

**DIVISION 31 – SITE WORK  
SECTION 31 23 33 – TRENCHING AND BACKFILLING FOR UTILITIES**

**PART 1 – GENERAL**

1.01 SECTION INCLUDES

- A. Excavating trenches for utilities.
- B. Backfilling and compaction of utility trenches.
- C. Excavation, backfill and compaction for manholes and air release valve chambers.

1.02 REFERENCES

- A. American Association of State Highway and Transportation Officials:
  - 1. AASHTO T 99, Moisture-Density Relations of Soils, Using a 5.5-lb. Rammer and a 12-inch Drop.
  - 2. AASHTO T 191, Standard Method of Test for Density of Soil In-Place by the Sand Cone Method.
- B. American Society for Testing and Materials:
  - 1. ASTM D698 – Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort.
  - 2. ASTM D1556 – Test Method for Density and Unit Weight of Soil in Place by Sand Cone Method.
  - 3. ASTM D2216 – Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock.
  - 4. ASTM D2321 – Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.
  - 5. ASTM D2977 – Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
  - 6. ASTM D3017 – Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
  - 7. ASTM D4643 – Test Method for Determination of Water Moisture Content of Soil by the Microwave Oven Method.
- C. Pennsylvania Department of Transportation:
  - 1. PennDOT Publication 408, Latest edition.

- a. PennDOT Section 220, Flowable Backfill.
  - b. PennDOT Section 601, Pipe Culverts.
  - c. PennDOT Section 703.2, Coarse Aggregate.
  - d. PennDOT Section 703.3, Select Granular Material.
2. PennDOT Chapter 459, Occupancy of Highways by Utilities, latest edition.
  3. PennDOT Chapter 213, Work Zone Traffic Control, latest edition.
  4. PennDOT Publication 72 – Standards for Roadway Construction (RC's), latest edition, as referenced throughout these Specifications.

### 1.03 DEFINITIONS

#### A. Definitions:

1. **Unclassified Excavation:** Removal of materials of any kind in the excavation, including rock excavation.
2. **Miscellaneous Unclassified Excavation:** Unclassified excavation required by the Engineer and not included in other items for payment.
3. **Miscellaneous Aggregate Backfill:** Aggregate backfill required by the Engineer and not included in other items of payment.
4. **Miscellaneous Earth Backfill:** Earth backfill required by the Engineer and not included in other items of payment.
5. **Subgrade:** Trench bottom prepared as specified to receive first class bedding, concrete cradle or concrete encasement or the bottom of excavations prepared to receive pipe line structures.
6. **Utility:** Any buried pipe, duct, conduit or cable as defined by Pennsylvania Underground Utility Line Protection Law – PA Act 287 of 1974 as amended by Act 187 of 1996, Act 199 of 2004, Act 181 of 2006 and Act 121 of 2008.
7. **Final Surfacing Elevation:** Elevation of bottom of final surfacing operation such as bottom of topsoil depth or paving subgrade.

### 1.04 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. **Samples:** Submit aggregate samples and other required submissions when requested by Engineer/Authority.

- C. Test Reports:
  - 1. Submit testing laboratory aggregate test reports based on requirements stated in Source Quality Control.
  - 2. Compaction density test reports based on method of density determination as specified in Reference Standards and the method as approved by the Engineer.
- D. Certificates: Submit certificate from aggregate supplier based on requirements stated in Source Quality Control, when requested by Engineer.

1.05 QUALITY ASSURANCE

- A. Source Quality Control:
  - 1. Laboratory Tests: Aggregate materials specified herein under Products require advance examination or testing according to methods referenced, or as required by the Engineer.
    - a. Testing laboratory shall furnish both Engineer and Contractor two copies of test result reports. Same reports will be considered as sufficient evidence of acceptance or rejection of materials represented.
    - b. Conduct aggregate quality tests in accordance with requirements of appropriate Referenced Standard for such materials.
    - c. The Engineer reserves the right to accept aggregate materials based on certification from supplier that the aggregate originates from a source approved by PennDOT and that the aggregate complies with specified PennDOT requirements.
    - d. The Contractor is responsible for the cost of all testing required by this section.
- B. Regulatory Requirements
  - 1. Work performed within Scott Township rights-of-way shall be completed according to all requirements of the Township.

