

ADDENDUM NO. 1

SOUTHWEST WATER DISTRIBUTION IMPROVEMENTS
BROWN ROAD TRUNK WATERLINE PHASE 2

CITY OF OREGON, OHIO

JOB NO. 1210-100

JULY 6, 2017

I. Proposal, Bid Form, and Contract Documents

- A. The time and date for the receipt of bids for this project is being extended to 3:00 p.m. (Local Time), Wednesday, July 19, 2017.
- B. A revised cover page is attached updating an employee's name.
- C. A revised unit price schedule is attached for your use in bidding this project.

II. Specifications

- A. Section 02310 – Fusible Polyvinylchloride Pipe is to be included in the contact documents and is attached.

III. Drawings

- A. Sheet 3 – Detail Note: Contractor to temporarily relocate existing 4" gas line. The 6" storm sewer and 8" waterline to accommodate proposed bore location with cost to be included in jack and bore bid item.
- B. Sheet 14 – The fitting called out at STA 98+39.71 should read "16'x16"x16" tee" and not "12"x12"x12" tee".
- C. Sheet 20 – Replace Sheet 20 the new Sheet 20 attached to this addendum.
- D. Sheet 27 – The maximum trench width is 12" on either side of the outside of the pipe.
- E. Sheet MT-97.10 2/2 is reissued, printed darker.

IV. Clarification

- A. The proposed 8" and 12" storm sewers that cross Brown Road (Station 48+25, Station 52+55, Station 53+59) shall connect into the existing 18" and 24" storm

sewer respectively; not the sanitary sewer as shown. The storm sewer pipe is concrete pipe.

- B. The butterfly valves in the manholes are to be flanged.
- C. Pickle Road waterline crossing can be installed by open cut with a 2 day road closure.
- D. Brown Road waterline crossing at Station 42+00 and Station 57+50 shall be installed by HDD.
- E. The 6" waterline is to be laid to grade as shown on the drawings.
- F. The 16" waterline installed by open cut shall be ductile iron pipe Class 52 or PVC C-900 DR18. The PVC pipe will require tracer wire. It shall be #12 gauge with a 30 mil polyethylene casing. Detectable tracer tape shall be installed directly over the PVC main for its entire length. Bond strength must prevent pitting or degradation after 300 hours continuous testing per ASTM B-117. Identifying print shall be 1/2" high bold letters repeated every 21 inches on 3" wide tape to be buried 30".
- G. The 16" waterline installed by HDD shall be fusible PVC. The pipe shall require tracer wire. It shall be #8 gauge with a 45 mil polyethylene casing.
- H. The valve chamber shown in plan view on Sheet 25 and in detail on Sheet 27 shall set on the edge of the concrete encasement of the existing 20" waterline as shown in the detail on Sheet 27.
- I. The bolts on the fittings will be blue Cor-ten bolts.

V. Planholders List

- A. A planholders list is available online for your reference at www.pdgplanroom.com.

* * * END OF ADDENDUM NO. 1 * * *

CITY OF OREGON, OHIO

5330 Seaman Road
Oregon, Ohio 43616-2633

SOUTHWEST WATER DISTRIBUTION IMPROVEMENTS BROWN ROAD TRUNK WATERLINE PHASE 2

PLANS AND SPECIFICATIONS

Michael J. Seferian, Mayor

MEMBERS OF COUNCIL

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Superintendent of Streets – Keith Henninger

Superintendent of Water Treatment – Doug Wagner

Superintendent of Wastewater Treatment - Robert Martin

PLANS AND SPECIFICATIONS PREPARED BY:

CITY OF OREGON

DEPARTMENT OF PUBLIC SERVICE

(419) 698-7047, FAX (419) 691-0241

BOOK 1 OF 1

BID FORM

PROJECT: SOUTHWEST WATER DISTRIBUTION IMPROVEMENTS – BROWN ROAD TRUNK WATERLINE PHASE 2

To the Director of Public Service
Municipal Building
5330 Seaman Road
Oregon, Ohio 43616-2633

I. The undersigned, having familiarized _____ with the local conditions affecting the cost of the work and with the Contract Documents, hereby proposes to perform everything required to be performed and to provide and furnish all of the labor, materials, necessary tools, expendable equipment, and all utility and transportation services necessary to perform and complete in a workmanlike manner all of the work required for the installation of approximately 11,000 lineal feet of 16” waterline for the CITY OF OREGON, OHIO, all in accordance with the specifications for the following prices, to wit:

REF. NO.	ITEM NO.	ITEM DESCRIPTION	ESTIMATED QUANTITY	UNIT	MATERIAL UNIT PRICE	LABOR UNIT PRICE	TOTAL UNIT PRICE	TOTAL BID PRICE
WATERLINE								
1		16” Waterline and Fittings, Installed By Open Cut	10,911	L.F.				
2		16” Waterline Installed by HDD	194	L.F.				
3		16” Butterfly Valve In 5’ Manhole	13	Each				
4		Air Release Valve Assembly in Manhole	2	Each				
5		New Water Main Connection To Existing (16” at Station 41 + 65)	1	Each				
6		New Water Main Connection To Existing (8” at Forester Drive) Including Gate Valve and Valve Box and Approximately 20 Lineal Feet of 8” Waterline	1	L.S.				
7		New Water Main Connection To Existing (8” at Coy Road) Including Gate Valve and Valve Box and Approximately 20 Lineal Feet of 8” Waterline	1	L.S.				
8		Preparation for Water Main Connection To Existing 20” on Navarre Including Encasing Tap Sleeve in Concrete	1	L.S.				

