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***SECTION 5***  
***SPECIFICATIONS***

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## SECTION 011100 - SUMMARY OF WORK

### PART 1 - GENERAL

#### 1.1 LOCATION OF THE PROJECT

- A. The project is located in the Village of Johnstown, Licking County, Ohio.

#### 1.2 PROJECT DESCRIPTION

- A. The project consists of installation of 16" waterline along the east side of Croton Road from Main Street/RT37 to 2,150' +/- north of Woodhaven Road.

#### 1.3 SPECIFICATIONS

- A. In general, these Specifications describe the work to be performed by the various trades, other than work specifically excluded. It shall be the responsibility of the Contractor and Subcontractors to perform all work incidental to their trade, whether or not specific mention is made of each item, unless such incidentals are included under another Item.
- B. It is advised that the Contractor and all Subcontractors familiarize themselves with the contents of the complete Specifications, particularly for the trades preceding, following, related or adjacent to their work.

#### 1.4 DRAWING SCHEDULE

- A. The work to be done under this Contract is shown in the contract drawings/plans.

END OF SECTION 011100

## SECTION 011419 – USE OF SITE

### PART 1 - GENERAL

#### 1.1 GENERAL

- A. The Contractor will be allowed the use of as much of the site designated for the improvements as is necessary for his operation.

#### 1.2 USE OF STREETS

- A. During the progress of the work, the Contractor shall make ample provisions for both vehicle and pedestrian traffic on any public street and shall indemnify and save harmless the Owner from any expense whatsoever due to their operations over said streets. The Contractor shall also provide free access to all the fire hydrants, water, and gas valves located along the line of his work. Gutters and waterways must be kept open or other provisions made for the removal of storm water. Street intersections may be blocked only one-half at a time, and the Contractor shall lay and maintain temporary driveways, bridges and crossings, such as in the opinion of the Engineer are necessary to reasonably accommodate the public.
- B. In the event of the Contractor's failure to comply with these provisions, the Owner may cause the same to be done, and may deduct the cost of such work from any monies due the Contractor under this Agreement, but the performance of such work by the Owner at its instance shall serve in no way to release the Contractor from his general or particular liability for the safety of the public or the work.
- C. The Contractor shall repair at no cost to the Owner, all existing roads, parking areas, grassed areas that are damaged due to the execution of his work. The Contractor shall remove daily all mud, soil and debris that may be tracked onto existing streets, drives, or walks by his equipment or that of subcontractors or suppliers.

#### 1.3 CLOSING STREETS TO TRAFFIC

The Contractor may, with the approval of the Engineer, close streets, or parts of streets, to vehicular traffic. The streets are to remain closed as long as the construction work or the condition of the finished work requires or as determined by the Engineer. The Engineer shall be the judge of how many streets or parts of streets it is necessary for the Contractor to close at any time, and may refuse to permit the closing of additional streets to traffic until the majority of the work on the closed streets is completed and they are opened to traffic.

#### 1.4 RIGHTS-OF-WAY

- A. Whenever it is required to perform work within the limits of public or private property or in rights-of-way, such work shall be done in conformity with all agreements between the Owner and the owners of such. Care shall be taken to avoid injury to the premises entered, which premises shall be left in a neat and orderly condition by the removal of rubbish and the grading of surplus materials, and the restoration of said public or private property to the same general conditions as pertained at the time of entry for work to be performed under this contract.
- B. The Contractor shall not (except after consent from the proper parties) enter or occupy with men, tools or equipment, any land outside the rights-of-way or property of the Owner.
- C. When the Contractor performs construction within 10 ft. of a right-of-way or easement line, he shall place tall stakes properly identified at points of change in width or direction of the right-of-way or easement line and at points along the line so that at least two stakes can be seen distinctly from any point on the line.

#### 1.5 EASEMENTS

- A. Where the work is to be constructed upon easements, such easements will be secured by the Owner without cost to the Contractor. The Contractor shall not enter upon or occupy any private property outside of the limits of the easements furnished.
- B. Care shall be taken to avoid injury to the premises entered, which premises shall be left in a neat and orderly condition by the removal of rubbish and the grading of surplus materials, and the restoration of said public or private property to the same general conditions as pertained at the time of entry for work to be performed under this contract.

