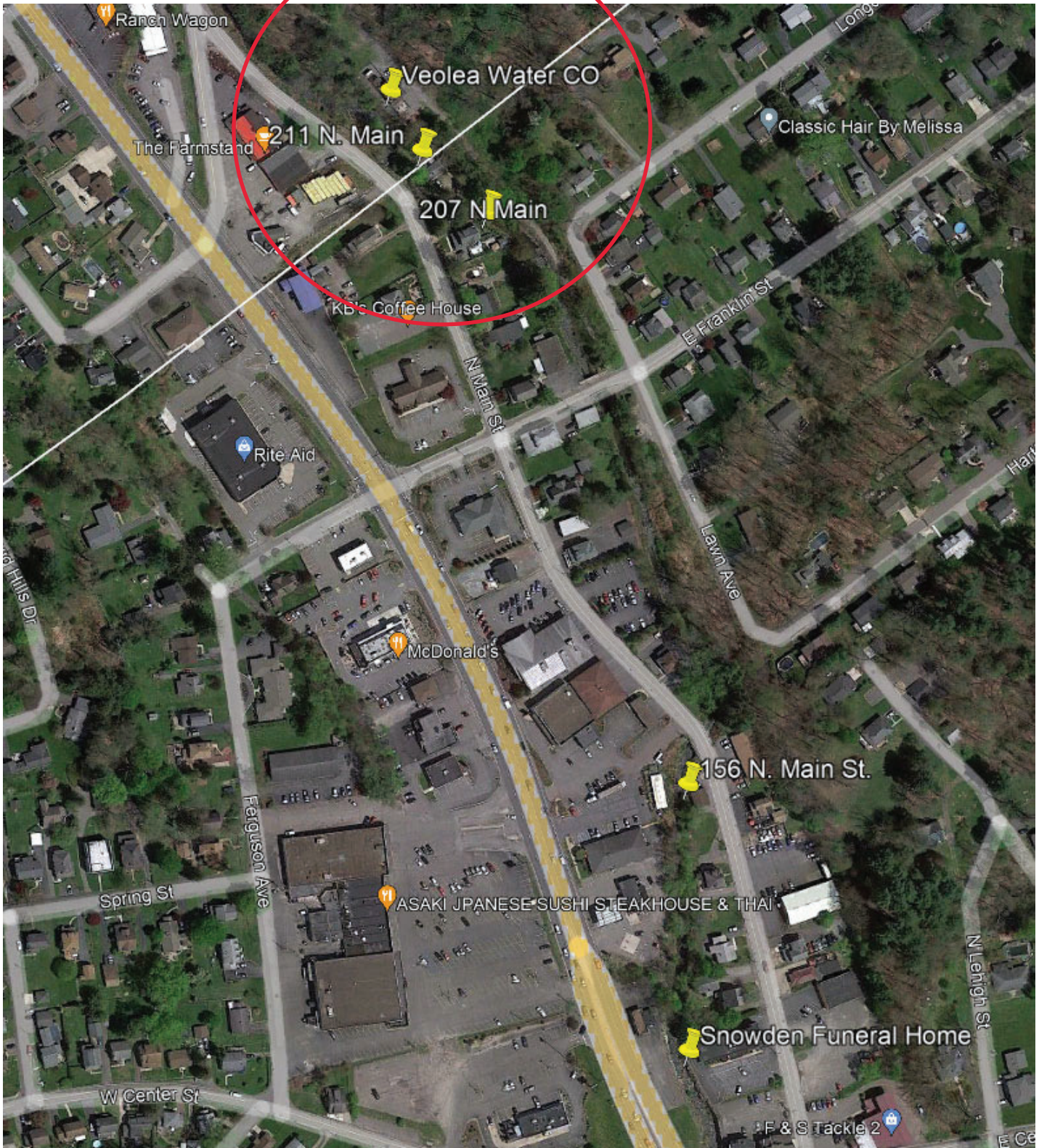




# EWP -LU-23-001

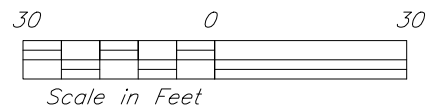
Tuesday, January 30, 2024 1:47 PM

LU-23-001  
-Veolea Water Co.  
-211 & 207 N Main St  
Shavertown, PA 18708

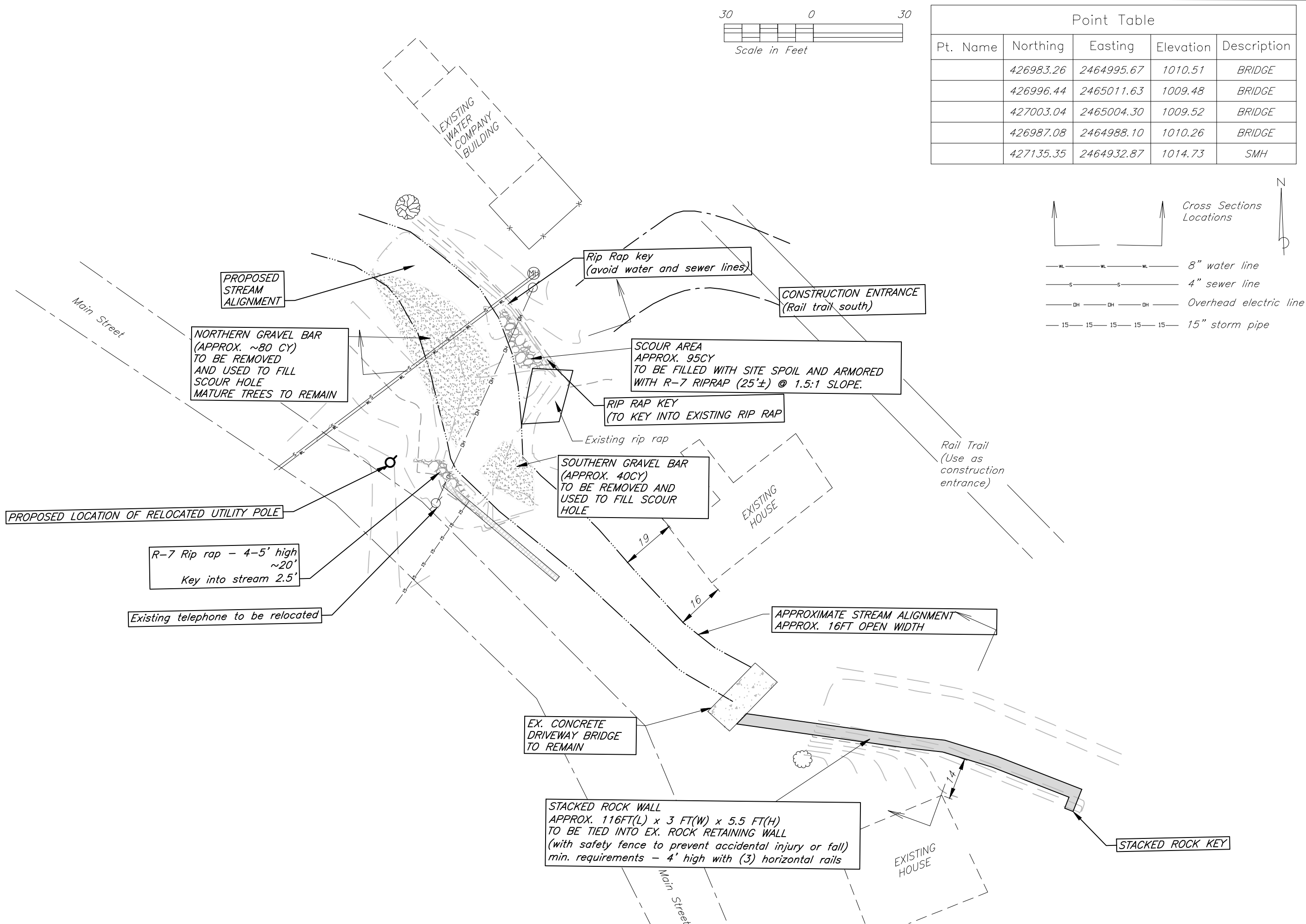
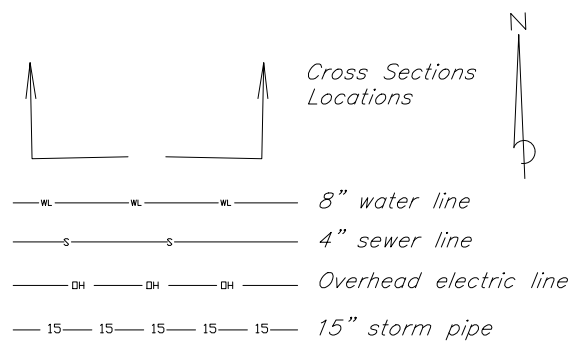


