

B. Payment: No separate payment will be made for the above work. The cost of the above work and all costs incidental thereto shall be included in the unit prices bid for the items to which the work pertains.

5.21 Utilities Services: Utilities service lines are not shown on the Drawings. Before a pipeline is laid, the Contractor shall locate water, sewer, gas and other utilities services as necessary for the Engineer to determine the depth at which the pipelines shall be laid to avoid interference with the pipelines as the case may be. The Contractor shall be responsible for and shall repair any damage done to utilities services or resulting from the construction operations.

A. The Engineer shall have the right to determine the services which are to remain in place and the services which shall be relocated as best suits conditions as found, in accordance with the following:

1. Services to Remain in Place: Where the Engineer determines the services shall remain in place, minimum specified depths of cover for the pipelines may be changed to avoid interference with such services.

2. Services to be Relocated: Where the Engineer determines the services shall be relocated, the Utilities will make the necessary changes without cost to the Contractor.

B. Payment: No separate payment will be made for the above work. The cost of the above work and all costs incidental thereto shall be included in the unit prices bid for the items to which the work pertains.

5.22 Additional Trench Depth: Where necessary to increase the minimum depth of cover to avoid interference with underground utilities, obstructions and utilities services, the Contractor shall furnish all construction equipment and shall perform all labor required for additional trench depth, as authorized by the Engineer.

A. Authorization: All authorization for performing work for additional trench depth shall be issued in writing.

B. Delay: Any delay or extra cost due to encountering underground utilities mains, obstructions and utilities services not shown on the Drawings or found in locations different from those shown on the Drawings shall not constitute a claim for additional payment, except as provided for payment for authorized additional trench depths.

5.23 Assembling, Laying, and Jointing Steel Pipe and Fittings: The Contractor shall assemble, joint and lay all pipe and fittings to accurately conform to the lines and grades established by the Engineer and as follows:

A. Handling: Proper and suitable tools and equipment, for the safe and convenient handling and laying of the pipe shall be used. Care shall be taken to prevent the pipe or fittings from being damaged. Steel pipe shall be carefully examined to ensure that pipe and coating is homogenous throughout, free from cracks, nicks, gouges, severe scratches, etc. No pipe or fitting shall be laid which is known to be defective. If any pipe or fitting is discovered to be cracked, broken, or defective after being laid; it shall be removed and replaced with sound material, without further charge. All pipe and fittings shall be thoroughly cleaned before being laid, and shall be kept clean until accepted in the completed work.

B. Cutting Steel Pipe: Whenever steel pipe is required to be cut, the cutting shall be done by skilled workmen using a power saw with a steel blade or abrasive discs. Pipe must be marked around its entire circumference prior to cutting to assure a square cut. After cutting is complete, the pipe end shall be checked for a smooth square edge. Prior to welding, the pipe end(s) shall be trued, stripped of coatings and prepared to weld.

C. Alignment and Gradient: Steel pipe may follow true curves but must be within the allowable laying radius, as recommended by the pipe manufacturer, both horizontal and vertical.

D. Cleaning: All dirt or foreign material must be cleaned from each joint of pipe or fitting while it is suspended before it is lowered into the trench. Before the system is accepted, the Contractor shall also thoroughly clean all lines.

E. Sequence of Work: Excavation, cleaning, laying, jointing and backfilling shall be kept up as closely as is possible so as to progress in a uniform, workmanlike manner. In no case shall pipe be left in the trench overnight, without completing jointing. The completed pipe line shall not be left exposed in the trench unnecessarily and the Contractor will be required to backfill and compact the trench as soon as possible after jointing and laying is completed. The Contractor shall keep exposed ends of pipe properly plugged during laying to prevent dirt and other materials entering the line. Each day at the close of work, and at all times when laying is not in progress the exposed end of the pipe line in the trench shall be closed by the use of an approved header or barrier of wood or metals. If at any time it becomes necessary to cover the ends of an uncompleted pipe line

with backfill, the end of such pipe line shall be closed, using a header with mechanical joint plug.

F. Coordination of Testing: Contractor shall properly plan and stage work such that x-ray and other testing can be performed efficiently, by scheduling testing of multiple joints on a single trip.