#### 1.6 PROTECTING EXISTING BUILDINGS, STRUCTURES AND ROADWAYS

- A. The Contractor shall, at his own expense, shore up and protect any buildings, roadways, utilities or other public or private structures which may be encountered or endangered in the prosecution of the work, and that may not be otherwise provided for, and he shall repair and make good any damages caused to any such property by reason of his operations. All existing fences removed due to the prosecution of the work shall be replaced by the Contractor. No extra payment will be made for said work or material, but the cost of this work must be included in the price stipulated for the work to be done under this contract.

#### 1.7 SITE FACILITIES

- A. The Contractor shall furnish and place sufficient quantities of portable toilet facilities at locations convenient for use by the Contractor's personnel, Subcontractors, the Engineer, and the Owner.

1.8 RESTORATION

- A. On all contract items that require and include surface restoration including repairs to driveways and roads outside trench limits, an amount equal to 10% of the unit price bid for sewer and/or waterline items will be considered the value of this work.
- B. As work is completed, the payment for each contract item will be reduced by the 10% until full performance of all contract requirements.
- C. Partial release of the 10% restoration money may be made by the Engineer commensurate with his determination of the value of said work.
- D. If, in the opinion of the Engineer, the value of the restoration exceeds 10% of the contract line item, he may require a greater amount to be held but not in excess of 25%.
- E. The amount held for restoration shall not be considered retainage of completed work but rather the value of work not yet performed and therefore not eligible for payment.
- F. On lump sum items or contracts, the value of the restoration work will be determined by the approved schedule of values submitted by the Contractor.

END OF SECTION 011419

## SECTION 013119 - PROJECT MEETINGS

### PART 1 - GENERAL

#### 1.1 PRECONSTRUCTION MEETING

- A. Prior to the Contractor beginning any work on the project, the Owner will schedule and hold a preconstruction meeting to discuss all aspects of the contract work.
- B. The Contractor shall be present and be prepared to comment in detail on all aspects of his work.
- C. The Contractor shall bring to the preconstruction meeting a proposed construction progress schedule, erosion control plan, quality control program, concrete mix designs, asphalt mix designs (JMF), etc. Approval of each by the Engineer is required prior to the start of any work.
- D. Included in the construction progress schedule shall be an implementation sequence of the proposed erosion control efforts required by the contract.

END OF SECTION 013119

## SECTION 013216 – CONSTRUCTION PROGRESS SCHEDULE

### PART 1 - GENERAL

#### 1.1 PROGRESS SCHEDULE

- A. Immediately after signing the Contract, the General Construction Contractor shall prepare a graphic progress schedule, indicating the work to be executed during each month and the rate of expected progress to secure completion on the agreed-upon completion date. The progress schedule shall be approved by the Engineer and Owner prior to starting work on the site. Copies of such graphic progress charts, upon which has been indicated the actual progress, shall be furnished to the Engineer with each requisition for payment.

This progress schedule must follow these general time frames (may vary with project):

1. Chip seal, paving fabric and/or the leveling course must start within 7 calendar days from the date of milling.
  2. Casting adjustments and/or curb replacements must start within 7 calendar days from the completion of the chip seal, intermediate course and/or fabric.
  3. Surface course asphalt concrete must begin installation within 7 calendar days from the completion of the casting adjustments and/or curb replacement.
  4. Traffic paint, temporary or permanent must be installed within a time period as deemed adequate and desirable for each location.
- B. Should the rate of progress fall materially behind the scheduled rate of progress, and unless the delay is authorized by the Engineer, each offending Contractor shall furnish additional labor, work overtime, or take other necessary means required for completion of the work on the scheduled date. No additional compensation beyond the set Contract price shall be paid for action taken or overtime expense incurred in maintaining scheduled progress.

END OF SECTION 013216

## SECTION 013223.02 – SURVEY AND LAYOUT DATA

### PART 1 - GENERAL

#### 1.1 REFERENCE POINTS AND STAKING

- A. The Owner shall provide engineering surveys for construction to establish reference points which, in his judgment, are necessary to enable the Contractor to proceed with the work. The Contractor shall be responsible for surveying and laying out the work and shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of the Engineer. He shall report to the Engineer whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations. The Contractor shall replace and accurately relocate all reference points so lost, destroyed or moved.