9	Allowance for Hot Tap to 20" PCCP on Navarre	1	L.S.			\$16,000.00	\$16,000.00
10	1" Water Service Replacement, Long-Bored With New Curb Box and Shut Off	1,408	L.F.				
11	1" Water Service Replacement, Short, With New Curb Box and Shut Off	180	L.F.				
12	Standard Hydrant Assembly	18	Each				
13	Catch Basin, No. 2-2B	5	Each				
14	8" Conduit, Type B	134	L.F.				
15	8" Conduit, Type B, Installed by HDD	53	L.F.				
16	12" Conduit, Type B	57	L.F.				
17	12" Conduit, Type B, Installed by HDD	99	L.F.				
18	Storm Sewer Repair, 12" and Smaller	520	L.F.				
19	Storm Sewer Repair, Over 12"	20	L.F.				
20	Abandon Existing 8" Waterline (Including 3 Cut and Caps)	1	L.S.				
RESTORATION							
21	Asphalt Concrete Trench Replacement	290	S.Y.				
22	Asphalt Drive Replacement	215	S.Y.				
23	Concrete Drive Replacement	145	S.Y.				
24	Stone Drive Replacement	135	S.Y.				
25	Curb Remove and Replace	10	L.F.				
26	Sidewalk, Remove and Replace	20	S.F.				
27	Seeding, Mulching	1	L.S.				
MISCELLANEOUS							
28	Clearing and Grubbing	1	L.S.				
29	Preconstruction Video	1	L.S.				
30	Traffic Control	1	L.S.				

31		Mobilization/Demobilization	1	L.S.				
32		Bonds and Insurance	1	L.S.				

The cost for any additional items required to complete the project per the specifications not specifically listed shall be included in the cost of the pertinent item.

TOTAL BID PROJECT IN FIGURES \$ _____
 (Unofficial total subject to correction)

II. Time of Completion. The undersigned agrees to substantially complete the work covered by **September 1, 2018** with final completion by **September 29, 2018**.

III. Accompanying this Bid is a Certified Check or Bid Bond in the amount of _____ Dollars (\$ _____), payable to the City of Oregon, Ohio, which it is agreed, shall be retained as liquidated damages to the City of Oregon, Ohio, if the undersigned fails to execute the Contract in conformity with the Form of Contract incorporated in the Contract Documents and furnish performance bond as specified within ten (10) days after notification of the award of the Contract to the undersigned.

IV. In submitting this Bid, it is understood that the right is reserved by the City of Oregon, Ohio, to reject any and all bids. It is agreed that this Bid may not be withdrawn for a period of 90 days from the opening thereof.

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

- A. Best Bid Criteria Form
- B. Delinquent Real Property Tax
- C. Delinquent Personal Property Tax
- D. Non-Collusion Affidavit
- E. Acknowledgement of Income Tax Policies
- F. Affidavit of Compliance with Ohio Revised Code Section 3517.13

V. Bidder further represents that:

- a) Bidder has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- b) Bidder is aware of the general nature of the Work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- c) Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.
- d) The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.
- e) Bidder has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged.

Bidder acknowledges receipt of the following addendum(s):

DATE _____, 20_____

FIRM NAME _____ BY _____
Signature

ADDRESS _____ TITLE _____

TELEPHONE _____

E.I. NO. _____

(Note: Bidders shall not add any conditions or qualifying statement to this Bid as otherwise the Bid may be declared irregular as not being responsive to the Advertisement for Bids.)

(Note: The successful bidder will be required to provide a Performance Bond in an amount not less than 100% of the contract price in favor of the City of Oregon, Ohio, conditioned upon the faithful performance of the Contract.)

SECTION 02310

FUSIBLE POLYVINYLCHLORIDE PIPE

PART 1 GENERAL

1.1 DESCRIPTION

A. Scope

1. This section specifies fusible polyvinylchloride pipe, including acceptable fusion technique and practice, and safe handling and storage.

B. Pipe Description

1. Pipe Supplier shall furnish fusible polyvinylchloride pipe conforming to all applicable standards and procedures, and meeting all applicable testing and material properties as described by those standards or within this specification.

1.2 QUALITY ASSURANCE

A. References:

1. This section contains references to the following documents. They are a part of this section as specified and modified. Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly. In the event of a conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.
2. Unless otherwise specified, references to documents shall mean the documents in effect at the time of construction. If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no

replacement documents, the last version of the document before it was discontinued.

3. Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, regardless of whether the document has been superseded by a version with a later date, discontinued or replaced.

Reference	Title
ANSI/AWWA C110/A21.10	American National Standard for Ductile-Iron and Gray-Iron Fittings, 3-inch through 48-inch, for Water and Other Liquids
ANSI/AWWA C111/A21.11	American National Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
AWWA C605	Standard for Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water
AWWA C651	Standard for Disinfecting Water Mains
AWWA C900	Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 in. through 12 in. (100mm through 300mm), for Water Distribution
AWWA C905	Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 in. through 48 in. (350mm-1200mm), for Water Distribution
AWWA M23	AWWA Manual of Supply Practices PVC Pipe - Design and Installation, Second Edition
ASTM C923	Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures,
ASTM D1784-02	Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
ASTM D1785	Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
	Test Method for Degree of Fusion of Extruded
ASTM D2152	Poly(Vinyl Chloride) (PVC) Pipe and Molded Fittings by Acetone Immersion
ASTM D2241	Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR)

ASTM D2665	Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
ASTM F477	Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F1057	Standard Practice for Estimating the Quality of Extruded Poly (Vinyl Chloride) (PVC) Pipe by the Heat Reversion Technique
ASTM F1417	Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air
UNI-PUB-6	Recommended Practice for Low-Pressure Air Testing of Installed Sewer Pipe
UNI-PUB-8	Recommended Practice for the Direct Tapping of Polyvinyl Chloride (PVC) Pressure Water Pipe (Nominal Diameters 6-12 Inch)
NSF-14	Plastics Piping System Components and Related Materials
NSF-61	Drinking Water System Components--Health Effects
PPI TR-2/2006	PVC Range Composition Listing of Qualified Ingredients

B. Manufacturer Requirements

1. Fusible polyvinylchloride pipe shall be tested at the extrusion facility for properties required to meet all applicable parameters as outlined in AWWA C900, AWWA C905, and applicable sections of ASTM D2241. Testing priority shall be in conformance with AWWA C900 and AWWA C905.