G. Laying Steel Pipe in Trenches: When laying pipe in trenches, care shall be taken to give the pipe solid bearing throughout its entire length.

1. Pipe Lines in Earth Trenches: Refer to "Excavation for Trenches" section.

2. Pipe Line in Rock Trenches: Refer to "Excavation for Trenches" section.

3. Dewatering Trenches: All excavation shall be dewatered properly before laying pipe. Where running sand is encountered, dewatering shall be done by well pointing whenever possible. Where soil conditions are not favorable for use of well point, french drains of graded stone shall be constructed to suitably located sumps and the water removed by bailing or pumping. All costs of equipment, labor, and materials required for dewatering shall be included in the prices bid for pipelines.

4. Jointing Steel Pipe: Any and all welding on the pipeline or appurtenances thereto, testing and qualification of welders shall be in accordance with the "Qualifications" section.

5. Backfill and Marking Tape: Backfill shall be carried to a point twelve (12") inches above the top of pipe, using hand tools for tamping. Puddling will not be allowed as a method of compaction. The remaining backfill shall be as specified in "Backfilling" paragraph of these Specifications. Pipe shall have at least thirty-inches of cover before wheel loading and at least forty-eight-inches of cover before using heavy duty tamping equipment such as a hydro-hammer.

H. Payment: Payment for laying and jointing pipe, laying and jointing fittings, the cost of material, and all cost incidental thereto shall be made in accordance with unit prices bid in the Proposal for pipe based on the measured quantity of the pipe actually installed. Cost of installing marking tape shall be included in the unit prices bid for the item to which the work pertains.

5.24 Assembling, Laying, and Jointing Polyethylene Pipe and Fittings: The Contractor shall assemble, joint and lay all pipe and fittings to accurately conform to the lines and grades established by the Engineer and as follows:

A. Handling: Proper and suitable tools and equipment, for the safe and convenient handling and laying of the pipe shall be used. Care shall be taken to prevent the pipe or fittings from being damaged. PE pipe shall be carefully examined to insure that pipe is homogenous throughout, free from cracks, nicks, gouges, severe scratches, etc. No pipe or fitting shall be laid which is known to be defective. If any pipe or fitting is discovered to be cracked, broken, or defective after being laid; it shall be removed and replaced with sound material, without

further charge. All pipe and fittings shall be thoroughly cleaned before being laid, and shall be kept clean until accepted in the completed work.

B. Cutting PE Pipe: Whenever PE pipe is required to be cut, the cutting shall be done by skilled workmen using a hacksaw, a fine toothed hand saw or a power saw with a steel blade or abrasive discs. Pipe must be marked around its entire circumference prior to cutting to assure a square cut. After cutting is complete, the pipe end shall be checked for a smooth square edge. Prior to fusion, the pipe end(s) shall be trued to a smooth square edge using cutting equipment on the fusion rig.

C. Alignment and Gradient: PE pipe may follow true curves but must be within the allowable laying radius, as recommended by the pipe manufacturer, both horizontal and vertical.

D. Cleaning: All dirt or foreign material must be cleaned from each joint of pipe or fitting while it is suspended before it is lowered into the trench. Before the system is accepted, the Contractor shall also thoroughly clean all lines.

E. Sequence of Work: Excavation, cleaning, laying, jointing and backfilling shall be kept up as closely as is possible so as to progress in a uniform, workmanlike manner. In no case shall pipe be left in the trench overnight, without completing jointing. The completed pipe line shall not be left exposed in the trench unnecessarily and the Contractor will be required to backfill and compact the trench as soon as possible after laying and jointing is completed. The Contractor shall keep exposed ends of pipe properly plugged during laying to prevent dirt and other materials entering the line. Each day at the close of work, and at all times when laying is not in progress the exposed end of the pipe line in the trench shall be closed by the use of an approved header or barrier of wood or metals. If at any time it becomes necessary to cover the ends of an uncompleted pipe line with backfill, the end of such pipe line shall be closed, using a header with mechanical joint plug.

F. Laying Polyethylene Pipe in Trenches: When laying pipe in trenches, care shall be taken to give the pipe solid bearing throughout its entire length.