#### 1.2 LAYOUT OF WORK

- A. The Contractor shall lay out his work and be responsible for correct locations, elevations and dimensions of all work executed by him under this Contract. The Contractor must exercise proper precautions to verify the figures shown on the Drawings before laying out the work and will be held responsible for any error resulting from his failure to exercise such precaution. The Contractor shall employ a competent surveyor to establish lines and grades to insure the new construction aligns with any existing work.

END OF SECTION 013223.02



## SECTION 013543 - ENVIRONMENTAL PROTECTION

### PART 1 - GENERAL

#### 1.1 UNNECESSARY NOISE, DUST AND ODORS

- A. The Contractor's performance of this contract shall be conducted so as to eliminate all unnecessary noise, dust and odors.

#### 1.2 SEWAGE, SURFACE AND FLOOD FLOWS

- A. The Contractor shall take whatever action is necessary to provide all necessary tools, equipment and machinery to adequately handle all sewage, surface flows and flood flows which may be encountered during the performance of the work. The entire cost of and liability for handling such flows is the responsibility of the Contractor and shall be included in the price for the appropriate item.

#### 1.3 WORK IN FREEZING WEATHER

- A. Written permission from the Engineer shall be obtained before any work is performed which, in the judgment of the Engineer, may be affected by frost, cold, or snow. When work is performed under such conditions, the Contractor shall provide facilities for heating the materials and for protecting the finished work.

#### 1.4 POLLUTION CONTROL

- A. It shall be the responsibility of the Contractor to prevent or limit pollution of air and water resulting from his operations.
- B. The Contractor shall perform work required to prevent soil from eroding or otherwise entering onto all paved areas and into natural watercourses, ditches, and public sewer systems. This work shall conform to all local ordinances and/or regulations, if any, and if not otherwise regulated by local ordinances or regulations shall at a minimum conform to the Ohio EPA General Storm Water NPDES Permit for Construction Activities and the Ohio Department of Natural Resources Rainwater and Land Development manual. This work may consist of but not be limited to construction and continual maintenance of silt fence, bio bag filters, sedimentation traps, stilling basins, check dams, temporary seeding, temporary mulching, erosion mats and other means to clarify waters containing suspended materials from excavations, embankments, cleared and grubbed or stripped areas, stockpiles, well points, and disposal sites and shall be commensurate with the contractor's schedule, sequence of work, means and methods. If a SWPPP plan is not required for the project, the contractor shall at a minimum submit a plan of his proposed erosion control prevention methods for approval by the Owner and/or other regulatory authorities having jurisdiction prior to starting any construction activities which may cause erosion.

- C. The Contractor shall perform work required to prevent dust attributable to his operations from entering the atmosphere. Dust on unsurfaced streets or parking areas and any remaining dust on surfaced streets shall be controlled with water and/or calcium chloride dust palliative as needed.
- D. Any material removed from sanitary or storm sewers shall be disposed in accordance with all applicable regulations.

END OF SECTION 013543

## SECTION 014323 – QUALIFICATIONS OF TRADESMEN

### PART 1 - GENERAL

#### 1.1 CHARACTER OF WORKMEN AND EQUIPMENT

- A. The Contractor shall employ competent and efficient workmen for every kind of work. Any person employed on the work who shall refuse or neglect to obey directions of the Engineer or his representative, or who shall be deemed incompetent or disorderly, or who shall commit trespass upon public or private property in the vicinity of the work, shall be dismissed when the Engineer so orders, and shall not be re-employed unless express permission be given by the Engineer. The methods, equipment and appliances used on the work and the labor employed shall be such as will produce a satisfactory quality of work, and shall be adequate to complete the contract within the specified time limit.
  
- B. In hiring of employees for the performance of work under this Contract, or any Subcontract hereunder, no Contractor or Subcontractor, nor any person acting on behalf of such Contractor or Subcontractor, shall, by reason of race, sex, creed or color, discriminate against any citizen of the State of Ohio in the work to which the employment relates. No Contractor, Subcontractor, nor any person on his behalf shall, in any manner, discriminate against or intimidate any employee hired for the performance of work under this contract on account of race, creed, sex or color.