C. Fusion Technician Requirements

1. Fusion Technician shall be fully qualified by the pipe supplier to install fusible polyvinylchloride pipe of the type(s) and size(s) being used. Qualification shall be current as of the actual date of fusion performance on the project.

D. Specified Pipe Suppliers

1. Fusible polyvinylchloride pipe shall be used as manufactured under the trade names Fusible C-900™, Fusible C-905®, and FPVC™ for Underground Solutions, Inc., Poway, CA, (858) 679-9551 or approved equal. Fusion process shall be as patented by Underground Solutions, Inc., Poway, CA, Patent No. 6,982,051 or approved equal.

E. Warranty

1. A one-year warranty for the pipe shall be included, and shall cover the cost of replacement pipe and freight to project site, should the pipe have any defects in material or workmanship.
2. In addition to the standard pipe warranty, the fusing contractor shall provide in writing a warranty for a period of one year for all the fusion joints, including formation, installation, and pressure testing.
3. Warranty periods shall begin on the date of substantial completion and product.

F. Submittals

1. The following PRODUCT DATA is required from the pipe supplier and/or fusion provider:
 - a. Name of the pipe manufacturer and a list of the piping and quantities to be provided by manufacturer.
 - b. Product data and pipe supplier data indicating conformance with this specification and applicable standards, including written documentation regarding any intended variance from this specification and applicable standards. This will include experience of pipe supplier by years and number of projects;

warranty information; and independent laboratory testing certification.

c. Material and pipe property testing in conformance with this specification and applicable standards indicating conformance from the pipe extruder per AWWA C900 and AWWA C905:

1. Dimensional Checks
2. Pipe Burst
3. Flattening
4. Extrusion Quality (Acetone Immersion)

2. Test results will be prepared and made available from the pipe extruder to the Owner or Engineer upon request, for each extrusion run.

3. Fusion joint data and fusion technician data indicating conformance with this specification and applicable standards, including written documentation regarding any intended variance from this specification and applicable standards. This will include fusion joint warranty information and recommended project specific fusion parameters, including criteria logged and recorded by data logger.

G. The following AS-RECORDED DATA is required from the contractor and/or fusion provider:

1. Fusion report for each fusion joint performed on the project, including joints that were rejected. Submittals of the Fusion Technician's joint reports are required as requested by the Owner or Engineer. Specific requirements of the Fusion Technician's joint report shall include:

- a. Pipe Size and Dimensions
- b. Machine Size
- c. Fusion Technician Identification
- d. Job Identification Number
- e. Fusion Number
- f. Fusion, Heating, and Drag Pressure Settings

- g. Heat Plate Temperature
- h. Time Stamp
- i. Heating and Cool Down Time of Fusion
- j. Ambient Temperature

PART 2 PRODUCTS

2.1 FUSIBLE POLYVINYLCHLORIDE PRESSURE PIPE

- A. Fusible polyvinylchloride plastic material for pipe shall conform to AWWA C900 or C905, ASTM D1784, and cell classification 12454. Pipe shall be in accordance with ASTM D2241 for Ductile Iron Pipe Size standard dimensions as indicated in these specifications. Compound formulation shall be in accordance with PPI TR-2/2006.
- B. Pipe shall be manufactured with 100% virgin resin. Pipe shall also have 0% recycled plastics content, and shall not consist of any rework compound, even that obtained from the manufacturer's own production using the same formulation.
- C. Fusible polyvinylchloride pipe shall be extruded with plain ends. The ends shall be square to the pipe and free of any bevel or chamfer. There shall be no bell or gasket of any kind incorporated into the pipe.
- D. Fusible polyvinylchloride pipe shall be manufactured in a standard 20', 30' or 40' nominal lengths.
- E. Fusible polyvinylchloride pipe shall be green in color.
- F. Pipe shall be marked per AWWA C900 or AWWA C905, and shall include as a minimum:
 - 1. Nominal size
 - 2. PVC
 - 3. Dimension Ratio, Standard Dimension Ratio or Schedule
 - 4. AWWA pressure class or rating
 - 5. AWWA Standard designation number
 - 6. Extrusion production-record code

7. Trademark or trade name
8. Cell Classification 12454 and/or PVC material code 1120 may also be included.

G. Pipe shall be homogeneous throughout and be free of visible cracks, holes, foreign material, blisters, or other deleterious faults.

2.2 FUSION JOINTS

A. Unless otherwise specified, fusible polyvinylchloride pipe lengths shall be assembled in the field with butt-fused joints. The Contractor shall follow the pipe supplier's written instructions for this procedure. Joint strength shall be equal to the pipe as demonstrated by testing requirements. All fusion joints shall be completed as described in this specification.

2.3 CONNECTIONS AND FITTINGS FOR PRESSURE APPLICATIONS

A. Connections shall be defined in conjunction with the linking of project piping, as well as the tie-ins to other piping systems.

2.4 DUCTILE IRON MECHANICAL FITTINGS

A. Acceptable fittings for use with fusible polyvinylchloride pipe shall include standard ductile iron fittings conforming to AWWA/ANSI C110/A21.10.

1. Restrained connections to fusible polyvinylchloride pipe may be made using a restrained retainer gland product for DIPS size, as well as for MJ.
2. Bends, tees and other ductile iron fittings shall be restrained as indicated on the drawings.
3. Ductile iron fittings and retainer glands must be installed per the manufacturer's recommendations.
4. Ductile iron fittings shall be field wrapped a distance of 5'-0" each side of the joint with a

minimum of 8 mil thick polyethylene tube meeting the requirements of AWWA C-105. Overlap seems shall be completely taped. All rips, punctures, and other damages shall be repaired to the Engineer's satisfaction. Tape shall be 2 inches in width.