1. Pipe Lines in Earth Trenches: Refer to “Excavation for Trenches” section.

2. Pipe Line in Rock Trenches: Refer to “Excavation for Trenches” section.

3. Dewatering Trenches: All excavation shall be dewatered properly before laying pipe. Where running sand is encountered, dewatering shall be done by well pointing whenever possible. Where soil conditions are not favorable for use of well point, french drains of graded stone shall be constructed to suitably located sumps and the water removed by bailing or pumping. All costs of equipment, labor, and materials required for dewatering shall be included in the prices bid for pipelines.

4. Jointing PE Pipe: All dirt or foreign material must be removed from the end of the pipe. If necessary, ends shall be wiped with a clean, dry cloth. Manufacturer's recommendations, ASTM D 2513, ASTM D 3261 and

ASTM D2683 must be strictly adhered to during butt or socket fusion procedures, respectively.

Plastic pipe and fittings shall be joined by the heat-fusion method in accordance with the written procedures of the pipe manufacturer and using the proper heating device. Heat shall not be applied with a torch or other open flame. Whenever possible all joints should be made above the ground. When it is deemed necessary to make a joint in a trench, the bellhole shall be dug wide and long enough to assure ample slack in the pipe to make a proper joint. The dead end of a plastic main should be terminated with a heat-fused cap. The Contractor shall use a pipe squeezer to control gas and purge air out before capping the dead end of the main.

5. Backfill, Marking Tape, and Tracer Wire: Backfill shall be carried to a point twelve (12") inches above the top of pipe, using hand tools for tamping. Puddling will not be allowed as a method of compaction. Before replacing the remaining backfill, detectable marking tape, imprinted with the words "BURIED GAS", as manufactured by Reef Industries, Inc., Allen Systems, Inc. or equal shall be placed in the ditch for the entire length of pipe line installed. Tape shall be two-inches in width. In addition to the marking tape, Contractor shall install conductive tracer wire wherever PE pipe is laid, including services. All ends in trench shall be spliced per manufacturer instructions. Ends of wire shall be terminated above ground as directed by Engineer. The remaining backfill shall be as specified in "Backfilling" paragraph of these Specifications. Pipe shall have at least thirty-inches of cover before wheel loading and at least forty-eight-inches of cover before using heavy duty tamping equipment such as a hydro-hammer.

G. Payment: Payment for laying and jointing pipe, laying and jointing fittings, the cost of material, and all cost incidental thereto shall be made in accordance with unit prices bid in the Proposal for pipe based on the measured quantity of the pipe actually installed. Cost of installing marking tape and tracer wire shall be included in the unit prices bid for the item to which the work pertains.

5.25 Installation of Valves: Valves, in general, shall be installed and jointed as specified above for pipe and fittings. Valve and valve assemblies include valves, companion flanges, bolts, nuts, gaskets, insulation materials and valve boxes. Valves and valve assemblies shall be installed at all locations as shown on the Drawings or as designated by the Engineer.

A. Payment: Payment for the installation of valves, valve boxes and appurtenances will be included in the cost per linear foot of pipe line.

5.26 Backfilling: The Contractor shall furnish all equipment and labor, and when necessary, the material required for backfilling the pipeline trenches as follows:

A. Selected Backfilling: All trenches shall be backfilled immediately after pipes are laid therein, and joints have been inspected by the Engineer, unless other

protection of the pipeline is directed. Selected backfill material shall consist of finely divided earthstone dust, sand, crushed stone, or other approved material carefully placed about the pipe and up to a height of at least 12 inches above the top of the pipe barrel, and in uniform layers not exceeding 6 inches in thickness, each layer thoroughly compacted with proper hand tools in a manner which will not disturb and/or injure the pipe. Backfilling shall be carried on simultaneously on both sides of the pipe and in a manner which will prevent injurious side pressures. If suitable select materials are not available from the trench excavation, the Contractor will be required to obtain the select materials elsewhere.

When testing for leaks in open trenches, backfilling shall not be done until after all testing has been completed and all leaks eliminated.