END OF SECTION 014323

## SECTION 015526 - TEMPORARY TRAFFIC CONTROL DEVICES

### PART 1 - GENERAL

#### 1.1 BARRICADES, SIGNS AND LIGHTS

- A. The Contractor shall employ watchmen on the work when and as necessary. The Contractor shall erect and maintain such strong and suitable barriers and such lights as will effectively prevent the occurrence of any accident to health, limb or property. Lights shall be maintained between the hours of one-half (1/2) hour after sunset and one-half (1/2) hour before sunrise.
- B. No manhole, trench, excavation will be left open awaiting connection or removal at a later date by the Contractor's forces or others but shall be temporarily backfilled and resurfaced if applicable with a temporary pavement passable to traffic at no additional cost to the Owner.
- C. In addition to other safety requirements, a minimum of four (4) foot high fence will be incorporated around any shaft or manhole or other excavation left open at the end of a day's work.

#### 1.2 MAINTENANCE OF TRAFFIC

- A. The Contractor is required to provide maintenance of traffic in conformance with the Ohio Manual of Uniform Traffic Control Devices and Item 614 of the current Construction and Material Specifications of the Ohio Department of Transportation.
- B. This work shall include providing suitable and satisfactorily trained and properly attired flagmen for use at any location where existing roadway is narrowed to a width of less than 2 full lanes (18 feet).
- C. The Contractor is also responsible for maintaining local access to all residences and businesses along the route of the sewer and to provide whatever temporary materials are necessary to provide a safe, adequate drive surface.
- D. At all boring locations, Contractor shall provide suitable flashers, barricades, and traffic control devices as may be deemed necessary by the Engineer or the responsible authority in the case of the Department of Transportation, Turnpike Commission, or Conrail. This may extend to maintain facilities on a 24-hour basis until such time as the areas are completely backfilled.

END OF SECTION 015526

## SECTION 017800 - FINAL COMPLIANCE AND SUBMITTALS

### PART 1 - GENERAL

- 1.1 The following forms and related sign-offs shall be documented in accordance with provisions of the contract. These forms shall be completed by the Contractor and approved by the Owner before final retainer is approved for release. Forms for Items A to E will be attached to the Contractor's executed copy of the contract.
- A. Certificate of Substantial Completion (To be submitted at time of Substantial Completion).
  - B. Contractor's Certification of Completion.
  - C. Contractor's Affidavit of Prevailing Wage.
  - D. Consent of Surety Company for Final Payment.
  - E. Affidavit of Final Acceptance Date and Correction Period.
  - F. Certificate of Insurance verifying completed operations insurance coverage.

END OF SECTION 017800

SECTION 330523.13 - HORIZONTAL DIRECTIONAL DRILLING (RESTRAINED JOINT  
PVC)

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Furnish all labor, materials, tools and equipment necessary to provide for installation of restrained joint PVC water pipe line using current horizontal directional drilling technology in accordance with the Drawings and as specified herein.
- B. General: This specification defines the approved method and material for the installation of water lines utilizing horizontal directional drilling technology.
- C. Definition: Horizontal directional drilling (HDD) involves utilization of an electronically tracked bore-head to guide the borehole to a pre-designed configuration. The HDD process begins with boring a small, horizontal pilot hole with a continuous string of steel drill rod. When the bore-head and rod emerge on the opposite end of the crossing, a back reamer is attached to the drill rod string and pulled back through the pilot hole. The reamer serves to enlarge the pilot hole to allow the restrained joint PVC pipe to be pulled through from the opposite end of the borehole. The size of the drilling equipment and required support equipment shall be determined by the Contractor based on the diameter and length of pipe to be installed.

1.2 QUALITY ASSURANCE

- A. Qualifications of manufacturers: Products used in this Work shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of quality production acceptable to the Owner.
- B. Contractor Certification: Contractor shall be certified by the particular horizontal directional drilling manufacturer that Contractor is a fully trained user of the drilling equipment.