1.06 PROJECT CONDITIONS

- A. Classification of Excavated Materials: Unclassified excavation as defined herein. No consideration will be given to the nature of the materials encountered in trenching operations or for difficulties encountered during excavating or handling of materials.
- B. Removal of Obstructions:
  - 1. Remove, realign or change the direction of above or below ground utilities and their appurtenant supports, if such is required in the opinion of the Engineer. Additional precautions concerning obstructions as follows:

- a. Do not interfere with persons, firms, corporations or utilities employing protective measures, removing, changing or replacing their property or structures, but allow said persons, firms, corporations or utilities to take such measures as they may consider necessary or advisable under the circumstances; which shall not relieve the responsibilities of the Contractor.
  - b. Break through and reconstruct if necessary, the invert or arch of a sewer, culvert or conduit that may be encountered if the said structure is in such a position, in the judgment of the Engineer, as not to require its removal, realignment or complete reconstruction.
- C. Environmental Requirements:
- 1. Do not perform trenching, backfilling or compacting when weather conditions or the condition of materials are such, in the opinion of the Engineer, that work cannot be performed satisfactorily.
  - 2. Do not use frozen materials as backfill nor wet materials containing moisture in excess of the amount necessary for satisfactory compaction.
  - 3. Prior to use, moisten dry backfill material not having sufficient moisture to obtain satisfactory placement or compaction.
  - 4. Plan work so as to provide adequate protection during storms with provisions available for preventing flood damage. Protect installed piping and other work against damage from uplift due to high ground water levels.
  - 5. Accommodation of Drainage: Keep gutters, sewers, drains and ditches open for surface drainage. No damming or ponding or water in gutters or other waterways will be permitted, except where stream crossings are necessary and then only to an extent which the Engineer shall consider necessary. Do not direct water flows across or over pavements except through approved pipes or properly constructed troughs. When so required, provide pipes or troughs of such sizes and lengths as required, and place the same as required at no expense to the Owner. Perform grading in the vicinity of trenches so that the ground surface is properly pitched to prevent water running into the trenches.
  - 6. Pumping: Keep excavations free from water during the performance of the work under this Contract at no expense to the Owner. Build dams and other devices necessary for this purpose, and provide and operate pumps of sufficient capacity for dewatering the excavations. Provide for the disposal of the water removed from excavations in such manner as not to cause injury to the public health, to public or private property, to the work of others, to the portion of the work completed or in progress or produce an impediment to the use of streets, roads and highways.
  - 7. When it is necessary to haul soft or wet soil material over roadways, use suitably tight vehicles to prevent spillage. Clear away spillage of materials caused by hauling on roadways.

8. Provide effective dust and mud control.
  9. Do not dispose of water in trenches by draining through completed portions of sewer piping.
- D. Protection: Assume the risks attending and presence or proximity of overhead or underground public utility and private lines, pipes, conduits and support work for same, existing structures and property of whatever nature. Damages and expenses for direct or indirect injury to such structures or to any person or property by reason of them or by reason of injury to them; whether such structures are or are not shown on the Contract Drawings, by work of this Contract, rests solely with the Contractor.
1. Outside Rights-of-Way: Take necessary precautions to protect trees, shrubs, lawns and such other landscaping from damage. Complete restitution work for damages at no additional cost to Owner.
  2. Pipe Supports: Adequately support underground pipes or conduits exposed as a result of excavations. Provide adequate support along their entire exposed length. Install such supports in such manner that backfilling may be performed without dislodging such pipes or conduits. Place and carefully compact Aggregate Backfill around the supports and leave such supports in place as a guard against breakage due to backfill settlement. No additional payment will be due the Contractor for support material left in place or for the labor of installing and maintaining supports.
  3. Temporary Protective Construction:
    - a. Temporary Fence Barricade: Erect and maintain substantial temporary fences surrounding excavation to prevent unauthorized persons from entering such areas.
    - b. Barricades: Furnish and erect substantial barricades at crossings of trenches, or along trenches, to protect the traveling public.
    - c. Excavation Covers: Cover open excavation when work therein is suspended or left unattended, including the end of a workday. For such covers, use materials of sufficient strength and weight to prevent their removal by unauthorized persons.
    - d. Remove temporary protective construction at the completion of work on the Project.
    - e. Comply with Scott Township requirements.
- E. Structure Supports: Where passing buildings or any structure which by their construction or position might bring a great pressure upon the trenches, the right is reserved by the Engineer to require that such buildings or structures be underpinned or supported and protected, or special sheeting be driven or that short lengths of trench be opened at one time. Failure of Engineer to recommend said protection shall not relieve Contractor of his responsibility to protect structures near the construction.