Map of EWP sites in Shavertown, PA





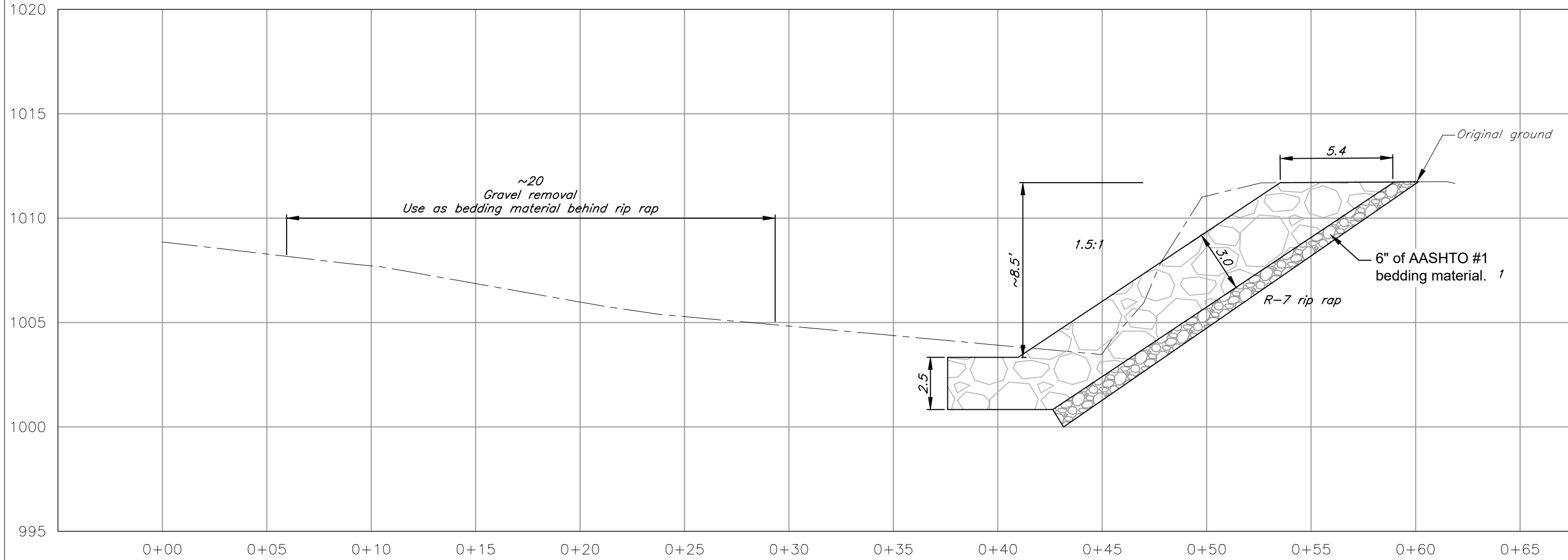
Point Table				
Pt. Name	Northing	Easting	Elevation	Description
	426983.26	2464995.67	1010.51	BRIDGE
	426996.44	2465011.63	1009.48	BRIDGE
	427003.04	2465004.30	1009.52	BRIDGE
	426987.08	2464988.10	1010.26	BRIDGE
	427135.35	2464932.87	1014.73	SMH



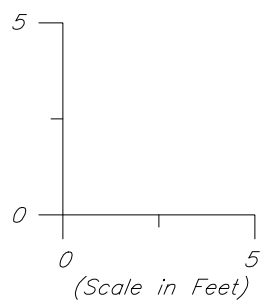
Date 6-24  
 Designed JMB / MB  
 Drawn JMB  
 Checked  
 Approved

211 NORTH MAIN STREET, SHAVERSTOWN, PA  
 EWP - DSR  
 PLAN VIEW  
 LUZERNE COUNTY, PENNSYLVANIA

United States Department of Agriculture  
 USDA  
 Natural Resources Conservation Service  
 File No.  
 Drawing No.  
 6 of 35  
 Sheet 1 of 1



UPPER SECTION – RIP RAP PROFILE



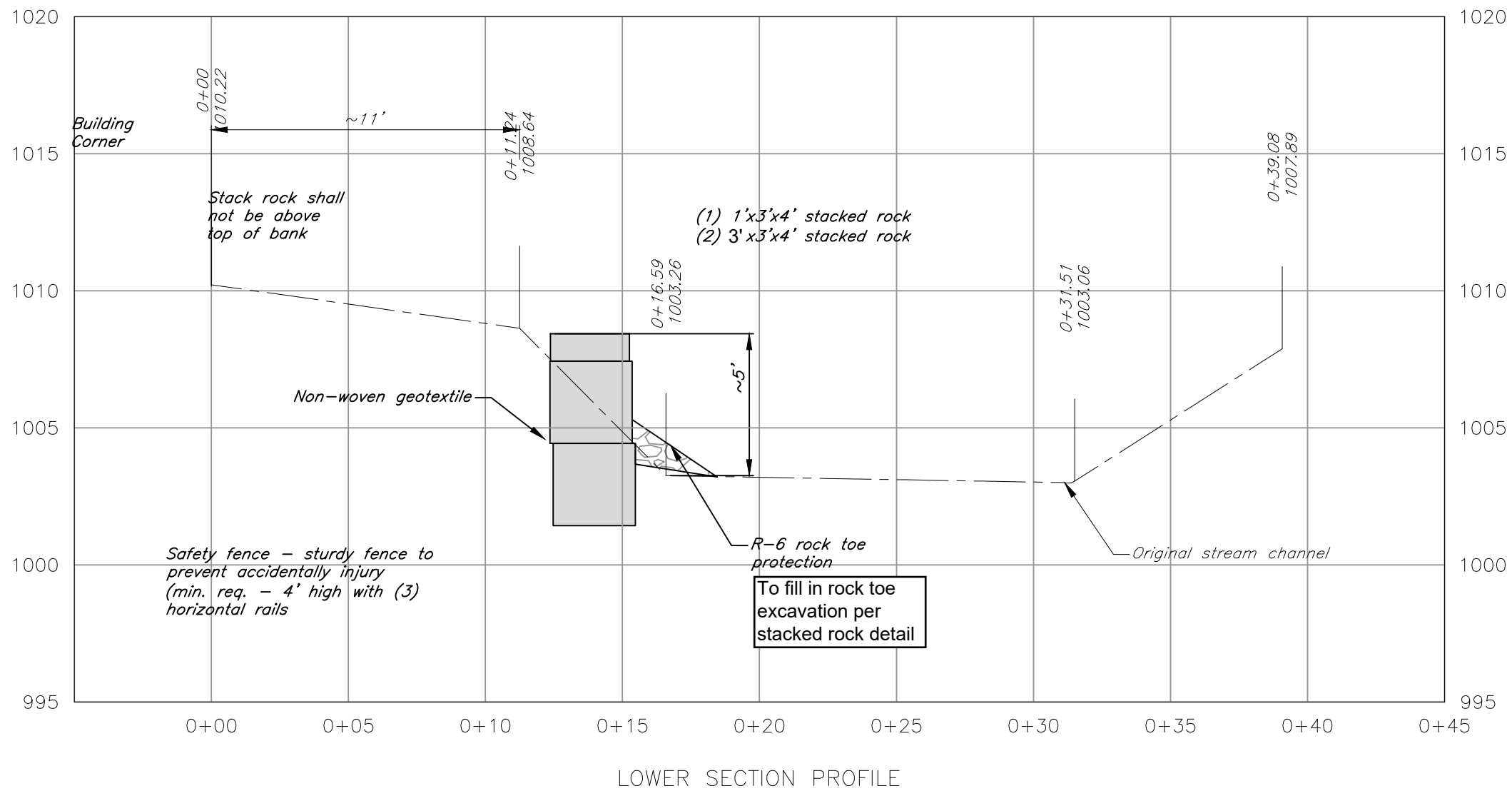
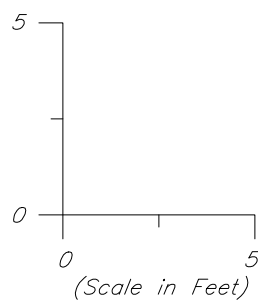
Designed	JMB / MB	Date	6-24
Drawn	JMB		6-24
Checked			
Approved			

LU-23-001  
 EWP 2023  
 CROSS SECTION – UPPER – RIP RAP  
 211 N. Main Street, Dallas Pa 18708  
 Luzerne County, PA



File No.  
 Drawing No.