1.3 SUBMITTALS

- A. General: All submittals shall be made in accordance with Section 01300 of these Specifications. Contractor shall furnish engineering data covering design and installation. Submittal shall be made in a timely manner so that the project schedule can be met.
- B. Shop drawings: As a minimum, the following data and shop drawing information shall be submitted to the Owner for review and approval:

1. Before beginning work, Contractor shall submit to the Owner for approval, the Vendor's shop drawings, catalog data and specific manufacturer's technical data showing complete information on material composition, physical properties, and dimensions of new pipe and fittings. Include manufacturer's recommendations for handling, storage, and repair of pipe and fittings, which are damaged.
2. Contractor shall submit certification of workmen training for all personnel involved in installation of pipe.
3. Contractor shall submit a work plan to the Owner for acceptance. Work plan shall address preparation steps required for pre-installation.
4. Contractor shall submit information to the Owner for approval of the procedure and the steps to be followed for installation of the restrained joint PVC pipe utilizing horizontal directional drilling technology, even if the process is named in the specification. Any proposed changes in installation procedures shall require submittal of revised procedures for acceptance by the Owner.
5. Contractor shall submit to the Owner for approval, full details about component materials and their properties, except those protected by trade secrets which may harm their claim to the product.

#### 1.4 PRODUCT HANDLING

##### A. Handling of materials:

1. All materials furnished by the Contractor shall be delivered and distributed by the Contractor.
2. Pipe, fittings, etc., shall be loaded and unloaded by lifting with hoists or skidding so as to avoid shock or damage. Under no circumstances shall such materials be dropped. Pipe handled on skidways shall not be skidded or rolled against pipe already on the ground.
3. In distributing the material at the site of work, each piece shall be unloaded opposite or near the place where it is to be laid in the trench.
4. Pipe shall be so handled that no damage shall occur. If any part of the pipe is damaged, Contractor shall replace damaged material at his expense.

##### B. Storage of Materials: Contractor shall be responsible for safe storage of material until it has been incorporated in completed Project. Interiors of all pipe, fittings and other accessories shall be kept free from dirt and foreign matter at all times.

#### 1.5 UTILITY NOTIFICATION

- ##### A. Contractor shall be responsible for notifying the Ohio Utilities Protection Service (OUPS) and other applicable underground utility protection services a minimum of 48 hours prior to any excavating operations in accordance with the requirements of the Ohio Revised Code.

## 1.6 WARRANTY

- A. All equipment and materials supplied under this Section shall be warranted to be free from defects in materials and workmanship for a minimum of one (1) year following acceptance by the Owner.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

#### A. PVC Restrained Joint Pipe (C900-RJ):

1. Materials: Restrained joint PVC pipe meeting the requirements of AWWA C900 shall be used for water lines within directional drill applications where designated. Pipe shall be C900/RJ Certa-Lok® PVC Pressure Pipe as manufactured by North American Pipe, Eagle Loc 900™ Internal Joint Restraint Pipe as manufactured by J.M. Eagle, or approved equal.
2. Dimensions: Nominal outside diameters and wall thicknesses of restrained joint pipe shall conform to the requirements of AWWA C900. Restrained joint pipe shall be furnished in 4", 6", 8", 10" and 12" sizes, in Class 165(DR25), Class 235(DR18) and/or Class 305(DR14) as designated on the Drawings. Pipe shall be furnished in standard lengths of 20 feet.
3. Manufacturer's Instructions: PVC pipe shall be installed according to the manufacturer's written instructions for installation by horizontal directional drilling.
4. Joints: Pipes shall be joined using restrained joints which have been designed with the pipe as an integral system for maximum reliability and interchangeability. The joints shall have been designed with consideration of installation of the pipe by horizontal directional drilling methods.
5. Solvent-weld cement joints shall not be allowed.

#### B. PVC Restrained Joint Pipe (Pressure Rated PVC-ASTM D2241-RJ):

1. Materials: Restrained joint PVC pipe meeting the requirements of ASTM D2241 shall be used for water lines within directional drill applications where designated. Pipe shall be Certain-Teed Products Corp., Valley Forge, Pennsylvania; John-Manville, New York, New York; Anesite Division, Clow Corporation, Chicago, Illinois; or approved equal.
2. Composition: Material used to produce the pipe shall conform to ASTM D1784, Type 1, Grade 1, 2000 PSI design stress.
3. Dimensions: The standard dimensional ratio for the pipe shall be SDR 21 through 17.
4. Standard: All PVC pipe shall conform to the latest revisions of ASTM Specification D2241 and Department of Commerce Specification PS22-PR (SDR-PR) for pressure rated pipe.