- F. Accommodation of Traffic: (Comply with the requirements of Section 01 50 00 and the Contract Drawings.) DO NOT OBSTRUCT FIRE HYDRANTS. Employ traffic control measures in accordance with PennDOT, Title 67, Chapter 213 and Scott Township Requirements.
- G. Explosives and Blasting:
1. Blasting will be permitted only in areas allowed by Scott Township and Scott Township Authority and where the proximity of structures, underground facilities, or public safety does not preclude the use of explosives. Blasting must comply with Township, State, and Federal regulations and requirements.
  2. The use of explosives shall be governed by the “Regulations for the Storage, Handling and the Use of Explosives” of the Pennsylvania Department of Labor and Industry and any other applicable federal, state or local codes that may have jurisdiction.
  3. All blasts shall be properly matted and securely covered. Contractor shall be solely responsible for injury to persons or property located within or beyond the area or scope of the project that may result from use of explosives.
  4. Blasting work shall be supervised by personnel licensed and experienced in this type of work.
  5. Explosives shall be stored in state-approved magazine off the job site and shall be delivered to the site in vehicles clearly marked to indicate cargo.
  6. Blasting within State Highway and railroad rights-of-way is not permitted unless authorized by PennDOT or the railroad. Contractor shall be responsible for securing required permits.
  7. Notify utilities having structures or other installations above or below ground in proximity to the trenching work prior to use of explosives. Such notice must be given sufficiently in advance to enable the utilities to take such steps as they may deem necessary to protect their property from injury. Such notice shall not relieve Contractor of responsibility of damage resulting from his use of explosives. The right is reserved to direct that rock within five (5) feet of pipe, conduit or other structures encountered in the trench be removed by methods other than blasting.
  8. Cease blasting operations when street paving adjacent to trench is damaged. Repair damaged street paving.
- H. Removal of Rock by Means Other Than Blasting: Where removal of rock by means other than blasting is required, in accordance with the requirements of State and local laws, rules and regulations, and utility owner requirements, remove by the use of mechanical surface impact equipment, or by drilling and hydraulic rock splitting equipment, or by other methods.
- I. Responsibility for Condition of Excavation: Condition and results of excavation are solely the responsibility of the Contractor. Remove slides and cave-ins at whatever time and under whatever circumstance they occur.

- J. Excess Materials: No right of property in materials is granted to the Contractor of excavated materials prior to backfilling. This provision does not relieve the Contractor of his responsibility to remove and dispose of surplus excavated materials.
- K. Borrow Material: When the required quantity of backfill material exceeds the quantity of suitable on site material, provide borrow material. If borrow material is needed, notify the Engineer sufficiently in advance to permit the Engineer to verify such need and to view the proposed borrow pit to determine the material suitability. Borrow excavation will be subject to the Engineer's approval whose written consent shall be obtained prior to its use. Contractor shall be responsible for all sampling and testing required by Engineer to determine suitability.
- L. Change of Trench Location or Depth:
  - 1. Should the Engineer require a change in location of a trench from that indicated on the Contract Drawings due to the presence of an obstruction, or from other cause and such change is made before the excavation is begun, the Contractor shall not be entitled to extra compensation or to a claim for damages.
  - 2. If a change in trench location made at the request of the Engineer involves the abandonment of excavation already made, such abandoned excavation, together with the necessary backfill will be classified as Additional Unclassified Excavation and Additional Aggregate Backfill.
  - 3. The Contractor shall have no claim for additional compensation as a result of changes in trench depths other than the unit price bid for trenches of the revised depth. However, if the change results in abandonment of excavation already made, such abandoned excavation together with the necessary backfill will be classified as Additional Unclassified Excavation and Additional Aggregate Backfill.
  - 4. If a changed location of a trench is authorized by the Engineer upon the Contractor's request, the Contractor shall not be entitled to extra compensation or to a claim for damage. If such change of trench location involves the abandonment of excavation already made, the abandoned excavation and backfill shall be at the Contractor's expense.
- M. Advance Trenching: Where existing Utilities or other suspected underground obstructions as indicated on the Contract Drawings are within close proximity of proposed pipelines, uncover and verify the exact location of Utilities and other underground obstructions far enough in advance of pipe laying to allow any changes in pipe alignment or grade required to bypass the obstructions to avoid removing sections of pipe already installed. If any sections of installed pipe must be removed and reinstalled as a result of not verifying Utilities or other underground obstructions far enough in advance, the Contractor shall remove and reinstall the pipe.