APPROVED: MGB 7/8/24



Designed	JMB / MB	Date	6-24
Drawn	JMB	Date	6-24
Checked			
Approved			

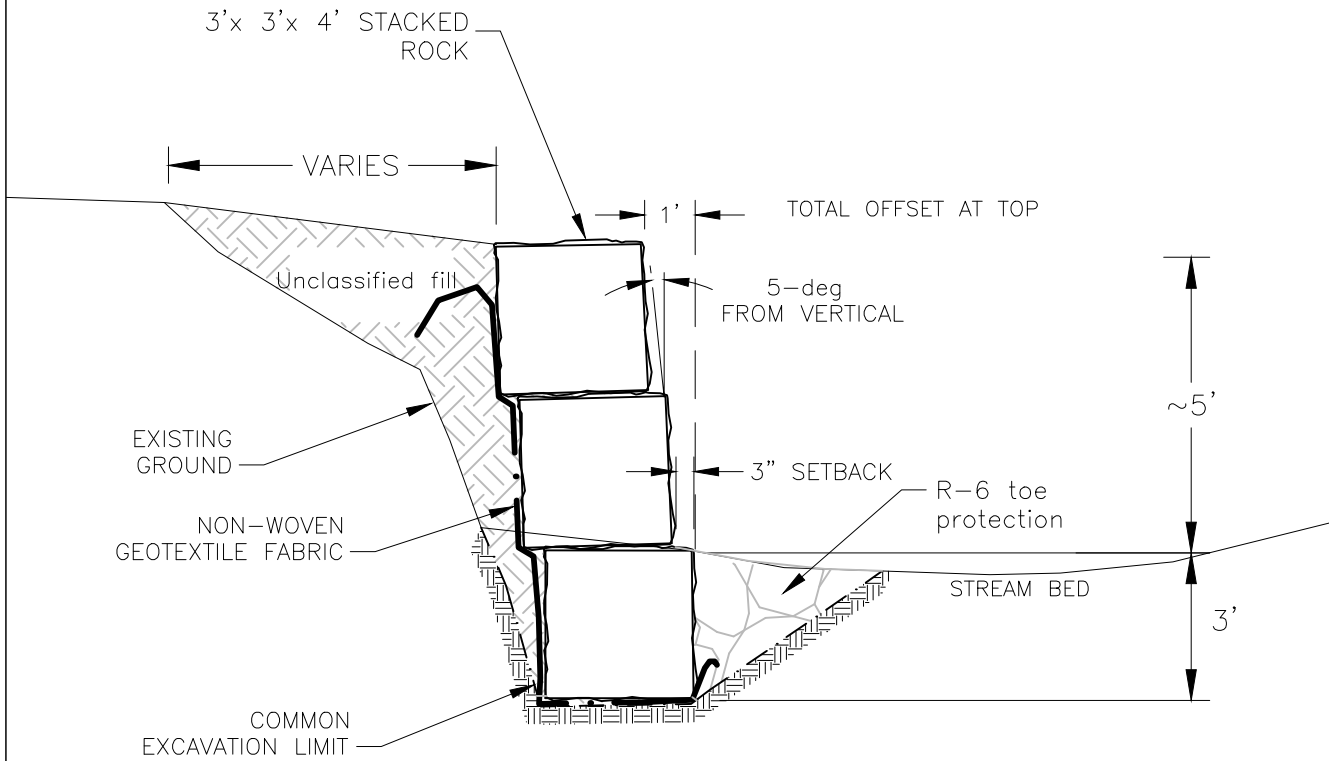
LU-23-001  
EWP 2023  
PROFILES  
211 N. Main Street, Dallas Pa 18708  
Luzerne County, PA



File No.  
Drawing No.

APPROVED: MGB 7/8/24

# TYPICAL STACKED ROCK SECTION (NOT TO SCALE)

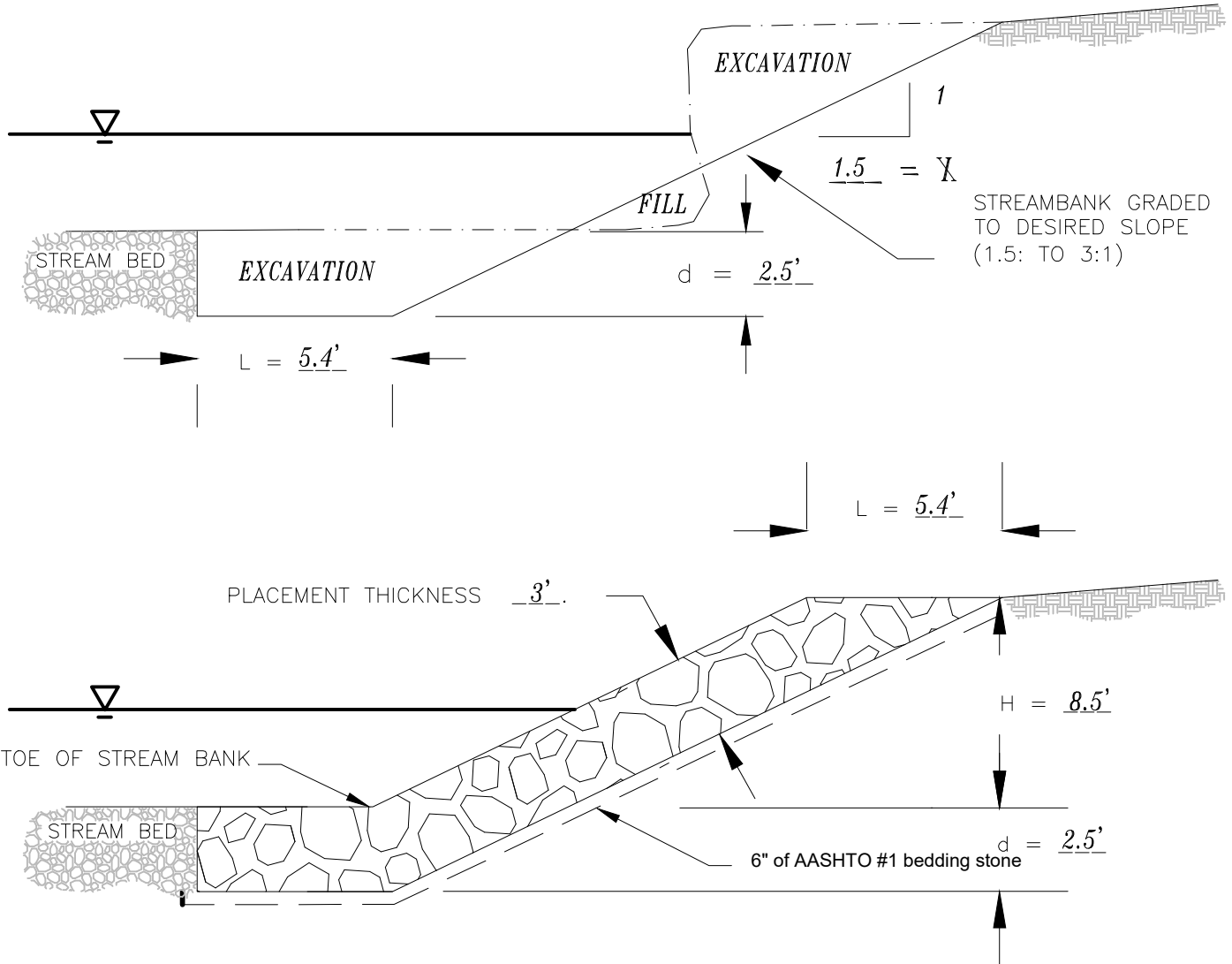


**NOTES:**

- STAGGER ALL VERTICAL JOINTS BETWEEN ROCKS IN ADJACENT ROWS.
- SETBACK SHALL BE UNIFORM ON EACH ROW OF ROCKS.
- INSTALL ROCK FACE TO MATCH UPSTREAM AND DOWNSTREAM CHANNEL WIDTHS.

# R-7 ROCK RIPRAP INSTALLATION

(NOT TO SCALE)



NOTES:

-FILL MATERIAL SHALL BE WELL GRADED DEPOSITION FROM STREAM DEPOSITS, STREAM BANK CUTS OR AS DIRECTED BY THE PROJECT INSPECTOR.

-DISPOSE OF UNSUITABLE, OR EXCESS MATERIALS IN SPOIL AREA. THE CONTRACTOR IS RESPONSIBLE FOR SECURING SPOIL AREAS.

SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
 DRAWING NO. \_\_\_\_\_  
 CAD FILE NAME \_\_\_\_\_

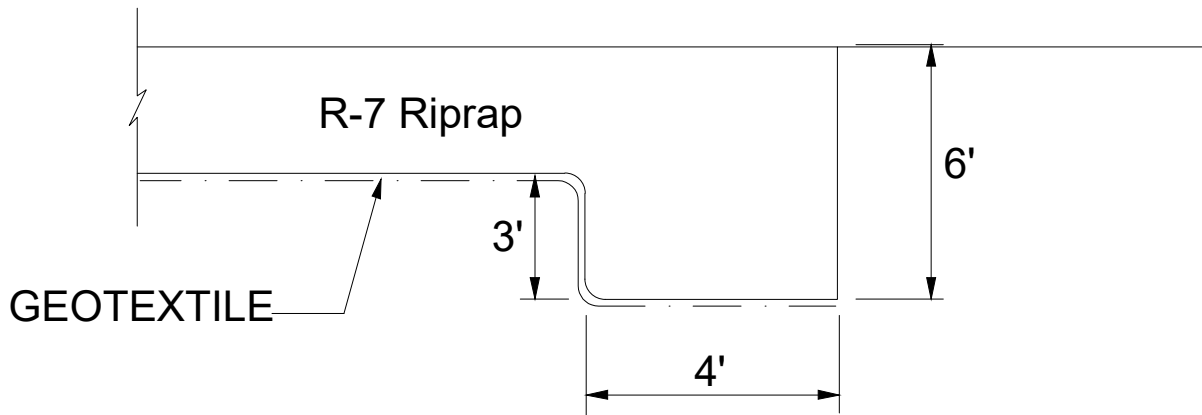


LU-23-001  
 LUZERNE COUNTY, PENNSYLVANIA  
 RIP RAP

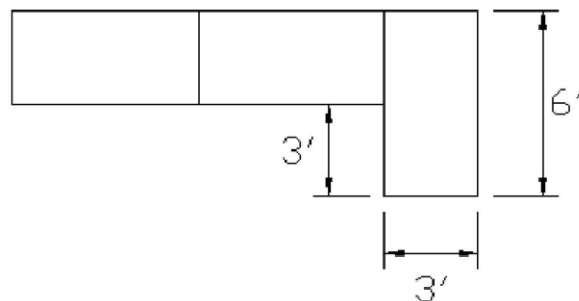
DESIGNED	JMB	DATE	6-23
DRAWN	JMB	DATE	6-23
CHECKED	MGB		
APPROVED	7/24		
TITLE			
SHEET NO. _____ OF _____		10 of 35	