B. General Backfilling: After selected backfill material has been placed and tamped, the remainder of the trench may be backfilled with general excavated material, provided such material does not contain more than 1/3 broken rock of which no single stone or boulder shall be larger than can easily be removed with a hand shovel. Backfill material shall be placed in uniform layers not exceeding 12 inches in thickness; each layer shall be thoroughly compacted with heavy-duty power tamping tools of the full satisfaction of the Engineer. The use of pneumatic power "Jumping Jack" tampers will not be permitted. Wherever the trenches have not been properly filled, or if settlement occurs, they shall be refilled, smoothed off, and finally made to conform to the surface of the ground. Backfilling shall be carefully performed, and the original surface restored to the full satisfaction of the Engineer. Surplus material shall be disposed of by the Contractor.

C. Protection or Steel Pipe Coating: No broken rock or crushed stone will be allowed in contact, or within 6-inches of the pipe. Where necessary, backfill with sand between gravel and pipe.

D. Outside Streets, Roads, etc.: At locations outside streets, roads, walks, or other traveled ways open to vehicular or pedestrian travel, the backfill material shall be windrowed and maintained in a suitable manner so as to concentrate and pond rainfall runoff over the trench. After sufficient settlement has been obtained the Contractor shall complete surface dressing, remove surplus material, and clean up in accordance with these Specifications. Wherever trenches have not been properly filled, or if settlement occurs, they shall be refilled, smoothed off, and finally made to conform to the surface of the ground. Backfilling shall be carefully performed and the original surface restored as specified herein. Surplus material shall be disposed of by the Contractor.

E. Areas Requiring Pavement Replacement: Mechanical tamping will be required of all backfilling of excavated portions. After backfilling and tamping as described above is completed the top six-inches of the ditch shall be backfilled with Compacted Crushed Stone, ASTM C 33 Gradation #67 or #57, as amended to date, with sufficient fines for compaction. Further compaction shall be accomplished by leaving the backfilled trench open to traffic while maintaining

the surface with stone. Settlement in trenches shall be refilled with stone and such maintenance shall continue until replacement of pavement is authorized by the Engineer.

F. Payment: No extra payment will be made for backfill, the cost thereof to be included in the prices bid for pipe lines. The cost of the six-inches of stone and any additional stone used shall be included in unit price bid for replacing pavement.

5.27 Testing Steel Pipe: When a section of pipe of a length deemed adequate by the Engineer is ready for testing, the line shall be thoroughly cleaned by forcing a "pig" through the pipe a sufficient number of times to remove foreign matter which may have been trapped inside the pipe during construction. After cleaning, all new mains shall be proved to be gas tight by an appropriate pressure test. The Engineer or Owner may require the Work to be divided into convenient sections for testing. All test segments shall be backfilled throughout its entire length before starting the test, except for necessary bell holes and open valve settings as approved by the Engineer or Owner. The Contractor shall furnish all labor, materials and equipment for carrying out these tests. All tests shall be conducted in the presence of the Engineer or his representative.

A. Temporary Bulkheads: The Contractor shall furnish, install and remove all temporary bulkheads, flanges or plugs, to permit the required pressure test, and shall furnish all equipment and labor to properly carry out such tests and to replace defective material.

B. Test Pressure and Leakage: Test pressure shall be one and one-half times the maximum operating pressure (MOP) for gas lines measured at the pipeline low point. Absolutely no pressure drop will be allowed after temperature corrections have been made during the test period. Minimum test period shall be twenty-four (24) hours. However, if, in the opinion of the Engineer, additional testing is required, such additional testing shall be performed by the Contractor at no additional expense to the Owner. Recording pressure gauges shall be installed at the end of the test section and recording charts shall be delivered to the Owner at the completion of the test. Tie-in welds and fittings not included in the pressure tests shall be leak tested with soap suds after the section of new main is put in service.

C. Defective Materials and Workmanship: Any cracked or broken material, such as pipe, fittings, valves or hydrants shall be removed and replaced with sound pieces, at the expense of the Contractor. Joints which leak shall be carefully remade. Remade joints and replaced material shall be re-tested under the same conditions of operation. If joints or materials are then found to be defective, they shall be remade and replaced until the line passes the required test.

D. Blow Down and Purging: No gas shall be admitted into any completed or partially completed construction prior to receiving an acceptable pressure test and/or before notifying and receiving the approval of the Engineer.