#### 1.07 COORDINATION

- A. Verify work associated with lower elevation Utilities is complete before placing higher elevation Utilities.

**PART 2 – PRODUCTS**

2.01 FILL MATERIAL

A. Backfill:

1. Suitable Trench Backfill Material: On site excavated soil or soil-rock mixed materials free of topsoil, vegetation, lumber, metal and refuse; and free of rock or similar hard objects larger than six inches in greatest dimension. Rock to soil ratio shall not exceed one part rock to three parts soil.
2. Clean Organic Material Backfill: On site excavated material free of vegetation, lumber, metal and refuse, and free of rocks or similar hard objects larger than one inch in greatest dimension. Rock to soil ratio shall not exceed one part rock to three parts soil.
3. Proposed Roadway:
  - a. Aggregate Backfill: PennDOT 2A Coarse Aggregate conforming to PennDOT Publication 408, Section 703.
4. Existing Roadway:
  - a. Flowable Backfill: Type A or B: In accordance with PennDOT Section 220 – Flowable Backfill.
5. Clay Dikes: Compacted Clean Earth Material suitable for use as trench plug.

B. Pipe Bedding:

1. First Class Bedding: Coarse Aggregate conforming to PennDOT Publication 408, Section 703.2.
  - a. For piping having a diameter of 24 inches and less, use AASHTO No. 8 Coarse Aggregate.
  - b. For pipes having a diameter greater than 24-inches, use AASHTO No. 57 Coarse Aggregate.
2. Initial Backfill: Coarse Aggregate conforming to PennDOT Publication 408, Section 703.2.
  - a. For piping having a diameter of 24 inches and less, use AASHTO No. 8 Coarse Aggregate.
  - b. For pipes having a diameter greater than 24-inches, use AASHTO No. 57 Coarse Aggregate.



- C. Concrete Cradle, Thrust Block, Anchor and Encasement: Concrete with a 28-day compressive strength of 3,000 psi.
- D. Concrete Abandonment Backfill: Concrete with a 28-day compressive strength of 2,500 psi.
- E. Suitable Bearing Material: AASHTO No. 3 Coarse Aggregate conforming to PennDOT Publication 408, Section 703.2.
- F. Underground Warning Tape:
  - 1. Printed 5-mil polyethylene aluminum backed, detectable tape, six inches minimum width, color coded with black ink on APWA (American Public Works Association) approved colors, one inch minimum lettering, printed with name of utility buried below, and suitable for direct burial in all soil types.
  - 2. Provide underground warning tape for pipe lines and utilities installed or encountered in the work. Permanent printing shall repeat as indicated below:
    - a. "CAUTION BURIED SEWER LINE BELOW" – Green.
    - b. "CAUTION BURIED WATER LINE BELOW" – Blue.
    - c. "CAUTION BURIED GAS LINE BELOW" – Yellow.
    - d. "CAUTION BURIED CATV LINE BELOW" – Orange.
    - e. "CAUTION BURIED COMMUNICATION LINE BELOW" – Orange.
    - f. "CAUTION BURIED FUEL LINE BELOW" – Yellow.
    - g. "CAUTION BURIED FIBER OPTIC LINE BELOW" – Orange.
    - h. "CAUTION BURIED HIGH VOLTAGE LINE BELOW" – Red.

### **PART 3 – EXECUTION**

#### **3.01 PREPARATION**

- A. Identify required lines, levels, contours, and datum locations.
- B. The Contractor shall use care in setting lasers or the other means that he plans to utilize for construction of the sewers. If not constructed at the required minimum grade, the Engineer shall have the option of directing the Contractor to relay the pipe to the required grade.
- C. Protect plant life, lawns, rock outcropping and other features remaining as a portion of final landscaping.
- D. Protect bench marks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

- E. Maintain and protect above and below grade utilities which are to remain.
- F. Sewer Flow Control: The Contractor shall provide for bypass of the flow of sanitary sewer flows around the section designated for repair, replacement, or construction.

