

## PENNSYLVANIA GAME COMMISSION

### SGL #217 BLUE MOUNTAIN ROAD ACCESS MAINTENANCE PROJECT

Southeast Region Forestry  
East Penn Township  
Carbon County

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**ELECTRONIC BID NOTICE TO PROPOSERS**  
**SGL #217**  
**BLUE MOUNTAIN ROAD ACCESS MAINTENANCE**

**PROJECT NO: PGC-217-20-01**

Pennsylvania Game Commission (PGC)  
2001 Elmerton Avenue  
Harrisburg, PA 17110-9797

September 9, 2020

The Pennsylvania Game Commission (PGC) is soliciting electronic Bids to provide access road maintenance and construction on State Game Lands (SGL) #217 in East Penn Township, Carbon County. The scope of the project generally includes building, grading, and surfacing approximately 5,125 linear feet of combination dirt and gravel access roadway and related work. Bids will be publicly opened and read in the Division of Contracts and Procurement, 2001 Elmerton Avenue, Harrisburg, PA 17110-9797, on **Tuesday, October 13, 2020 at 2:00 PM.**

**When bidding, amount Bid should be in dollars and cents-----no fractions of a cent will be accepted.**

Questions concerning project specifications and requirements should be directed to the PGC Project Manager:

Randall Bauman, PGC Southeast Region Regional Forester  
Phone: 610-926-3136 Ext. 66686  
Email: rbauman@pa.gov

Any questions concerning completion of the electronic Bid should be directed to the PGC Contracts and procurement Section at 717-787-6594.

Bidders should visit the project site to view and determine existing site conditions and constraints that must be considered in their proposal such as site access, road conditions, topography, proximity of utilities, existing infrastructure / structures, vegetation, and other conditions and features in the work area. Contact the PGC Project Manager, Randall Bauman, for detailed directions to the site.

**There will be an optional site inspection tour held at 10:00 AM on Tuesday, September 29, 2020. A location map of the project area is included in the specifications, this map shows the meeting location.**

Bidders shall be experienced and fully capable to perform the type and extent of Work required on this project. After Bids are opened, the PA Game Commission reserves the right to request the names and contact information from at least three (3) references for projects completed within the previous three (3) years that are similar in size and scope in order to verify experience

and qualifications. Reference information shall include: Project Name, Description, and Final Cost; and Reference Name, Company, Address, and Phone No.

Attached to the project listing in electronic format are this Bid Notice, Project Terms and Conditions, Specifications, and applicable Drawings / Details. These documents are all part of the electronic proposal. Bids must be submitted electronically using the SRM system and must be submitted by the Bid Opening date and time listed above. A bid guarantee or bond is not required.

The Commonwealth reserves the right to reject any and all Bids, to waive technical defects in Bids and to accept or reject any part of the Bid deemed in the best interests of the Commonwealth. Except as otherwise provided by law, award will be made to the lowest responsible and responsive Bidder, and all Bidders will be advised of the Bid results. A Purchase Order will be generated at the time of award without further input from the successful Bidder. Awarded vendor will be sent a copy of this document and no work will be authorized until the vendor is in receipt of the Purchase Order.

All vendors who conduct business with the Pennsylvania Game Commission must have a Vendor Number assigned to them in order to conduct business and receive payment from the Commonwealth. Access the website [www.pasupplierportal.state.pa.us](http://www.pasupplierportal.state.pa.us) or phone (877) 435-7363 or (717) 346-2676 or email [ra-srmhelp@state.pa.us](mailto:ra-srmhelp@state.pa.us) for assistance to register as a new vendor or, if you are an existing vendor, to change a main or remit to address.

COMMONWEALTH OF PENNSYLVANIA  
PENNSYLVANIA GAME COMMISSION

PROPOSAL FORM – CONSTRUCTION SERVICE

DESCRIPTION: **SGL #217 Blue Mountain Road Access Maintenance**

PROJECT NO.: **PGC-217-20-01**

LOCATION OF WORK: State Game Lands #217, East Penn Townships, Carbon County

DATE DUE: **October 13, 2020**      **TIME: 2:00 P.M.**

TO: Pennsylvania Game Commission, Bureau of Administrative Services, Contracts and Procurement Division, 2001 Elmerton Ave., Harrisburg, PA 17110-9797

In response to this proposal, the undersigned hereby proposes to furnish all labor, materials, tools and equipment to perform the work for the above described project, in strict accordance with applicable Commonwealth Regulations, Specifications and Plans for the Price of:

<b>No.</b>	<b><u>Work Item</u></b>	<b><u>Estimated Quantity</u></b>	<b><u>Unit Price</u></b>	<b><u>Total Price</u></b>
<b>1</b>	ADMINISTRATION, MOBILIZATION, TERMS AND CONDITIONS, CONTRACT BONDS – SGL 217 Blue Mountain Road Access Maintenance Project, Carbon County, PA	Job	Lump Sum	\$ _____
<b>2</b>	CLEARING AND GRUBBING	Job	Lump Sum	\$ _____
<b>3</b>	GRADE AND SHAPE EXISTING ROADWAY	2,590 LF	\$/LF	\$ _____
<b>4</b>	CONSTRUCT GRADE AND SHAPE NEW ROADWAY	2,535 LF	\$/LF	\$ _____
<b>5</b>	24" DRAIN PIPE	55 LF	\$/LF	\$ _____
<b>6</b>	AASHTO #3 COARSE AGGREGATE ROADWAY SURFACE	1,600 Ton	\$/Ton	\$ _____
<b>7</b>	SOIL EROSION AND SEDIMENTATION CONTROL	Job	Lump Sum	\$ _____
<b>8</b>	RESTORATION	Job	Lump Sum	\$ _____
<b>Total Project Cost</b>				\$ _____

**PROJECT SPECIFICATIONS**

The Contractor shall comply with the *Contract Terms and Conditions* provided with the Bid Documents including but not limited to the following:

**INSURANCE REQUIREMENTS** – In accordance with the *Contract Terms and Conditions*, the Contractor is required to have in place during the term of the Contract and any renewals or extensions thereof, the following types of insurance, issued by companies acceptable to the Commonwealth and authorized to conduct such business under the laws of the Commonwealth of Pennsylvania:

- A. **Worker's Compensation Insurance** for all of the Contractor's employees and those of any subcontractor, engaged in Work at the site of the project as required by law.
- B. **Public Liability and Property Damage Insurance** to protect the Commonwealth, the Contractor, and any and all subcontractors from claims for damages for personal injury (including bodily injury), sickness or disease, accidental death and damage to property including the loss of use resulting from any property damage, which may arise from the activities performed under the Contract or the failure to perform under the Contract, whether such performance or non-performance be by the Contractor, by any subcontractor, or by anyone directly or indirectly employed by either. **The minimum amounts of coverage shall be \$250,000 per person and \$1,000,000 per occurrence for bodily injury, including death, and \$250,000 per person and \$1,000,000 per occurrence for property damage.** Such policies shall be occurrence rather than claims-made policies and shall not contain any endorsements or any other form designated to limit and restrict any action by the Commonwealth, as an additional insured, against the insurance coverage in regard to Work performed for the Commonwealth.

Prior to commencement of the Work under the Contract and at each insurance renewal date during the term of the Contract, the Contractor shall provide the Commonwealth with current certificates of insurance. **These certificates or policies shall name the Commonwealth AND Pennsylvania Game Commission as additional insured and shall contain a provision that the coverage's afforded under the policies will not be cancelled or changed until at least thirty (30) days written notice has been given to the Commonwealth.**

**COMPLIANCE WITH LAW** – The Contractor shall comply with all applicable federal and state laws and regulations and local ordinances in the performance of the Contract.

**WORKMANSHIP** - All Work shall be performed in a Workmanlike manner and all materials and labor shall be in strict and entire conformity with the Drawings and Specifications.

**INSPECTION AND CHANGES** - All Work is subject to inspection and acceptance by the Pennsylvania Game Commission. Any Work rejected as defective or unsuitable shall be

removed and replaced with suitable Work and materials at the sole cost of the Contractor to the complete satisfaction of the Game Commission.

Changes shall be in accordance with the *Contract Terms and Conditions*.

**TEMPORARY SERVICES AND JOB CONDITIONS** - The Contractor shall be responsible for providing any and all temporary facilities necessary to execute and protect the Work. The Contractor shall accept all conditions as found upon examination of the site and shall coordinate, plan, and execute the Work accordingly. The Contractor shall cooperate in the arrangements of the Work as necessary to least affect the administration or operations of existing buildings, facilities, and infrastructure. The Contractor shall keep the Work site clean at all times.

**PREVAILING WAGE** – Prevailing minimum wages apply to this project. See *Contract Terms and Conditions* and attached Prevailing Wage Determination.

The Contractor and each Subcontractor shall file a statement each week and a final statement at the conclusion of the Work on the contract with the contracting agency, under oath, and in form satisfactory to the Secretary, certifying that workmen have been paid wages in strict conformity with the provisions of the contract as prescribed by this section or if wages remain unpaid to set forth the amount of wages due and owing to each workman respectively. The PA Labor and Industry “Weekly Payroll Certification for Public Works Projects” form shall be used. The initial and final Payroll Certifications shall be notarized.

**PAYMENT TERMS** - A schedule of values is provided with the bid. Payment will be made on a monthly basis upon satisfactory completion of items listed on the Schedule of Values and in accordance with the *Contract Terms and Conditions*.

All payments due to the Contractor shall be processed after all Work has been inspected and approved by an agent of the Pennsylvania Game Commission. Payment will not be made for Work that is not progressing satisfactorily or for unsuitable or defective Work.

Payments may be withheld for failure to provide required documentation for the project including but not limited to required submittals / shop drawings and weekly submission of Certified Payrolls.

**INVOICING** – All Project invoices shall be submitted directly to:

Randall Bauman, Southcentral Regional Forester  
Pennsylvania Game Commission  
253 Snyder Road  
Reading PA 19605  
Office: 610-926-3136  
Cell Phone 717-413-1362  
Email: [rbauman@pa.gov](mailto:rbauman@pa.gov)

All invoices must be submitted in black and white with no color and shaded areas. Invoices must include the Purchase Order Number, Contractor's SAP Vendor Number, and the Contractor's name and address as listed on the Purchase Order. Payment items on invoices shall match the items on the Purchase Order. Failure to submit invoices that meet these requirements will result in a delay of payment.

**Please Note:** Vendors are reminded to **NOT** include employer identification numbers, Social Security Numbers, bank account information, or other personally identifiable information on their invoices. That information is uniquely tied to your SAP Vendor Number and, for security purposes, should not be explicitly stated on an invoice.

**CONTRACT TERM** - The Contract shall commence upon delivery of Purchase Order to Contractor and shall terminate on **June 16, 2021**. Contract time is of the essence of the Project. All Work must be completed and accepted by this date.

**EXCISE TAXES, PENNSYLVANIA SALES TAX** - The Commonwealth is exempt from all Excise Taxes. See *Contract Terms and Conditions*.

**OFFSET PROVISION** - The Contractor agrees that the Commonwealth may set off the amount of any state liability or other debt of the Contractor or its subsidiaries that is owed to the Commonwealth and not being contested on appeal against any payments due the Contractor under this or any other contract with the Commonwealth.

**PERFORMANCE SECURITY / CONTRACT BONDS** – Within 10 days after award of the purchase order, the Bidder to whom the Contract is awarded, shall provide **Contract Performance Security** and a **Payment Bond** in a form acceptable to the Commonwealth for the amounts listed below and in accordance with the *Contract Terms and Conditions*.

A **Performance Bond** at one hundred percent (100%) of the contract amount, conditioned upon the faithful performance of the contract in accordance with the plans, specifications and conditions of the contract.

A **Payment Bond** in an amount equal to one hundred percent (100%) of the contract amount.

Performance and Payment Bonds shall be executed by a surety company authorized to do business in the Commonwealth and listed on the current U.S. Dept. of Treasury, Bureau of Fiscal Service, Department Circular 570 (<https://fiscal.treasury.gov/surety-bonds/list-certified-companies.html>). Bonds shall include a current Power of Attorney dated the same as the date of the bond. Bonds shall be made payable to the Commonwealth.

**GUARANTY / WARRANTY** – See *Contract Terms and Conditions* – all items are warranted for a period of one year following delivery by the Contractor and acceptance by the Commonwealth.

**HOLD HARMLESS PROVISION** - See *Contract Terms and Conditions* - The Contractor shall hold the Commonwealth harmless from and indemnify the Commonwealth against any and

all third party claims, demands and actions based upon or arising out of any activities performed by the Contractor and its employees and agents under this Contract, provided the Commonwealth gives Contractor prompt notice of any such claim of which it learns.

**ADDITIONAL PROVISIONS** -

Contractor shall comply with the conditions listed below in accordance with the *Contract Terms and Conditions*:

1. **Steel Products Procurement Act**
2. **Prohibition Against the Use of Certain Steel and Aluminum Products (Trade Practices Act)**
3. **Reciprocal Limitations Act** - The form GSPUR89 (*Reciprocal Limitations Act Requirements*) is attached. The Contractor shall complete the applicable portions of pages 3 and 4 of the form and submit the completed pages within two days after the bid opening.



**BUREAU OF LABOR LAW COMPLIANCE  
PREVAILING WAGES PROJECT RATES**

Project Name:	SGL 217 Blue Mountain Road
Awarding Agency:	PA Game Commission
Contract Award Date:	9/30/2020
Serial Number:	20-05298
Project Classification:	Highway
Determination Date:	8/17/2020
Assigned Field Office:	Scranton
Field Office Phone Number:	(570)963-4577
Toll Free Phone Number:	(877)214-3962
Project County:	Carbon County

**BUREAU OF LABOR LAW COMPLIANCE  
PREVAILING WAGES PROJECT RATES**

<b>Project: 20-05298 - Building</b>	<b>Effective Date</b>	<b>Expiration Date</b>	<b>Hourly Rate</b>	<b>Fringe Benefits</b>	<b>Total</b>
Asbestos & Insulation Workers	7/1/2016		\$32.48	\$18.52	\$51.00
Asbestos & Insulation Workers	7/1/2018		\$32.83	\$19.17	\$52.00
Asbestos & Insulation Workers	7/1/2019		\$33.33	\$19.67	\$53.00
Asbestos & Insulation Workers	7/1/2020		\$33.33	\$20.67	\$54.00
Asbestos & Insulation Workers	7/1/2021		\$34.58	\$20.67	\$55.25
Asbestos & Insulation Workers	7/1/2022		\$35.83	\$20.67	\$56.50
Boilermaker (Commercial, Institutional, and Minor Repair Work)	3/1/2017		\$28.52	\$18.22	\$46.74
Boilermaker (Commercial, Institutional, and Minor Repair Work)	3/1/2018		\$29.52	\$18.22	\$47.74
Boilermaker (Commercial, Institutional, and Minor Repair Work)	1/1/2019		\$29.26	\$18.48	\$47.74
Boilermakers	1/1/2018		\$46.26	\$33.36	\$79.62
Boilermakers	3/1/2018		\$45.89	\$33.73	\$79.62
Boilermakers	1/1/2019		\$45.51	\$34.11	\$79.62
Boilermakers	8/1/2019		\$47.21	\$34.11	\$81.32
Bricklayers, Stone Masons, Pointers, Caulkers, Cleaners	5/1/2017		\$31.72	\$18.94	\$50.66
Bricklayers, Stone Masons, Pointers, Caulkers, Cleaners	5/1/2018		\$32.14	\$19.32	\$51.46
Bricklayers, Stone Masons, Pointers, Caulkers, Cleaners	5/1/2019		\$32.65	\$19.71	\$52.36
Bricklayers, Stone Masons, Pointers, Caulkers, Cleaners	5/3/2020		\$32.95	\$20.41	\$53.36
Bricklayers, Stone Masons, Pointers, Caulkers, Cleaners	5/1/2021		\$33.94	\$20.52	\$54.46
Carpenter - Chief of Party (Surveying & Layout)	5/1/2017		\$36.01	\$25.54	\$61.55
Carpenter - Chief of Party (Surveying & Layout)	5/1/2018	4/30/2019	\$37.33	\$25.84	\$63.17
Carpenter - Chief of Party (Surveying & Layout)	5/1/2019		\$38.27	\$25.84	\$64.11
Carpenter - Instrument Person (Surveying & Layout)	5/1/2017		\$32.74	\$25.54	\$58.28
Carpenter - Instrument Person (Surveying & Layout)	5/1/2018	4/30/2019	\$33.49	\$25.84	\$59.33
Carpenter - Instrument Person (Surveying & Layout)	5/1/2019		\$34.79	\$25.84	\$60.63
Carpenter - Rodman (Surveying & Layout)	5/1/2017		\$26.19	\$20.35	\$46.54
Carpenter - Rodman (Surveying & Layout)	5/1/2018	4/30/2019	\$26.79	\$20.75	\$47.54
Carpenter - Rodman (Surveying & Layout)	5/1/2019		\$27.83	\$20.75	\$48.58
Carpenters	5/1/2017		\$32.74	\$25.54	\$58.28
Carpenters	5/1/2018	4/30/2019	\$33.49	\$25.84	\$59.33
Carpenters	5/1/2019		\$34.79	\$25.84	\$60.63
Cement Masons	5/1/2017		\$28.40	\$22.88	\$51.28
Cement Masons	5/1/2019		\$31.00	\$22.68	\$53.68
Cement Masons	5/1/2020		\$31.60	\$23.33	\$54.93
DockBuilder/ Divers (Building Heavy & Highway)	5/1/2020		\$52.44	\$37.27	\$89.71
DockBuilder/Pile Drivers (Building, Heavy & Highway)	5/1/2018		\$43.45	\$34.47	\$77.92
DockBuilder/Pile Drivers (Building, Heavy & Highway)	5/1/2020		\$43.70	\$37.27	\$80.97
DockBuilder/Pile Drivers/ Diver Tender (Building Heavy & Highway)	5/1/2020		\$43.70	\$37.27	\$80.97
Dockbuilder/Piledriver (Building, Heavy, Highway)	11/1/2017		\$43.45	\$33.22	\$76.67

**BUREAU OF LABOR LAW COMPLIANCE  
PREVAILING WAGES PROJECT RATES**

<b>Project: 20-05298 - Building</b>	<b>Effective Date</b>	<b>Expiration Date</b>	<b>Hourly Rate</b>	<b>Fringe Benefits</b>	<b>Total</b>
Dockbuilder/Piledriver (Building, Heavy, Highway)	5/1/2018		\$44.70	\$33.22	\$77.92
Drywall Finisher	5/1/2017		\$27.81	\$18.17	\$45.98
Drywall Finisher	5/1/2019		\$28.61	\$20.04	\$48.65
Drywall Finisher	5/1/2020		\$29.19	\$20.71	\$49.90
Electricians	12/1/2018		\$41.06	\$19.38	\$60.44
Electricians	6/1/2019	5/31/2020	\$42.86	\$19.38	\$62.24
Electricians	6/1/2020		\$41.94	\$22.16	\$64.10
Elevator Constructor	1/1/2018		\$47.48	\$33.00	\$80.48
Floor Coverer	5/1/2019		\$34.32	\$26.84	\$61.16
Floor Coverer	5/1/2020		\$35.70	\$26.84	\$62.54
Floor Layer	5/1/2017		\$32.72	\$26.31	\$59.03
Floor Layer	5/1/2018		\$33.32	\$26.49	\$59.81
Glazier	5/1/2017		\$34.69	\$18.05	\$52.74
Glazier	5/1/2018		\$35.69	\$18.35	\$54.04
Glazier	5/1/2019	4/30/2020	\$35.53	\$20.06	\$55.59
Glazier	5/1/2020	4/30/2021	\$35.53	\$21.51	\$57.04
Glazier	5/1/2021		\$35.53	\$22.86	\$58.39
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2017		\$32.32	\$28.42	\$60.74
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2018		\$33.07	\$28.42	\$61.49
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2019		\$32.76	\$29.88	\$62.64
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2020		\$33.76	\$30.13	\$63.89
Laborers (Class 01 - See notes)	5/1/2017		\$25.39	\$17.34	\$42.73
Laborers (Class 01 - See notes)	5/1/2018	4/30/2019	\$25.94	\$17.89	\$43.83
Laborers (Class 01 - See notes)	5/1/2019	4/30/2020	\$26.99	\$18.14	\$45.13
Laborers (Class 01 - See notes)	5/1/2020		\$27.89	\$18.44	\$46.33
Laborers (Class 02 - See notes)	5/1/2017		\$26.42	\$17.34	\$43.76
Laborers (Class 02 - See notes)	5/1/2018	4/30/2019	\$26.97	\$17.89	\$44.86
Laborers (Class 02 - See notes)	5/1/2019	4/30/2020	\$28.02	\$18.14	\$46.16
Laborers (Class 02 - See notes)	5/1/2020		\$28.92	\$18.44	\$47.36
Laborers (Class 03 - See notes)	5/1/2017		\$26.19	\$17.63	\$43.82
Laborers (Class 03 - See notes)	5/1/2018	4/30/2019	\$26.74	\$18.18	\$44.92
Laborers (Class 03 - See notes)	5/1/2019		\$26.74	\$19.33	\$46.07
Laborers (Class 03 - See notes)	5/3/2020		\$28.69	\$18.58	\$47.27
Laborers (Class 03 - See notes)	5/2/2021		\$29.59	\$18.58	\$48.17
Laborers (Class 03 - See notes)	5/1/2022		\$30.54	\$18.58	\$49.12
Laborers (Class 03 - See notes)	4/30/2023		\$31.14	\$19.18	\$50.32
Laborers (Class 04 - See notes)	5/1/2017		\$26.19	\$17.63	\$43.82
Laborers (Class 04 - See notes)	5/1/2018	4/30/2019	\$26.74	\$18.18	\$44.92
Laborers (Class 04 - See notes)	5/1/2019		\$27.79	\$18.28	\$46.07
Laborers (Class 04 - See notes)	5/3/2020		\$30.19	\$18.58	\$48.77
Laborers (Class 04 - See notes)	5/2/2021		\$31.09	\$18.58	\$49.67
Laborers (Class 04 - See notes)	5/1/2022		\$32.04	\$18.58	\$50.62