Gradation Name	Riprap Gradations				Bedding	
	Size – Inches <sup>1/</sup> (sq. opening <sup>2/</sup> )				Gradation	Thickness
	D <sub>100</sub>	D <sub>85</sub>	D <sub>50</sub> <sup>3/</sup>	D <sub>15</sub>	AASHTO	(inches)
R-3	6	5	3	2	#57	3
R-4	12	10	6	3	#57	4
R-5	18	15	9	5	#57	5
R-6	24	20	12	7	#1	6
<b>R-7</b>	<b>30</b>	<b>26</b>	<b>15</b>	<b>12</b>	<b>#1</b>	<b>6</b>
R-8	42	30	24	18	#1	8

- <sup>1/</sup> The subscript number is the maximum percent, by weight, which may be smaller than the respective size.
- <sup>2/</sup> The nominal size of a rock is that dimension (middle or composite average) which passes through a square opening with the same side dimension; i.e. it is not the longest dimension.
- <sup>3/</sup> At least 15%, by weight of the gradation, must be smaller than the D<sub>50</sub> size.



### STACKED ROCK WALL TIE-BACK



Note: The rock wall ends shall be keyed into the streambank a distance of 6' (min).  
Rocks in the tie-back shall be part of the from wall and joints staggered for stability



United States  
Department of  
Agriculture

Natural Resources  
Conservation Service

LU-23-001  
EWP 2023

DETAILS

211 N. Main Street, Dallas Pa 18708,  
Luzerne County, PA

Designed JMB / MB Date 6-24

Drawn JMB Date 6-24

Checked MGB

Approved 7/24

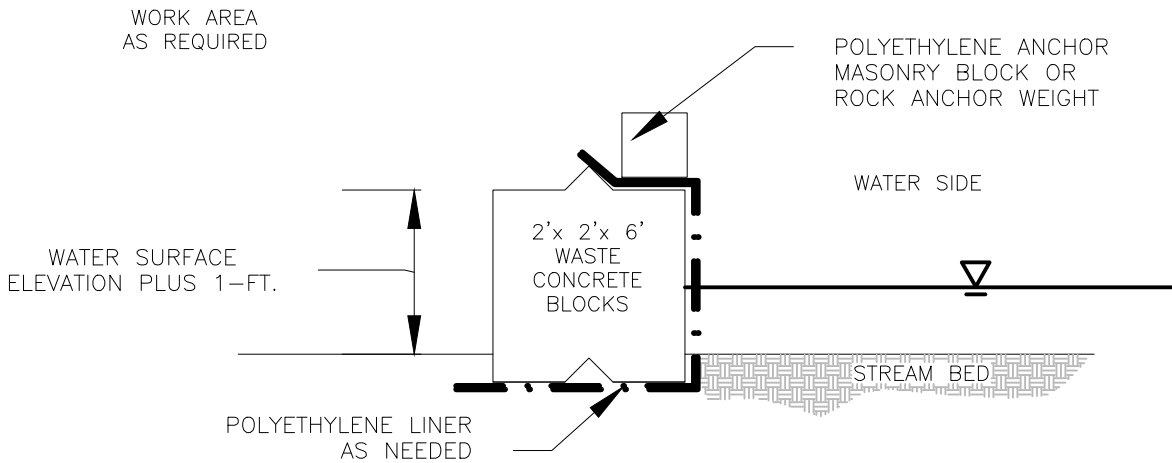
File Name  
2023 EWP  
Luzerne Co  
211 Main  
Street.dwg

6/12/24 3:14 PM

11 of 35 sheets



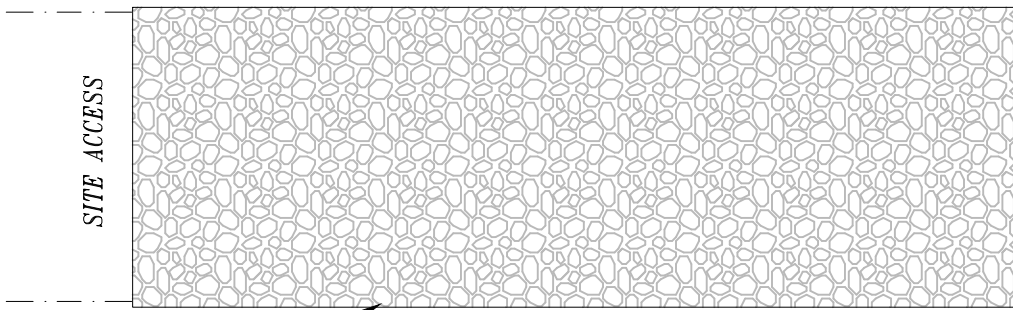
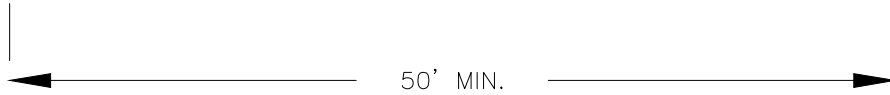
# TYPICAL STREAM DIVERSION (NOT TO SCALE)



**NOTES:**

- WASTE CONCRETE BLOCKS SHALL BE EMBEDDED INTO THE STREAM BED 4" TO 6" OR AS DIRECTED BY THE PROJECT INSPECTOR.
- A POLYETHYLENE LINER WILL BE REQUIRED IF WATER FLOW IS PRESENT IN THE DESIGNATED WORK AREA. POLYETHYLENE LINER SHALL BE SUPPORTED IN PLACE WITH A TOP WEIGHT SUCH AS MASONRY BLOCKS OR ON SITE ROCKS.
- PUMPING MAY BE REQUIRED TO DEWATER THE WORK AREA OF STANDING WATER, WHEN DIRECTED BY THE PROJECT INSPECTOR.
- MAXIMUM HEIGHT OF CONCRETE WASTE BLOCKS IS 4- FEET. TONGUE AND GROVES SHALL BE TOTALLY SEATED BETWEEN BLOCKS.

*ROCK CONSTRUCTION ENTRANCE*  
(NOT TO SCALE)



STONE AASHTO  
#1 OR #3

PLAN

NOT LESS THAN FULL  
WIDTH OF ALL POINTS OF  
INGRESS OR EGRESS.  
(APPROX. 12'-20')

PUBLIC  
RIGHT OF WAY

SITE ACCESS



CROSS-SECTION

8" MIN. STONE  
AASHTO #1 OR #3

SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
DRAWING NO. LU-23-001  
8x11

LU-23-001  
LUZERNE COUNTY, PENNSYLVANIA  
ROCK CONSTRUCTION ENTRANCE

U.S. DEPARTMENT OF AGRICULTURE - NATURAL RESOURCES CONSERVATION SERVICE

DESIGNED	JMB	DATE	6/24
DRAWN	JMB	DATE	6/24
TRACED	<b>MGB</b>		
CHECKED	<b>7/24</b>		

APPROVED BY	DATE
_____	_____
TITLE	_____
TITLE	_____

*ITEMS OF WORK RELATED TO*  
**THE TECHNICAL SPECIFICATIONS AND DRAWINGS  
FOR THE LUZERNE EWP PROJECT**

1. Data concerning the utilities at this site has been obtained from Pennsylvania One-Call System, Serial No 20241651620, 20241651619. Accuracy of this data is not guaranteed. The Contractor must contact the PA One-Call System (1-800-242-1776) at least 3, but not more than 10, working days prior to the commencement of construction for utility information.
2. The primary scope of work for this project includes grading and stabilizing the streambanks of properties along the Toby Creek, Dallas Pa. This includes installation of ~50 feet of R-7 Riprap, establishing a new primary channel and removing some deposition material to fill in scour happening in the existing channel. Included in the project, are (1) stacked wall location (Southern section). R-7 rip rap is to be installed in voids of the existing riprap adjacent to Main Street and grouted. Riprap shall be installed to top of bank. Height of the bank varies slightly. Refer to the design for average heights. Install fencing along the stacked wall to prevent injury.
3. Access development shall be considered a component of Mobilization. Compensation for the development of the access road to the work site is to be included in the payment for Mobilization/Demobilization. The Contractor is responsible for the protection of any private or public facilities in the work area for the duration of the contract. The Contractor will be responsible for repairing any of their damages to a condition equal to or better. No additional compensation will be made for damaged facility repair.
4. Install the rock construction entrance (RCE) at the junction of site access. Maintain the entrance in a clean condition and minimize the amount of soil tracked onto the roadway. Upon construction completion the construction entrance shall be removed and disposed of unless it is suitable to the owner for it to remain. RCE specification shall be subsidiary to the Mobilization/Demobilization Specification.
5. Implement the erosion control practices as described in the Erosion & Sedimentation Control Specification. Erosion and Sedimentation Control shall be subsidiary to the Riprap & Stacked Rock Specifications. The extent of stream diversion and dewatering will be a function of the permit.
6. Prepare riprap subgrades in accordance with the detail drawings and the Excavation specification. A uniform bank alignment is expected with no abrupt bulges or indents. Excavated material, that cannot be used as unclassified fill, shall be removed from the site and disposed of at a location off site chosen by