3.02 EXCAVATING

- A. Excavation shall be performed to limit soil erosion and sediment pollution in accordance with the Pennsylvania Department of Environmental Protection's Erosion and Sediment Pollution Control Program Manual or as directed by Engineer.
- B. Notify PA One Call System at least 3 days prior to any excavation in order that all utility locations may be marked.
- C. General:
  - 1. Excavation shall be performed to the lines and grades indicated on the Drawings.
  - 2. Perform excavation and backfilling using machinery except where hand excavation and backfilling is required or is necessary to protect existing structures, utilities, or other private or public properties.
  - 3. Begin excavation in trenches at the control point having the lower invert and proceed upward.
  - 4. Remove pavement according to requirements of Scott Township.
  - 5. Perform excavation to subgrade at least twenty-five (25) feet in advance of pipe laying.
  - 6. Do not interfere with 45 degree bearing splay of foundations.
- D. Subgrade Preparation:
  - 1. Do not excavate below depths indicated or specified except where unsuitable material is encountered at subgrade.
  - 2. Remove unsuitable material found below subgrade to a depth determined by Engineer and backfill with Suitable Bearing Material (AASHTO No. 3 Coarse Aggregate) or as directed by Engineer to required Subgrade.
  - 3. Remove rocks or other hard matter protruding through trench bottom at Subgrade which could damage pipe or impede consistent backfilling or compaction. Backfill with first class bedding to required Subgrade. Compact in four (4) inch lifts.
  - 4. Remove rock below subgrade if shattered due to excessive drilling impact or splitting operations and in the opinion of the Engineer it is unfit for foundations. Backfill to Subgrade with Concrete or other material acceptable to the Engineer. No separate or additional payment will be made for such removal and backfill.

E. Excavated Material Storage:

1. Separate and stockpile in designated area, excavated materials suitable for use as backfill. Remove from the site, excess materials and excavated materials not suitable for backfill.
2. In no case shall excavated materials be stockpiled outside of the construction easements or the permanent right-of-way if construction easements are not in place.

F. Trench Width:

1. From subgrade elevation to an elevation at least twelve inches above the top of the outside barrel of the pipe, excavate trench banks to vertical lines and not less than the minimum or more than the maximum widths specified in Table A. If shoring is required, the following Table A dimensions apply to the inside face of sheeting.

TABLE A		
Diameter of Pipe	Minimum Trench Width (Outside Diameter of Pipe at the Barrel Plus)	Maximum Trench Width (Outside Diameter of Pipe at the Barrel Plus)
1½ through 24 inches	12 inches	16 inches
27 through 36 inches	20 inches	24 inches
42 through 72 inches	26 inches	30 inches
Larger than 72 inches	30 inches	36 inches

2. From a point twelve inches above the top of the outside barrel of the pipe, maintain trench banks as follows:
  - a. Vertical as possible for trenches in paved or unpaved roadways to accommodate required shoring and boxes.
  - b. In open areas, trenches may be sloped at angles required to make trench stand; however, in no case shall angle exceed one-half horizontal to one vertical.
  - c. Top of trench shall not exceed limits of right-of-way or construction easements if such is in place.
  - d. Maintain trenches such that there is no conflict with State or OSHA regulations.

G. Length of Open Trench:

1. Complete trench excavation at least twenty-five (25) feet but not more than one hundred (100) feet in advance of pipe laying, Contractor shall request approval from Engineer for trench excavations in excess of more than one (100) feet in advance of pipe laying, and keep trenches free from obstructions, except that at the end of a work day or at the discontinuance of work, the pipe laying may be completed to within five feet of the end of the open trench.
2. The Contractor shall limit all trench openings to a distance commensurate with all rules of safety.
3. If the work is stopped either totally or partially, the Contractor shall refill the trench and temporarily repave over the same at his expense. The trench shall not be opened until he is ready to proceed with the construction of the pipeline.
4. Engineer reserves the right to request trench refilling over completed pipe if, in his judgment, such action is necessary. No claim for extra compensation will be allowed for such refilling even though work may be stopped elsewhere as a result.

3.03 PIPE BEDDING

- A. Place Pipe Bedding and Initial Backfill as specified herein unless indicated otherwise on Contract Drawings. Place material in trench for full width. Place on each side of pipe and fittings simultaneously.
- B. First Class Bedding: Carefully place on undisturbed subgrade or compacted subgrade as approved by the Engineer, pipe bedding material from six (6) inches below outside of pipe barrel to pipe springline. Work pipe bedding material by hand under pipe haunching to provide adequate side support. Place in three (3) inch layers.
- C. Initial Backfill: From pipe springline to twelve (12) inches above outside of pipe barrel, carefully place initial backfill in four (4) inch layers. Place carefully so as not to disturb pipe.