5. Manufacturer's Instructions: PVC pipe shall be installed according to the manufacturer's written instructions for installation by horizontal directional drilling.
6. Joints: Pipes shall be joined using restrained joints which have been designed with the pipe as an integral system for maximum reliability and interchangeability. The joints shall have been designed with consideration of installation of the pipe by horizontal directional drilling methods.
7. Solvent-weld cement joints shall not be allowed.

## 2.2 EQUIPMENT

### A. Directional Drilling Machine:

1. Directional drilling equipment shall be self-powered and self-contained. Equipment shall be designed and manufactured with an electronically tracked bore-head so as to guide the borehole to a desired configuration, both horizontally and vertically.
2. Directional drilling equipment shall generate sufficient torque and thrust/pullback force to drill a pilot hole, enlarge the pilot hole by back reaming and pull the pipeline back through the enlarged hole.
3. Contractor shall comply with manufacturers specifications as to the machine size requirement for a given diameter and length of pipe, as well as parameters of the required size machine for percentage of upsize allowed.

### B. Vacuum Excavation Unit:

1. Directional drilling operations shall be assisted by use of an adequately sized vacuum excavation system mounted on either a trailer or truck body.
2. Vacuum excavation system shall provide sufficient storage tank capacity and power pack to efficiently remove drilling fluid from the insertion pit during horizontal directional drilling operations.
3. Vacuum excavation system shall be equipped with a high-pressure water system designed to assist with "pothole" excavation operations.

### C. Drilling Fluid Management System:

1. Directional drilling operations shall be assisted by use of a truck mounted drilling fluid mixing system.
2. Fluid management system shall include two mixing tanks to allow for flexibility in mixing, transferring and delivering drilling fluid.
3. Fluid management system shall have the capability to transfer between tanks while providing drilling fluid to the directional drilling machine.

## 2.3 TRACER WIRE

- A. Tracer wire for directional boring installation shall be a 12 AWG solid and shall be RoHS Compliant wire. Tracer wire for directional boring installation shall be made in the USA.

- B. Conductor shall be hard-drawn, 21% IACS, copper clad steel, utilizing a AISI 1065 high carbon steel core (required to meet break load), with rated break load of 1,330 lbs (260,000 psi).
- C. Conductor shall be extruded with a 45 mil, high-density, high molecular weight polyethylene (HMW-HDPE) pursuant to ASTM D1248 standard. Insulation color shall meet the APWA color code standard for identification of buried utilities.
- D. Tracer wire shall be PRO-TRACE HDD-CCS PE45 as manufactured by Pro-Line Safety Products, SoloShot Extra High Strength Tracer Wire as manufactured by Copperhead Industries LLC, or approved equal.
- E. Tracer wire utilized through the directional drill area shall terminate on either side of the directional drill area in a in ground/at grade tracer wire terminal box that will serve as an access point and terminal. The terminal box shall be specifically designed for use with tracer wire systems and shall be equipped with a color coded lid to indicate the proposed utility application. Terminal boxes shall be appropriate for use in roadway or non-roadway locations as required by the location of the directional drill terminations as shown in the Drawings.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. It is the responsibility of the Contractor to implement means and procedures compatible with anticipated ground conditions.
- B. The Engineer and Owner must be notified immediately if any condition is encountered that stops the forward progress of drilling operations. The Contractor and Engineer must review the situation and jointly determine the feasibility of continuing drilling operations. When it is determined that it is impossible to continue drilling operations, the Contractor will be allowed to abandon the completed portion in place and start a new hole as directed by the Owner and Engineer.
- C. The Contractor shall allow sufficient lengths of product pipe to extend past the termination point to allow connections to adjacent pipe sections or manholes. Pulled pipe shall be allowed 48 hours of stabilization prior to making tie-ins or prior to backfill grouting of the pipe. The length of extra product pipe shall be at the Contractor's discretion.
- D. Waterline pipe shall have no deflection, which exceeds the pipe manufacturer's recommendation for the specific material.
- E. Contractor shall develop and maintain a "Frac-Out" Contingency Plan to establish procedures for addressing potential impacts associated with the inadvertent release of drilling fluid during the directional drilling of identified resource crossings.