**BUREAU OF LABOR LAW COMPLIANCE  
PREVAILING WAGES PROJECT RATES**

<b>Project: 20-05298 - Building</b>	<b>Effective Date</b>	<b>Expiration Date</b>	<b>Hourly Rate</b>	<b>Fringe Benefits</b>	<b>Total</b>
Laborers (Class 04 - See notes)	4/30/2023		\$32.64	\$19.18	\$51.82
Laborers (Class 05 - See notes)	5/1/2017		\$28.19	\$17.63	\$45.82
Laborers (Class 05 - See notes)	5/1/2018	4/30/2019	\$28.74	\$18.18	\$46.92
Laborers (Class 05 - See notes)	5/1/2019		\$29.79	\$18.28	\$48.07
Laborers (Class 05 - See notes)	5/3/2020		\$30.69	\$18.58	\$49.27
Laborers (Class 05 - See notes)	5/2/2021		\$31.59	\$18.58	\$50.17
Laborers (Class 05 - See notes)	5/1/2022		\$32.54	\$18.58	\$51.12
Laborers (Class 05 - See notes)	4/30/2023		\$33.14	\$19.18	\$52.32
Laborers (Class 06 - See notes)	5/1/2017		\$26.74	\$17.34	\$44.08
Laborers (Class 06 - See notes)	5/1/2018	4/30/2019	\$26.74	\$18.18	\$44.92
Laborers (Class 06 - See notes)	5/1/2019		\$28.34	\$19.34	\$47.68
Laborers (Class 06 - See notes)	5/1/2020		\$29.24	\$18.44	\$47.68
Marble Mason	5/1/2017		\$28.15	\$18.56	\$46.71
Marble Mason	5/1/2018		\$28.77	\$18.94	\$47.71
Marble Mason	5/1/2019		\$29.38	\$19.33	\$48.71
Marble Mason	5/1/2020		\$29.98	\$19.73	\$49.71
Marble Mason	5/1/2021		\$30.57	\$20.14	\$50.71
Millwright	7/1/2017		\$39.19	\$30.24	\$69.43
Millwright	5/1/2018		\$41.02	\$30.96	\$71.98
Millwright	5/1/2019		\$42.94	\$31.29	\$74.23
Operators (Building, Class 01 - See Notes)	5/1/2017		\$35.24	\$24.58	\$59.82
Operators (Building, Class 01 - See Notes)	5/1/2018		\$36.78	\$25.03	\$61.81
Operators (Building, Class 01 - See Notes)	5/1/2019		\$36.78	\$27.03	\$63.81
Operators (Building, Class 01 - See Notes)	5/1/2020		\$38.32	\$27.49	\$65.81
Operators (Building, Class 01 - See Notes)	5/1/2021		\$39.87	\$27.94	\$67.81
Operators (Building, Class 01A - See Notes)	5/1/2017		\$37.49	\$25.23	\$62.72
Operators (Building, Class 01A - See Notes)	5/1/2018		\$39.03	\$25.69	\$64.72
Operators (Building, Class 01A - See Notes)	5/1/2019		\$39.03	\$27.69	\$66.72
Operators (Building, Class 01A - See Notes)	5/1/2020		\$40.57	\$28.15	\$68.72
Operators (Building, Class 01A - See Notes)	5/1/2021		\$42.12	\$28.60	\$70.72
Operators (Building, Class 02 - See Notes)	5/1/2017		\$34.96	\$24.49	\$59.45
Operators (Building, Class 02 - See Notes)	5/1/2018		\$36.50	\$24.95	\$61.45
Operators (Building, Class 02 - See Notes)	5/1/2019		\$36.50	\$26.94	\$63.44
Operators (Building, Class 02 - See Notes)	5/1/2020		\$38.05	\$27.39	\$65.44
Operators (Building, Class 02 - See Notes)	5/1/2021		\$39.59	\$27.85	\$67.44
Operators (Building, Class 02A - See Notes)	5/1/2017		\$37.21	\$25.16	\$62.37
Operators (Building, Class 02A - See Notes)	5/1/2018		\$38.75	\$25.61	\$64.36
Operators (Building, Class 02A - See Notes)	5/1/2019		\$38.75	\$27.61	\$66.36
Operators (Building, Class 02A - See Notes)	5/1/2020		\$40.30	\$28.06	\$68.36
Operators (Building, Class 02A - See Notes)	5/1/2021		\$41.84	\$28.52	\$70.36
Operators (Building, Class 03 - See Notes)	5/1/2017		\$32.23	\$23.68	\$55.91
Operators (Building, Class 03 - See Notes)	5/1/2018		\$33.78	\$24.12	\$57.90
Operators (Building, Class 03 - See Notes)	5/1/2019		\$33.78	\$26.13	\$59.91
Operators (Building, Class 03 - See Notes)	5/1/2020		\$35.32	\$26.59	\$61.91

**BUREAU OF LABOR LAW COMPLIANCE  
PREVAILING WAGES PROJECT RATES**

<b>Project: 20-05298 - Building</b>	<b>Effective Date</b>	<b>Expiration Date</b>	<b>Hourly Rate</b>	<b>Fringe Benefits</b>	<b>Total</b>
Operators (Building, Class 03 - See Notes)	5/1/2021		\$36.87	\$27.04	\$63.91
Operators (Building, Class 04 - See Notes)	5/1/2017		\$30.33	\$22.12	\$52.45
Operators (Building, Class 04 - See Notes)	5/1/2018		\$32.63	\$23.80	\$56.43
Operators (Building, Class 04 - See Notes)	5/1/2019		\$32.63	\$25.81	\$58.44
Operators (Building, Class 04 - See Notes)	5/1/2020		\$34.18	\$26.26	\$60.44
Operators (Building, Class 04 - See Notes)	5/1/2021		\$35.72	\$26.72	\$62.44
Operators (Building, Class 05 - See Notes)	5/1/2017		\$29.87	\$21.99	\$51.86
Operators (Building, Class 05 - See Notes)	5/1/2018		\$32.18	\$23.69	\$55.87
Operators (Building, Class 05 - See Notes)	5/1/2019		\$32.19	\$25.67	\$57.86
Operators (Building, Class 05 - See Notes)	5/1/2020		\$33.73	\$26.13	\$59.86
Operators (Building, Class 05 - See Notes)	5/1/2021		\$35.27	\$26.59	\$61.86
Operators (Building, Class 06 - See Notes)	5/1/2017		\$29.00	\$21.72	\$50.72
Operators (Building, Class 06 - See Notes)	5/1/2018		\$31.31	\$23.41	\$54.72
Operators (Building, Class 06 - See Notes)	5/1/2019		\$31.31	\$25.41	\$56.72
Operators (Building, Class 06 - See Notes)	5/1/2020		\$32.86	\$25.86	\$58.72
Operators (Building, Class 06 - See Notes)	5/1/2021		\$34.40	\$26.32	\$60.72
Operators (Building, Class 07A- See Notes)	5/1/2017		\$42.44	\$28.13	\$70.57
Operators (Building, Class 07A- See Notes)	5/1/2018		\$44.29	\$28.68	\$72.97
Operators (Building, Class 07A- See Notes)	5/1/2019		\$44.60	\$30.77	\$75.37
Operators (Building, Class 07A- See Notes)	5/1/2020		\$46.46	\$31.31	\$77.77
Operators (Building, Class 07A- See Notes)	5/1/2021		\$48.31	\$31.86	\$80.17
Operators (Building, Class 07B- See Notes)	5/1/2017		\$42.09	\$28.03	\$70.12
Operators (Building, Class 07B- See Notes)	5/1/2018		\$43.95	\$28.58	\$72.53
Operators (Building, Class 07B- See Notes)	5/1/2019		\$44.26	\$30.66	\$74.92
Operators (Building, Class 07B- See Notes)	5/1/2020		\$46.11	\$31.21	\$77.32
Operators (Building, Class 07B- See Notes)	5/1/2021		\$47.96	\$31.77	\$79.73
Painters Class 1 (see notes)	5/1/2017		\$27.25	\$18.17	\$45.42
Painters Class 1 (see notes)	5/1/2019		\$28.05	\$20.04	\$48.09
Painters Class 1 (see notes)	5/1/2020		\$28.63	\$20.71	\$49.34
Painters Class 2 (see notes)	5/1/2017		\$30.15	\$18.17	\$48.32
Painters Class 2 (see notes)	5/1/2019		\$30.95	\$20.04	\$50.99
Painters Class 2 (see notes)	5/1/2020		\$31.53	\$20.71	\$52.24
Painters Class 3 (see notes)	5/1/2017		\$36.25	\$18.17	\$54.42
Pile Driver Divers (Building, Heavy, Highway)	1/1/2013		\$47.18	\$14.10	\$61.28
Plasterers	5/1/2017		\$29.93	\$21.51	\$51.44
Plasterers	5/1/2019		\$32.08	\$21.86	\$53.94
Plasterers	5/1/2020		\$32.88	\$22.31	\$55.19
plumber	8/1/2020		\$47.43	\$32.86	\$80.29
Plumbers and Steamfitters	6/1/2017		\$41.24	\$20.77	\$62.01
Plumbers and Steamfitters	6/1/2018		\$42.64	\$20.77	\$63.41
Plumbers and Steamfitters	6/1/2019		\$43.54	\$21.27	\$64.81
Roofers (Composition)	5/1/2017		\$36.15	\$30.22	\$66.37
Roofers (Composition)	5/1/2018		\$37.15	\$31.27	\$68.42
Roofers (Composition)	5/1/2019		\$38.35	\$31.80	\$70.15

**BUREAU OF LABOR LAW COMPLIANCE  
PREVAILING WAGES PROJECT RATES**

<b>Project: 20-05298 - Building</b>	<b>Effective Date</b>	<b>Expiration Date</b>	<b>Hourly Rate</b>	<b>Fringe Benefits</b>	<b>Total</b>
Roofers (Composition)	5/1/2020		\$39.50	\$32.30	\$71.80
Roofers (Shingle)	5/1/2016		\$25.70	\$19.17	\$44.87
Roofers (Shingle)	5/1/2019		\$28.50	\$20.87	\$49.37
Roofers (Shingle)	5/1/2020		\$29.50	\$21.25	\$50.75
Roofers (Slate & Tile)	5/1/2016		\$28.70	\$19.17	\$47.87
Roofers (Slate & Tile)	5/1/2018		\$30.50	\$20.37	\$50.87
Roofers (Slate & Tile)	5/1/2019		\$31.50	\$20.87	\$52.37
Roofers (Slate & Tile)	5/1/2020		\$32.50	\$21.25	\$53.75
Sheet Metal Workers	5/1/2017		\$30.61	\$22.95	\$53.56
Sheet Metal Workers	5/1/2018		\$30.63	\$23.73	\$54.36
Sheet Metal Workers	5/1/2019		\$30.79	\$25.07	\$55.86
Sheet Metal Workers	5/1/2020		\$31.04	\$26.32	\$57.36
Sprinklerfitters	4/1/2017		\$37.40	\$21.74	\$59.14
Sprinklerfitters	4/1/2018		\$38.80	\$22.74	\$61.54
Sprinklerfitters	4/1/2020		\$38.90	\$26.42	\$65.32
Steamfitters	5/1/2020		\$51.73	\$37.07	\$88.80
Terrazzo Finisher	5/1/2017		\$31.64	\$15.62	\$47.26
Terrazzo Finisher	5/1/2018		\$32.35	\$15.91	\$48.26
Terrazzo Finisher	5/1/2019		\$33.04	\$16.22	\$49.26
Terrazzo Finisher	5/1/2020		\$32.26	\$18.48	\$50.74
Terrazzo Grinder	5/1/2020		\$32.95	\$18.48	\$51.43
Terrazzo Mechanics	5/1/2020		\$32.91	\$20.11	\$53.02
Terrazzo Setter	5/1/2017		\$30.63	\$18.85	\$49.48
Terrazzo Setter	5/1/2018		\$31.23	\$19.25	\$50.48
Terrazzo Setter	5/1/2019		\$31.81	\$19.67	\$51.48
Tile & Marble Finisher	5/1/2017		\$26.39	\$14.70	\$41.09
Tile & Marble Finisher	5/1/2018		\$27.05	\$15.04	\$42.09
Tile & Marble Finisher	5/1/2019		\$27.69	\$15.40	\$43.09
Tile & Marble Finisher	5/1/2020		\$28.31	\$15.78	\$44.09
Tile & Marble Finisher	5/1/2020		\$28.31	\$15.78	\$44.09
Tile & Marble Finisher	5/1/2021		\$28.90	\$16.19	\$45.09
Tile Setter	5/1/2017		\$28.15	\$18.56	\$46.71
Tile Setter	5/1/2018		\$28.77	\$18.94	\$47.71
Tile Setter	5/1/2019		\$29.38	\$19.33	\$48.71
Tile Setter	5/1/2020		\$29.98	\$19.73	\$49.71
Tile Setter	5/1/2020		\$29.68	\$20.03	\$49.71
Tile Setter	5/1/2021		\$30.57	\$20.14	\$50.71
Truckdriver class 1(see notes)	5/1/2017		\$34.47	\$0.00	\$34.47
Truckdriver class 1(see notes)	5/1/2018		\$35.32	\$0.00	\$35.32
Truckdriver class 1(see notes)	5/1/2019		\$36.12	\$0.00	\$36.12
Truckdriver class 2 (see notes)	5/1/2017		\$34.54	\$0.00	\$34.54
Truckdriver class 2 (see notes)	5/1/2018		\$35.39	\$0.00	\$35.39
Truckdriver class 2 (see notes)	5/1/2019		\$36.19	\$0.00	\$36.19
Truckdriver class 3 (see notes)	5/1/2017		\$35.03	\$0.00	\$35.03

**BUREAU OF LABOR LAW COMPLIANCE  
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<b>Project: 20-05298 - Building</b>	<b>Effective Date</b>	<b>Expiration Date</b>	<b>Hourly Rate</b>	<b>Fringe Benefits</b>	<b>Total</b>
Truckdriver class 3 (see notes)	5/1/2018		\$35.88	\$0.00	\$35.88
Truckdriver class 3 (see notes)	5/1/2019		\$36.68	\$0.00	\$36.68
Window Film / Tint Installer	6/1/2019		\$24.52	\$12.08	\$36.60

**BUREAU OF LABOR LAW COMPLIANCE  
PREVAILING WAGES PROJECT RATES**

<b>Project: 20-05298 - Heavy/Highway</b>	<b>Effective Date</b>	<b>Expiration Date</b>	<b>Hourly Rate</b>	<b>Fringe Benefits</b>	<b>Total</b>
Carpenter - Chief of Party (Surveying & Layout)	5/1/2015		\$37.36	\$23.69	\$61.05
Carpenter - Chief of Party (Surveying & Layout)	5/1/2019	4/30/2020	\$36.88	\$15.49	\$52.37
Carpenter - Chief of Party (Surveying & Layout)	5/1/2020	4/30/2021	\$39.12	\$15.49	\$54.61
Carpenter - Chief of Party (Surveying & Layout)	5/1/2021		\$41.42	\$15.49	\$56.91
Carpenter - Instrument Person (Surveying & Layout)	5/1/2015		\$32.49	\$23.69	\$56.18
Carpenter - Instrument Person (Surveying & Layout)	5/1/2019	4/30/2020	\$32.07	\$15.49	\$47.56
Carpenter - Instrument Person (Surveying & Layout)	5/1/2020	4/30/2021	\$34.02	\$15.49	\$49.51
Carpenter - Instrument Person (Surveying & Layout)	5/1/2021		\$36.02	\$15.49	\$51.51
Carpenter - Rodman (Surveying & Layout)	5/1/2015		\$23.39	\$23.69	\$47.08
Carpenter - Rodman I (Survey & Layout)	5/1/2019	4/30/2020	\$25.66	\$12.39	\$38.05
Carpenter - Rodman I (Survey & Layout)	5/1/2020	4/30/2021	\$27.22	\$12.39	\$39.61
Carpenter - Rodman I (Survey & Layout)	5/1/2021		\$28.82	\$12.39	\$41.21
Carpenter	5/1/2019	4/30/2020	\$32.07	\$15.49	\$47.56
Carpenter	5/1/2020	4/30/2021	\$34.02	\$15.49	\$49.51
Carpenter	5/1/2021		\$36.02	\$15.49	\$51.51
Carpenters	6/1/2017		\$30.92	\$14.14	\$45.06
DockBuilder/ Divers (Building Heavy & Highway)	5/1/2020		\$52.44	\$37.27	\$89.71
DockBuilder/Pile Drivers/ Diver Tender(Building Heavy & Highway)	5/1/2020		\$43.70	\$37.27	\$80.97
Electric Lineman	1/1/2018		\$55.43	\$22.48	\$77.91
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2015		\$29.42	\$27.78	\$57.20
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2017		\$32.32	\$28.42	\$60.74
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2018		\$33.07	\$28.42	\$61.49
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2019		\$32.76	\$29.88	\$62.64
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2020		\$33.76	\$30.13	\$63.89
Iron Workers	7/1/2016		\$29.42	\$28.78	\$58.20
Laborers (Class 01 - See notes)	5/1/2016		\$19.81	\$15.79	\$35.60
Laborers (Class 01 - See notes)	5/1/2017		\$20.36	\$16.29	\$36.65
Laborers (Class 01 - See notes)	5/1/2018		\$20.96	\$16.79	\$37.75
Laborers (Class 01 - See notes)	5/1/2019		\$21.61	\$17.29	\$38.90
Laborers (Class 01 - See notes)	5/1/2020		\$22.41	\$17.69	\$40.10
Laborers (Class 01 - See notes)	5/1/2021		\$23.21	\$18.09	\$41.30
Laborers (Class 01 - See notes)	5/1/2022		\$24.01	\$18.54	\$42.55
Laborers (Class 01 - See notes)	5/1/2023		\$24.81	\$18.99	\$43.80
Laborers (Class 01 - See notes)	5/1/2024		\$25.61	\$19.49	\$45.10
Laborers (Class 02 - See notes)	5/1/2016		\$26.43	\$15.79	\$42.22
Laborers (Class 02 - See notes)	5/1/2017		\$26.98	\$16.29	\$43.27
Laborers (Class 02 - See notes)	5/1/2018		\$27.58	\$16.79	\$44.37
Laborers (Class 02 - See notes)	5/1/2019		\$28.23	\$17.29	\$45.52
Laborers (Class 02 - See notes)	5/1/2020		\$29.03	\$17.69	\$46.72
Laborers (Class 02 - See notes)	5/1/2021		\$29.83	\$18.09	\$47.92



**BUREAU OF LABOR LAW COMPLIANCE  
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<b>Project: 20-05298 - Heavy/Highway</b>	<b>Effective Date</b>	<b>Expiration Date</b>	<b>Hourly Rate</b>	<b>Fringe Benefits</b>	<b>Total</b>
Laborers (Class 02 - See notes)	5/1/2022		\$30.63	\$18.54	\$49.17
Laborers (Class 02 - See notes)	5/1/2023		\$31.43	\$18.99	\$50.42
Laborers (Class 02 - See notes)	5/1/2024		\$32.23	\$19.49	\$51.72
Laborers (Class 03 - See notes)	5/1/2016		\$23.42	\$15.79	\$39.21
Laborers (Class 03 - See notes)	5/1/2017		\$23.97	\$16.29	\$40.26
Laborers (Class 03 - See notes)	5/1/2018		\$24.57	\$16.79	\$41.36
Laborers (Class 03 - See notes)	5/1/2019		\$25.22	\$17.29	\$42.51
Laborers (Class 03 - See notes)	5/1/2020		\$26.02	\$17.69	\$43.71
Laborers (Class 03 - See notes)	5/1/2021		\$26.82	\$18.09	\$44.91
Laborers (Class 03 - See notes)	5/1/2022		\$27.62	\$18.54	\$46.16
Laborers (Class 03 - See notes)	5/1/2023		\$28.42	\$18.99	\$47.41
Laborers (Class 03 - See notes)	5/1/2024		\$29.22	\$19.49	\$48.71
Laborers (Class 04 - See notes)	5/1/2016		\$23.77	\$15.79	\$39.56
Laborers (Class 04 - See notes)	5/1/2017		\$24.32	\$16.29	\$40.61
Laborers (Class 04 - See notes)	5/1/2018		\$24.92	\$16.79	\$41.71
Laborers (Class 04 - See notes)	5/1/2019		\$25.57	\$17.29	\$42.86
Laborers (Class 04 - See notes)	5/1/2020		\$26.37	\$17.69	\$44.06
Laborers (Class 04 - See notes)	5/1/2021		\$27.17	\$18.09	\$45.26
Laborers (Class 04 - See notes)	5/1/2022		\$27.97	\$18.54	\$46.51
Laborers (Class 04 - See notes)	5/1/2023		\$28.77	\$18.99	\$47.76
Laborers (Class 04 - See notes)	5/1/2024		\$29.57	\$19.49	\$49.06
Laborers (Class 05 - See notes)	5/1/2016		\$24.44	\$15.79	\$40.23
Laborers (Class 05 - See notes)	5/1/2017		\$24.99	\$16.29	\$41.28
Laborers (Class 05 - See notes)	5/1/2018		\$25.59	\$16.79	\$42.38
Laborers (Class 05 - See notes)	5/1/2019		\$26.24	\$17.29	\$43.53
Laborers (Class 05 - See notes)	5/1/2020		\$27.04	\$17.69	\$44.73
Laborers (Class 05 - See notes)	5/1/2021		\$27.84	\$18.09	\$45.93
Laborers (Class 05 - See notes)	5/1/2022		\$28.64	\$18.54	\$47.18
Laborers (Class 05 - See notes)	5/1/2023		\$29.44	\$18.99	\$48.43
Laborers (Class 05 - See notes)	5/1/2024		\$30.24	\$19.49	\$49.73
Laborers (Class 06 - See notes)	5/1/2016		\$23.86	\$15.79	\$39.65
Laborers (Class 06 - See notes)	5/1/2017		\$24.41	\$16.29	\$40.70
Laborers (Class 06 - See notes)	5/1/2018		\$25.01	\$16.79	\$41.80
Laborers (Class 06 - See notes)	5/1/2019		\$25.66	\$17.29	\$42.95
Laborers (Class 06 - See notes)	5/1/2020		\$26.46	\$17.69	\$44.15
Laborers (Class 06 - See notes)	5/1/2021		\$27.26	\$18.09	\$45.35
Laborers (Class 06 - See notes)	5/1/2022		\$28.06	\$18.54	\$46.60
Laborers (Class 06 - See notes)	5/1/2023		\$28.86	\$18.99	\$47.85
Laborers (Class 06 - See notes)	5/1/2024		\$29.66	\$19.49	\$49.15
Laborers (Class 07 - See notes)	5/1/2016		\$24.15	\$15.79	\$39.94
Laborers (Class 07 - See notes)	5/1/2017		\$24.70	\$16.29	\$40.99
Laborers (Class 07 - See notes)	5/1/2018		\$25.30	\$16.79	\$42.09
Laborers (Class 07 - See notes)	5/1/2019		\$25.95	\$17.29	\$43.24
Laborers (Class 07 - See notes)	5/1/2020		\$26.75	\$17.69	\$44.44