3.04 BACKFILL

- A. Backfill trenches to contours and elevations indicated on Contract Drawings.
- B. Maintain optimum moisture content of fill materials to attain required compaction density.
- C. Do not use frozen backfill materials or place backfill on frozen subgrades or trench subgrades.
- D. Perform backfilling by methods which will result in thorough compaction of backfill material.
- E. Backfill to Final Restoration Elevation: Backfill from one (1) foot above the top of pipe to Final Restoration Elevation using backfill materials specified in Schedule at end of this Section. Consolidate backfill materials evenly from center to side of trench to prevent arching.
- F. If there is a deficiency of backfill material, provide borrow material as required at no additional

cost to Owner.

3.05 FLOWABLE BACKFILL

- A. Provide Flowable Backfill for abandonment of existing sanitary sewer facilities and for backfill material within existing Township roadway and PennDOT right-of-way.
  - 1. Do not place Flowable Backfill at a material temperature below 10°C (50° F).

3.06 CLAY DIKES

- A. Clay dikes shall be installed at mid-point of manhole run. If a joint falls at the specified locations, the clay dike shall be placed upgradient of the joint at the mid-point between this joint and the next upgradient joint. If pipe grade exceeds 10%, the clay dikes will be installed at one-third and two-thirds of manhole run, or where directed by Engineer.

3.07 COMPACTION

- A. Solidly tamp each layer of bedding around the pipeline and above pipeline using proper tamping tools made specially for this purpose. Compact each layer to the densities specified below using ASTM D698 Standard Proctor Test Methods determined at maximum density at optimum moisture content as determined by AASHTO T 99.
  - 1. Within the Right-of-Way Limits of State Highways and Municipal Streets:
    - a. Paved Areas and Unpaved Shoulders: 100%.
    - b. Outside Shoulders: 90%.
    - c. Compacting Backfill in State Highways: Trench excavation and backfill within State Highway right-of-way will be subject to inspection by representatives of the Commonwealth of Pennsylvania, Department of Transportation, and the work shall be performed in accordance with the requirements of that department without additional payment even though such requirements may entail more labor or services than the methods herein described.
  - 2. Bituminous Parking Areas and Driveways: 100%.
  - 3. Stone Parking Areas: 100%.
  - 4. Sidewalks: 100%.
  - 5. Unpaved Areas: 90%.
- B. Do not use rolling equipment or heavy tampers to consolidate backfill until at least two (2) feet of backfill is placed over the top of the pipe.
- C. The use of HYDRA-HAMMER for compacting backfill in trenches is prohibited.

- D. The use of puddling or jetting for compacting backfill in trenches is prohibited.
- E. **Compaction Tests:** During the course of backfilling and compacting, Engineer may at various locations and depths of trenches request that Contractor make field tests to verify that specified compactions are being achieved. Perform field density tests according to AASHTO T 191 or ASTM D2977 and ASTM D3017. The location of tests will be determined by the Engineer.
- F. If compaction tests indicate that Work does not meet specified requirements, remove Work, replace, compact and retest.

### 3.07 ANCILLARY WORK

- A. **Stream Crossings**
  - 1. Excavate trenches in stream crossings to the depth shown on the Drawings or otherwise required by the Engineer.
  - 2. Material excavated may be used as backfill unless specifically prohibited by the state agency having jurisdiction.
  - 3. Make all necessary provisions for cofferdaming, dewatering, and removal of excess excavated material.
  - 4. Maintain the flow in the stream.
- B. **Underground Warning Tape:** For the purposes of early warning and identification of buried pipes during future trenching or other excavation, provide continuous identification tapes in trenches. Install in accordance with printed recommendations of the tape manufacturer, and as specified below:
  - 1. Bury tape at a depth of 24 inches below grade.

### 3.08 CLEAN-UP AND MAINTENANCE

- A. **General:** During construction, the surfaces of all areas including, but not limited to, roads, streets, and driveways shall be maintained on a daily basis to produce a safe, desirable, and convenient condition. Streets shall be swept and flushed after backfilling, and re-cleaned as dust, mud, stones and debris caused by the work, or related to the work again accumulates.
- B. Remove surplus excavated materials, rubbish and other construction debris from the site after backfilling is completed.
- D. Construction site shall be left clean at end of each working day to satisfaction of Engineer.

**END OF SECTION**