After pressure testing is completed, and under the direction and in the presence of the Engineer, the Contractor shall admit gas into the line in sufficient quantities to

clear air, dust, and other foreign matter from the pipe, after which all valves shall be closed and gas pressure maintained in the line continuously. The Owner shall furnish the gas necessary for this operation.

Purging of polyethylene pipe shall be done through a metallic vent stack located at the end of the main, which extends to at least 8 feet above ground level, and is equipped with valving where necessary for safe control.

Vent stacks shall be located so that gas may be discharged safely taking into consideration nearby buildings, overhead power lines and other sources of ignition. All smoking and open flames shall be prohibited in the area during the purging and blowing operation. Vent stacks shall be effectively grounded to prevent build-up of static electricity.

Before putting gas in the main the vent shall be carefully braced and blocked as necessary to prevent a blow off. Gas should be admitted into the main at the moderately rapid flow to minimize mixing of the gas and air. However, high velocities which could case a spark by moving solid particles, such as rocks, should be avoided.

E. Payment: No separate payment will be made for the above work. The cost of the above work, and all cost incidental thereto, shall be included in the unit prices bid for the item to which the work pertains.

5.28 Testing PE Pipe: When a section of pipe of a length deemed adequate by the Engineer is ready for testing, the line shall be thoroughly blown free of debris and a leakage test made, and the Contractor shall furnish all labor, materials and equipment for carrying out these tests. Wherever conditions will permit, in the opinion of the Engineer, pipelines shall be tested before the trench is backfilled. All joints then shall be examined during open trench test and all leaks entirely stopped. The Contractor shall furnish a test air compressor, and means for accurate measurement of pressure drop. Maximum gauge graduations acceptable shall be 1-psi.

A. Temporary Bulkheads: The Contractor shall furnish, install and remove all temporary bulkheads, flanges or plugs, to permit the required pressure test, and shall furnish all equipment and labor to properly carry out such tests and to replace defective material.

B. Test Pressure and Leakage: Test pressure shall be one and one-half times the maximum operating pressure (MOP) for gas lines measured at the pipeline low point or 100 psi, whichever is greater. Absolutely no pressure drop will be allowed during the test period. Minimum test period shall be twenty-four (24) hours. However, if, in the opinion of the Engineer, additional testing is required, such additional testing shall be performed by the Contractor at no additional expense to the Owner.

C. Defective Materials and Workmanship: Any cracked or broken material, such as pipe, fittings, valves or hydrants shall be removed and replaced with sound pieces, at the expense of the Contractor. Joints which leak shall be carefully remade. Remade joints and replaced material shall be re-tested under the same conditions

of operation. If joints or materials are then found to be defective, they shall be remade and replaced until the line passes the required test.

D. Blow Down and Purging: No gas shall be admitted into any completed or partially completed construction prior to receiving an acceptable pressure test and/or before notifying and receiving the approval of the Engineer.

After pressure testing is completed, and under the direction and in the presence of the Engineer, the Contractor shall admit gas into the line in sufficient quantities to clear air, dust, and other foreign matter from the pipe, after which all valves shall be closed and gas pressure maintained in the line continuously. The Owner shall furnish the gas necessary for this operation.

Purging of polyethylene pipe shall be done through a metallic vent stack located at the end of the main, which extends to at least 8 feet above ground level, and is equipped with valving where necessary for safe control.

Vent stacks shall be located so that gas may be discharged safely taking into consideration nearby buildings, overhead power lines and other sources of ignition. All smoking and open flames shall be prohibited in the area during the purging and blowing operation. Vent stacks shall be effectively grounded to prevent build-up of static electricity.

Before putting gas in the main the vent shall be carefully braced and blocked as necessary to prevent a blow off. Gas should be admitted into the main at the moderately rapid flow to minimize mixing of the gas and air. However, high velocities which could case a spark by moving solid particles, such as rocks, should be avoided.

E. Payment: No separate payment will be made for the above work. The cost of the above work, and all cost incidental thereto, shall be included in the unit prices bid for the item to which the work pertains.

5.29 Abandoned Pipe: It shall be noted on the As Built Drawing whether the abandoned pipe has been removed or left in place. If abandoned pipe is to be left in place it is to be purged with air until no gas is present according to the LEL scale on a CGI and the ends sealed as per DOT 192.727.