**BUREAU OF LABOR LAW COMPLIANCE  
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<b>Project: 20-05298 - Heavy/Highway</b>	<b>Effective Date</b>	<b>Expiration Date</b>	<b>Hourly Rate</b>	<b>Fringe Benefits</b>	<b>Total</b>
Laborers (Class 07 - See notes)	5/1/2021		\$27.55	\$18.09	\$45.64
Laborers (Class 07 - See notes)	5/1/2022		\$28.35	\$18.54	\$46.89
Laborers (Class 07 - See notes)	5/1/2023		\$29.15	\$18.99	\$48.14
Laborers (Class 07 - See notes)	5/1/2024		\$29.95	\$19.49	\$49.44
Laborers (Class 08 - See notes)	5/1/2016		\$24.63	\$15.79	\$40.42
Laborers (Class 08 - See notes)	5/1/2017		\$25.18	\$16.29	\$41.47
Laborers (Class 08 - See notes)	5/1/2018		\$25.78	\$16.79	\$42.57
Laborers (Class 08 - See notes)	5/1/2019		\$26.43	\$17.29	\$43.72
Laborers (Class 08 - See notes)	5/1/2020		\$27.23	\$17.69	\$44.92
Laborers (Class 08 - See notes)	5/1/2021		\$28.03	\$18.09	\$46.12
Laborers (Class 08 - See notes)	5/1/2022		\$28.83	\$18.54	\$47.37
Laborers (Class 08 - See notes)	5/1/2023		\$29.63	\$18.99	\$48.62
Laborers (Class 08 - See notes)	5/1/2024		\$30.43	\$19.49	\$49.92
Operators (Building/Heavy, Class 01 - See Notes)	5/1/2017		\$33.80	\$24.16	\$57.96
Operators (Building/Heavy, Class 01 - See Notes)	5/1/2018		\$35.35	\$24.61	\$59.96
Operators (Building/Heavy, Class 01 - See Notes)	5/1/2019		\$35.35	\$26.61	\$61.96
Operators (Building/Heavy, Class 01 - See Notes)	5/1/2020		\$36.90	\$27.06	\$63.96
Operators (Building/Heavy, Class 01 - See Notes)	5/1/2021		\$38.44	\$27.52	\$65.96
Operators (Building/Heavy, Class 01a - See Notes)	5/1/2017		\$36.05	\$24.82	\$60.87
Operators (Building/Heavy, Class 01a - See Notes)	5/1/2018		\$37.60	\$25.27	\$62.87
Operators (Building/Heavy, Class 01a - See Notes)	5/1/2019		\$37.60	\$27.27	\$64.87
Operators (Building/Heavy, Class 01a - See Notes)	5/1/2020		\$39.14	\$27.73	\$66.87
Operators (Building/Heavy, Class 01a - See Notes)	5/1/2021		\$40.69	\$28.18	\$68.87
Operators (Building/Heavy, Class 02 - See Notes)	5/1/2017		\$33.52	\$24.07	\$57.59
Operators (Building/Heavy, Class 02 - See Notes)	5/1/2018		\$35.07	\$24.52	\$59.59
Operators (Building/Heavy, Class 02 - See Notes)	5/1/2019		\$35.07	\$26.52	\$61.59
Operators (Building/Heavy, Class 02 - See Notes)	5/1/2020		\$36.61	\$26.98	\$63.59
Operators (Building/Heavy, Class 02 - See Notes)	5/1/2021		\$38.16	\$27.43	\$65.59
Operators (Building/Heavy, Class 02a - See Notes)	5/1/2017		\$35.78	\$24.72	\$60.50
Operators (Building/Heavy, Class 02a - See Notes)	5/1/2018		\$37.32	\$25.19	\$62.51
Operators (Building/Heavy, Class 02a - See Notes)	5/1/2019		\$37.32	\$27.19	\$64.51
Operators (Building/Heavy, Class 02a - See Notes)	5/1/2020		\$38.87	\$27.64	\$66.51
Operators (Building/Heavy, Class 02a - See Notes)	5/1/2021		\$40.41	\$28.10	\$68.51
Operators (Building/Heavy, Class 03 - See Notes)	5/1/2017		\$30.60	\$23.21	\$53.81
Operators (Building/Heavy, Class 03 - See Notes)	5/1/2018		\$32.15	\$23.66	\$55.81
Operators (Building/Heavy, Class 03 - See Notes)	5/1/2019		\$32.15	\$25.66	\$57.81
Operators (Building/Heavy, Class 03 - See Notes)	5/1/2020		\$33.69	\$26.12	\$59.81
Operators (Building/Heavy, Class 03 - See Notes)	5/1/2021		\$35.24	\$26.57	\$61.81
Operators (Building/Heavy, Class 04 - See Notes)	5/1/2017		\$29.47	\$22.88	\$52.35
Operators (Building/Heavy, Class 04 - See Notes)	5/1/2018		\$31.01	\$23.32	\$54.33
Operators (Building/Heavy, Class 04 - See Notes)	5/1/2019		\$31.01	\$25.33	\$56.34
Operators (Building/Heavy, Class 04 - See Notes)	5/1/2020		\$32.55	\$25.79	\$58.34
Operators (Building/Heavy, Class 04 - See Notes)	5/1/2021		\$34.10	\$26.24	\$60.34
Operators (Building/Heavy, Class 05 - See Notes)	5/1/2017		\$29.02	\$22.74	\$51.76

**BUREAU OF LABOR LAW COMPLIANCE  
PREVAILING WAGES PROJECT RATES**

<b>Project: 20-05298 - Heavy/Highway</b>	<b>Effective Date</b>	<b>Expiration Date</b>	<b>Hourly Rate</b>	<b>Fringe Benefits</b>	<b>Total</b>
Operators (Building/Heavy, Class 05 - See Notes)	5/1/2018		\$30.56	\$23.20	\$53.76
Operators (Building/Heavy, Class 05 - See Notes)	5/1/2019		\$30.56	\$25.20	\$55.76
Operators (Building/Heavy, Class 05 - See Notes)	5/1/2020		\$32.11	\$25.65	\$57.76
Operators (Building/Heavy, Class 05 - See Notes)	5/1/2021		\$33.65	\$26.11	\$59.76
Operators (Building/Heavy, Class 06 - See Notes)	5/1/2017		\$28.14	\$22.49	\$50.63
Operators (Building/Heavy, Class 06 - See Notes)	5/1/2018		\$29.68	\$22.93	\$52.61
Operators (Building/Heavy, Class 06 - See Notes)	5/1/2019		\$29.68	\$24.94	\$54.62
Operators (Building/Heavy, Class 06 - See Notes)	5/1/2020		\$31.23	\$25.39	\$56.62
Operators (Building/Heavy, Class 06 - See Notes)	5/1/2021		\$32.77	\$25.84	\$58.61
Operators (Heavy, Class 07A - See Notes)	5/1/2017		\$40.73	\$27.63	\$68.36
Operators (Heavy, Class 07A - See Notes)	5/1/2018		\$42.58	\$28.18	\$70.76
Operators (Heavy, Class 07A - See Notes)	5/1/2019		\$42.89	\$30.27	\$73.16
Operators (Heavy, Class 07A - See Notes)	5/1/2020		\$44.74	\$30.82	\$75.56
Operators (Heavy, Class 07A - See Notes)	5/1/2021		\$46.59	\$31.37	\$77.96
Operators (Heavy, Class 07B - See Notes)	5/1/2017		\$40.38	\$27.53	\$67.91
Operators (Heavy, Class 07B - See Notes)	5/1/2018		\$42.23	\$28.09	\$70.32
Operators (Heavy, Class 07B - See Notes)	5/1/2019		\$42.54	\$30.17	\$72.71
Operators (Heavy, Class 07B - See Notes)	5/1/2020		\$44.39	\$30.72	\$75.11
Operators (Heavy, Class 07B - See Notes)	5/1/2021		\$46.25	\$31.26	\$77.51
Operators (Highway, Class 01 - See Notes)	5/1/2016		\$32.16	\$22.64	\$54.80
Operators (Highway, Class 01 - See Notes)	5/1/2017		\$32.93	\$23.87	\$56.80
Operators (Highway, Class 01 - See Notes)	5/1/2018		\$34.47	\$24.33	\$58.80
Operators (Highway, Class 01 - See Notes)	5/1/2019		\$34.47	\$26.33	\$60.80
Operators (Highway, Class 01 - See Notes)	5/1/2020		\$37.56	\$25.24	\$62.80
Operators (Highway, Class 01 - See Notes)	5/1/2021		\$39.10	\$25.70	\$64.80
Operators (Highway, Class 01a - See Notes)	5/1/2017		\$35.18	\$24.56	\$59.74
Operators (Highway, Class 01a - See Notes)	5/1/2018		\$36.72	\$25.01	\$61.73
Operators (Highway, Class 01a - See Notes)	5/1/2019		\$36.72	\$27.01	\$63.73
Operators (Highway, Class 01a - See Notes)	5/1/2020		\$39.81	\$25.92	\$65.73
Operators (Highway, Class 01a - See Notes)	5/1/2021		\$41.35	\$26.38	\$67.73
Operators (Highway, Class 02 - See Notes)	5/1/2016		\$30.98	\$22.31	\$53.29
Operators (Highway, Class 02 - See Notes)	5/1/2017		\$31.75	\$23.53	\$55.28
Operators (Highway, Class 02 - See Notes)	5/1/2018		\$33.30	\$23.98	\$57.28
Operators (Highway, Class 02 - See Notes)	5/1/2019		\$33.29	\$25.99	\$59.28
Operators (Highway, Class 02 - See Notes)	5/1/2020		\$36.38	\$24.90	\$61.28
Operators (Highway, Class 02 - See Notes)	5/1/2021		\$37.93	\$25.35	\$63.28
Operators (Highway, Class 03 - See Notes)	5/1/2016		\$30.28	\$22.10	\$52.38
Operators (Highway, Class 03 - See Notes)	5/1/2017		\$31.06	\$23.32	\$54.38
Operators (Highway, Class 03 - See Notes)	5/1/2018		\$32.59	\$23.80	\$56.39
Operators (Highway, Class 03 - See Notes)	5/1/2019		\$32.59	\$25.79	\$58.38
Operators (Highway, Class 03 - See Notes)	5/1/2020		\$35.69	\$24.69	\$60.38
Operators (Highway, Class 03 - See Notes)	5/1/2021		\$37.23	\$25.16	\$62.39
Operators (Highway, Class 04 - See Notes)	5/1/2016		\$29.82	\$21.98	\$51.80
Operators (Highway, Class 04 - See Notes)	5/1/2017		\$30.60	\$23.20	\$53.80

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Operators (Highway, Class 04 - See Notes)	5/1/2018		\$32.14	\$23.66	\$55.80
Operators (Highway, Class 04 - See Notes)	5/1/2019		\$32.14	\$25.66	\$57.80
Operators (Highway, Class 04 - See Notes)	5/1/2020		\$35.23	\$24.57	\$59.80
Operators (Highway, Class 04 - See Notes)	5/1/2021		\$36.77	\$25.03	\$61.80
Operators (Highway, Class 05 - See Notes)	5/1/2016		\$29.31	\$21.83	\$51.14
Operators (Highway, Class 05 - See Notes)	5/1/2017		\$30.08	\$23.06	\$53.14
Operators (Highway, Class 05 - See Notes)	5/1/2018		\$31.63	\$23.51	\$55.14
Operators (Highway, Class 05 - See Notes)	5/1/2019		\$31.63	\$25.51	\$57.14
Operators (Highway, Class 05 - See Notes)	5/1/2020		\$34.72	\$24.42	\$59.14
Operators (Highway, Class 05 - See Notes)	5/1/2021		\$36.26	\$24.87	\$61.13
Operators (Highway, Class 06 - See Notes)	5/1/2016		\$32.40	\$22.70	\$55.10
Operators (Highway, Class 06 - See Notes)	5/1/2017		\$33.17	\$23.94	\$57.11
Operators (Highway, Class 06 - See Notes)	5/1/2018		\$34.71	\$24.39	\$59.10
Operators (Highway, Class 06 - See Notes)	5/1/2019		\$34.71	\$26.39	\$61.10
Operators (Highway, Class 06 - See Notes)	5/1/2020		\$36.25	\$26.85	\$63.10
Operators (Highway, Class 06 - See Notes)	5/1/2021		\$39.33	\$25.78	\$65.11
Operators (Highway, Class 06/A - See Notes)	5/1/2016		\$34.65	\$23.36	\$58.01
Operators (Highway, Class 06/A - See Notes)	5/1/2017		\$35.42	\$24.59	\$60.01
Operators (Highway, Class 06/A - See Notes)	5/1/2018		\$36.96	\$25.05	\$62.01
Operators (Highway, Class 06/A - See Notes)	5/1/2019		\$36.96	\$27.05	\$64.01
Operators (Highway, Class 06/A - See Notes)	5/1/2020		\$40.04	\$25.97	\$66.01
Operators (Highway, Class 06/A - See Notes)	5/1/2021		\$41.58	\$26.43	\$68.01
Operators (Highway, Class 07/A - See Notes)	5/1/2009		\$32.94	\$18.67	\$51.61
Operators (Highway, Class 07/A - See Notes)	5/1/2010		\$34.55	\$19.72	\$54.27
Operators (Highway, Class 07/A - See Notes)	5/1/2011		\$36.10	\$20.83	\$56.93
Operators (Highway, Class 07/A - See Notes)	5/1/2012		\$36.10	\$22.28	\$58.38
Operators (Highway, Class 07/A - See Notes)	5/1/2013		\$36.10	\$23.73	\$59.83
Operators (Highway, Class 07/A - See Notes)	5/1/2014		\$36.45	\$24.88	\$61.33
Operators (Highway, Class 07/A - See Notes)	5/1/2015		\$37.51	\$25.44	\$62.95
Operators (Highway, Class 07/A - See Notes)	5/1/2016		\$38.56	\$25.99	\$64.55
Operators (Highway, Class 07/A - See Notes)	5/1/2017		\$39.66	\$27.31	\$66.97
Operators (Highway, Class 07/A - See Notes)	5/1/2018		\$41.52	\$27.84	\$69.36
Operators (Highway, Class 07/A - See Notes)	5/1/2019		\$41.82	\$29.95	\$71.77
Operators (Highway, Class 07/A - See Notes)	5/1/2020		\$45.23	\$28.94	\$74.17
Operators (Highway, Class 07/A - See Notes)	5/1/2021		\$47.08	\$29.49	\$76.57
Operators (Highway, Class 07/B - See Notes)	5/1/2009		\$31.53	\$18.25	\$49.78
Operators (Highway, Class 07/B - See Notes)	5/1/2010		\$33.13	\$19.31	\$52.44
Operators (Highway, Class 07/B - See Notes)	5/1/2011		\$34.69	\$20.41	\$55.10
Operators (Highway, Class 07/B - See Notes)	5/1/2012		\$34.69	\$21.86	\$56.55
Operators (Highway, Class 07/B - See Notes)	5/1/2013		\$34.69	\$23.31	\$58.00
Operators (Highway, Class 07/B - See Notes)	5/1/2014		\$35.04	\$24.46	\$59.50
Operators (Highway, Class 07/B - See Notes)	5/1/2015		\$36.10	\$25.02	\$61.12
Operators (Highway, Class 07/B - See Notes)	5/1/2016		\$37.17	\$25.57	\$62.74
Operators (Highway, Class 07/B - See Notes)	5/1/2017		\$38.25	\$26.89	\$65.14

**BUREAU OF LABOR LAW COMPLIANCE  
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Operators (Highway, Class 07/B - See Notes)	5/1/2018		\$40.10	\$27.44	\$67.54
Operators (Highway, Class 07/B - See Notes)	5/1/2019		\$40.41	\$29.53	\$69.94
Operators (Highway, Class 07/B - See Notes)	5/1/2020		\$43.81	\$28.53	\$72.34
Operators (Highway, Class 07/B - See Notes)	5/1/2021		\$45.66	\$29.08	\$74.74
Painters Class 2 (see notes)	5/1/2020		\$31.53	\$20.71	\$52.24
Painters Class 3 (see notes)	5/1/2019		\$37.05	\$20.04	\$57.09
Painters Class 3 (see notes)	5/1/2020		\$37.63	\$20.71	\$58.34
Piledrivers	5/1/2009		\$25.30	\$9.86	\$35.16
Piledrivers	5/1/2010		\$25.98	\$10.83	\$36.81
Piledrivers	5/1/2011		\$27.03	\$11.73	\$38.76
Steamfitters (Heavy and Highway - Gas Distribution)	5/1/2017		\$40.98	\$32.53	\$73.51
Steamfitters (Heavy and Highway - Gas Distribution)	5/1/2020		\$45.35	\$36.93	\$82.28
Truckdriver class 1(see notes)	5/1/2015		\$32.57	\$0.00	\$32.57
Truckdriver class 1(see notes)	5/1/2016		\$33.57	\$0.00	\$33.57
Truckdriver class 1(see notes)	5/1/2017		\$34.47	\$0.00	\$34.47
Truckdriver class 1(see notes)	5/1/2018		\$35.32	\$0.00	\$35.32
Truckdriver class 1(see notes)	5/1/2019		\$36.12	\$0.00	\$36.12
Truckdriver class 2 (see notes)	5/1/2015		\$32.64	\$0.00	\$32.64
Truckdriver class 2 (see notes)	5/1/2016		\$33.64	\$0.00	\$33.64
Truckdriver class 2 (see notes)	5/1/2017		\$34.54	\$0.00	\$34.54
Truckdriver class 2 (see notes)	5/1/2018		\$35.39	\$0.00	\$35.39
Truckdriver class 2 (see notes)	5/1/2019		\$36.19	\$0.00	\$36.19
Truckdriver class 3 (see notes)	5/1/2016		\$34.13	\$0.00	\$34.13
Truckdriver class 3 (see notes)	5/1/2017		\$35.03	\$0.00	\$35.03
Truckdriver class 3 (see notes)	5/1/2018		\$35.88	\$0.00	\$35.88
Truckdriver class 3 (see notes)	5/1/2019		\$36.68	\$0.00	\$36.68

## RECIPROCAL LIMITATIONS ACT REQUIREMENTS

Please Complete Applicable Portion of Pages 3 & 4 and Return with Bid.

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NOTE: These Requirements Do Not Apply To Bids Under \$10,000.00

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### I. REQUIREMENTS

- A.** The Reciprocal Limitations Act requires the Commonwealth to give preference to those bidders offering supplies produced, manufactured, mined or grown in Pennsylvania as against those bidders offering supplies produced, manufactured, mined or grown in any state that gives or requires a preference to supplies produced, manufactured, mined or grown in that state. The amount of the preference shall be equal to the amount of the preference applied by the other state for that particular supply.

The following is a list of states which have been found by the Department of General Services to have applied a preference for in-state supplies and the amount of the preference:

	<b>STATE</b>	<b>PREFERENCE</b>
1.	Alaska	7% (applies only to timber, lumber, and manufactured lumber products originating in the state)
2.	Arizona	5% (construction materials produced or manufactured in the state only)
3.	Hawaii	10%
4.	Illinois	10% for coal only
5.	Iowa	5% for coal only
6.	Louisiana	4% meat and meat products 4% catfish 10% milk & dairy products 10% steel rolled in Louisiana 7% all other products
7.	Montana	5% for residents * 3% for non-residents* *offering in-state goods, supplies, equipment and materials
8.	New Mexico	5%
9.	New York	3% for purchase of food only
10.	Oklahoma	5%
11.	Virginia	4% for coal only
12.	Washington	5% (fuels mined or produced in the state only)
13.	Wyoming	5%

- B.** The Reciprocal Limitations Act requires the Commonwealth to give preference to those bidders offering printing performed in Pennsylvania as against those bidders offering printing performed in any state that gives or requires a preference to printing performed in that state. The amount of the preference shall be equal to the amount of the preference applied by the other state for that particular category of printing.

The following is a list of states which have been found by the Department of General Services to have applied a preference for in-state printing and the amount of the preference:

	<b>STATE</b>	<b>PREFERENCE</b>
1.	Hawaii	15%
2.	Idaho	10%
3.	Louisiana	3%
4.	Montana	8%
5.	New Mexico	5%
6.	Wyoming	10%

- C.** The Reciprocal Limitations Act, also requires the Commonwealth to give resident bidders a preference against a nonresident bidder from any state that gives or requires a preference to bidders from that state or exclude bidders from states that exclude nonresident bidders. The amount of the preference shall be equal to the amount of the preference applied by the state of the nonresident bidder. The following is a list of the states which have been found by the Department of General Services to have applied a preference for in-state bidders and the amount of the preference:

<b>STATE</b>	<b>PREFERENCE</b>
1. Alaska	5% (supplies only)
2. Arizona	5% (construction materials from Arizona resident dealers only)
3. California	5% (for supply contracts only in excess of \$100,000.00)
4. Connecticut	10% (for supplies only)
5. Montana	3%
6. New Mexico	5% (for supplies only)
7. South Carolina	2% (under \$2,500,000.00) 1% (over \$2,500,000.00)
	This preference does not apply to construction contracts nor where the price of a single unit exceeds \$10,000.
8. West Virginia	2.5% (for the construction, repair or improvement of any buildings)
9. Wyoming	5%

<b>STATE</b>	<b>PROHIBITION</b>
1. New Jersey	For supply procurements or construction projects restricted to Department of General Services Certified Small Businesses, New Jersey bidders shall be excluded from award even if they themselves are Department of General Services Certified Small Businesses.

D. The Reciprocal Limitations Act also requires the Commonwealth not to specify, use or purchase supplies which are produced, manufactured, mined or grown in any state that prohibits the specification for, use, or purchase of such items in or on its public buildings or other works, when such items are not produced, manufactured, mined or grown in such state. The following is a list of the states which have been found by the Department of General Services to have prohibited the use of out-of-state supplies:

<b>STATE</b>	<b>PROHIBITION</b>
1. Alabama	Only for printing and binding involving "messages of the Governor to the Legislature", all bills, documents and reports ordered by and for the use of the Legislature or either house thereof while in session; all blanks, circulars, notices and forms used in the office of or ordered by the Governor, or by any state official, board, commission, bureau or department, or by the clerks of the supreme court . . . /and other appellate courts/; and all blanks and forms ordered by and for the use of the Senate and Clerk or the House of Representatives, and binding the original records and opinions of the Supreme Court . . . /and other appellate courts/
2. Georgia	Forest products only
3. Indiana	Coal
4. Michigan	Printing
5. New Mexico	Construction
6. Ohio	Only for House and Senate bills, general and local laws, and joint resolutions; the journals and bulletins of the Senate and house of Representatives and reports, communications, and other documents which form part of the journals; reports, communications, and other documents ordered by the General Assembly, or either House, or by the executive department or elective state officers; blanks, circulars, and other work for the use of the executive departments, and elective state officers; and opinions of the Attorney General.
7. Rhode Island	Only for food for state institutions.