B. PVC Gasketed, Push-on Fittings (Not Acceptable)

C. Sleeve-Type Couplings

1. Sleeve-type mechanical couplings shall be manufactured for use with PVC pipe, and shall be restrained as indicated on the drawings.

D. Connection Hardware

1. Bolts and nuts for buried service shall be made of non-corrosive, high-strength, low-alloy steel having the characteristics specified in ANSI/AWWA C111/A21.11, regardless of any other protective coating shall be galvanized or cadmium plated.

2.5 TRACER WIRE

A. Refer to Section 02667 for tracer wire specifications.

PART 3 EXECUTION

3.1 DELIVERY AND OFF-LOADING

A. All pipe shall be bundled or packaged in such a manner as to provide adequate protection of the ends during transportation to the site. Any pipe damaged in shipment shall be replaced as directed by the Owner or Engineer.

B. Each pipe shipment should be inspected prior to unloading to see if the load has shifted or otherwise been damaged. Notify Owner or Engineer immediately if more than immaterial damage is found.

- C. Each pipe shipment should be checked for quantity and proper pipe size, color and type.
- D. Pipe should be loaded, off-loaded, and otherwise handled in accordance with AWWA M23.
- E. A forklift with chisel forks shall be used to off-load the pipe. The fork chisel should be checked to be sure it is not thicker than the gap between the units of pipe strapped together for shipping and handling purposes. Extend forks to remove each top unit from the truck. When unloading 20' lengths, remove back units first. Do not run forks too far under the units, as fork ends striking adjacent units may cause damage. Insure that the forks are fully engaged. The 30' and 40' lengths are shipped in single length units. Because these are longer, the packages will flex or bend more than the 20' length units. If left bundled in units, unloading can be done with a single forklift so long as it is of sufficient capacity to handle the load. If sag exceeds recommendation (see the table below as to allowable sag), then each piece of pipe should be unloaded individually. The forks should be placed as far apart as possible to provide support to the unit. When unloading individual pieces of pipe, the pipe should be supported at approximately the 1/3 point measured from each end of the pipe.

Sag in Pipe Lengths During Unloading and Moving		
Segment Height (Sag)		
Pipe Size (DIPS)	40' Length -in Inches	30' Length -in Inches
4	24	13 1/2
6	16 1/2	9 1/2
8	12 3/4	7 1/4
10	10 1/4	5 3/4
12	8 3/4	4 3/4
16	6 1/2	3 3/4
20	5 1/4	3
24	4	2 1/2
30	3 1/2	2

- F. Sag is the measurement of the pipe ends relative to the pipe center. With a pipe raised on the forklift, a

string line can be pulled from the bottom of one end of the pipe to the bottom of the other end of the pipe. The distance in the center from the string to the bottom of the pipe is the sag.

- G. If a forklift is not available, a spreader bar with fabric straps capable of handling the load should be used. Recommended lift points when using fabric slings are at the point approximately 1/3 of the length measured from each end of the unit.
- H. Off-loading devices such as chains, wire rope, chokers, or other pipe handling implements that may scratch, nick, cut, or gouge the pipe are strictly prohibited.
- I. During removal and handling, be sure that the pipe does not strike anything. Significant impact could cause damage, particularly during cold weather.
- J. If appropriate unloading equipment is not available, pipe may be unloaded by removing individual pieces. Care should be taken to insure that pipe is not dropped or damaged.
- K. Pipe should be carefully lowered, not dropped, from trucks.
- L. In preparation for pipe installation, placement of pipe should be as close to the fusion area as practical.

3.2 HANDLING AND STORAGE

- A. Any length of pipe showing a crack or which has received a blow that may have caused an incident fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once from the work. Damaged areas, or possible areas of damage may be removed by cutting out and removing the suspected incident fracture area. Limits of the acceptable length of pipe shall be determined by the Owner or Engineer.
- B. Any scratch or gouge greater than 10% of the wall thickness will be considered significant and can be

rejected unless determined acceptable by the Owner or Engineer.

- C. Pipe lengths should be stored and placed on level ground. Pipe should be stored at the job site in the unit packaging provided by the manufacturer. Caution should be exercised to avoid compression, damage, or deformation to the ends of the pipe. The interior of the pipe, as well as all end surfaces, should be kept free from dirt and foreign matter.
- D. Pipe shall be handled and supported with the use of woven fiber pipe slings or approved equal. Care shall be exercised when handling the pipe to not cut, gouge, scratch or otherwise abrade the piping in any way. Use of hooks, chains, wire rope or any other handling device which creates the opportunity to damage the surface of the pipe is strictly prohibited.
- E. After delivery to the project site, fusible polyvinylchloride pipe shall be stored at ambient temperature and protected from ultraviolet light degradation. If pipe is to be stored for periods of 6 months or longer, the pipe must be shaded or otherwise shielded from direct sunlight. Covering of the pipe which allows for temperature build-up is strictly prohibited. Pipe should be covered with an opaque material while permitting adequate air circulation above and around the pipe as required to prevent excess heat accumulation.
- F. Racks or dunnage to prevent damage to the bottom of the pipe during storage should support the pipe lengths. Supports should be spaced to prevent pipe bending and deformation. The pipe shall be stored in stacks no higher than that given in the following table:

<u>Pipe Diameter (inches)</u>	<u>Max. No. of Rows Stacked</u>
8 or less	5
12 to 21	4
24 to 30	3
33 to 48	2
54 and larger	1