MGB  
7/24

the contractor or at a location suitable to the landowner that is out of the floodway. Excavation is a subsidiary to the Stacked Rock Wall, and R-7 Riprap pay items.

7. Compacted backfill behind the stacked rock wall shall be a free draining material. Silt and clay are not acceptable as backfill material. Gravel bar material that is 6" or less may be used as unclassified fill behind the wall. Compacted backfill shall be subsidiary to the Stacked Rock bid item. The geotextile and its installation shall be subsidiary to the Stacked Rock bid item.
8. Stacked rock wall shall be flat and stable when stacked. The base and middle rocks shall have a thickness of 3' and the top rock shall vary in thickness to attain top of bank height. The width shall be 3', and adjacent rows shall be staggered. The 2<sup>nd</sup> block of the northern wall shall be 4' wide and anchored to the base rock with no. 8 rebar, as per the drawing detail. The upstream and downstream ends of stacked rock shall be keyed into the streambed 6' (min). Rocks in the tie-back shall be part of the front wall and joints staggered for stability. Install R-6 rock at the toe of the stacked rock wall.
9. Follow the R-7 Grouted Riprap construction specification for applications and curing of grout.
10. Payment of the lump sum items, Stacked Rock Wall, R-7 Riprap, and grouted rip rap, will include all materials, equipment and labor for a complete installation. This includes the streambank shaping, excavated streambed and bank cutoffs, Geotextile, AASHTO #1 bedding and rock placement.
11. All disturbed areas shall be promptly seeded and mulched in accordance with the technical specification, Seeding.

## Erosion and Sediment Control Guidelines

The guidelines presented below, which address erosion and sediment control, will be included as a condition of all emergency permits. These guidelines must also be followed when work is conducted under an existing permit or when work is undertaken that does not require a permit.

1. Maps and plans show the location of the project with respect to municipalities, access roads, existing structures or other landmarks. The maps and plans show details of the specific work site(s) including limits of disturbance, stream width, depth, extent of debris and deposition removal, and placement details for bank stabilization materials.
2. Staging areas and construction entrances, including those used for equipment maintenance and servicing should be located away from flowing streams, and shall be stabilized with AASHTO No. 1 rock.
3. All work should be done as quickly as possible, with bank stabilization to occur as segments of debris and deposition removal are completed.
4. Work should be performed from stream banks, as opposed to equipment operating in flowing streams, whenever possible.
5. Rock riprap used to stabilize stream banks or other areas shall be clean, dense, angular, blocky material. Minimum rock size shall be R-4, as rated by the National Stone Association.
6. All disturbed areas not stabilized with rock riprap, other materials, or seeded and mulched, shall be graded to avoid ponding water or concentrated flow. Standard seed mixtures and their specifications should be used. Hay and straw mulch shall be applied to such disturbed areas at a rate of approximately 3 tons to the acre (a loose layer 3/4 to 1 inch thick). Compost may be applied at a rate of 270-540 cubic yards per acre (2 to 4 inch thick uniform layer). Erosion control blankets should be installed/applied according to the manufacturer's specifications.
7. Only clean, non-polluting materials shall be used as fill. Exposed fill surfaces are to be stabilized.
8. Any sediment, trees, brush, or similar material excavated during debris removal shall be deposited in a suitable site away from the areas affected by flooding or wetlands, and stabilized with permanent vegetative cover. Other debris containing harmful or potentially hazardous materials should be disposed of in approved landfills.

*These guidelines, and the maps and plans mentioned in item 1, along with any required contract specifications undertaken in cooperation with the Department of Environmental Protection (DEP) and the Natural Resources Conservation Service (NRCS), are considered to be the Erosion and Sedimentation Control Plan for Emergency Watershed Restoration projects.*



## **TECHNICAL SPECIFICATIONS**

### **MOBILIZATION AND DEMOBILIZATION**

#### **SCOPE**

The work consists of the mobilization and demobilization of the contractor's forces and equipment necessary for performing the work required under the contract. Mobilization will not be considered as work in fulfilling the contract requirements for commencement of work.

#### **PROCEDURE**

Mobilization shall include all activities and associated costs for transportation of contractor's personnel, equipment, and operating supplies to the site; establishment of offices, buildings, and other necessary general facilities for the contractor's operations at the site; permits, premiums paid for performance and payment bonds including coinsurance and reinsurance agreements as applicable; and other items specified in Items of Work.

Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not required or included in the contract from the site; including the disassembly, removal, and site cleanup of offices, buildings, and other facilities assembled on the site specifically for this contract.

This work includes mobilization and demobilization required by the contract at the time of award. If additional mobilization and demobilization activities and costs are required during the performance of the contract as a result of changed, deleted, or added items of work for which the contractor is entitled to an adjustment in contract price, compensation for such costs will be included in the price adjustment for the item or items of work changed or added.

# TECHNICAL SPECIFICATIONS

## ROCK CONSTRUCTION ENTRANCE

### SCOPE

This work is providing a construction entrance into a work site by placing rock aggregate adjacent to the public access or other access where possible erosion or dust can be a problem. Placement procedure should follow the plan detail drawing entitled “Standard Construction Detail #16, Rock Construction Entrance”.

### APPLICABLE PUBLICATIONS

Pub. 408 - Specifications, Pennsylvania Department of Transportation.

Bulletin 14 - Aggregate Producers, Pennsylvania Department of Transportation.

Bulletin 15 - Approved Construction Materials, Pennsylvania Department of Transportation.

### MATERIALS

- A. **Coarse Aggregate** - Coarse aggregate shall be AASHTO #1 coarse aggregate, as specified in Section 703.2 of Publication 408. Obtain coarse aggregate from a PennDOT approved source.
- B. **Geotextile** - Geotextiles shall meet the requirements of Section 735 of Publication 408 for Class 1 geotextiles. Use a geotextile listed in Bulletin 15.

### PROCEDURE

Place aggregate in the dry, and not on frozen ground. Identify location of construction entrance and layout an area not less than 20 feet wide by 50 feet long. This area is the minimum roadway size, the on-site inspector or the detail drawing may require larger entrance areas. Once the area and location have been determined then strip vegetation from the site and place the geotextile material over the entire area. Pins should be used to hold the material in place. Place the aggregate to a depth of eight (8) inches and compact the aggregate with mechanical tampers or other approved means.

## TECHNICAL SPECIFICATIONS

### EXCAVATION

#### SCOPE

This work is the removal, hauling, and disposal of all materials encountered, as shown on the Drawings.

#### PROCEDURE

- A. General** – Follow all guidelines set forth in the Construction Industry Standards, OSHA 2207, of the Occupational Safety and Health Administration, U.S. Department of Labor.

Maintain stable slopes. In case of a slide as a result of negligence or carelessness on the Contractor's part, it shall remove and replace material in the slide at no extra cost.

Protect the work, adjacent buildings, and property.

During excavation, keep the top surface graded for drainage. Replace overexcavated work with materials designated by the Inspector.

- B. Excavation** – Remove all materials to the limits shown on the Drawings. During excavation of a channel, keep erosion and interference with the flow of the stream to a minimum.
- C. Disposal** – Incorporate suitable materials from required excavation into the work, providing they meet the requirements of the appropriate sections of these Technical Specifications. If necessary, stockpile suitable materials for later use. Dispose of unsuitable, or excess, materials in spoil area. The Contractor is responsible for securing spoil areas.

## TECHNICAL SPECIFICATIONS

### R-7 RIPRAP

#### SCOPE

This work is riprap, as shown on the Drawings, or as directed by the Inspector.

#### APPLICABLE PUBLICATIONS

Pub.408 - Specifications; Pennsylvania Department of Transportation.

Bulletin 15 - Approved Construction Materials; Pennsylvania Department of Transportation

#### MATERIALS AND STORAGE

**A - General** - Obtain materials from sources approved by the Inspector, but the approval of any source shall not be construed as approval of all materials from that source. Materials from required excavation may be used, provided they meet the requirements of these Technical Specifications.