### 3.2 HORIZONTAL DIRECTIONAL DRILLING OPERATION AND PIPE INSTALLATION

- A. Installation Procedures - General: All approved installation instructions and procedures submitted shall be carefully followed during installation. Any proposed changes in installation procedures shall require submittal of revised procedures and acceptance by the Owner.
  - 1. Equipment used to perform the work shall be located as far away from buildings as possible. Provide enclosed, insulated power packs for all mechanical equipment to reduce machine noise, as required to meet local requirements.
  - 2. Contractor shall install all pulleys, rollers, bumpers, alignment control devices and other equipment required to protect existing structures, and to protect the pipe from damage during installation. Lubrication shall be used as recommended by the manufacturer. Under no circumstances will the pipe be stressed beyond its elastic limit.
- B. Pipe Joining of Restrained Joint PVC Pipe:
  - 1. Restrained joint PVC shall be assembled and joined at the site using couplings designed with the pipe as an integral system. Threaded or solvent-cement joints and connections shall not be permitted.

### 3.3 TRACER WIRE INSTALLATION

- A. Tracer wire within directional drilled areas shall be installed in accordance with the tracer wire manufacturer's recommendations.
- B. Two tracer wires shall be pulled back through the bored hole with the pipe. Wire shall be tested for continuity after installation. At least one wire must have continuity.
- C. Ends of wires with continuity shall be terminated in a terminal box that shall serve as both an access point and a terminal point. The top of the terminal box shall be installed flush with the ground at each end of the directionally bored section.
- D. If none of the wires has continuity, new wire shall be installed by the Contractor to provide a continuous wire for location purposes at no additional expense to the Owner.
- E. Tracer wire splices within directional drill areas shall be avoided unless approval has been obtained from the Owner.

### 3.4 CARE AND RESTORATION OF PROPERTY

- A. All heavy equipment shall be operated with care to prevent damage to existing structures and/or wires.
- B. On paved surfaces, the Contractor shall not use or operate tractors, bulldozers, or other power-operated equipment the treads or wheels of which are so shaped as to cut or otherwise damage such surfaces.

- C. All surfaces which have been damaged by the Contractor's operations shall be restored to a condition at least equal to that in which they were found immediately prior to the beginning of operations. Suitable materials and methods shall be used for such restoration.
- D. Restoration of existing property or structures shall be done as promptly as practicable and shall not be left until the end of the construction period.

### 3.5 PROTECTION OF EXISTING STRUCTURES, PRIVATE PROPERTY, AND RIGHTS-OF-WAY

- A. All existing pipes, poles, wires, fences, curbing, property-line markers, and other structures which, in the opinion of Owner must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from injury by Contractor, and in case of injury, Contractor shall notify the appropriate party so that proper steps may be taken to repair any and all damage done. When the owners do not wish to make the repairs themselves, all damage shall be repaired by Contractor, or, if not promptly done by him, Owner may have the repairs made at expense of Contractor.
- B. The Contractor shall consult the Owner or his representatives prior to removing or disturbing any tree, shrub, bush, fence, sidewalk, building structure, or improvement that may be encountered in the line of the water line or in the path of the easement, or right-of-way secured by the Owner. Immediately upon completion of sewer line rehabilitation through each piece of private property, the Contractor shall replace the sod, lawns, bushes, shrubs, or whatever else may have been removed, disturbed or altered during the progress of the work.

## PART 4 - FRAC-OUT CONTINGENCY PLAN GENERAL OUTLINE

### 4.1 INTRODUCTION

- A. Installation of the pipeline will involve horizontal directional drilling of identified resource crossings (i.e. streams, wetlands, roads, etc.). Although directional drilling is a much less intrusive method of crossing than open-trench cutting, there is a possibility of a surface disturbance if a "frac-out", or inadvertent return of drilling fluid, occurs during the drilling process. Releases are typically caused by the pressurization of the drill hole beyond the containment capability of the overburden soil. Therefore, the type of material and the depth of overburden are key factors in preventing a frac-out.
- B. The purpose of this Frac-out Contingency Plan is to establish procedures for addressing potential impacts associated with the inadvertent release of drilling fluid during the directional drilling of identified resource crossings. Every effort will be made to prevent a drilling fluid loss from becoming a seepage to the ground surface, stream or wetland. This will be done by maintaining proper drilling fluid parameters (viscosity, mud weight, solids content, etc.) and using controlled drilling practices (fluid pressure, drilling rate, flowrate, trip speed, etc.).