3.3 FUSION PROCESS

A. General

1. Fusible polyvinylchloride pipe will be handled in a safe and non-destructive manner before, during, and after the fusion process and in accordance with this specification and pipe supplier's recommendations.
2. Fusible polyvinylchloride pipe will be fused by qualified fusion technicians, as documented by the pipe supplier. Training records for qualified fusion technicians shall be available to Owner or Engineer upon request.
3. Each joint fusion shall be recorded and logged by an electronic monitoring device (data logger) affixed to the fusion machine. Joint data shall be submitted as part of the As-Recorded information, in accordance with this specification.
4. The fusible polyvinylchloride pipe will be installed in a manner so as not to exceed the recommended bending radius.
5. Where fusible polyvinylchloride pipe is installed by pulling in tension, the recommended Safe Pulling Force, according to the pipe supplier, will not be exceeded.
6. Only appropriately sized, and outfitted fusion machines that have been approved by the pipe supplier shall be used for the fusion process. Fusion machines must incorporate the following properties, including the following elements:
 - a. HEAT PLATE - Heat plates shall be in good condition with no deep gouges or scratches within the pipe circle being fused. Plates shall be clean and free of any contamination. Heater controls shall properly function, and

cord and plug shall be in good condition. The appropriately sized heat plate shall be capable of maintaining a uniform and consistent heat profile and temperature for the size of pipe being fused, per the pipe supplier's recommendations.

- b. CARRIAGE - Carriage shall travel smoothly with no binding at less than 50 psi. Jaws shall be in good condition with proper inserts for the pipe size being fused. Insert pins shall be installed with no interference to carriage travel.
 - c. GENERAL MACHINE - Overview of machine body shall yield no obvious defects, missing parts, or potential safety issues during fusion.
 - d. DATALOGGER - The current version of the pipe supplier's recommended and compatible software shall be used. Protective case shall be utilized for the hand held wireless portion of the unit. Datalogger operations and maintenance manual shall be with the unit at all times. If fusing for extended periods of time, an independent 110V power source shall be available to extend battery life.
7. Other equipment specifically required for the fusion process shall include the following:
- a. Pipe rollers shall be used for support of pipe to either side of the machine
 - b. A weather protection canopy that allows full machine motion of the heat plate, fusion assembly and carriage shall be provided for fusion in inclement and/or windy weather.
 - c. Fusion machine operations and maintenance manual shall be kept with the fusion machine at all times.

- d. Facing blades specifically designed for cutting fusible polyvinylchloride pipe.

B. Joint Recording

1. Each fusion joint shall be recorded and logged by an electronic monitoring device (data logger) connected to the fusion machine. The fusion data logging and joint report shall be generated by software developed specifically for the fusion of fusible polyvinylchloride pipe. The software shall include fusible polyvinylchloride pipe based dimensional data and fusible polyvinylchloride pipe based interfacial pressure relationships. Data not logged by the data logger shall be logged manually and be included in the Fusion Technician's joint report.

3.4 PREPARATION PRIOR TO MAKING CONNECTIONS INTO EXISTING PIPING SYSTEMS

A. Approximate locations for existing piping systems are shown on the drawings or detailed in the specifications. Prior to making connections into existing piping systems, the Contractor shall:

1. Field verify location, size, piping material and piping system of the existing pipe.
2. Obtain all required existing piping manufacturer(s) approved fittings (i.e., saddles, sleeve type couplings, flanges, tees, etc., as shown).
3. Have installed all temporary pumps and/or pipes in accordance with established connection plans.
4. Have on hand necessary pipe stoppers, pancake flanges or other items which may be necessary should an existing valve or appurtenance fail to seal properly.

B. Unless otherwise approved by the Engineer, new piping systems shall be completely assembled and successfully

tested prior to making connections into existing pipe systems.

3.5 PIPE SYSTEM CONNECTIONS

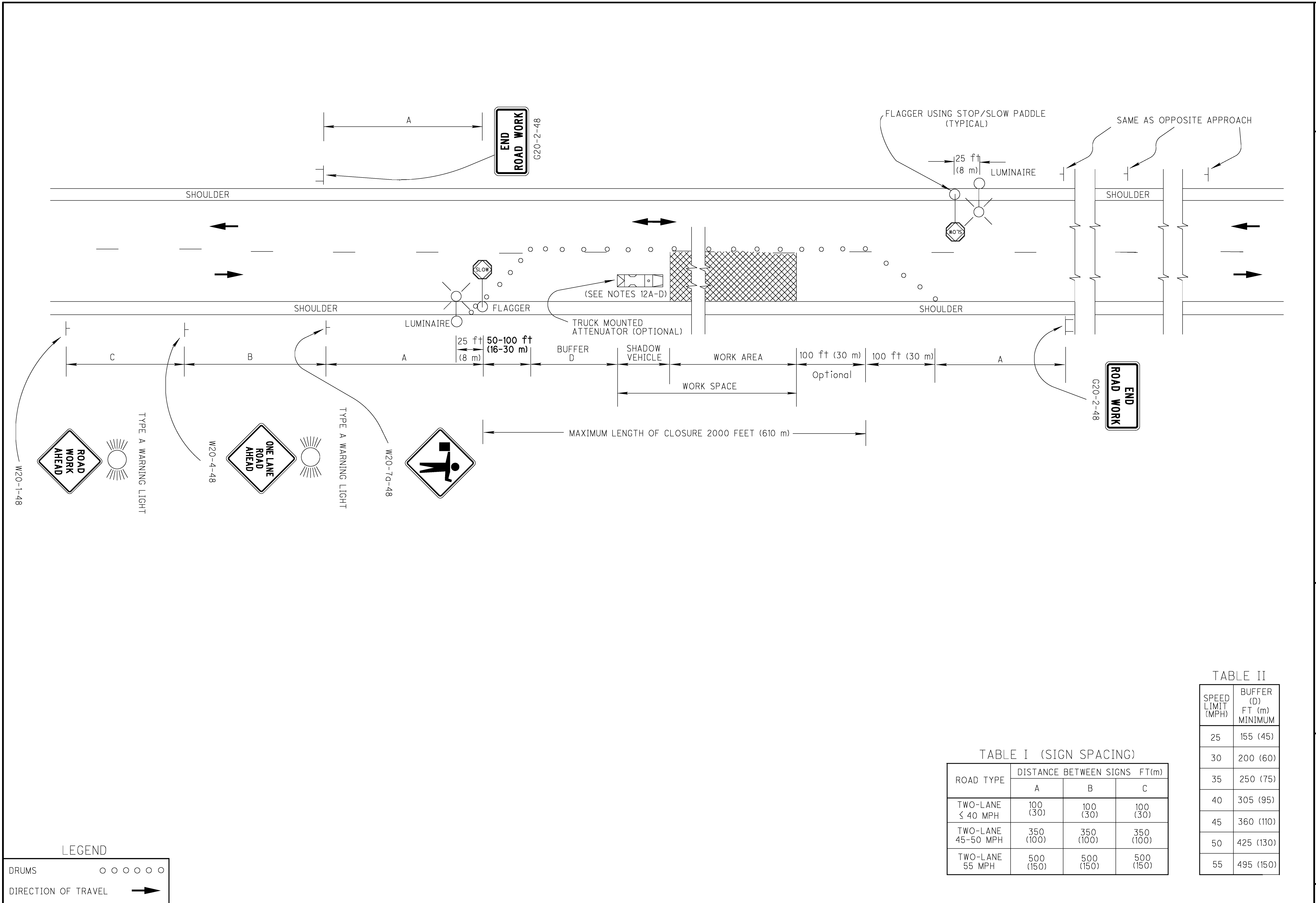
- A. Pipe connections shall be installed per applicable standards and regulations, as well as per the connection manufacturer's recommendations and as indicated on the drawings. Pipe connections to structures shall be installed per applicable standards and regulations, as well as per the connection manufacturer's recommendations.