\*If the bid discloses that the bidder is offering to supply one of the above-listed products that is manufactured, mined, or grown in the listed state, it shall be rejected. Contractors are prohibited from supplying these items from these states.

## II. CALCULATION OF PREFERENCE

In calculating the preference, the amount of a bid submitted by a Pennsylvania bidder shall be reduced by the percentage preference which would be given to a nonresident bidder by its state of residency (as found by the Department of General Services in Paragraph C<sub>above</sub>). Similarly, the amount of a bid offering Pennsylvania goods, supplies, equipment or materials shall be reduced by the percentage preference which would be given to another bidder by the state where the goods, supplies, equipment or materials are produced, manufactured, mined or grown (as found by the Department of General Services in Paragraphs A and B above).

THIS FORM MUST BE COMPLETED AND RETURNED WITH THE BID

**III. STATE OF MANUFACTURE**

All bidders must complete the following chart by listing the name of the manufacturer and the state (or foreign country) of manufacture for each item. If the item is domestically produced, the bidder must indicate the state in the United States where the item will be manufactured. **This chart must be completed and submitted with the bid or no later than two (2) business days after notification from the Issuing Office to furnish the information. Failure to complete this chart and provide the required information prior to the expiration of the second business day after notification shall result in the rejection of the bid.**

ITEM NUMBER	NAME OF MANUFACTURER	STATE (OR FOREIGN COUNTRY) OF MANUFACTURE

**IV. BIDDER'S RESIDENCY**

**A.** In determining whether the bidder is a nonresident bidder from a state that gives or requires a preference to bidders from that state, the address given on the first page of this invitation to bid shall be used by the Commonwealth. If that address is incorrect, or if no address is given, the correct address should be provided in the space below:

Correct Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



- B.** In order to claim the preference provided under Section I.B., Pennsylvania resident bidders must complete the following or have such information on file with the Issuing Office:
1. Address of bidder's bona fide establishment in Pennsylvania at which it was transacting business on the date when bids for this contract/requisition were first solicited: \_\_\_\_\_
  2. **a.** If the bidder is a corporation:
    - (1) The corporation  is or  is not incorporated under the laws of the Commonwealth of Pennsylvania.
      - (a) If the bidder is incorporated under the laws of the Commonwealth of Pennsylvania, provide date of incorporation: \_\_\_\_\_
      - (b) If the bidder is not incorporated under the laws of the Commonwealth of Pennsylvania, it must have a certificate of authority to do business in the Commonwealth of Pennsylvania from the Pennsylvania Department of State as required by the Pennsylvania Business Corporation Law (15 P.S. §2001). Provide date of issuance of certificate of authority: \_\_\_\_\_
    - (2) The corporation  is or  is not conducting business in Pennsylvania under an assumed or fictitious name. If the bidder is conducting business under an assumed or fictitious name, it must register the fictitious name with the Secretary of the Commonwealth and the office of the prothonotary of the county wherein the registered office of such corporation is located as required by the Fictitious Corporate Name Act, as amended 15 P.S. §51 et seq. Corporate bidders conducting business under an assumed or fictitious name must provide date of registry of the assumed or fictitious name: \_\_\_\_\_
  - b.** If the bidder is a partnership:
    - (1) The partnership  is or  is not conducting business in Pennsylvania under an assumed or fictitious name. If the bidder is conducting business under an assumed or fictitious name, it must file with the Secretary of the Commonwealth and the office of the prothonotary the county wherein the principal place of business is located as required by the Fictitious Name Act of May 24, 1945, P.L. 967, as amended 54 P.S. §28.1. Partnerships conducting business under an assumed or fictitious name must provide the date of filing of the assumed or fictitious name with the Secretary of the Commonwealth: \_\_\_\_\_
    - (2) The partnership  is or  is not a limited partnership formed under the laws of any jurisdiction other than the Commonwealth of Pennsylvania. If the bidder is an Out-of-state limited partnership, it must register with the Pennsylvania Department of State as required by the Act of July 10, 1981, P.L. 237, as amended, 59 Pa. C.S.A. §503. Out-of-state limited partnerships must provide the date of registry with the Pennsylvania Department of State: \_\_\_\_\_
  - c.** If the bidder is an individual:

He or she  is or  is not conducting business under an assumed or fictitious name. If the bidder is conducting business under an assumed or fictitious name, he or she must file with the Secretary of the Commonwealth and the office of the prothonotary in the county wherein the principal place of business is located as required by the Fictitious Name Act of May 24, 1945, P.L. 967, as amended, 54 P.S. §28.1. Individuals conducting business under an assumed or fictitious name must provide the date of filing of the assumed or fictitious name with the Secretary of the Commonwealth: \_\_\_\_\_

## **TECHNICAL SPECIFICATIONS**

The following stipulations, specifications and description of Work are defined and described as Technical Specifications and it is understood and agreed that everything herein contained is hereby made part of the Contract. Wherever any feature of the Work is not fully set forth in these Technical Specifications and is necessary for the completion of Work, it shall be understood that the same is governed by the rules of the best prevailing practice for that class of Work, as determined by the Pennsylvania Game Commission and its representatives.

These Technical Specifications and any drawings, details, maps and/or plans forming a part thereof, will cover the furnishing of all labor, equipment, tools, materials, and related items necessary to perform the Work, as required under this Contract.

- Section 1 – Summary of Work
- Section 2 – Measurement and Payment
- Section 3 – Clearing and Grubbing
- Section 4 – Excavation
- Section 5 – Road Surface Preparation and Construction
- Section 6 – Drain Pipe
- Section 7 – Erosion and Sedimentation Control
- Section 8 – Restoration

## **ATTACHMENTS**

The following Attachments are included (see separate attachments):

Details:

1. New Road Section Detail – Existing Roadway
2. New Road Section Detail – New Roadway
3. Pipe Bedding Detail
4. Broad Based Dips\*\*
5. Crosspipe Installation\*\*
6. Grade Breaks\*\*
7. Stacked Stone Headwalls\*\*

\*\* *PSU Center for Dirt and Gravel Road Studies Technical Bulletins*

## **TECHNICAL SPECIFICATION SECTION 1 - SUMMARY OF WORK**

### **1.1 – SCOPE OF PROJECT**

This project involves the construction and maintenance of a total of approximately 5,125-feet of dirt and gravel road in East Penn Township, Carbon County including construction, grading, ditching, pipe installation, driving surface installation, and related work.

### **1.2 – WORK AREA**

SGL #217 is located in East Penn Township, Carbon County. See Location Map included with the Bid Documents. The site is owned by the Pennsylvania Game Commission (PGC).

### **1.3 – WORK HOURS**

The work hours at the project site are during regular PGC business hours which are Monday through Friday, 7:45AM to 4:00PM. Work during different hours must have prior written approval by the PGC. Requests for different working hours must be submitted in writing three days in advance. No work will be permitted on Saturdays or Sundays.

**No work will be permitted on the project during the following period:**

- **November 20, 2020 – April 1, 2021 (weather and site conditions dependent)**

The contractor shall provide notice to the Regional Forester at least 96 hours (4 days) prior to start of the work.

### **1.4 – ACCESS TO WORK AREA**

Access to the project sites and staging of equipment and materials shall be coordinated with the PGC. The Contractor shall keep access roads leading to the project sites open for use by the PGC. The Contractor is required to repair any ruts or other damage to the access roads and parking areas caused by construction equipment.

All equipment shall be cleaned of soil and debris before being moved onto site to prevent spread of invasive species.

### **1.5 – CONTROL OF WORK AREA**

Coordinate with PGC staff for access and control of work areas. Provide barricades, signs and other devices as needed to prevent unauthorized access to work areas until construction activities are completed and parking areas are opened for public use.

Do not block public roads at any time during construction. If necessary, provide temporary Maintenance and Control of Traffic in accordance with PennDOT Pub. 213 Temporary Traffic Control Guidelines and related PennDOT references.

Damage to trails, roads, streams, rights-of-way, infrastructure, and property caused by the contractor's equipment shall be repaired or restored to original condition at no additional cost.

All trash and construction debris / waste shall be removed from the project site and properly disposed of.

### **1.6 – PERMITS, LAWS AND REGULATIONS**

The Contractor shall procure and pay for all permits, licenses, inspections, conveniences, or other approvals necessary for the execution of the contract. The PGC is not aware of any permits required for this project.

The Contractor shall comply with all laws, ordinances, rules, orders and regulations relating to the performance of the work, the protection of adjacent property, the maintaining of surface passageways, guard fences, and/or other protective facilities.

All applicable Federal and State laws and regulations, municipal ordinances and rules and regulations of all authorities, having jurisdiction over construction of the project shall apply to the contract throughout, and they shall be deemed to be included in the contract as a part, thereof, the same as though herein written out in full.

All regulations of the Occupational Safety and Health Act are in effect on this contract. It will be the Contractor's responsibility to make himself aware of all appropriate County, State and Federal regulations that apply to this contract.

Any violations incurred from improper execution of the above provisions shall be paid for by the Contractor. Loss of time on the project from such violations will not be tolerated.

### **1.7 – ROAD PERMITS AND BONDING**

The Contractor shall coordinate, acquire, pay for, and maintain for the duration of the project any and all permits or bonds required by local municipalities and/or PennDOT to utilize public roads and infrastructure for heavy hauling and related construction activities. Responsibilities shall include any pre or post construction inspections and related reports if required. All costs related to permitting and bonding public roadways and infrastructure shall be included with and incidental to the Bid submitted by the Contractor and will not be paid for separately.

### **1.8 – MEASUREMENT AND PAYMENT**

See Technical Specification Section 2 for description of pay items.

**TECHNICAL SPECIFICATION SECTION 2 – MEASUREMENT AND PAYMENT**

**2.1 – GENERAL**

- A. The items on the Bid Form for this Contract will be measured and the payment made in accordance with this Section.
- B. All payments will be made at the unit prices for each item listed in the Bid Form.
- C. Any items not specifically listed on the Bid Form but are necessary to complete the Work will be considered incidental to the related items listed on the Bid Form.

**2.2 – PAY ITEMS AND MEASUREMENT METHODS**

Pay items are listed in the order they appear on the Bid Form and unless stated otherwise, the numbers correspond to the Pay Item Numbers on the Bid Form and the Purchase Order.

- 1. ADMINISTRATION, MOBILIZATION, TERMS AND CONDITIONS, CONTRACT BONDS
  - a. This price and payment shall constitute full compensation for providing Performance and Payment Bonds, insurance coverage and certificates, compliance with the Terms and Conditions, and general project requirements except where specifically described and scheduled elsewhere, mobilization, demobilization, temporary facilities, municipal and state (PennDOT) roadway bonding requirements / fees and costs / inspections, and compliance with requirements of permits and approvals (not measured and paid for elsewhere) required for the project by the Contract Documents.
  - b. Unit of Measurement: Lump Sum.
- 2. CLEARING AND GRUBBING
  - a. This price and payment shall constitute full compensation for providing Clearing and Grubbing operations along the roadway corridor as specified and shown and directed by PGC staff including but not limited to all labor, materials, equipment, supervision, protection of trees to remain, tree cutting, tree removal, stump removal, brush and vegetation clearing, disposal of waste materials, and other related work required to clear and prepare the corridor for the roadway work.
  - b. Unit of Measurement: Lump Sum
- 3. GRADE AND SHAPE EXISTING ROADWAY
  - a. This price and payment shall constitute full compensation to grade and shape the existing roadway as specified and shown on the drawings / details and directed by

- PGC staff including but not limited to all labor, materials, equipment, supervision, excavation and earthwork operations, cut / fill excavation and earthwork operations, borrow site excavation and fill operations (if required), compaction of subgrade; excavations / grading required to create ditches, turn-outs, grade breaks, and broad based dips; disposal of excess / waste materials, and related work required to provide the roadway subgrade.
- b. Unit of Measurement: Linear Foot measured horizontally along the roadway.
4. CONSTRUCT GRADE AND SHAPE NEW ROADWAY
- a. This price and payment shall constitute full compensation to grade and shape the new proposed roadway as specified and shown on the drawings / details and directed by PGC staff including but not limited to all labor, materials, equipment, supervision, excavation and earthwork operations, cut / fill excavation and earthwork operations, borrow site excavation and fill operations (if required), compaction of subgrade; excavations / grading required to create ditches, turn-outs, grade breaks, and broad based dips; disposal of excess / waste materials, and related work required to provide the roadway subgrade.
  - b. Unit of Measurement: Linear Foot measured horizontally along the roadway.
5. 24" DRAIN PIPE
- a. This price and payment shall constitute full compensation to provide drain pipe of the size and type specified and shown and as directed by PGC staff including but not limited to all labor, materials, equipment, supervision, excavation and earthwork operations, coarse aggregate pipe bedding, compaction, miscellaneous pipe fittings / accessories, disposal of waste excavated materials, stacked stone headwalls and tail walls, riprap lined pipe discharge apron, and related work required to provide the drain pipe.
  - b. Unit of Measurement: Linear Foot measured horizontally along the pipe.
6. AASHTO #3 COARSE AGGREGATE ROADWAY SURFACE
- a. This price and payment shall constitute full compensation to provide AASHTO #3 Coarse Aggregate roadway surface as specified and shown and directed by PGC staff including but not limited to all labor, materials, equipment, supervision, aggregate spreading and grading, compaction, and related work required to provide the coarse aggregate roadway surface.
  - b. Unit of Measurement: Tons – Loose as shipped and dumped at the site. Quantity in Bid is estimated based on anticipated volume required. Actual quantity measured and paid shall be based on load slips provided by the aggregate supplier / quarry where the material is obtained and weighed. The Contractor shall provide copies of

ALL select granular material and coarse aggregate load slips provided by the aggregate supplier for verification of quantities and quality control. Load slips shall include the following minimum information: 1) supplier, 2) contractor, 3) project name, 4) aggregate type, 5) quantity delivered (tons), 6) delivery date, and 7) specific delivery location. In addition to individual load / weigh slips, a summary spreadsheet in Microsoft Excel format of all aggregate material shipments shall be provided.

**7. SOIL EROSION AND SEDIMENTATION CONTROL**

- a. This price and payment shall constitute full compensation for providing Soil Erosion and Sedimentation Controls as specified and shown and directed by PGC staff including but not limited to all labor, materials, equipment, supervision, and related work and incidental items required to prevent accelerated soil erosion and surface water contamination and to address and correct erosion problems that occur during construction.
- b. Unit of Measurement: Lump Sum

**8. RESTORATION**

- a. This price and payment shall constitute full compensation to stabilize and restore all disturbed areas along the roadway corridor as specified and shown and directed by PGC staff including but not limited to all labor, materials, equipment, supervision, seed mixtures, mulches, soil amendments, and related work.
- b. Unit of Measurement: Lump Sum

**TECHNICAL SPECIFICATION SECTION 3 – CLEARING AND GRUBBING**

**3.1 -SCOPE**

This work includes incidental removal and disposal of trees, stumps, and vegetation in the project area necessary for the roadway maintenance, construction, and related work.

Clearing is cutting trees and brush so that stumps are no more than three inches above the ground. Grubbing is removal of stumps and roots at least twelve inches below finished grade.

**3.2 - PROCEDURE**

Review with PGC staff areas where clearing and grubbing will be necessary before commencing clearing and grubbing operations. Protect and do not damage any plants or trees, natural growth, or other objects outside the areas to be cleared and grubbed.

Cut down the trees and brush in the designated areas. Cut the trees and brush so that the stumps are no more than three inches above the ground. Stumps must also be removed from the areas designated to be grubbed.

Remove trees from road corridor as marked and directed by PGC staff. Remove stumps within the limits of the road cartway and as directed by PGC staff. Stumps beyond the limits of the road cartway and drainage ditches that will not impact the road maintenance and construction work can remain.

Cleared and grubbed material shall be placed at the project site as directed by PGC staff. Burning is not permitted at the site.

**3.3 - MEASUREMENT AND PAYMENT**

See Technical Specification Section 2 for description of pay items.



## **TECHNICAL SPECIFICATION SECTION NO. 4 - EXCAVATION**

### **4.1- SCOPE**

This work includes grading and other excavation activities to construct the roadway, drainage features, and related work to establish and shape the road subgrade in preparation for placement of the AASHTO #3 surface material. Work includes but is not limited to removal, hauling, and disposal of all materials encountered for construction of the project as required and directed by PGC staff.

### **4.2 - 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. Protect the work, adjacent roadways, and surrounding property.

The Contractor shall contact the PA One Call System at 1-800-242-1776 prior to excavation operations at the site.

The Contractor shall coordinate work and roadway alignment / corridor areas and layout start and end locations with PGC staff. Do not over-excavate - unauthorized excavation and replacement of materials in the over-excavated areas will not be measured and paid for. Replace over-excavated work with PennDOT Class A concrete, compacted 2A coarse aggregate, or compacted suitable fill material as determined by PGC staff at no additional cost to the Game Commission.

**B. Excavation** - Remove all materials to the limits required for the roadway work. All excavation work is considered unclassified and shall include the excavation of all materials encountered, including rock materials, regardless of their nature or the manner in which they are removed. No additional payment will be considered or paid for unsuitable material or rock excavation.

**C. Disposal** – Suitable excavated materials can be used for backfilling and grading at the site. Unsuitable materials and excess excavated material shall be disposed of on-site as directed by PGC staff.

### **4.3 - MEASUREMENT AND PAYMENT**

**None** – No separate payment will be made for this item. This work shall be considered incidental to the other items of work in the project and included in the Bid and will not be measured and paid for separately.

**TECHNICAL SPECIFICATION SECTION NO. 5 – ROAD SURFACE PREPARATION AND CONSTRUCTION**

**5.1- SCOPE**

This work includes but is not limited to preparing the road subgrade by clearing the corridor of trees and vegetation, filling stump holes, removing organic material, scarifying, grading and shaping the scarified material and compacting the graded material; constructing the new road surface with coarse aggregate as specified herein and shown on the drawings / details.

**5.2- MATERIALS**

**A. AASHTO #3 Coarse Aggregate** - The stone shall Type A quality conforming to the requirements of Section 703.2 of PennDOT Pub. 408. Obtain the AASHTO #3 stone from a source approved in PennDOT Bulletin 14.

**B.** All aggregate / stone supplied for this project shall be crushed limestone. Sandstone aggregate is not acceptable.

**5.3 – APPROVAL OF MATERIALS**

Submit gradation tests, certifications and other documents to attest to the suitability of the aggregates to the PGC for review and approval. Representatives from the PGC will review the submittals and if necessary visit the quarry to review and approve the material. Do not order materials until final approval is received from the PGC.

**5.4 - PROCEDURE**

**A. General** – All work in this section shall be coordinated to provide the designed features of the new road surface.

**B. Project Layout** – The project layout was prepared by Pennsylvania Game Commission (PGC) Southeast Region Staff. The roadway centerline is marked with orange paint and the approximate limits of the roadway corridor are marked with blue paint. A PGC representative will perform periodic site visits and inspections during construction to provide assistance and quality control.

**C. Tree Removal** – All trees inside the road corridor shall be cut and all sawtimber logs shall be removed from the site. Sawtimber logs are defined as logs larger than 10 inches on the small end. The contractor shall exercise care and caution in all operations to prevent damage to all trees not in the road corridor.

**D. Filling Potholes** – Voids within the limits of the roadway resulting from tree and stump removal or removal of large rocks shall be filled with on-site suitable excavated material. Compact the material with a vibratory plate compactor and/or jumping jack.

**E. Remove Organic Material** – Scrape leaves, roots, grass, weeds, etc. off the surface of the road alignment. Spoil this material on site as directed by PGC staff.

**F. Scarifying** – Scarify the surface of the existing road to a minimum depth of two (2) inches to obtain material for grading and shaping the road.

**G. Grading and Shaping** – Grade and shape the roadway in accordance with the attached details and as directed by PGC staff to form the required road section shape and to provide an even surface for placement of the AASHTO #3 coarse aggregate.

- 1.) Grade the entire road surface of the existing roadway (approximately 2,590 feet) to a 14-foot minimum cartway width with broad shallow ditches and improved turnouts beyond the 14 feet.
- 2.) Construction of a total of approximately 2,535 feet of woods road to a 14-foot minimum cartway width with broad shallow ditches and improved turnouts beyond the 14 feet.
- 3.) In coordination with and approval from PGC staff, borrow sites may be created along the roadway corridor to obtain suitable fill. All borrow sites shall be graded and restored upon completion of the project. Borrow fill material shall only be used with express approval from PGC staff to construct the roadway subgrade.

**H. Compaction** – Compact the graded and shaped material with a single drum (smooth) vibratory roller (min. 10 ton).

**I. AASHTO #3 Coarse Aggregate Material Road Section** – Place AASHTO #3 Coarse Aggregate Material on the prepared subgrade. Compact the coarse aggregate with a single drum smooth roller (vibratory, 10-ton min.) to a minimum compacted thickness of 4-inches. Maintain the road shape, slope and profile during placement and compaction operations.

## **5.5 - MEASUREMENT AND PAYMENT**

See Technical Specification Section 2 for description of pay items.

**TECHNICAL SPECIFICATION SECTION NO. 6 – DRAIN PIPE**

**6.1 - SCOPE**

This work is constructing drainage pipe as shown on the drawings / details.

**6.2 – MATERIALS**

**A. PennDOT No. 2A Coarse Aggregate** – Coarse aggregate for the pipe bedding and backfill shall be PennDOT No. 2A as specified in Section 703.2 of PennDOT Pub. 408. Obtain the coarse aggregate from a source listed in PennDOT Bulletin 14.

**B. RIPRAP** – Rock utilized for riprap should consist of sound, durable rock, insoluble in water. Riprap should be free of structural defects, shale seams, and foreign materials such as quarry dust, soil, shale, and organic matter. Individual pieces should be sharply angular, whenever possible, block-shaped and have a minimum specific gravity of 2.5. No piece should have a length exceeding three (3) times its width or depth. Each load should be well-graded from the smallest to the largest stone size. Pieces smaller than the minimum size may not exceed 15% of the tonnage shipped. Riprap shall be R-4 size meeting the following requirements:

<b>Rock Size (Inches)</b>	<b>R-4 Riprap (Percent Passing – Square Openings)</b>
12	100
6	15-50
3	0-15

**C.** All aggregate / stone supplied for this project shall be crushed limestone or limestone rock. Sandstone aggregate is not acceptable.