**B - Geotextile** - Provide Class 4, Type A Geotextile, conforming with the requirements of Section 735 of Pub.408. Obtain geotextiles from a manufacturer listed in Bulletin 15.

During the periods of shipment and storage, protect geotextiles from direct sunlight, ultraviolet rays, temperatures greater than 140°F, mud, dirt, dust, and debris. To the extent possible, maintain geotextiles wrapped in a heavy-duty covering or shield from direct sunlight.

Geotextiles will be rejected at the time of installation if any defects, deterioration, or damage has occurred during manufacture, transportation, or storage.

**C - Securing Pins for Geotextiles** - Provide steel securing pins, 18 inches long x 3/16 inches in diameter, pointed at one end; and with a 1½-inch washer head at the other end. Alternate securing devices, approved by the Inspector, may be used.

**D - Riprap** - Obtain riprap from a source approved by the Inspector. Riprap shall consist of sound durable rock, insoluble in water. Friable, stratified rocks such as shales, and rocks liable to decompose in water, such as claystones, will not be approved. The Inspector shall reject localized areas, strata, or channels within an approved area or zone when, in its opinion, the material has disintegrated, weathered badly, or is otherwise unsatisfactory for the intended use. The materials shall be free of objectionable amounts of earth, quarry dust, or other materials; however, washing will not be required.

Stone for riprap shall be block shaped with a specific gravity of at least 2.5. Smooth rounded stone or boulders; flat, thin, elongated, and slab-shaped stone shall not be acceptable. Not more than 25 percent of the stones reasonably well distributed throughout the gradation shall have a length more than two and one-half (2.5) times the breadth or thickness. No stone shall have a length exceeding three (3) times its breadth or thickness.

Riprap shall be R-7 gradation, conforming to Section 850 of Pub.408, except as noted above. The riprap shall be certified as to size and gradation and the Inspector shall accept the onsite riprap based on a visual inspection.

**PROCEDURE**

**A - General** - Thicknesses indicated on the Drawings are the placement thicknesses of riprap layers.

**B - Foundation Preparation** - Prepare the areas on which riprap is to be placed by excavating, trimming, and dressing to conform to cross sections and slopes shown on the Drawings. Bring up the low areas to grade by filling and compacting in accordance with the "Unclassified Fill" Specification, with materials comparable to adjacent foundation materials.

**C - Geotextile** - Use Class 4, Type A Geotextile.

Place the fabric on the prepared area in a loose, unstretched condition to minimize shifting, puncturing, or tearing the fabric. For stream slope protection, lay the fabric with the long dimension parallel to stream flow, and for protection of the entire stream, lay the fabric with the long dimension perpendicular to the centerline of the channel. Provide a minimum overlap of twelve (12) inches at the joints, with the upstream fabric over the downstream fabric and the upslope fabric over the downslope fabric. Anchor the fabrics in place by inserting securing pins through both fabrics at the overlaps at the spacing shown on the following table:

	<b>STEEPER THAN</b>		<b>FLATTER THAN</b>
<b>SLOPE</b>	3 : 1	4 : 1	4 : 1
<b>SECURING PIN PACING ALONG OVERLAPS</b>	2 FEET	3 FEET	5 FEET

Install additional pins as necessary to prevent any slippage of the fabrics.

Protect the fabrics at all times during construction from contamination by surface runoff. Place riprap or cover the fabric with approved covering material as soon as possible, so that Type A fabric is not exposed for more than two (2) weeks.

Do not drop rocks, two (2) feet or larger in any dimension directly on the fabric from a height greater than one (1) foot. Do not allow the riprap placement procedure to puncture or damage the fabric.

Repair and/or replace all damaged fabric to the satisfaction of, and at no additional cost.



**D - Riprap** - Place stones for riprap on the geotextiles, in the dry, and conforming to the lines and grades shown on the Drawings or as directed by the Inspector. Place the stones in such manner as to produce a reasonably well-graded and uniform surface providing the full thickness shown on the Drawings. A tolerance of plus or minus three inches will be allowed in the finished surface except that either extreme of such tolerance shall not be continuous over an area greater than 200 square feet. Place stones to the full course thickness in one operation and without displacing the underlying material. Do not place stones in layers. The finished work shall be free from objectionable pockets of small stones and clusters of larger stones, and the entire mass of stones shall be roughly graded to conform to the gradation specified. Smaller stones shall be well distributed in order to chink the voids between larger stones, insofar as practicable. Do not place riprap by dumping stones into chutes or by similar methods, likely to cause segregation of the various sizes. Do not use a tractor equipped with bulldozer blade, stone rake, or any similar equipment. The desired distribution of the various sizes of stones throughout the mass shall be obtained by selective loading of the material at the quarry, by controlled dumping of successive loads during final placing, or by other approved methods. Rearrange individual stones by hand or mechanical means only to the extent necessary to break down bridging and to obtain a reasonably well-graded mass.

Provide cutoff at the upstream and downstream ends of riprap as shown on the Drawings, and do not allow any equipment to pass over the finished riprap surface.

**MAINTENANCE** - Make all necessary repairs to riprap for the duration of the Contract.

## TECHNICAL SPECIFICATIONS

### STACKED ROCK

#### SCOPE

This work is stacked rock, as shown on the Drawings, or as directed by the Inspector.

#### MATERIALS AND STORAGE

**A General** - Obtain materials from sources approved by the Inspector, but the approval of any source shall not be construed as approval of all materials from that source. Materials from required excavation may be used, provided they meet the requirements of these Technical Specifications.

**B Geotextile** - Provide Class 4, Type A Geotextile, conforming with the requirements of Section 735 of Pub.408. Obtain geotextiles from a manufacturer listed in Bulletin 15.

During the periods of shipment and storage, protect geotextiles from direct sunlight, ultraviolet rays, temperatures greater than 140°F, mud, dirt, dust, and debris. To the extent possible, maintain geotextiles wrapped in a heavy-duty covering or shield from direct sunlight.

Geotextiles will be rejected at the time of installation if any defects, deterioration, or damage has occurred during manufacture, transportation, or storage.

**C Securing Pins for Geotextiles** - Provide steel securing pins, 18 inches long x 3/16 inches in diameter, pointed at one end; and with a 1½-inch washer head at the other end. Alternate securing devices, approved by the Inspector, may be used.

**D Stacked Rock** - Obtain Stacked Rock from a source approved by the Inspector. The stacked rocks shall be durable limestone or sandstone, approximately 3' X 3' X 4' and cubical.

#### PROCEDURE

**A - General** - Dimensions indicated on the Drawings are the placement dimensions of stacked rock.

**B - Foundation Preparation** - Prepare the areas on which the stacked rock is to be placed by excavating, trimming, and dressing to conform to cross sections and slopes shown on the Drawings. Bring up the low areas to grade by filling and compacting in accordance with the "Unclassified Fill" Specification, with materials comparable to adjacent foundation materials.

**C - Geotextile** - Use Class 4, Type A Geotextile.

Place the fabric on the prepared area in a loose, unstretched condition to minimize shifting, puncturing, or tearing the fabric. For stream slope protection, lay the fabric with the long dimension parallel to stream flow, and for protection of the entire stream, lay the fabric with the long dimension perpendicular to the centerline of the channel. Provide a minimum overlap of twelve (12) inches at the joints, with the upstream fabric over the downstream fabric and the upslope fabric over the downslope fabric. Anchor the fabrics in place by inserting securing pins through both fabrics at the overlaps at the spacing shown on the following table:

	<b>STEEPER THAN</b>		<b>FLATTER THAN</b>
<b>SLOPE</b>	3 : 1	4 : 1	4 : 1
<b>SECURING PIN PACING ALONG OVERLAPS</b>	2 FEET	3 FEET	5 FEET

Install additional pins as necessary to prevent any slippage of the fabrics.

Protect the fabrics at all times during construction from contamination by surface runoff. Place stacked rock or cover the fabric with approved covering material as soon as possible, so that Type A fabric is not exposed for more than two (2) weeks.

Do not drop rocks, two (2) feet or larger in any dimension directly on the fabric from a height greater than one (1) foot. Do not allow the stacked rock placement procedure to puncture or damage the fabric. Repair and/or replace all damaged fabric to the satisfaction of, and at no additional cost.

**D – Stacked Rock** – Place the stacked rocks neatly as shown on the Typical Stacked Rock Repair Section drawing. Smaller rock shall be used to fill voids so that each rock rests solidly on the lower layer without movement. Vertical joints between rocks in the top layer shall be offset from those in the bottom layer and laterally, each rock shall be shingled outward 3” from the next downstream rock. Place R-7 riprap at the toe of the stacked rock wall as shown on the Typical Stacked Rock Repair Section drawing.

## TECHNICAL SPECIFICATIONS

### GROUTED R-7 RIPRAP

#### SCOPE

This work is grouted riprap as shown on the Drawings, or as directed by the Inspector.