3.6 TRACER WIRE TESTING

- A. Upon completion of the directional bore, the Contractor shall demonstrate that the wire is continuous and unbroken through the entire run of the pipe.
 - 1. Demonstration shall include full signal conductivity (including splices) when energizing for the entire run in the presence of the Owner or Engineer.
 - 2. If the wire is broken, the Contractor shall repair or replace it. Pipeline installation will not be accepted until the wire passes a continuity test.

3.7 TESTING - INDICATED ON THE DRAWINGS

END OF SECTION



LEGEND

- DRUMS ○ ○ ○ ○ ○ ○
- DIRECTION OF TRAVEL →

TABLE I (SIGN SPACING)

ROAD TYPE	DISTANCE BETWEEN SIGNS FT(m)		
	A	B	C
TWO-LANE ≤ 40 MPH	100 (30)	100 (30)	100 (30)
TWO-LANE 45-50 MPH	350 (100)	350 (100)	350 (100)
TWO-LANE 55 MPH	500 (150)	500 (150)	500 (150)

TABLE II

SPEED LIMIT (MPH)	BUFFER (D) FT (m) MINIMUM
25	155 (45)
30	200 (60)
35	250 (75)
40	305 (95)
45	360 (110)
50	425 (130)
55	495 (150)

GENERAL NOTES:

FLAGGERS

- 1. Flaggers, one for each direction, shall be used to control traffic continuously for as long as a one lane operation is in effect. The flaggers shall be able to communicate with each other at all times.

LENGTH OF CLOSURE

- 2. Several small work areas close together should be combined into one work zone. However, the closure shall not be more than 2000 feet (610 meters) long unless approved by the Engineer. The minimum length between closures shall be 2000 feet (610 meters). Only one side of the road shall be closed in any one work zone.

SIGN LOCATION AND SPACING

- 3A. The minimum spacing between work zone signs is shown in Table I. Maximum spacing should not be greater than 1.5 times the distances shown in Table I.
- 3B. Sign spacing should be adjusted to avoid conflict with existing signs. Minimum spacing to existing signs shall be 200 feet (60 meters) for speeds of 45 mph or less and a minimum of 400 feet (120 meters) for speeds of 50 mph or greater.
- 3C. The location of the advance warning signs should be adjusted to provide for adequate sight distance for the existing vertical and horizontal roadway alignment.

ADJUSTMENTS FOR SIGHT DISTANCE

- 4. The location of the flagger station and the advance warning signs should be adjusted to provide for adequate sight distance for the existing vertical and horizontal roadway alignment.

BASIC SIGNING

- 5A. ROAD WORK AHEAD (W20-1) signs shall be provided on entrance ramps or roadways entering the work limits.
- 5B. END ROAD WORK (G20-2) signs are only required for lane closures of more than one day. It is intended that these signs be placed on the mainline, on all exit ramps, and on roadways exiting the work limits.
- 5C. Overlapping of signing for adjacent projects should be avoided where the messages could be confusing. Any W20-1 or G20-2 sign which falls within the limits of another traffic control zone shall be omitted or covered during the period when both projects are active.

SIGNING DETAILS

- 6A. The Advisory Speed plaque W13-1 shall be used when specified in the plan.
- 6B. 36 inch (900 millimeter) warning signs may be used when the approach speed limit is 40 mph or less.

FLASHING WARNING LIGHTS

- 7. Type A flashing warning lights shown on the ROAD WORK AHEAD (W20-1) signs and on the LANE CLOSED AHEAD (W20-5) signs are required whenever a night lane closure is necessary.

DRUMS/CONES

- 8A. Drum spacing shall be as follows:
 - a) Spacing along the closure shall be 40 feet (12 meters) center to center.
 - b) Spacing along the approach taper shall be 10 feet (3 meters) center to center.
- 8B. Cones may be substituted for drums as follows:
 - a) Cones used for daytime traffic control shall have a minimum height of 28 inches (0.7 meters).
 - b) Cones used for nighttime traffic control shall have a minimum height of 42 inches (1.1 meters).
 - c) Use of cones at night shall be prohibited along tapers.
- 8C. Provisions shall be made to stabilize the cones and drums to prevent them from blowing over.
- 8D. A minimum of 2 drums shall be used to close the paved shoulder.