**D. Drain Pipe** (Size as indicated on details and Scope of Work) – The drain pipe shall be high density polyethylene (HDPE) corrugated pipe conforming to the requirements of Section 601 of PennDOT Pub. 408. Pipe shall have a smooth interior and annular exterior corrugations. Pipe shall meet AASHTO M294, Type S or SP, ASTM F2306. Pipe joints shall be soil tight bell and spigot meeting the requirements of AASHTO M 294. Polyethylene shall conform with the minimum requirements of cell classification 435400C in accordance with ASTM D3350. Obtain the pipe from a source listed in PennDOT Bulletin 15.

**6.3 - PROCEDURE**

Coordinate with PGC staff and provide construction layout to determine elevations and set pipe inverts and slope to accommodate field conditions and provide positive drainage.

Two (2) 24-inch smooth bore corrugated plastic culvert pipes shall be installed at locations designated by PGC staff:

- One culvert pipe shall be installed at a 90-degree angle to the roadway and be a minimum of 25-feet long.
- One culverts installed to carry ditch water across the road shall be installed at a 45 to 60-degree angle to the roadway and be a minimum of 30-feet long.

Construct drainage pipe in the dry in non-flow conditions. The culverts shall be installed as shallow as possible with fill used in the approaches to help create grade breaks in the roadway. Excavate to the required depth, length and shape as shown on the details. Install pipe in accordance with manufacturer's written instructions. Provide coarse aggregate pipe bedding compacted in 6-inch lifts with a stand-up hand operated or walk behind vibratory compactor to 12" above top of pipe. Backfill remaining trench with suitable excavated material and/or required roadway materials. Compaction of pipe bedding will be considered adequate with no visible movement of material under compaction equipment and no rutting or displacement under vehicle loads.

All culvert pipes shall be provided with a stacked stone head wall and tail wall.

R-4 riprap discharge apron shall be placed in the tail ditch at the culvert pipe outlets. The riprap apron shall be 4-feet wide by 10-feet long a 1-foot thick.

#### **6.4 - MEASUREMENT AND PAYMENT**

See Technical Specification Section 2 for description of pay items.

**TECHNICAL SPECIFICATION SECTION 7 - EROSION AND SEDIMENTATION CONTROL**

**7.1 -SCOPE**

This work consists of implementing the soil erosion and sedimentation (E&S) control measures contained on the drawings / details and described herein. E&S control measures shall be implemented in accordance with the provisions of the Clean Streams Law and 25 Pennsylvania Code Chapter 102. The Pennsylvania Department of Environmental Protection Erosion and Sediment Program Pollution Control Manual (including the E & S Plan Template and recommendations for Timber Harvesting Operations) as well as the Commonwealth of Pennsylvania Department of Transportation Publication 408 and the PSU Center for Dirt and Gravel Road Studies Technical Bulletins and Standard Detail Sheets are the sources for the construction items described and referenced herein and incorporated into this plan.

**7.2 – PROCEDURE**

- A. Project Description** – See Project Summary and related Erosion and Sedimentation Control plan specifications and drawings / details included with the Contract Documents as well as supplemental information and requirements provided by PGC staff.

This Soil Erosion and Sedimentation Control Plan is designed to control soil erosion at its source and to prevent runoff flows from carrying sediment beyond the work area limits. The Contractor is responsible for the implementation and execution of this plan and for providing and maintaining proper soil erosion and sedimentation controls during the duration of the project until permanent stabilization conditions are achieved.

- B. Stormwater Runoff and Drainage** – The project site(s) consist of an existing and proposed access / administrative road corridor on an undeveloped, rural, forested PGC State Game Land. Post construction runoff will reach existing drainage features and surface waters by way of overland flow consistent with existing conditions. Existing storm water flow at the individual sites will not be substantially altered as a result of the project. Existing drainage features or facilities disturbed during construction shall be repaired or reconstructed by the Contractor.

Construction details are included with or referenced in the Contract Documents. The roadway and adjacent areas will be graded as needed to provide the desired road cross section and suit existing site conditions and requirements for access; however, finished contours for the affected adjacent areas will not be substantially different than existing. Roadway surfaces will be stabilized with aggregate. All other disturbed areas will be restored to their pre-construction conditions with seed and mulch.

Drainage from the project site flows to Lizard Creek (Chapter 93 designation: TSF, MF).

- C. Soils Information / Limitations** - Soils information for the project is available from the U.S.D.A. Natural Resources Conservation Service soil survey for Pennsylvania. For

reference and information, a Soils Map and Descriptions for the project site is included as an Attachment included with the Contract Documents.

Subsurface conditions from the NRCS Soil Survey have not been verified in the field by the PGC.

The Contractor shall provide appropriate excavation equipment and construction techniques to conduct earthwork operations required for the project.

Unsuitable materials shall be separated prior to compacting embankment fill.

**D. Hydrology and Hydraulics** - Construction will not significantly affect the overall hydrology of the project sites. Vegetation clearing and grubbing and grading work will be required for construction. Roadways will be stabilized with aggregate and all other disturbed areas and pre-construction drainage patterns will be restored after the construction activities have ended.

The Contractor shall provide and maintain E&S controls during construction as described herein and shown on the details to minimize the impact of runoff during rainfall events. Once the temporary impacts of construction have ended, the pre-existing hydrology will be re-established.

**E. Erosion Control Measures -**

1. General

- a.) Accelerated erosion control shall be accomplished through the rapid stabilization of all disturbed surfaces throughout the project area, use of Best Management Practices (BMPs), and precautions in the use of construction equipment.
- b.) During the earth disturbance activity, precautions must be taken to prevent accelerated erosion, minimize damage, injury or destruction of property; prevent pollution; protect natural vegetation not targeted for removal during the activity/project; and protect natural drainage ways and surface waters. All disturbed areas shall be stabilized immediately.
- c.) The Contractor shall provide temporary erosion control measures as required and site conditions dictate to reduce the erosion potential of the site. Compost Filter Sock shall be provided as needed in accordance with the attached details and as directed by PGC staff.

2. Temporary Stabilization

- a.) Provide temporary stabilization of disturbed areas as shown on the details.

- b.) At a minimum, all disturbed areas shall be temporarily restored and stabilized (mulched) within 4 days of the disturbance. Seed mixture and application rates are included in the specifications.

**C. Permanent Stabilization**

- a.) Permanent seeding and soil supplements shall be provided on disturbed and final graded areas during the germinating season as soon as practical but not than 15 days after disturbance. Seeding and mulching shall be provided as specified herein and as shown on the drawings / details.
- b.) Provide permanent stabilization of disturbed areas as specified herein.
- c.) The project area will be considered permanently stabilized when all permanent control measures/facilities have been completed and are operational, all temporary control measures/facilities removed, and a minimum uniform 70% perennial vegetative cover, with a density capable of resisting accelerated erosion and sedimentation is established.

**D. Maintenance**

- a.) Maintain temporary control measures and facilities as shown on the details.
- b.) Sediment accumulation shall be removed and disposed of at approved locations. These locations shall be selected such that the sediment will not erode into the construction area or any natural waterway.
- c.) Stabilized coarse aggregate (stone or gravel) surfaces that become eroded shall be restored with additional coarse aggregate materials.
- d.) Any permanent seeded areas that become eroded shall be repaired / regraded, seeded, and new mulch applied.
- e.) If the vegetative cover deteriorates and becomes ineffective, a fertilization and re-seeding program shall be established and carried out as the construction proceeds. Areas where failures have been experienced in the establishment of both permanent and temporary vegetative protection shall be promptly treated. Re-establishment of permanent vegetative cover shall be initiated as soon as possible.
- f.) After permanent site stabilization has been achieved, temporary erosion and sedimentation controls must be removed. Areas disturbed during removal of the control must be stabilized immediately. Re-grade areas as needed and seed and mulch using the permanent seeding schedule as indicated.



- F. Recycling and Disposal of Construction Materials** - All construction materials, including soils and aggregates, should be recycled and/or re-used to the greatest extent possible at the Project Site. Woody vegetation waste materials should be shredded/chipped for use on-site as mulch materials if possible or as directed by PGC staff. Other debris and other construction by-products, including waste pipe / fitting materials, metal, paper, plastic, cardboard, batteries, rubber, etc. shall be properly disposed of at a local recycling center or waste transfer/landfill site. The Contractor shall not disposal of waste materials on-site via burning or burial.
- G. Waste Disposal Sites** - Excess excavated material shall be properly and legally disposed of off-site or as directed by the PGC. The contractor shall provide appropriate soil erosion and sedimentation controls for the waste sites and they shall be stabilized. Provision of E&S controls at disposal sites is considered incidental to construction.
- H.** Failure to implement soil erosion and sediment pollution control measures may result in a cease and desist order, causing shutdown of the work. No extension of time, nor additional compensation will be granted if such a shutdown should occur as a result of act or neglect of the Contractor.

### **7.3 - MEASUREMENT AND PAYMENT**

See Technical Specification Section 2 for description of pay items.



Deliver premixed seed in bags or other suitable containers, each fully labeled with the name, trademark, and warranty of the producer and with the mixture type, weed seed percentage, purity percentage, germination percentage, and mix formula or composition.

Do not use seed which has become wet, moldy, or otherwise damaged in transit or storage, has a mix date older than 9 months prior to seeding, or has a test date older than 6 months prior to seeding.

**B - Fertilizer** – If required and specified, use dry formulation of 10-20-20-analysis. Fertilizer shall be delivered in bags or other suitable containers, each fully labeled and bearing the name, trademark, and warranty of the producer.

**C - Lime** - If required and specified, lime application shall conform to Section 804.2(a).1 of Pub.408.

**D – Inoculant** – If required and specified, provide in accordance with Section 804.2(c) of Pub. 408.

**E - Mulches** - Mulches shall be free from mature seedbearing stalks or roots of prohibited or noxious weeds as defined by law. Do not use mulches which are cut into lengths of less than 6 inches.

Mulches shall be either one or a combination of the following, shall contain no stems of tobacco, soybeans, or other coarse or woody materials.

**1. - Straw** - Either wheat or oat straw, and free of weeds and viable seeds, well-cured to less than 20 percent moisture content by weight, not chopped or finely broken.

**2. - Wood Fiber** - Use wood fiber meeting the requirements of Section 805.2(a).1.c of Pub. 408.

**3. - Pellet Mulch** - Use pellet mulch meeting the requirements of Section 805.2(a).1.d of Pub. 408.

**F - Mulch Binders** - Use one of the following mulch binders in accordance with Section 805.2(b) of Pub. 408. Use Recycled Cellulose Fiber, Wood Fiber, Non-asphaltic Emulsion, Polyvinyl Acetate, or a Mixture of Recycled Cellulose Wood Fiber and Wood Fiber. Obtain binders from a producer listed in Bulletin 15.

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

**H – Topsoil** - Acceptable friable loam that is reasonably free of subsoil, clay lumps, brush, roots, weeds, other objectionable vegetation, stones, other foreign material larger than 2 inches in any dimension, litter, and/or other material unsuitable or harmful to plant growth in accordance with Section 801.2 (a) and 802.2 of Pub. 408.

## 8.4 - PROCEDURE

Follow the procedures specified below and as listed in Section 804.3 of Pub. 408. The amounts of seed, lime, fertilizer and mulch specified are the minimum acceptable. Employ modifications if they are deemed necessary, at no additional cost to the PGC, and accept full responsibility for obtaining a satisfactory stand of grass.

**A – Topsoil Furnished and Placed** – Reference Section 802 of Pub. 408. Provide topsoil as shown on the drawings / details and as required to restore disturbed areas. Grade the areas to be covered by topsoil. Using acceptable methods, loosen soil to a depth of 2 inches before placing the topsoil. Remove stones and other foreign material 2 inches or larger in any dimension. Remove and satisfactorily dispose of unsuitable and surplus material. Place topsoil on the prepared areas and, unless otherwise indicated, spread and compact to a 4-inch uniform depth  $\pm 1 \frac{1}{2}$  inches. Compact with a roller having a weight not over 120 pounds per foot width of roller or by other acceptable methods, as directed. Remove over-depth topsoil, unless otherwise agreed upon in writing. Do not place topsoil in a wet or frozen condition.

**B - Sowing** - Sow the seed mixture on a still day at a rate specified in Section 804.2 of Pub. 408. Sow by hand or by approved sowing equipment in 2 applications, one-half the seed while the seeder is traveling in one direction and the other half while the seeder is traveling at right angle to the first direction. After sowing, rake, cultipack, or brush drag the surface very lightly, just deep enough to cover the seeds. Rake only in a direction parallel to the contour lines.

**C - Mulching** - After sowing is completed, spread mulch uniformly over the entire seeded area at a rate of 3 tons (dry weight) per acre. The mulch shall be moist at the time of placement.

Apply wood fiber mulch hydraulically in accordance with the manufacturer's tank-mixing instructions. Wood fiber mulch may be incorporated into the slurry after the seed and soil supplements have been thoroughly mixed. Apply wood fiber mulch at a rate of 800 Lbs. per acre unless otherwise indicated by the manufacturer.

On slopes 6:1 or flatter, apply pellet mulch by hand or using a mechanical spreader immediately after seeding, at a rate of 2,615 Lbs. per acre. Thoroughly wet pellet mulch with water without dislodging mulch.

To prevent loss or bunching by wind and to form a soil-binding mulch, anchor the moist mulch to the soil with a mulch binder. Use mulch binders at the following rates:

Recycled Cellulose Fiber - 775 Lbs./Acre

Wood Fiber - 775 Lbs./Acre

Mixture of Recycled Cellulose Fiber and Wood Fiber - 775 Lbs./Acre

Non-asphaltic Emulsion - Manufacturer's Recommended Rate

Polyvinyl Acetate - Manufacturer's Recommended Rate

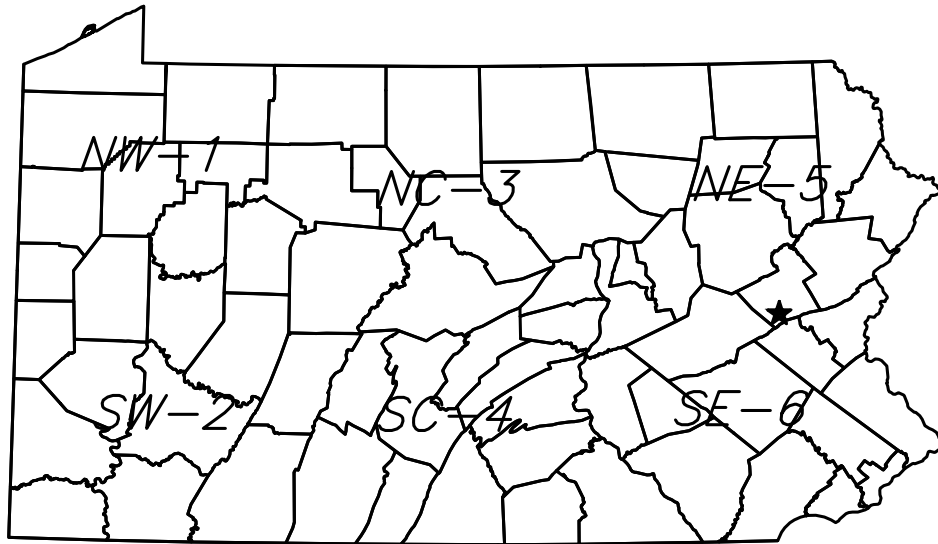
On slopes where machinery cannot be used, retain the mulch in place by some suitable means which will not be detrimental to subsequent operations.

**8.5 - MAINTENANCE**

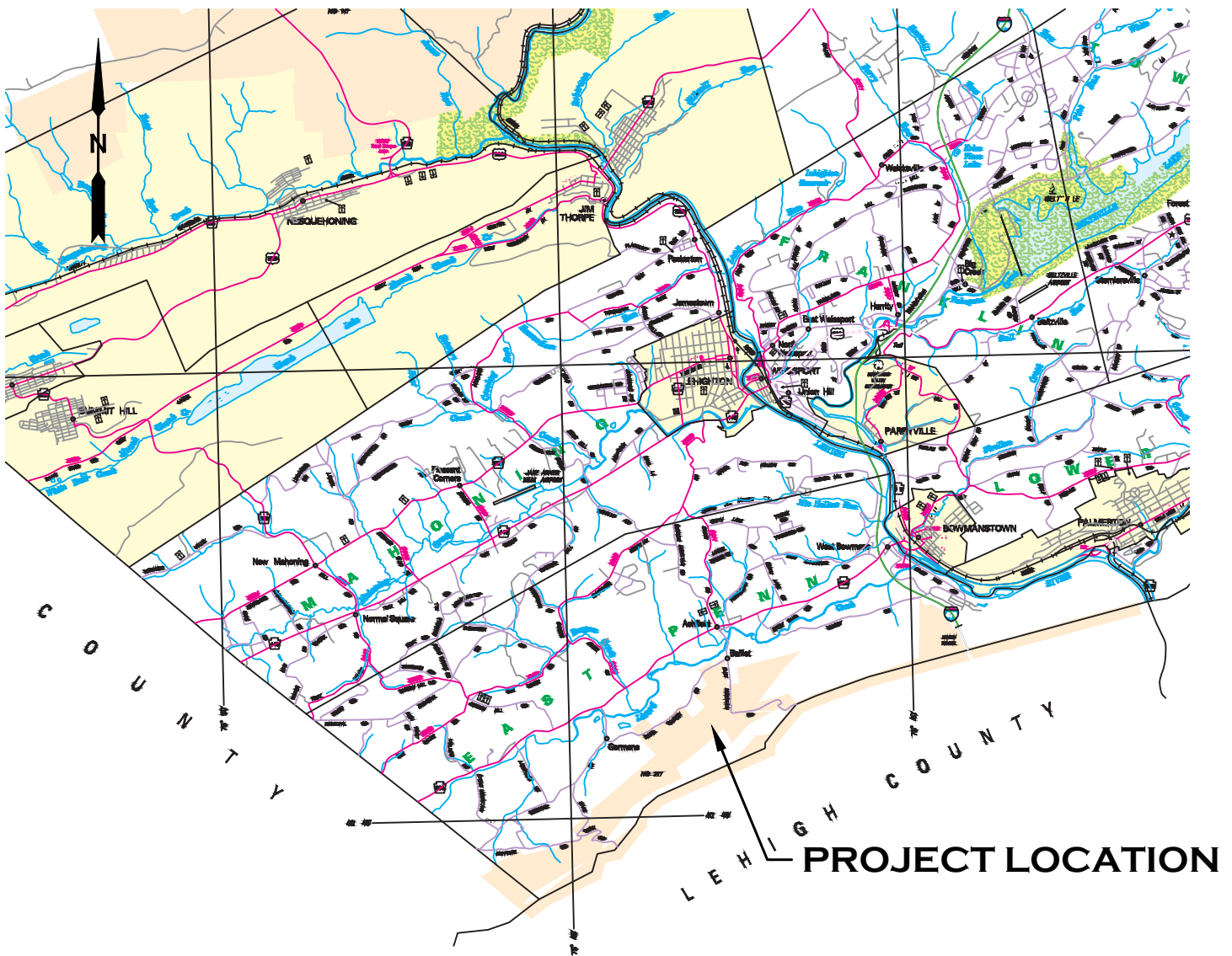
At no additional cost to the PGC, maintain the seeded areas until all work under the Contract has been completed and accepted by the PGC. Maintenance shall include refilling rain-washed gullies, reseeding, reapplying fertilizer, lime and mulch, and removal of large and noxious weeds, as directed by the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

**8.6 - MEASUREMENT AND PAYMENT**

See Technical Specification Section 2 for description of pay items.



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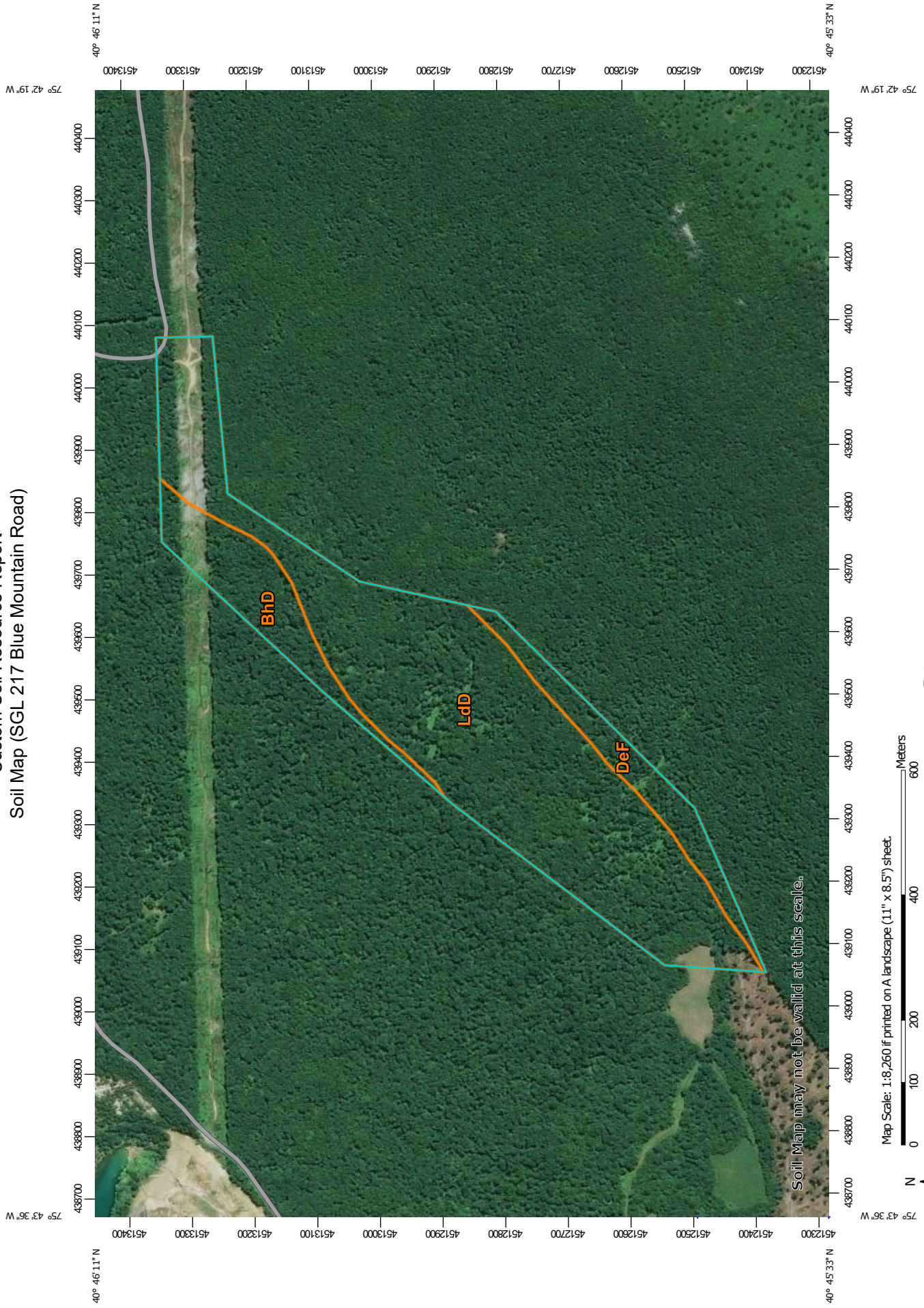


**PROJECT LOCATION**

**LOCATION MAP**  
 NOT TO SCALE



Custom Soil Resource Report  
Soil Map (SGL 217 Blue Mountain Road)



Soil Map may not be valid at this scale.