#### 4.2 DRILLING ENTRANCE AND EXIT POINTS

- A. A temporary sediment barrier will be installed prior to drilling operations to contain potential releases where determined necessary based on field conditions at the time of drilling.

#### 4.3 TERRESTRIAL AREAS

- A. When a frac-out is suspected while drilling a terrestrial area:
  1. The contractor will temporarily suspend forward progress of the drilling operations if excessive loss of bentonite circulation is noted and the surface of the drill path will be examined for release. The drilling equipment should continue to operate, at reduced pressure, so that the drilling hole does not collapse.
  2. If a surface release has occurred, isolate the area with hay bales, sand bags, or silt fencing to contain the spread of bentonite.
  3. The contained bentonite area will be left in place to dry
  4. The dried bentonite will be removed to grade and used as backfill around the pipeline.
  5. Surface releases can also be removed by the use of a vacuum truck where appropriate.
  6. The affected areas will be restored as closely as possible to their previous condition.
  7. After containment has been achieved, the drilling contractor and the inspector will make every effort to determine why the frac-out occurred and develop corrective measures to minimize the chance of recurrence.

#### 4.4 WETLANDS

- A. When a suspected frac-out is identified while drilling a wetland area:
  1. The contractor will temporarily suspend forward progress of the drilling operations if excessive loss of bentonite circulation is noted and the surface of the drill path will be examined for release. The drilling equipment should continue to operate, at reduced pressure, so that the drilling hole does not collapse.
  2. If a surface release has occurred, isolate the area with hay bales, sand bags, or silt fencing to contain the spread of bentonite.
  3. Contact the environmental inspector for the project to document the release and direct the clean-up operations. The Ohio EPA shall be notified of the frac-out.
  4. The contained bentonite area will be left in place to dry to avoid potential damage from vehicles entering the area.
  5. The dried bentonite will be removed to grade by the use of hand shoveling or the use of small-mechanized equipment outside the wetland area.
  6. The bentonite will be used as backfill around the pipeline.

7. The affected areas will be restored as closely as possible to their previous condition.
8. After containment has been achieved, the drilling contractor and the inspector will make every effort to determine why the frac-out occurred and develop corrective measures to minimize the chance of recurrence.

#### 4.5 SMALL STREAMS

A. When a suspected frac-out is identified while drilling a small stream crossing:

1. The contractor will temporarily suspend forward progress of the drilling operations if excessive loss of bentonite circulation is noted and the surface of the drill path will be examined for release. The drilling equipment should continue to operate, at reduced pressure, so that the drilling hole does not collapse.
2. If a surface release has occurred, check effectiveness of the sediment barrier, make necessary repairs.
3. Contact the environmental inspector for the project to document the release and direct the clean-up operations. The Ohio EPA shall be notified of the frac-out.
4. Remove the bentonite by shovel or vacuum truck. The bentonite can be used as pipeline backfill.
5. The affected areas will be restored as closely as possible to their previous condition.
6. After containment has been achieved, the drilling contractor and the inspector will make every effort to determine why the frac-out occurred and develop corrective measures to minimize the chance of recurrence.

#### 4.6 RESPONSE PERSONNEL

- A. In the event of a frac-out, the person discovering the release will notify the following individuals and initiate the appropriate response steps. The Contractor personnel will notify appropriate agencies and obtain any clearances necessary for clean-up operations. The Contractor project personnel and HDD contractor manager will coordinate all response activities.

**CONTRACTOR PROJECT MANAGER:**

Name:

Company:

Cell Phone:

Office Phone:

**CONTRACTOR ENVIRONMENTAL PROFESSIONAL:**

Name:

Company:

Cell Phone:

Office Phone:

HDD CONTRACTOR MANAGER:

Name:

Company:

Cell Phone:

Office Phone:

EMERGENCY RESPONSE CONTRACTOR:

Name:

Company:

Cell Phone:

Office Phone:

4.7 RESPONSE EQUIPMENT

A. The following is a minimum list of response equipment that will be kept on site during HDD operations.

1. Sand bags
2. Hand Tools
3. Portable pumps and hoses
4. Straw bales
5. Silt fence
6. Spill kits
7. Backhoe or excavator

END OF SECTION 330523.13