#### APPLICABLE PUBLICATIONS

AASHTO M 85 - Standard Specification for Portland Cement.

Pub. 408 - Specifications, Pennsylvania Department of Transportation.

Bulletin 14 - Aggregate Producers, Pennsylvania Department of Transportation.

Bulletin 15 - Approved Construction Materials, Pennsylvania Department of Transportation.

#### MATERIALS AND STORAGE

**A - General** - Obtain materials from sources approved by the Inspector, but the approval of any source shall not be construed as approval of all materials from that source. Materials from required excavation may be used, provided they meet the requirements of the Technical Specification titled, "Unclassified Fill".

**B - Geotextile** - Provide Class 4, Type A Geotextile, conforming with the requirements of Section 735 of Pub. 408. Obtain geotextiles from a manufacturer listed in Bulletin 15.

During the periods of shipment and storage, protect geotextiles from direct sunlight, ultraviolet rays, temperature greater than 140°F, mud, dirt, dust and debris. To the extent possible, maintain geotextiles wrapped in a heavy-duty covering or shield from direct sunlight.

Geotextiles will be rejected at the time of installation if any defects, deterioration, or damage has incurred during manufacture, transportation, or storage.

**C - Securing Pins for Geotextiles** - Provide steel securing pins, 18 inches long by 3/16 inches in diameter, pointed at one end, and with a 1-1/2 inch washer head at the other end.

**D - Riprap** - Riprap shall consist of sound durable rock, insoluble in water. Friable, stratified rocks such as shales, and rocks liable to decompose in water, such as claystones, will not be approved. The Inspector may reject localized areas, strata, or channels within an approved area or zone when, in its opinion, the material has disintegrated, weathered badly, or is otherwise unsatisfactory for the intended use. The materials shall be free of objectionable amounts of earth, quarry dust, or other materials; however, washing will not be required.

Stone for riprap shall be block shaped with a specific gravity of at least 2.5. Smooth rounded stone or boulders, flat, thin, elongated, and slab shaped stone shall not be acceptable. Not more than 25 percent of the stones reasonably well distributed throughout the gradation shall have a length more than 2.5 times the breadth or thickness. No stone shall have a length exceeding 3 times its breadth or thickness.

Riprap shall be R-7 gradation, conforming to Section 850 of Pub. 408, except as noted above. The riprap shall be certified as to size and gradation and the Inspector shall accept the onsite riprap based on a visual inspection.

**E - Grout** - Grout shall consist of 1 part cement, 2 parts fine aggregate, by volume, and sufficient water to form a workable mix and shall be mixed in a mixer approved by the Inspector. Use Type IIA cement, conforming to AASHTO M 85, and Type A fine aggregate, conforming to Section 703.1 of Pub.408. Use reasonably clean water, free from vegetable matter, oil, acid, alkali, sugar, or other objectionable materials. When the water source is relatively shallow, enclose the intake to exclude silt, mud, grass or other undesirable materials. Obtain fine aggregate and cement from sources listed in Bulletin 14 and Bulletin 15 respectively. Store fine aggregate in the same manner prescribed above for geotextiles.

Cement shall be delivered only in approved moisture proof bags with the name of brand, type, and manufacturer clearly marked on each bag, or may be delivered in bulk in a manner approved in Pub. 408. Similar information shall be provided in the shipping invoices accompanying bulk shipment. Store cement in a weathertight building in a manner to provide easy access for inspection and identification of each shipment. With the approval of and as directed by the Inspector, cement may be stored in the open on a platform with ample weatherproof covering. Use cement in the chronological order in which it is delivered on the site. The cement shall be free of lumps and shall be otherwise undamaged. Do not use cement which has been retrieved or reclaimed from used bags.

**PROCEDURE -**

**A - General** - Follow the applicable procedures specified below:

**B - Foundation Preparation** - Prepare the areas on which riprap is to be placed by excavating, trimming, and dressing to conform to cross sections and slopes shown on the Drawings. Bring up the low areas to grade by filling and compacting in accordance with the Technical Specification titled “Unclassified Fill” with materials comparable to adjacent foundation materials.

**C - Geotextile** - Use Class 4, Type A Geotextile. Place the fabric on the prepared area in a loose unstretched condition to minimize shifting, puncturing, or tearing the fabric. For stream slope protection, lay the fabric with the long dimension parallel to stream flow, and for protection of the entire stream, lay the fabric with the long dimension perpendicular to the center line of the channel. Provide a minimum overlap of 12 inches at the joints, with the upstream fabric over the downstream fabric and the upslope fabric over the downslope fabric. Anchor the fabrics in place by inserting securing pins through both fabrics at the overlaps at the spacing shown on the following table:

Slope	Steeper than 3:1	4:1	Flatter than 4:1
Securing pin spacing			



along overlaps	2 feet	3 feet	5 feet
----------------	--------	--------	--------

Install additional pins as necessary to prevent any slippage of the fabrics.

Protect the fabrics at all times during construction from contamination by surface runoff. Place riprap or cover the fabric with approved covering material as soon as possible, so that the fabric is not exposed for more than 2 weeks.

Do not drop rocks, 2 feet or larger in any dimension, directly on the fabric from a height greater than 1 foot. Do not allow the riprap placement procedure to puncture or damage the fabric.

Repair and/or replace all damaged fabric to the satisfaction of the Inspector.

**D - Riprap** - Place stones for riprap on the filter material or on the geotextiles, in the dry, and conforming to the lines and grades shown on the Drawings, or as directed by the Inspector. Place the stones in such manner as to produce a reasonably well-graded and uniform surface providing the full thickness shown on the Drawings. A tolerance of plus or minus 3 inches will be allowed in the finished surface except that either extreme of such tolerance shall not be continuous over an area greater than 200 square feet. Place stones to its full course thickness in one operation and without displacing the underlying material. Do not place stones in layers. The finished work shall be free from objectionable pockets of small stones and clusters of larger stones, and the entire mass of stones shall be roughly graded to conform to the gradation previously specified in this Technical Specification. Smaller stones shall be well distributed in order to chink the voids between larger stones, insofar as practicable. Do not place riprap by dumping stones into chutes or by similar methods, likely to cause segregation of the various sizes. Do not use tractor equipped with bulldozer blade, stone rake, or any similar equipment. The desired distribution of the various sizes of stones throughout the mass shall be obtained by selective loading of the material at the quarry, by controlled dumping of successive loads during final placing, or by other approved methods. Rearrange individual stones by hand or mechanical means to the extent necessary to break down bridging and to obtain a reasonably well graded mass.

Do not allow any equipment to pass over the finished riprap surface.

**E - Grouted Riprap** - Grout riprap and/or derrick stone in the dry, and do not grout in freezing weather.

Immediately prior to placing grout, wash and wet thoroughly the riprap to be grouted. If, for any reasons, the grouting operation is delayed causing the stone surfaces to dry out, resoak the stones before grouting. Do not use retempered grout, or grout which has been mixed for more than 45 minutes. Fill the voids with grout by hand shoveling and rodding or other approved method in such way that the grout reaches the bottom of riprap or derrick stone. At grouted riprap gutter, finish the top surface of the grout flush with the stones. At grouted riprap, leave the top surface of the grout rough and low so that rock protrudes 2 inches above the grout. Begin grouting operation at the lowest end of the work and progress upward, however, discharge of grout from the mixer at a location above the area of operations will be permitted provided the operations of filling and rodding are continuous and progress upward.

Do not hammer, roll, or ram the stones after grouting. Remove grout and stones around which the bond has broken, and reset the stones with fresh grout.

Cure the grout by keeping continuously moist for 24 hours and protect the grout during this period from inclement weather, flowing water and other disturbances.

Movement of equipment over grouted riprap shall not be permitted.

**MAINTENANCE** - Make all necessary repairs to the grouted riprap for the duration of the Contract.

## **TECHNICAL SPECIFICATIONS**

### **SEEDING**

#### **SCOPE**

This work is securing a satisfactory stand of grass on all disturbed areas or where directed by the Inspector. This work includes preparing the seedbed, furnishing and applying lime and fertilizer, furnishing and sowing seed, furnishing and placing mulch, and maintaining the seeded areas.