## MAP LEGEND

<b>Area of Interest (AOI)</b>	 Area of Interest (AOI)	 Spoil Area
<b>Soils</b>	 Soil Map Unit Polygons	 Stony Spot
	 Soil Map Unit Lines	 Very Stony Spot
	 Soil Map Unit Points	 Wet Spot
<b>Special Point Features</b>	 Blowout	 Other
	 Borrow Pit	 Special Line Features
	 Clay Spot	<b>Water Features</b>
	 Closed Depression	 Streams and Canals
	 Gravel Pit	<b>Transportation</b>
	 Gravelly Spot	 Rails
	 Landfill	 Interstate Highways
	 Lava Flow	 US Routes
	 Marsh or swamp	 Major Roads
	 Mine or Quarry	 Local Roads
	 Miscellaneous Water	<b>Background</b>
	 Perennial Water	 Aerial Photography
	 Rock Outcrop	
	 Saline Spot	
	 Sandy Spot	
	 Severely Eroded Spot	
	 Sinkhole	
	 Slide or Slip	
	 Sodic Spot	

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Carbon County, Pennsylvania  
 Survey Area Data: Version 19, Jun 5, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 8, 2018—Aug 8, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.



## Map Unit Legend (SGL 217 Blue Mountain Road)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BhD	Buchanan very stony loam, 8 to 25 percent slopes	8.5	13.0%
DeF	Dekalb very stony loam, 25 to 100 percent slopes, very stony	6.4	9.8%
LdD	Laidig very stony loam, 8 to 25 percent slopes	50.3	77.2%
<b>Totals for Area of Interest</b>		<b>65.2</b>	<b>100.0%</b>

## Map Unit Descriptions (SGL 217 Blue Mountain Road)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

## Custom Soil Resource Report

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## Carbon County, Pennsylvania

### BhD—Buchanan very stony loam, 8 to 25 percent slopes

#### Map Unit Setting

*National map unit symbol:* 135t  
*Elevation:* 600 to 2,400 feet  
*Mean annual precipitation:* 38 to 46 inches  
*Mean annual air temperature:* 46 to 57 degrees F  
*Frost-free period:* 140 to 170 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Buchanan and similar soils:* 95 percent  
*Minor components:* 5 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Buchanan

##### Setting

*Landform:* Mountain slopes, valley sides  
*Landform position (two-dimensional):* Footslope  
*Landform position (three-dimensional):* Lower third of mountainflank, base slope  
*Down-slope shape:* Concave, linear  
*Across-slope shape:* Linear, concave  
*Parent material:* Mountain slope colluvium derived from sedimentary rock

##### Typical profile

*H1 - 0 to 5 inches:* very stony loam  
*H2 - 5 to 25 inches:* gravelly loam  
*H3 - 25 to 60 inches:* gravelly loam

##### Properties and qualities

*Slope:* 8 to 25 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* 20 to 36 inches to fragipan  
*Drainage class:* Moderately well drained  
*Runoff class:* High  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)  
*Depth to water table:* About 12 to 30 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water capacity:* Low (about 3.3 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6s  
*Hydrologic Soil Group:* C/D  
*Hydric soil rating:* No

#### Minor Components

##### Andover

*Percent of map unit:* 5 percent  
*Landform:* Depressions

## Custom Soil Resource Report

*Hydric soil rating:* Yes

### **DeF—DeKalb very stony loam, 25 to 100 percent slopes, very stony**

#### **Map Unit Setting**

*National map unit symbol:* 2w6nl  
*Elevation:* 370 to 2,070 feet  
*Mean annual precipitation:* 39 to 43 inches  
*Mean annual air temperature:* 50 to 53 degrees F  
*Frost-free period:* 155 to 177 days  
*Farmland classification:* Not prime farmland

#### **Map Unit Composition**

*DeKalb and similar soils:* 90 percent  
*Minor components:* 10 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### **Description of DeKalb**

##### **Setting**

*Landform:* Mountain slopes  
*Landform position (two-dimensional):* Shoulder, backslope  
*Landform position (three-dimensional):* Mountainflank  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Linear  
*Parent material:* Residuum weathered from sandstone and shale

##### **Typical profile**

*O<sub>i</sub> - 0 to 1 inches:* slightly decomposed plant material  
*A - 1 to 4 inches:* very channery loam  
*E - 4 to 7 inches:* very channery loam  
*B<sub>w</sub> - 7 to 26 inches:* very channery sandy loam  
*C - 26 to 34 inches:* extremely channery sandy loam  
*R - 34 to 44 inches:* bedrock

##### **Properties and qualities**

*Slope:* 25 to 100 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* 20 to 40 inches to lithic bedrock  
*Drainage class:* Well drained  
*Runoff class:* High  
*Capacity of the most limiting layer to transmit water (K<sub>sat</sub>):* Moderately high to high  
(0.57 to 5.95 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water capacity:* Very low (about 2.5 inches)

##### **Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s

## Custom Soil Resource Report

*Hydrologic Soil Group: A*  
*Hydric soil rating: No*

### Minor Components

#### Clymer

*Percent of map unit: 5 percent*  
*Landform: Mountain slopes*  
*Landform position (two-dimensional): Backslope, shoulder*  
*Landform position (three-dimensional): Mountainflank*  
*Down-slope shape: Convex, linear*  
*Across-slope shape: Linear*  
*Hydric soil rating: No*

#### Hazleton

*Percent of map unit: 5 percent*  
*Landform: Mountain slopes*  
*Landform position (two-dimensional): Backslope, shoulder*  
*Landform position (three-dimensional): Mountainflank*  
*Down-slope shape: Convex, linear*  
*Across-slope shape: Linear*  
*Hydric soil rating: No*

## LdD—Laidig very stony loam, 8 to 25 percent slopes

### Map Unit Setting

*National map unit symbol: 137k*  
*Elevation: 500 to 3,800 feet*  
*Mean annual precipitation: 34 to 60 inches*  
*Mean annual air temperature: 50 to 57 degrees F*  
*Frost-free period: 120 to 175 days*  
*Farmland classification: Not prime farmland*

### Map Unit Composition

*Laidig and similar soils: 100 percent*  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Laidig

#### Setting

*Landform: Mountains*  
*Landform position (two-dimensional): Footslope*  
*Landform position (three-dimensional): Lower third of mountainflank*  
*Down-slope shape: Concave*  
*Across-slope shape: Concave*  
*Parent material: Mountain slope colluvium derived from sedimentary rock*

#### Typical profile

*H1 - 0 to 4 inches: very stony loam*  
*H2 - 4 to 33 inches: gravelly sandy clay loam*  
*H3 - 33 to 65 inches: very gravelly sandy loam*

## Custom Soil Resource Report

### Properties and qualities

*Slope:* 8 to 25 percent

*Surface area covered with cobbles, stones or boulders:* 1.6 percent

*Depth to restrictive feature:* 30 to 50 inches to fragipan

*Drainage class:* Well drained

*Runoff class:* Medium

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.60 in/hr)

*Depth to water table:* About 30 to 45 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water capacity:* Low (about 3.3 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6s

*Hydrologic Soil Group:* B

*Hydric soil rating:* No

## SOIL EROSION AND SEDIMENTATION CONTROL PLAN

### SOIL EROSION & SEDIMENTATION CONTROL NOTES:

1. All earth disturbances, including clearing and grubbing as well as cuts and fills shall be done in accordance with this soil erosion and sedimentation control (E&S) plan. A copy of this plan and the project bid / construction documents must be available at the project site at all times.
2. At least 3 days prior to starting any earth disturbance activities, or expanding into an area previously unmarked, the Pennsylvania One Call System Inc. shall be notified at 1-800-242-1776 for the location of existing underground utilities.
3. All earth disturbance activities shall proceed in accordance with the sequence provided in the plan.
4. Areas to be filled are to be cleared, grubbed, and stripped of topsoil to remove trees, vegetation, roots and other objectionable material.
5. Clearing, grubbing, and topsoil stripping shall be limited to those areas described in each stage of the construction sequence. General site clearing, grubbing and topsoil stripping may not commence in any stage or phase of the project until the E&S BMPs specified by the BMP sequence for that stage or phase have been installed and are functioning as described in this E&S plan.
6. At no time shall construction vehicles be allowed to enter areas outside the limit of disturbance boundaries shown on the drawings / details and/or as identified and directed by PGC staff. These areas must be clearly marked and fenced off before clearing and grubbing operations begin.
7. Immediately upon discovering unforeseen circumstances posing the potential for accelerated erosion and/or sediment pollution, the Contractor shall implement appropriate best management practices to minimize the potential for erosion and sediment pollution and notify the PGC.
8. All building materials and wastes shall be removed from the site and recycled or disposed of in accordance with the Department's Solid Waste Management Regulations at 25 Pa. Code 260.1 et seq., 271.1, and 287.1 et. seq. No building materials or wastes or unused building materials shall be burned, buried, dumped, or discharged at the site.
9. The Contractor shall provide and fully implement E&S BMPs and controls for all off-site waste and borrow areas.
10. The contractor is responsible for ensuring that any material brought on PGC State Game Lands is clean fill. Form FP-001 must be retained by the property owner for any fill material affected by a spill or release of a regulated substance but qualifying as clean fill due to analytical testing.
11. Until the site is stabilized, all erosion and sediment BMPs shall be maintained properly. Maintenance shall include inspections of all erosion and sediment BMPs after each runoff event and on a weekly basis. All preventative and remedial maintenance work must be performed immediately. If the E&S BMPs fail to perform

## SOIL EROSION AND SEDIMENTATION CONTROL PLAN

- as expected, replacement BMPs, or modifications of those installed will be required.
12. A log showing dates that E&S BMPs were inspected as well as any deficiencies found and the date they were corrected shall be maintained on the site and be made available to regulatory agency officials at the time of inspection.
  13. Sediment tracked onto any public roadway shall be returned to the construction site by the end of each work day and disposed in the manner described in this plan. In no case shall the sediment be washed, shoveled, or swept into any roadside ditch, storm sewer, or surface water.
  14. All sediment removed from BMPs shall be disposed of in the manner described on the plan drawings / details. All sediment collected from BMPs shall be returned to suitable upland areas in coordination with PGC staff and stabilized.
  15. All fills shall be compacted as required to reduce erosion, slippage, settlement, subsidence or other related problems.
  16. All earthen fills shall be placed in compacted layers not to exceed 9 inches in thickness.
  17. Fill materials for embankments shall be free of frozen particles, brush, roots, woody vegetation, organic material, sod, or other foreign or objectionable materials that would interfere with or prevent construction of satisfactory fills. Frozen materials or soft, mucky, or highly compressible materials shall not be incorporated into fills. Fill shall not be placed on saturated or frozen surfaces.
  18. All graded areas shall be permanently stabilized immediately upon reaching finished grade. Cut slopes in competent bedrock and rock fills need not be vegetated. Seeded areas within 50 feet of a surface water, or as otherwise shown on the plan drawings / details, shall be blanketed according to the standards of this plan.
  19. Immediately after earth disturbance activities cease in any area of the project, the Contractor shall stabilize all disturbed areas. During non-germinating months, mulch or protective blanketing shall be applied as described in the plan. Areas not at finished grade, which will be reactivated within 1 year, may be stabilized in accordance with the temporary stabilization specifications. Those areas which will not be reactivated within 1 year shall be stabilized in accordance with the permanent stabilization specifications.
  20. Permanent stabilization is defined as a minimum uniform, perennial 70% vegetative cover or other permanent non-vegetative cover with a density sufficient to resist accelerated erosion. Cut and fill slopes shall be capable of resisting failure due to slumping, sliding, or other movements.
  21. E&S BMPs shall remain functional as such until all areas tributary to them are permanently stabilized or until they are replaced by another approved BMP.



## **SOIL EROSION AND SEDIMENTATION CONTROL PLAN**

22. Upon completion of all earth disturbance activities and permanent stabilization of all disturbed areas, the Contractor shall contact the PGC for an inspection prior to removal/conversion of the E&S BMPs.
23. After final site stabilization has been achieved, temporary erosion and sediment BMPs must be removed. Areas disturbed during removal of the BMPs shall be stabilized immediately. In order to ensure rapid revegetation of disturbed areas, such removal/conversions are to be done only during the germinating season.

### **TEMPORARY STABILIZATION MEASURES:**

1. All disturbed areas shall be temporarily stabilized with mulch within 4 days of ceasing earth disturbance activities at the location.
2. Rough graded areas that will not be final graded and permanently seeded within 4 days from the time of original exposure / disturbance shall be temporarily seeded with a cover crop (Oats or Wheat - 50 lbs/acre) and straw mulch (1,200 lbs. / 1,000 square yards).

### **PERMANENT STABILIZATION MEASURES:**

1. Permanent seeded and soil supplements shall be provided on disturbed and final graded area during the germinating season as soon as practical but not more than 15 days after disturbance.
2. Establish finished grading for seeding and apply seed as specified.
3. Time of Seeding: Spring (March 15 - May 15); Fall (August 15 - October 1) If permanent seeding is not practical due to the time of year, provide temporary stabilization measures with the necessary follow-up action / work and permanent stabilization completed at the appropriate time of year.
4. Apply straw mulch as specified.

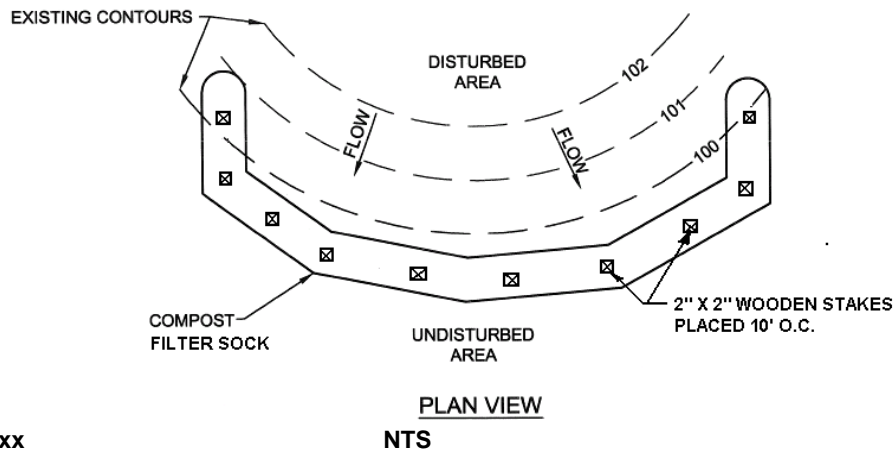
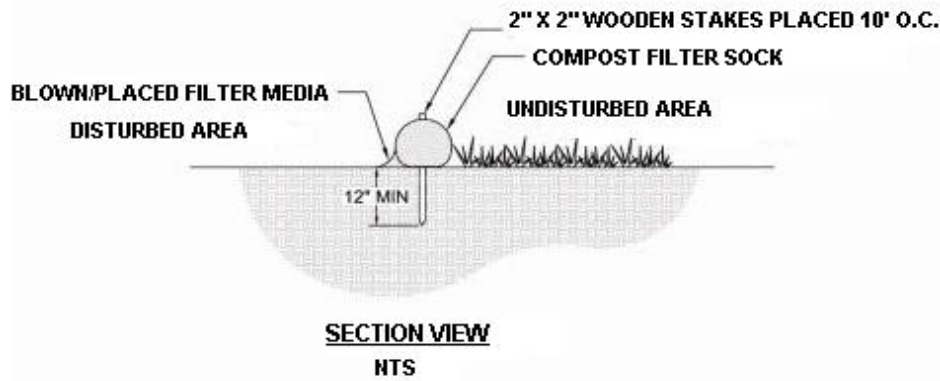
### **SEQUENCE OF CONSTRUCTION:**

1. Stage equipment in coordination with PGC staff. Install signs / barricades as required to protect and limit access to work areas.
2. Provide and maintain E&S BMPs at project sites to control soil erosion and sedimentation in accordance with the drawings / details and specifications and the PA DEP Erosion and Sediment Pollution Control Program Manual.
3. Clean wheels of construction vehicles as required to avoid tracking sediment onto public roadways.

## **SOIL EROSION AND SEDIMENTATION CONTROL PLAN**

4. Perform clearing / grubbing operations along roadway corridor and adjacent work areas in accordance with the project scope and requirements and in coordination with PGC staff.
5. Immediately upon completion of construction, permanently restore and stabilize all disturbed areas.
6. Remove E&S BMPs when permanent stabilization is achieved.
7. Conduct final site clean-up and demobilize equipment.

## STANDARD CONSTRUCTION DETAIL #4-1 COMPOST FILTER SOCK



Filtrexx

**Sock fabric shall meet standards of Table 4.1. Compost shall meet the standards of Table 4.2.**

**Compost filter sock shall be placed at existing level grade. Both ends of the sock shall be extended at least 8 feet up slope at 45 degrees to the main sock alignment (Figure 4.1). Maximum slope length above any sock shall not exceed that shown on Figure 4.2. Stakes may be installed immediately downslope of the sock if so specified by the manufacturer.**

**Traffic shall not be permitted to cross filter socks.**

**Accumulated sediment shall be removed when it reaches half the aboveground height of the sock and disposed in the manner described elsewhere in the plan.**

**Socks shall be inspected weekly and after each runoff event. Damaged socks shall be repaired according to manufacturer's specifications or replaced within 24 hours of inspection.**

**Biodegradable filter socks shall be replaced after 6 months; photodegradable socks after 1 year. Polypropylene socks shall be replaced according to manufacturer's recommendations.**

**Upon stabilization of the area tributary to the sock, stakes shall be removed. The sock may be left in place and vegetated or removed. In the latter case, the mesh shall be cut open and the mulch spread as a soil supplement.**

**TABLE 4.1  
Compost Sock Fabric Minimum Specifications**

Material Type	3 mil HDPE	5 mil HDPE	5 mil HDPE	Multi-Filament Polypropylene (MFPP)	Heavy Duty Multi-Filament Polypropylene (HDMFPP)
<b>Material Characteristics</b>	Photo-degradable	Photo-degradable	Bio-degradable	Photo-degradable	Photo-degradable
<b>Sock Diameters</b>	12" 18"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"
<b>Mesh Opening</b>	3/8"	3/8"	3/8"	3/8"	1/8"
<b>Tensile Strength</b>		26 psi	26 psi	44 psi	202 psi
<b>Ultraviolet Stability % Original Strength (ASTM G-155)</b>	23% at 1000 hr.	23% at 1000 hr.		100% at 1000 hr.	100% at 1000 hr.
<b>Minimum Functional Longevity</b>	6 months	9 months	6 months	1 year	2 years
<b>Two-ply systems</b>					
<b>Inner Containment Netting</b>	HDPE biaxial net				
	Continuously wound				
	Fusion-welded junctures 3/4" X 3/4" Max. aperture size				
<b>Outer Filtration Mesh</b>	Composite Polypropylene Fabric (Woven layer and non-woven fleece mechanically fused via needle punch)				
	3/16" Max. aperture size				
<b>Sock fabrics composed of burlap may be used on projects lasting 6 months or less.</b>					

The physical parameters of the compost should comply with the standards in Table 4.2. The standards contained in the PennDOT Publication 408 are an acceptable alternative.