EQUIPMENT/MATERIALS STORAGE

- 9A. No equipment or material shall be located within the taper or buffer zone.
- 9B. When no work is being performed, all material and equipment shall be stored as per CMS 614.03.

AREA ILLUMINATION

- 10A. Adequate area illumination of each flagger station shall be provided at night. Use of portable flood lighting is acceptable. Luminaires shall be located adjacent to each flagger station.
- 10B. To ensure the adequacy of floodlight placement and the elimination of glare, the Contractor and the Engineer shall drive through the worksite each night when the lighting is in place. Light placement and shielding shall be adjusted to the satisfaction of the Engineer.

INTERSECTION/DRIVEWAY ACCESS

- 11. Within the length of closure, provision shall be made to control traffic entering from intersecting streets and major drives as necessary to prevent wrong-way movements and to keep vehicles off of new pavement not ready for traffic. The contractor shall:
 - a) Place across the closed lane, either 3 drums (cones) or barricades,
 - b) Provide an additional flagger at every public street intersection and major driveway.

Drums (cones) placed across the closed lane shall be located 25 feet (8m) beyond the projected pavement edges of the driveway or cross highway, as shown in Standard Construction Drawings MT-97.11 or MT-97.12. For Barricades, see Standard Construction Drawing MT-101.60.

Existing stop signs shall be relocated as necessary to assure proper location for the traffic conditions.

The method of control shall be subject to the approval of the Engineer.

SHADOW VEHICLE

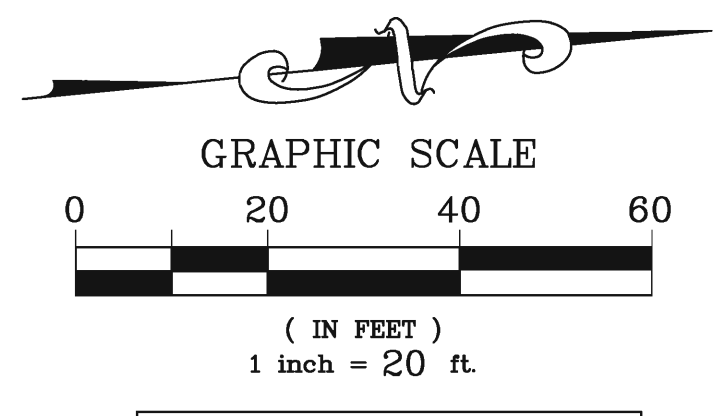
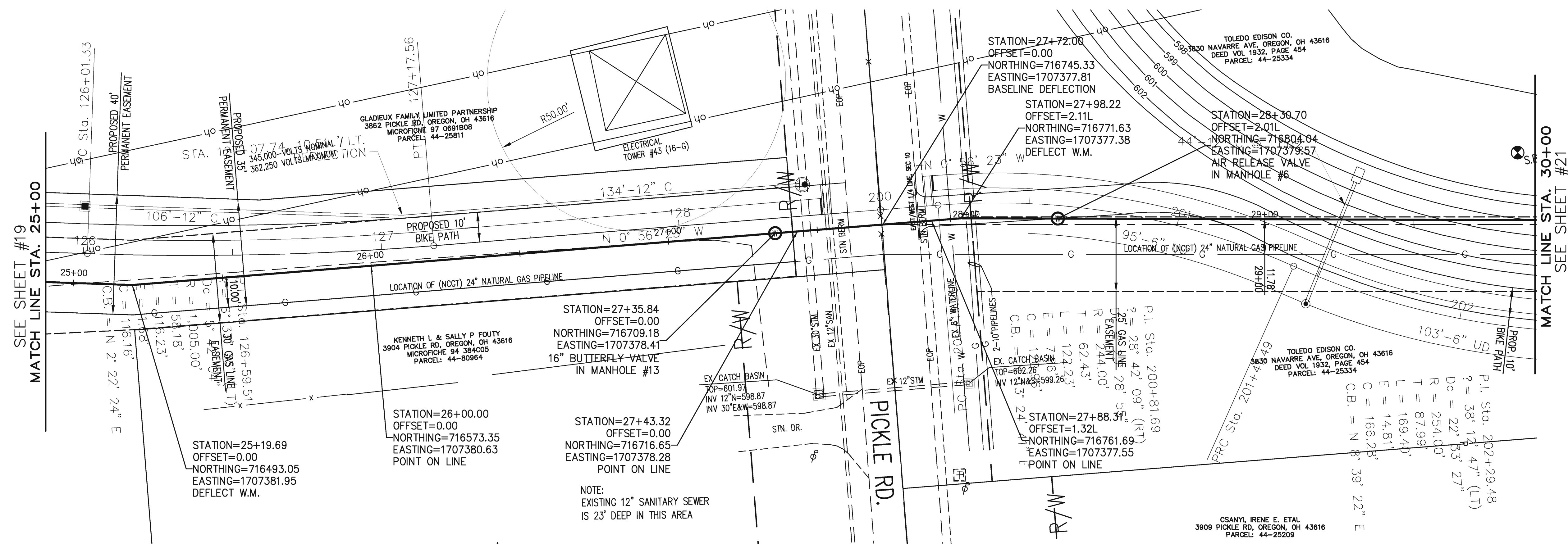
- 12A. The shadow vehicle shall be in place and unoccupied whenever workers are in the work area. This vehicle shall be removed from the pavement whenever workers are not in the work area.
- 12B. The shadow vehicle shall be equipped with a high-intensity yellow rotating, flashing, oscillating, or strobe light(s).
- 12C. The vehicle shall be equipped with a truck-mounted attenuator (TMA) when called for in the plans.
- 12D. Other protective devices may be used in lieu of the shadow vehicle shown when approved by the Engineer.