#### **APPLICABLE ACTS AND PUBLICATIONS**

Pennsylvania Seed Act of 1965 (Act No. 187), as amended

Rules For Testing Seed, Association of Official Seed Analysts

Regulations of the Pennsylvania Department of Agriculture, Bureau of Plant Industry

Pennsylvania Agricultural Liming Materials Act of 1978, P.L.15, No.9, as amended

Specification No. L-36 (current issue), Pennsylvania Department of General Services, Bureau of Purchases, Division of Standards and Specifications

Agricultural Liming Materials Rules & Regulations (7 Pa. Code, Part V, Chapter 108)

Pennsylvania Soil Conditioner and Plant Growth Substance Law, Act of December 1, 1977, P.L.258, No.86 (3P.S.68.2) as amended

Bulletin 15 - Approved Construction Materials,  
Pennsylvania Department of Transportation

#### **MATERIALS**

**A. Grass Seed** - Grass seed shall conform to the applicable acts and regulations specified above in these Technical Specifications, and shall consist of the following seed types and mixtures:

**PERMANENT SEEDING** (for all areas – including levees, channels, lawns,  
and parks)

Formula & Species	% Of Total Weight	Minimum Purity %	Minimum Germination %	Maximum Weed Seed %	Seed Application Rate Lbs./1000 SF
<p>Kentucky Bluegrass Mix (poa pratensis) A blend of improved certified varieties, such as Victa, Baron, Fortuna, &amp; Gnome, with no one variety exceeding 40% of total bluegrass component.</p>	40	98	80	0.20	2.8
<p>Strong Creeping Red Fescue or Chewings Fescue (festuca rubra). An improved certified variety, such as Pennlawn.</p>	30	98	85	0.15	2.1
<p>Fine Perennial Ryegrass Mix (lolium perenne) A blend of improved certified varieties, such as Pennefine, Regal, Manhattan, and Citation, with no one variety exceeding 50% of total ryegrass component.</p>	30	98	90	0.15	2.1
Total Lbs./1000 SF					7.0

<b>TEMPORARY SEEDING</b> (for borrow and spoil areas, and uncompleted areas where work will be delayed by 20 days or more)				
Formula & Species	Minimum Purity %	Minimum Germination %	Maximum Weed Seed %	Seed Application Rate Lbs./1000 SF
Annual Ryegrass ( <i>Iolium multiflorum</i> )	98	90	0.15	2.0

No seed shall contain Canada Thistle, Field Bindweed, Johnson Grass, Perennial Sowthistle, Quackgrass, Horse Nettle, Bedstraw, Corncockle, Brassica Kaber, Brassica Nigra, Wild Onion, or Wild Garlic.

Each variety of specified seed shall be separately packaged and fully tagged. Seed shall be mixed in the presence of a representative of the Department. Premixed seed is acceptable, provided an inspection tag stamped, dated, and signed by the Pennsylvania Department of Agriculture inspector is sewn or stapled to the outside of each bag.

Seed which has become wet, moldy, or otherwise damaged in transit or storage, or has a mix date older than 9 months prior to sowing, or has a test date older than 6 months prior to sowing shall not be used.

**B. Fertilizer** - Fertilizer shall conform to the applicable acts specified in the section of these Technical Specifications titled, “Applicable Acts and Publications”. Use dry formulation of 10-20-20-analysis.

Fertilizers shall be delivered in bags or other suitable containers, each fully labeled and bearing the name, trademark, and warranty of the producer.

**C. Lime** - Lime shall be pulverized agricultural limestone conforming to the applicable acts specified in the section of these Technical Specifications titled, “Applicable Acts and Publications”. Lime shall conform to the requirements of Specification No. L-36, Group 1, Class B, Type MO and have an effective neutralizing power of not less than 64 when calculated, using the guaranteed chemical analysis and fineness, in accordance with the Agricultural Liming Materials Rules and Regulations.

**D. Mulches** - Mulches shall be free of foreign materials, coarse or woody materials such as tobacco and soybean stems, substances toxic to plant growth, and mature seed bearing stalks or roots of prohibited and noxious weeds as defined by law. Mulches shall be cut into lengths of not less than 6 inches and cured to less than 20 percent moisture content by weight.

Mulches shall be hay, straw, or a combination both. Hay shall be timothy hay, mixed clover and timothy hay, or other approved native or forage grasses. Straw shall be either wheat or oat straw, reasonably free of viable seeds.

**E. Mulch Binders** - Mulch binders shall be nonasphaltic emulsions, of either a water soluble natural vegetable gum blended with gelling and hardening agents or a water soluble blend of hydrophylic polymers, viscosifiers, sticking aids, and gums. Obtain binders from a producer listed in Bulletin 15.

**F. Water** - Water shall be fresh and free from injurious amounts of oil, acid, alkali, salts, and any other materials that may be harmful to the growth of grass.

## **PROCEDURE**

**General** - The application rates specified for seed, lime, fertilizer and mulch are minimum acceptable rates. The Department may, at its own expense, test the soils to determine if the specified lime and fertilizer application rates are appropriate. If the test results indicate a need for adjustment, do so at no additional cost to the Department and accept full responsibility for obtaining a satisfactory stand of grass.

**A. Prepare Seed Bed by Shallow Tilling** - After the Department has approved the final grading of areas to be seeded, thoroughly till the surface to a depth of 3 inches by discing, harrowing, or other approved means. Apply fertilizer at a rate of 750 pounds per acre. Apply lime at a rate of 5,000 pounds per acre. Work both thoroughly into the soil to a depth of 3 inches, to ensure satisfactory soil conditions conducive to sowing seed. Bring the surface to a smooth and even final grade. Immediately prior to sowing, rake the soil to a depth of 3/4 inch. Rake parallel to contour lines, not uphill or downhill. On lawn areas, remove all sticks, stones, weeds, roots, and other objectionable materials larger than 5/8 inches in any dimension. On all other areas to be seeded, remove sticks, stones, weeds, roots, and other objectionable materials larger than 2 inches in any dimension. Maintain the surface in a true and even condition while sowing the seed. If hydroseeding or grain drilling is employed, apply limestone and fertilizer as specified in the section of these Technical Specifications titled, "Materials". On areas that are steeper than 3:1, till the surface in the cross slope (horizontal) direction. Sufficiently scarify so as to break up surface crust and eliminate irregularities that may have been caused by soil erosion. Remove all objectionable materials from the surface.

**B. Sow Seed** - Sow the seed mixture on a still day at the minimum rate specified in the section of these Technical Specifications titled, "Materials". Do not sow seed on frozen or partially frozen ground. For best results, sow permanent seed from March 15 to June 15 for spring establishment or from August 15 to October 15 for fall establishment. Sow by hand or by approved sowing equipment in 2 applications. Sow one-half the seed while traveling in one direction and the other half while traveling at a right angle to the first direction. After seeding is complete, lightly rake, cultipack, or brush drag the surface, just deep enough to cover the seeds. Rake parallel to contour lines, not uphill or downhill.

Hydroseeding or grain drilling is acceptable, provided the Department approves all methods and equipment used. If hydroseeding is employed, fertilizer and limestone may be applied at the time of

sowing. If grain drilling is employed, only fertilizer may be applied at the time of sowing, provided it does not come in contact with the seed. Drill parallel to contour lines, not uphill or downhill.

**C. Apply Mulch** – Immediately after seeding, or within 6 hours after seeding is completed, spread mulch uniformly over the entire seeded area at a rate of 6,000 pounds (dry weight) per acre. The mulch shall be moist at the time of placement. To prevent the mulch from being blown away or bunched by the wind and to ensure the mulch cover holds the soil and seed in place, anchor the moist mulch to the soil by an approved means. On slopes where machinery cannot be used, hold the mulch in place by a means that will not be detrimental to subsequent operations. Nonasphaltic mulch binders may be applied uniformly over and through the mulch at the manufacturer's recommended rate.

## **MAINTENANCE**

At no additional cost, maintain the seeded areas until all work under the Contract has been completed and accepted. Maintenance shall include refilling rain-washed gullies, reseeding, reapplying fertilizer, lime and mulch, and removal of large and noxious weeds, as directed by the Inspector.

# **TECHNICAL SPECIFICATIONS**

## **DEBRIS REMOVAL**

### **SCOPE**

This work is the removal and disposal of floatable materials which have been transported by high water flows and deposited in the channel, at bridges and culverts, or in the stream overbanks, with limits as shown on the Drawings and/or as directed by the inspector.

### **PROCEDURE**

- A.** Removal of objectionable material shall be accomplished by standard practices of the industry for this type of work. Equipment shall operate in the dry as much as practical. Care shall be taken not to endanger near-by structures, or improved property. At no additional cost to the Department, repair or remedy property or structures damaged as a result of your operations.
- B.** Storage, collection, transportation, processing and final disposal of solid waste shall be in accordance with local codes and ordinances.
- C.** Open pit burning is an acceptable means of processing removed materials and final site clean-up materials. At no time shall a fire be left unattended, and the Contractor will be held responsible for any damage resulting from such fires.
- D.** Burn site or spoil area shall be covered and final graded to conform with adjacent contours.



## **TECHNICAL SPECIFICATIONS**

### **UNCLASSIFIED FILL**

#### **SCOPE**

This work is filling areas with suitable materials, to the limits and grades shown on the Drawings, or as directed by the Inspector

#### **MATERIALS**

Obtain material from required excavation to the extent of its availability. The material need not be well graded but shall be free of clusters of large materials, organic matter, trash, and frozen and other objectionable materials. Unless otherwise specified by the Inspector, the material shall be granular and pervious. If necessary, sort the material and/or stockpile for later use at no additional cost.

#### **PROCEDURE**

Do not place material on frozen ground. Deposit material and compact to the satisfaction of the Inspector.

After completion of spreading and compacting, grade the area to the lines and grades shown on the Drawings, or as directed by the Inspector, in such a way that the area blends in with the surrounding terrain with the top surface sloped for drainage.