**TABLE 4.2  
Compost Standards**

Organic Matter Content	80% - 100% (dry weight basis)
Organic Portion	Fibrous and elongated
pH	5.5 - 8.0
Moisture Content	35% - 55%
Particle Size	98% pass through 1" screen
Soluble Salt Concentration	5.0 dS/m (mmhos/cm) Maximum





# Legend



Culvert

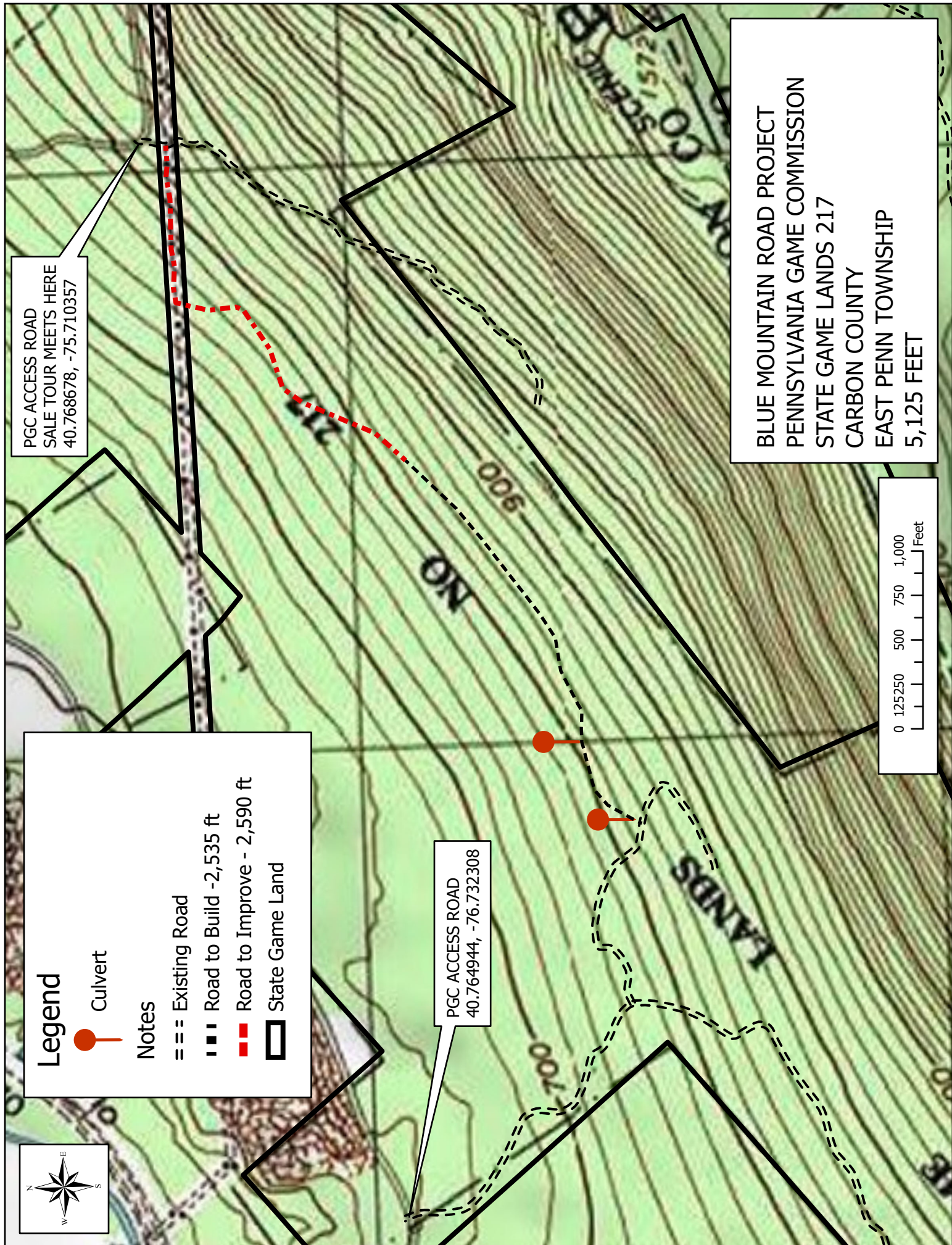
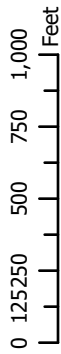
## Notes

- == Existing Road
- ▬ Road to Build - 2,535 ft
- ▬ Road to Improve - 2,590 ft
- ▭ State Game Land

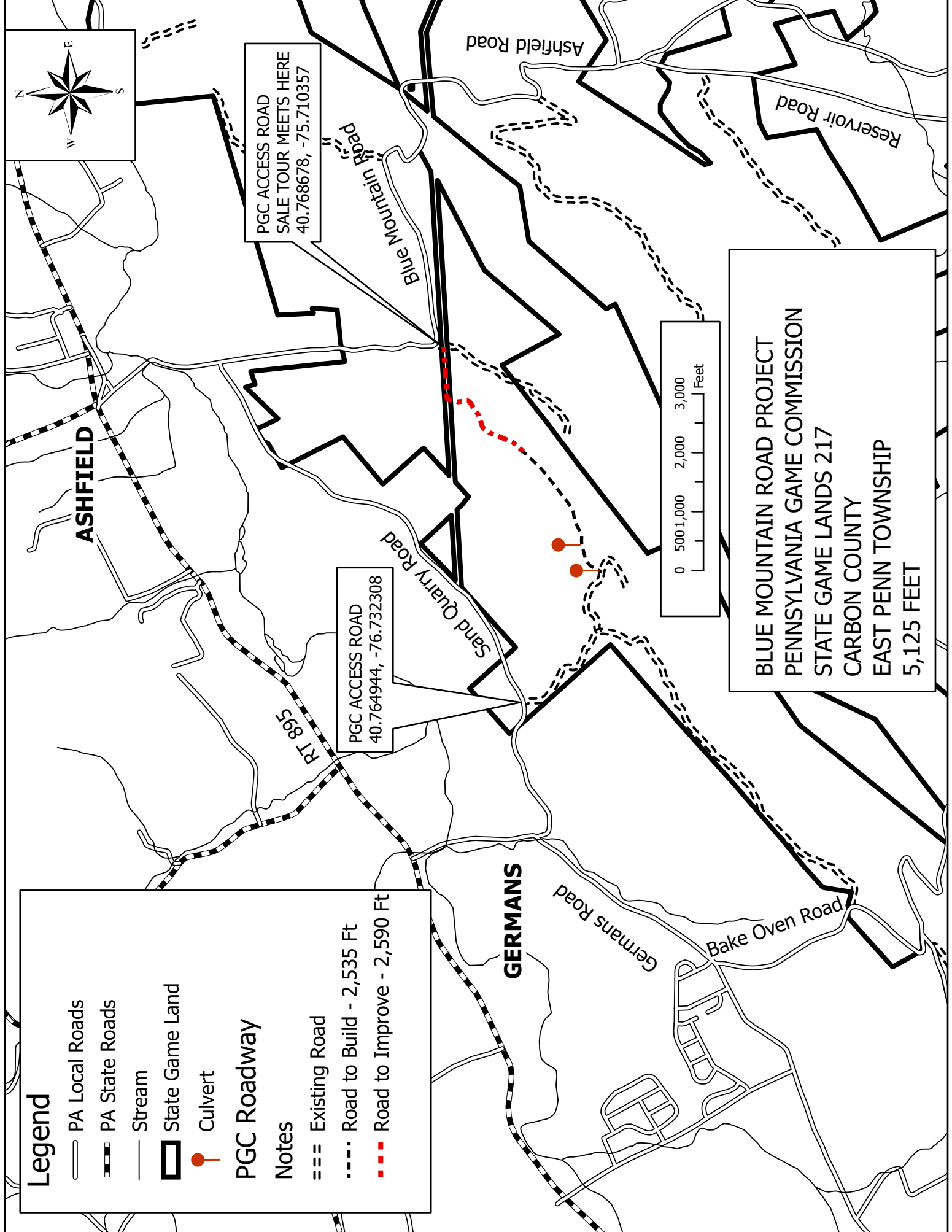
PGC ACCESS ROAD  
SALE TOUR MEETS HERE  
40.768678, -75.710357

PGC ACCESS ROAD  
40.764944, -76.732308

BLUE MOUNTAIN ROAD PROJECT  
PENNSYLVANIA GAME COMMISSION  
STATE GAME LANDS 217  
CARBON COUNTY  
EAST PENN TOWNSHIP  
5,125 FEET







**Legend**

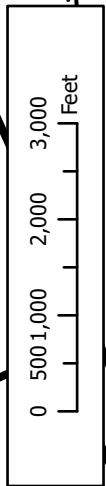
- PA Local Roads
- PA State Roads
- Stream
- ▭ State Game Land
- Culvert

**PGC Roadway**

- Notes**
- === Existing Road
  - Road to Build - 2,535 Ft
  - Road to Improve - 2,590 Ft

PGC ACCESS ROAD  
SALE TOUR MEETS HERE  
40.768678, -75.710357

PGC ACCESS ROAD  
40.764944, -76.732308



BLUE MOUNTAIN ROAD PROJECT  
PENNSYLVANIA GAME COMMISSION  
STATE GAME LANDS 217  
CARBON COUNTY  
EAST PENN TOWNSHIP  
5,125 FEET

## Report For Simple Road

<b>Sale Name:</b>	Simple Road	<b>SGL Number:</b>	217
<b>Forester:</b>	JAW	<b>Report Date:</b>	04/24/2020
<b>Blocks Numbers in Sale:</b>	1	<b>Acres:</b>	5.3
<b>County:</b>	Carbon	<b>Township:</b>	EAST PENN

### The Pennsylvania Game Commission SGL #217 - Simple Road Timbersale Scribner Rule (BDFT) - All Volumes are Estimates

Sale Summary by Harvest Block														
Block Number	Area		Harvest Type	Sawtimber				Pulpwood				Culls		
	Acres	% of Sale		Method	BDFT	Per Acre	% of Sale	Method	Tons	Per Acre	% of Sale	2 - 4"	6 - 10"	12 +"
1	5	100%	Road	100% Tally	22,862	4,320	100%	100% Tally	184	35	100%	124	6	5
Total	5	100%			22,862		100%		184	34.7	100%	124	6	5

# The Pennsylvania Game Commission

## SGL #217 - Simple Road Timbersale

### Scribner Rule (BDFE) - All Volumes are Estimates

Block All - 5 acres

Species	10"-12" DBH		14" DBH		16" DBH		18" DBH		20" DBH		22" DBH		24" DBH		26" DBH		28" DBH		30"+ DBH		Sawtimber Totals			Pulpwood	
	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	Total Trees	Total Volume	Avg Vol Per Tree	Trees	Tons
Yellow-poplar	1	48	0	0	0	0	4	880	5	1,560	6	2,495	4	2,068	1	689	0	0	2	1,527	23	9,267	403	4	1
Red Maple	28	1,178	11	975	8	1,018	4	569	1	247	1	308	0	0	0	0	0	0	0	0	53	4,294	81	184	42
Sweet Birch	11	388	11	870	8	1,067	0	0	1	177	0	0	0	0	0	0	0	0	0	0	31	2,502	81	89	22
White Oak	1	33	2	150	3	416	2	410	1	234	0	0	1	258	0	0	0	0	0	0	10	1,502	150	8	2
Black Oak	1	33	2	150	3	345	0	0	0	0	1	364	1	355	0	0	0	0	0	0	8	1,248	156	1	0
N. Red Oak	3	123	3	264	2	289	1	194	1	247	0	0	0	0	0	0	0	0	0	0	10	1,117	112	10	2
Chestnut Oak	2	63	5	414	1	135	3	489	0	0	0	0	0	0	0	0	0	0	0	0	11	1,101	100	16	5
Sassafras	15	480	5	303	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	783	39	34	9
Hickories	2	79	1	71	0	0	1	214	0	0	0	0	0	0	0	0	0	0	0	0	4	365	91	1	0
Black Gum	0	0	0	0	1	98	1	214	0	0	0	0	0	0	0	0	0	0	0	0	2	312	156	107	26
White Ash	0	0	1	49	1	175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	224	112	1	0
White Ash - dead	0	0	1	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	77	77	0	0
White Pine	0	0	1	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	71	71	2	0
Chestnut Oak - dead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	24
White Oak - dead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	24
N. Red Oak - dead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	13
Sassafras - dead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	3
Sweet Birch - dead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	3
Red Maple - dead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	2
Black Oak - dead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2
Scarlet Oak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
Yellow Birch	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
American Beech	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Serviceberry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Black Gum - dead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
<b>Total</b>	<b>64</b>	<b>2,424</b>	<b>43</b>	<b>3,395</b>	<b>27</b>	<b>3,543</b>	<b>16</b>	<b>2,970</b>	<b>9</b>	<b>2,466</b>	<b>8</b>	<b>3,167</b>	<b>6</b>	<b>2,681</b>	<b>1</b>	<b>689</b>			<b>2</b>	<b>1,527</b>	<b>176</b>	<b>22,862</b>	<b>130</b>	<b>649</b>	<b>184</b>



# The Pennsylvania Game Commission

## SGL #217 - Simple Road Timbersale

### Scribner Rule (BDFE) - All Volumes are Estimates

Block 1 - 5 acres

Species	10"-12" DBH		14" DBH		16" DBH		18" DBH		20" DBH		22" DBH		24" DBH		26" DBH		28" DBH		30"+ DBH		Sawtimber Totals			Pulpwood	
	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	Total Trees	Total Volume	Avg Vol Per Tree	Trees	Tons
Yellow-poplar	1	48	0	0	0	0	4	880	5	1,560	6	2,495	4	2,068	1	689	0	0	2	1,527	23	9,267	403	4	1
Red Maple	28	1,178	11	975	8	1,018	4	569	1	247	1	308	0	0	0	0	0	0	0	0	53	4,294	81	184	42
Sweet Birch	11	388	11	870	8	1,067	0	0	1	177	0	0	0	0	0	0	0	0	0	0	31	2,502	81	89	22
White Oak	1	33	2	150	3	416	2	410	1	234	0	0	1	258	0	0	0	0	0	0	10	1,502	150	8	2
Black Oak	1	33	2	150	3	345	0	0	0	0	1	364	1	355	0	0	0	0	0	0	8	1,248	156	1	0
N. Red Oak	3	123	3	264	2	289	1	194	1	247	0	0	0	0	0	0	0	0	0	0	10	1,117	112	10	2
Chestnut Oak	2	63	5	414	1	135	3	489	0	0	0	0	0	0	0	0	0	0	0	0	11	1,101	100	16	5
Sassafras	15	480	5	303	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	783	39	34	9
Hickories	2	79	1	71	0	0	1	214	0	0	0	0	0	0	0	0	0	0	0	0	4	365	91	1	0
Black Gum	0	0	0	0	1	98	1	214	0	0	0	0	0	0	0	0	0	0	0	0	2	312	156	107	26
White Ash	0	0	1	49	1	175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	224	112	1	0
White Ash - dead	0	0	1	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	77	77	0	0
White Pine	0	0	1	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	71	71	2	0
Chestnut Oak - dead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	24
White Oak - dead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	24
N. Red Oak - dead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	13
Sassafras - dead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	3
Sweet Birch - dead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	3
Red Maple - dead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	2
Black Oak - dead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2
Scarlet Oak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
Yellow Birch	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
American Beech	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Serviceberry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Black Gum - dead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
<b>Total</b>	<b>64</b>	<b>2,424</b>	<b>43</b>	<b>3,395</b>	<b>27</b>	<b>3,543</b>	<b>16</b>	<b>2,970</b>	<b>9</b>	<b>2,466</b>	<b>8</b>	<b>3,167</b>	<b>6</b>	<b>2,681</b>	<b>1</b>	<b>689</b>			<b>2</b>	<b>1,527</b>	<b>176</b>	<b>22,862</b>	<b>130</b>	<b>649</b>	<b>184</b>

## The Pennsylvania Game Commission SGL #217 - Simple Road Timbersale Scribner Rule (BDFT) - All Volumes are Estimates

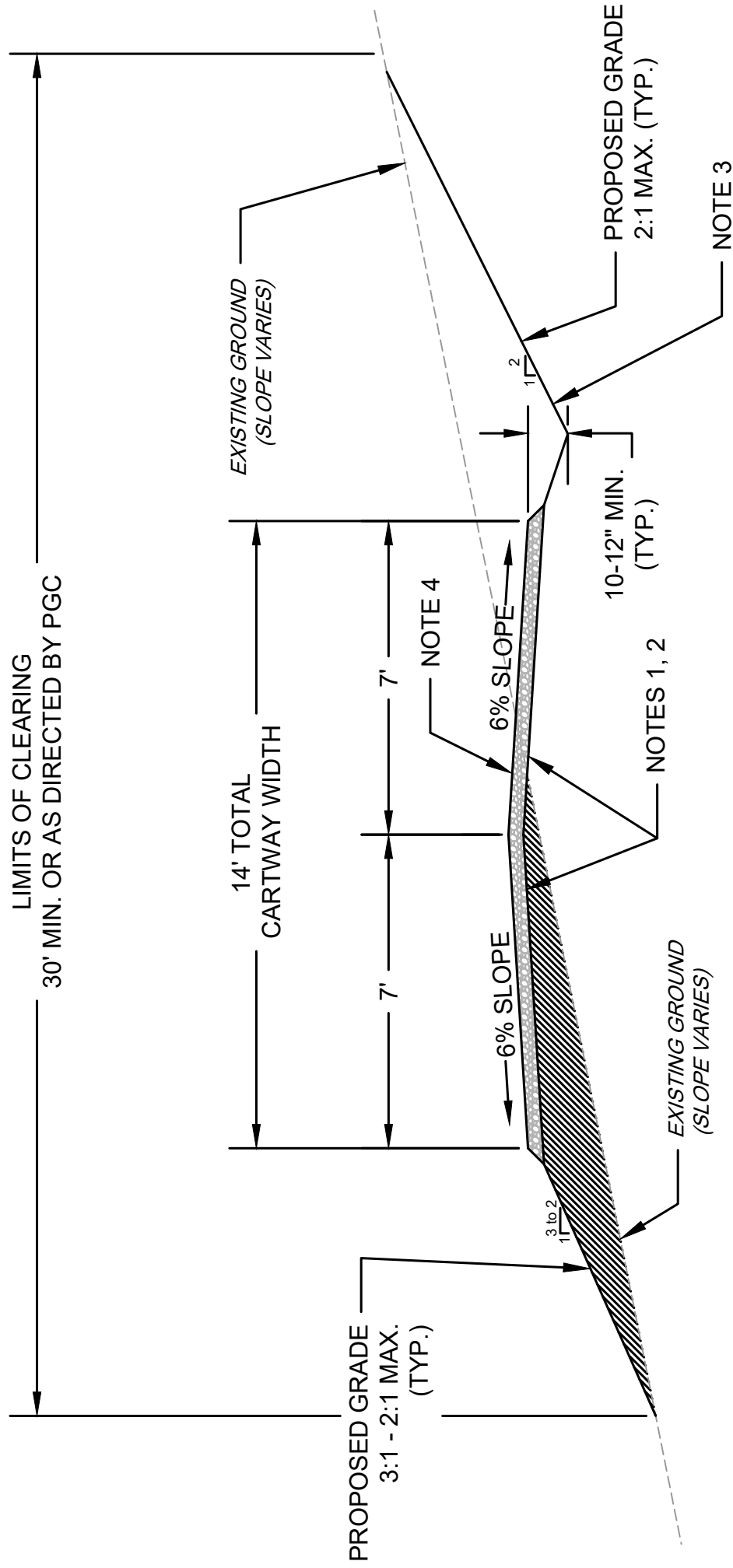
Block All - 5 acres - Pulp Tree Stand and Stock Table

Species	2" DBH		4" DBH		6" DBH		8" DBH		10" DBH		12" DBH		14" DBH		16" DBH		18" DBH		20"+ DBH		Pulpwood	
	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	#TR	VOL	Total Trees	Total Tons
Red Maple	0	0	0	0	85	10	68	15	39	15	4	2	1	1	0	0	0	0	1	2	198	45
Chestnut Oak	0	0	0	0	20	2	30	6	29	10	10	5	1	1	3	3	1	1	1	2	95	29
Black Gum	0	0	0	0	38	4	29	4	18	4	12	5	9	6	2	2	0	0	1	2	109	27
White Oak	0	0	0	0	2	0	7	1	10	3	6	3	5	4	1	1	5	7	1	2	39	26
Sweet Birch	0	0	0	0	32	4	26	5	31	10	6	3	2	1	1	1	0	0	0	0	98	25
N. Red Oak	0	0	0	0	6	1	11	2	5	2	5	3	1	1	0	0	1	1	2	4	32	15
Sassafras	0	0	0	0	15	1	17	2	21	5	4	2	2	1	1	1	0	0	0	0	60	12
Black Oak	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	1	1	0	0	4	2
Scarlet Oak	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	2	1
Yellow-poplar	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1
White Pine	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0
Yellow Birch	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
American Beech	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Serviceberry	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
White Ash	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Hickories	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
American Chestnut	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>					203	22	194	36	157	50	49	24	21	15	8	8	8	11	6	11	649	184



**CONSTRUCTION NOTES:**

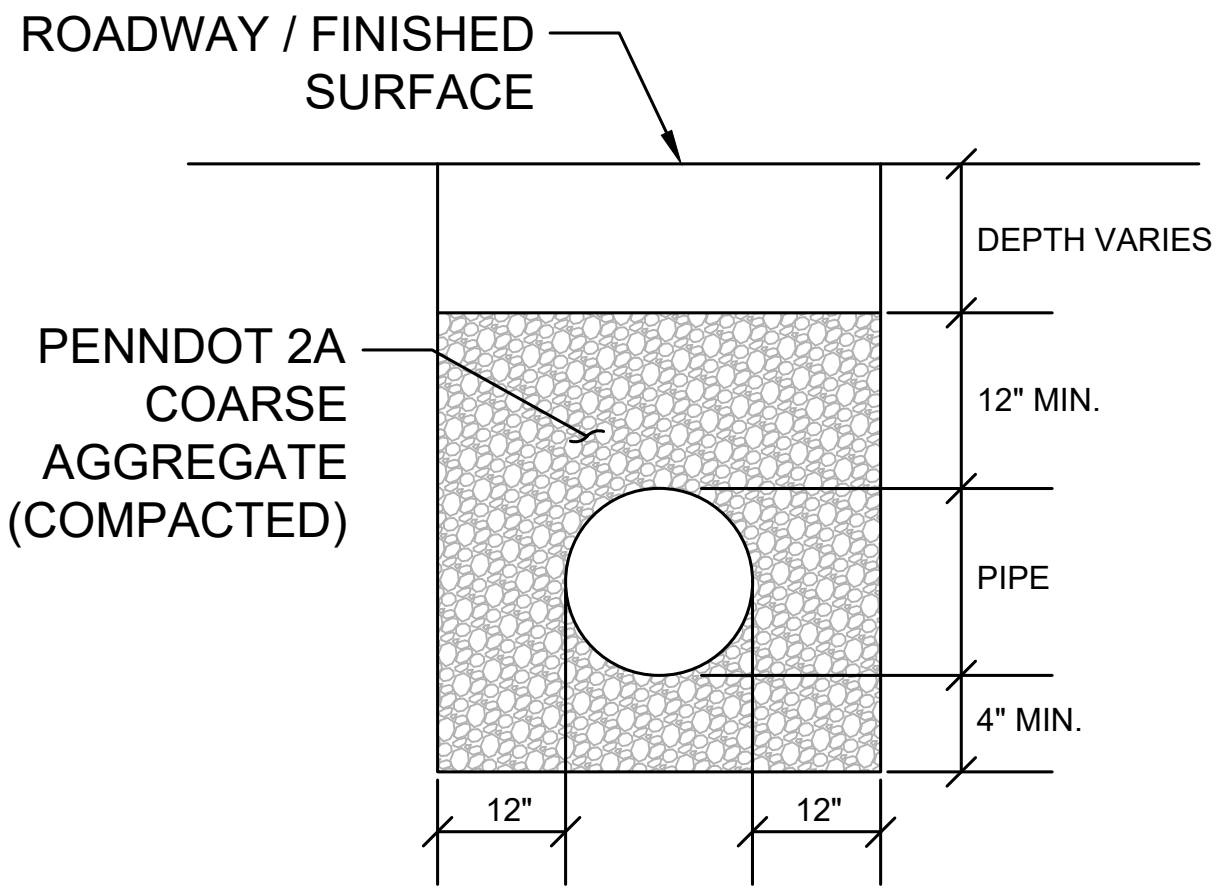
1. GRADE ROADWAY SUBGRADE TO REQUIRED WIDTH WITH CENTER CROWN AS SHOWN. BALANCE CUT / FILL AS REQUIRED TO MINIMIZE SPOIL MATERIAL. PROVIDE SUITABLE ON-SITE FILL MATERIAL ACCEPTABLE TO PGC STAFF FOR ROAD BASE MATERIAL - NO ROCKS > 4" OR ORGANIC MATERIALS. COMPACT SUBGRADE WITH 10-TON (MIN.) VIBRATORY DRUM ROLLER.
2. PROVIDE GRADE BREAKS AND BROAD BASED DIPS AS REQUIRED OR AS DIRECTED BY PGC STAFF TO ACCOMMODATE THE TERRAIN AND SITE CONDITIONS TO FACILITATE DRAINAGE ALONG AND ACROSS ROADWAY.
3. PROVIDE DITCHES AND DITCH TURNOUTS AS SHOWN OR AS DIRECTED BY PGC STAFF TO COLLECT AND DIRECT STORMWATER RUNOFF AWAY FROM ROAD SURFACE.
4. PROVIDE AASHTO #3 COARSE AGGREGATE ROAD SURFACE - 4" MINIMUM COMPACTED DEPTH WITH CENTER CROWN AS SHOWN. COMPACT WITH 10-TON (MIN.) VIBRATORY DRUM ROLLER.