CHIP SEAL OPERATIONS

- 13. For chip seal operations, additional signing shall be incorporated in the advanced warning area.
 - a) The LOOSE GRAVEL (W8-7) and FRESH TAR (W21-2) signs shall both be used in advance of the chip seal operation.
 - b) Repeat the LOOSE GRAVEL (W8-7) sign with a 35 mph Advisory Speed plaque (W13-1) every half mile per CMS 422.09.
 - c) The FRESH TAR (W21-2) and the LOOSE GRAVEL (W8-7) signs shall both be used for signing of side roads intersecting the work area.

ANY INFORMATION OR DATA ON THIS DRAWING IS NOT INTENDED TO BE SUITABLE FOR REUSE BY ANY PERSON, FIRM OR CORPORATION OR ANY OTHERS ON EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT WRITTEN VERIFICATION AND ADAPTATION BY THE ENGINEER, ARCHITECT OR SURVEYOR FOR THE SPECIFIC PURPOSE. INTENDED WILL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY OR LEGAL EXPOSURE TO THE ENGINEER, ARCHITECT OR SURVEYOR.

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UNDERGROUND UTILITIES
TWO WORKING DAYS BEFORE YOU DIG
 Call 1-800-362-2764 (Toll Free)
 OHIO UTILITIES PROTECTION SERVICE
 NON-MEMBERS MUST BE CALLED DIRECTLY

NOTE: A MINIMUM OF TEN (10) FEET HORIZONTALLY AND EIGHTEEN (18) INCHES VERTICALLY FROM ANY SANITARY SEWER, STORM SEWER OR SEPTIC LINE MUST ALWAYS BE MAINTAINED UNLESS OTHERWISE APPROVED BY THE OHIO EPA. NO OR ENTRY CONTACT WITH A SEWER MANHOLE IS PERMITTED.

NOTE: IT IS THE CONTRACTOR'S RESPONSIBILITY TO SUPPORT AND PROTECT ALL UTILITIES EXPOSED DURING ANY EXCAVATION PERFORMED AS A RESULT OF THIS PROJECT.

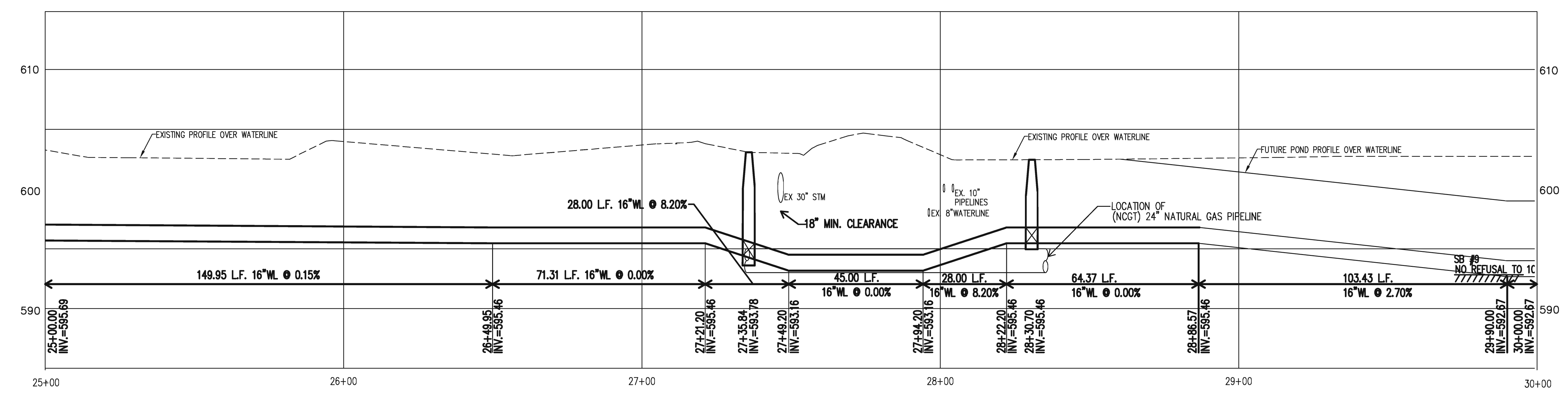
NOTE: SERVICES SHOWN ARE FOR BIDDING PURPOSES ONLY. LOCATIONS WILL BE ESTABLISHED IN THE FIELD DURING CONSTRUCTION.

NOTE: CAUTION SEE RESTRICTIONS FOR WORKING OVER, UNDER AND AROUND PIPELINE.

NOTE: PICKLE ROAD CAN BE OPEN CUT WITH A TWO DAY ROAD CLOSURE.

Coordination of Work

As required in the Contract Documents, the Contractor shall coordinate all work involved in construction of Southwest Water Distribution Project with the Pickle Road Storm Relief Project and Multi-Use Path, Phase 1 that are expected to be under construction simultaneously. The contractor shall fully cooperate with and coordinate their work with contractors on other projects for the City, utility service companies, City employees working at the Site for the satisfactory and expeditious completion of the Project. The Contractor shall review the Progress Schedule and installation procedures under other City Projects and contracts that may affect their Work and coordinate installation of such work with appropriate party or parties.



ADDENDUM #1

POGEMEYER DESIGN GROUP, INC.
 ARCHITECTS ENGINEERS PLANNERS
 1168 NORTH MAIN STREET BOWLING GREEN, OHIO 43402
 (419) 352-7537

SOUTHWEST WATER DISTRIBUTION IMPROVEMENT PROJECT
 CITY OF OREGON
 EASEMENT BL

PLAN & PROFILE
 25+00 TO 30+00
 EASEMENT BL

DRAWN BY	CHECKED BY
RAO	DMP
REVISION	
ADM #1 7-5-2017	

20 OF

JOB NUMBER
 1210-100