 SUBGRADE FILL (TYP.)

**DETAIL - TYPICAL ROADWAY SECTION  
PROPOSED NEW ROAD**

NOT TO SCALE



**PIPE BEDDING DETAIL**

NOT TO SCALE

# Technical Bulletin

## Broad Based Dips

**BROAD BASED DIP (BBD) –** An intentional reverse grade built into a roadway that diverts flow from the road surface and the uphill ditch across the road to a discharge area.

### PURPOSE

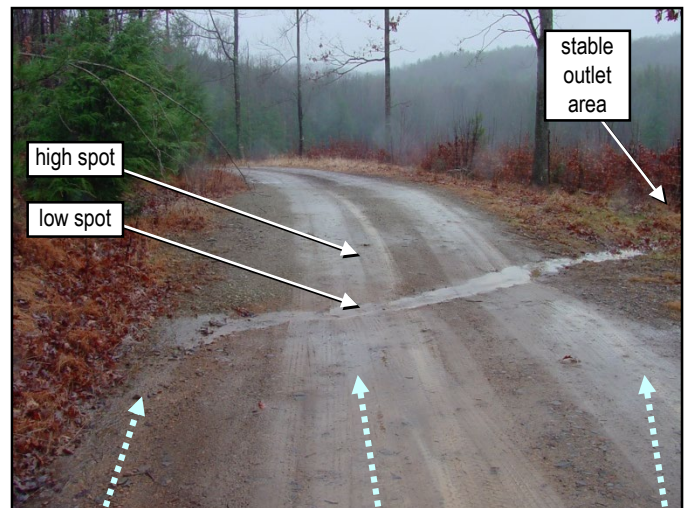
*Broad based dips* collect flowing water from the road surface and ditches and direct it across the road to a stable outlet. In certain situations, *broad based dips* can be used in place of crosspipes, to convey water from the uphill ditch across the road to an outlet. A *Broad based dip* can prevent accelerated aggregate loss and sediment generation by stopping drainage from flowing a long distance in wheel tracks or ruts.

### BENEFITS

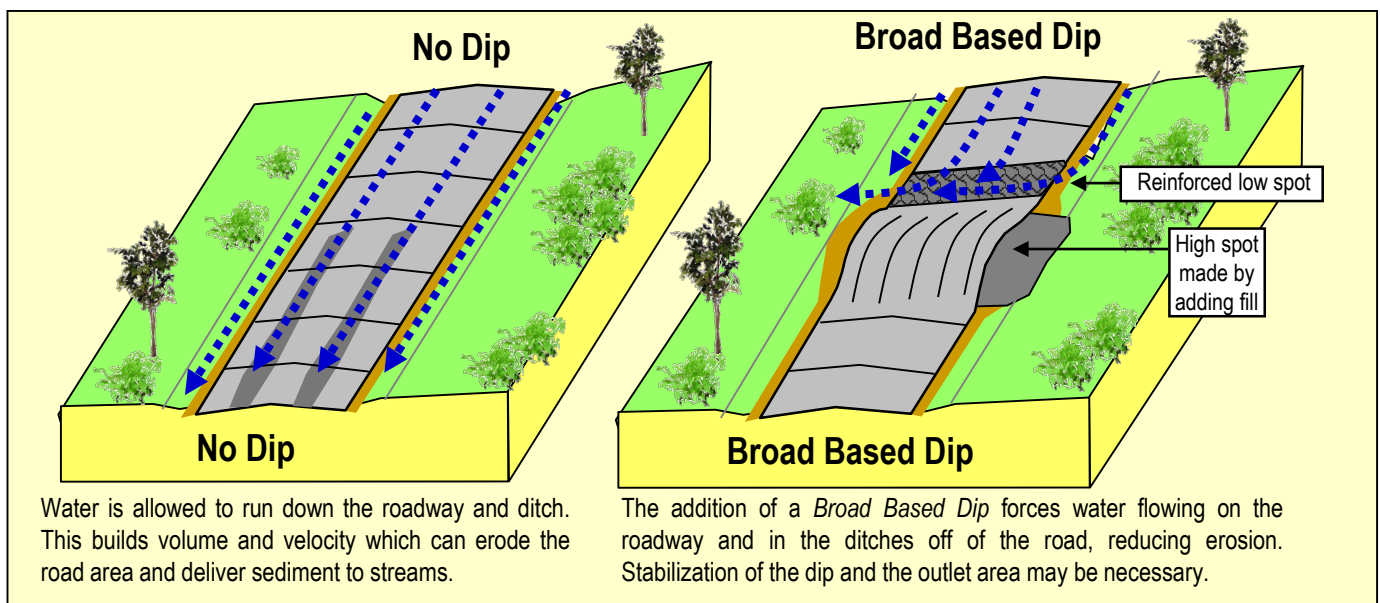
- Prevents erosion caused by concentrated water flowing on road.
- Serves as an outlet for drainage from the uphill side of the road, reducing erosion and potential stream pollution from long ditch runs.
- Cheap, easy, and effective on low volume roads.

### CONSIDERATIONS

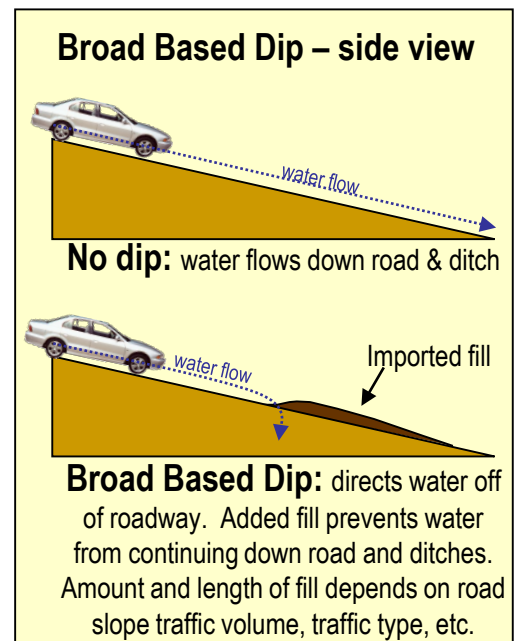
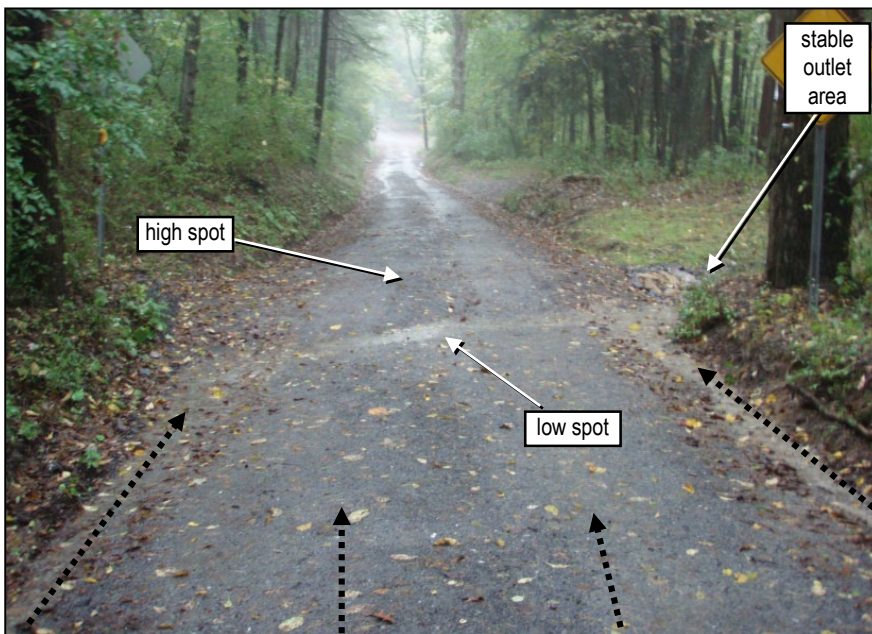
- Use discretion when considering *broad based dips*. BBDs are only appropriate for use on low traffic roads. Roads with high vehicle traffic and oversized loads may not be appropriate for *broad based dips*.
- *Broad based dips* may not be appropriate on roads with a slope of greater than 10%.
- Depending on site conditions, it may be necessary to reinforce the bottom of the dip and dip outlet to prevent erosion.
- *Broad based dips* are not “mini fords,” and are not intended to accommodate continually flowing water such as springs or streams.



This *broad based dip* is located on a forest access road that is only open to the public for hunting season. This low-use road is an ideal location to use *broad based dips* instead of crosspipes to reduce long term maintenance. This simple and effective drainage practice is a good fit in this situation.







A *broad based dip* is pictured here during a rainstorm. Notice how gradual the dip would be to vehicles, yet how effectively road and ditch flow is directed across the road. Without the dip, road and ditch drainage would continue to build erosive force downslope.

### CONSTRUCTION CONSIDERATIONS

- **SPACING:** Multiple *broad based dips* can be used in sequence, similar to crosspipes, to drain a long stretch of road. Spacing for *broad based dips* depends on site-specific conditions including road slope, upslope drainage, soil type, and available outlets.
- **SIZE & SHAPE:** Size determination for *broad based dips* will vary depending on road slope and anticipated traffic. BBDs on flat roads may be relatively small, with slight elevation changes and short fill transitions. Whereas dips installed on steeper sections of road will need to be higher and will require longer approaches to ease the transition into and out of the structure. Be sure to take anticipated traffic into account. The abrupt dip pictured on the front of this document is on a private access road. The BBD pictured above is on a public road and has much smoother transitions to accommodate cars and commercial vehicles. A relatively wide channel in the dip bottom is recommended to spread flow and to ease vehicle transitions. The upslope end of the dip should be tied into the uphill bank to insure water does not bypass the structure and continue to flow down the ditch.
- **ANGLE:** *Broad based dips* should be angled across the road at approximately 20-40 degrees and not placed perpendicular to the road like a speed bump. The angle will facilitate the flow of water across the road. A dip placed straight across the road is more likely to fail and causes more erosion, since it forces water to turn at a right angle to cross the roadway.
- **SLOPE:** Similar to a crosspipe, the bottom of a *broad based dip* should have a continuous elevation drop towards the outlet end. The slope is usually dictated by the grade of the road and the angle of the dip.
- **DIP REINFORCEMENT:** Because a *broad based dip* is designed to carry concentrated flow on the surface of the road, reinforcement of the dip bottom is recommended, especially on steeper slopes. Hard stone and even geo-synthetic materials can be used to reinforce the bottom of the dip to resist erosion.
- **OUTLET REINFORCEMENT:** Because *broad based dips* discharge concentrated flow like a crosspipe, the outlet area must be stable. When possible, outlet dips into a vegetated buffer areas. Depending on the flow volume and velocity, additional stabilization methods, such as rock armoring, may be required.
- **MAINTENANCE:** A properly constructed *broad based dip* will function with minimal maintenance. Mark BBDs as you would other drainage features and take care not to remove them during future maintenance.

Broad based dips are a cheap and effective means of drainage control on low volume public roads. In addition, BBDs help control run-on flow from farm lanes, camp roads, and other access roads that intersect the public road. Remember to always discharge dips to a stable outlet away from streams.

*Grade Breaks* are also effective road surface drainage structures and are covered in a separate technical bulletin.

**Crosspipe Installation:** This technical bulletin deals with techniques for the installation of traditional road drainage culverts (not stream pipes). Traditional crosspipes rely on road surface elevation to determine pipe depth. A related technical bulletin includes details of a “Shallow Crosspipe Installation.”

## Pipe Elevation

Adhere to minimum cover requirements and attempt to outlet pipes at the elevation of the natural ground, where possible. This will eliminate the need for long “tail ditches” at pipe outlets, which are an on-going source of maintenance and erosion. More information on pipe elevation can be found in the “Shallow Crosspipe Installation” Tech Bulletin.

## Pipe Length and Angle

On roads with linear grade, install crosspipes at an angle, to line up with natural drainage patterns and to more efficiently move water through the road (*Figure 1*). This has advantages over installing pipes straight across a road:

- Reduces erosion around pipe inlet and outlet that results when water “turns” to enter or exit the pipe.
- Pipe efficiency is increased when water does not have to turn 90° to enter the inlet.
- Traffic loading on the pipe is decreased, since only one vehicle tire at a time is directly over the pipe.
- Angled pipes tend to “self clean,” and collect less sediment and debris in the pipe and at the inlet.

## Bedding/Fill Material

When selecting a material for use as bedding and fill around a crosspipe, compaction and frost action are the two most important concerns. When possible, use the material that is excavated out of the pipe trench. However, if the material contains a lot of large rocks it will not compact properly and new material must be imported. Keep in mind the following when selecting a bedding material:

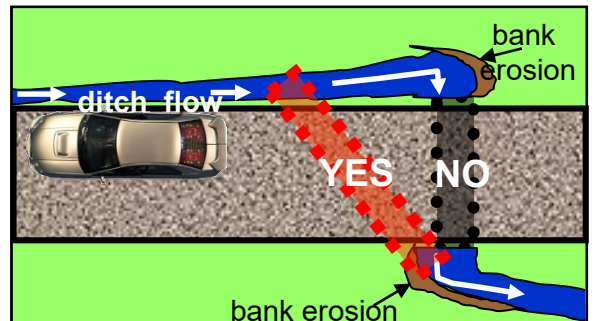
- Imported bedding and fill should be as similar as possible to existing road material. This will insure that the entire road will react in the same way to cycles of freeze and thaw.
- Bedding and fill material must be moist to achieve the best compaction. Compaction is crucial beneath, beside, and above the pipe to provide proper pipe support and avoid pipe flexing. A ribbed pipe gets its structural strength when properly compacted into the road bed.
- Some common fill materials include crushed bank run gravel, shale, and PENNDOT 2RC aggregate.

## Other Considerations

- When raising the road, fill should be placed and compacted prior to pipe installation. After road fill is in place, excavate the pipe trench and proceed with installation.
- Ensure that all crosspipes have effective fall (shoot for 2%+ and no less than 1%).
- Pipes require headwalls and endwalls to reduce erosion, improve function, and protect the pipe inlet/outlet.
- Drop-inlets (grates like on storm sewers) are not recommended for use on unpaved roads.



**Photo 1.** A plastic crosspipe is shown during installation. Notice the pipe bedding material, endwall, and stone at outlet.



**Figure 1.** The crosspipe shown in black is improperly aligned straight across the road. The red pipe indicates a better pipe placement that will carry more water, cause less erosion, and will better resist crushing.



## Crosspipe Installation

1. **Excavate Pipe Trench:** Trench should be wide enough to fit compaction device (*shown in "D"*) on both sides of pipe. Trench depth will depend on outlet elevation. Ideally, outlet pipe at natural ground elevation to eliminate the need for a tail-ditch. Bottom of pipe inlet should be at the same elevation as the upslope ditch. Use a level to ensure fall in the pipe trench (see photo A). If needed, use fill to adjust the elevation of the upslope ditch and the road surface to ensure pipe has fall and proper cover. *Consider a Shallow Crosspipe where appropriate.*
2. **Place Pipe Bedding:** Once the trench is complete, some bedding material may be needed. Use bedding to smooth trench bottom for pipe support and to achieve proper fall. Some shovel and rake work is usually required to spread bedding evenly. Use a level to find any uneven spots and double-check slope (See *photo B*). Compact bedding material before pipe placement.
3. **Place Pipe in Trench:** Place and align first section of pipe in trench. Pipe inlet should be located in the existing ditch line, with room between the pipe and the bank for a headwall. Inlets that are too close to the road pose traffic hazards. Inlets that are too far off the road can cause unnecessary bank erosion. Align additional pipe sections and secure together with collars or by seating the attached gasket. Look for uniform support in the pipe bedding. Voids under the pipe will cause sagging upon compaction. Headwalls and endwalls can be constructed at this time or after the pipe installation is complete. Either way, the fill behind headwalls and endwalls must be placed and compacted in shallow lifts (3 min) and should tie the wall into the road bed.
4. **Place and compact fill material around pipe:** Place the first lift of fill material around pipe until approximately 8" of material is on each side of pipe. Pipe must be held in place so fill material does not move or lift pipe (See *photo C*). Use an upright tamper to compact fill on both sides of pipe. Compaction of the first layer of fill material is crucial because it fills voids and packs material around the base of the pipe for support (See *photo D*). The importance of compaction cannot be overstated! HDPE pipes (plastic pipes) get their structural strength from the material compacted tightly around them and into the ribs. Care should be taken not to damage the pipe with the foot of the tamper while compacting. Continue to fill and compact in stages, or lifts, placing approximately 8" of fill before compaction. If too much fill is placed at once, proper compaction cannot be achieved. Continue to fill and compact overtop of pipe (See *photo E*). Be sure to provide adequate compacted cover over the pipe. Adequate cover varies with pipe size and construction. Most plastic pipes, up to 48" in diameter, require a minimum of 12" of compacted cover.
5. **Never allow truck traffic over partially installed crosspipes without at least 12" of compacted cover for protection.**





# Technical Bulletin

## Grade Break



PennState

2/2019

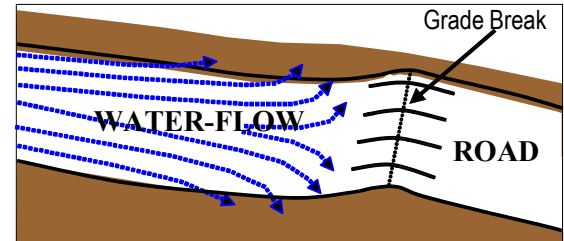


Center for Dirt and Gravel Road Studies

**GRADE BREAK** – An intentional rise in road elevation on a downhill slope, which causes water to flow to both sides of the road, where it can be collected in ditches or dispersed at a stable outlet.

### HOW DOES A GRADE BREAK WORK?

An intentional increase in road surface elevation, or a “hump” in the road, slows water flowing on the road (in wheel tracks or in erosion rills) and allows established cross-slope to drain the surface. The linear grade on the upslope end of the hump must be less than the established crown, or side-slope for the grade break to be effective. A grade break that creates a reverse grade on the road surface is optimal.



**NO GRADE BREAK** – Water flows on road causing excess erosion and aggregate loss.



**WITH GRADE BREAK (and associated crosspipe)** – Interruption in slope redirects flow and guides water to a pipe inlet and a turnout.

### BENEFITS OF GRADE BREAKS

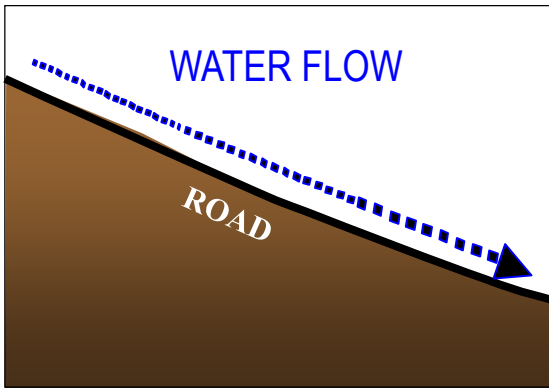
- *Grade Breaks* prevent loss of purchased aggregate and associated sediment
- *Grade Breaks* reduce road maintenance expenses
- *Grade Breaks* provide a measure of insurance against road washouts
- *Grade Breaks* can calm traffic by inducing lower driving speeds
- *Grade Breaks* can provide necessary pipe cover where shallow pipes are desired or required

### WHERE TO USE GRADE BREAKS

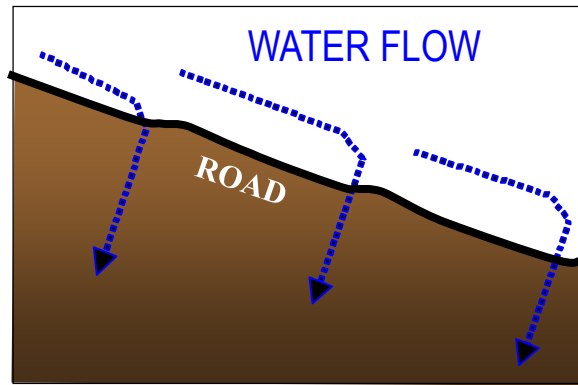
- On a sloping section of road where crown cannot be adequately maintained.
- Prior to stream crossings to force surface drainage into turnouts or vegetative filters.
- At frequent enough intervals to prevent the build up of concentrated water on the road surface.
- Prior to cross pipes to cause water to flow into the inlet side ditch.
- On unpaved access roads that intersect the main road from upslope, to reduce run-on flow.
- *Grade Breaks* may not be appropriate on roads with a slope of greater than 10%.

*Grade Breaks* are easy to build with common construction equipment. They are inexpensive, but highly effective structures to reduce and prevent erosion of dirt and gravel roads. When installed on access roads, grade breaks can also be a very effective way to reduce problematic run-on flow.





**NO GRADE BREAKS** – When a road lacks effective crown, water can flow on the road, in wheel tracks, ruts, etc., causing aggregate loss and generating sediment pollution.



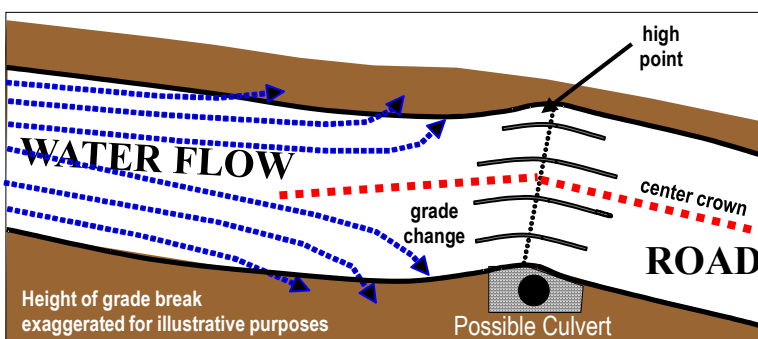
**GRADE BREAKS** – Intentional grade changes on the road forces water to leave the road surface. Road slope and site conditions influence the practicality and number of grade breaks possible.

### IMPORTANT CONSIDERATIONS:

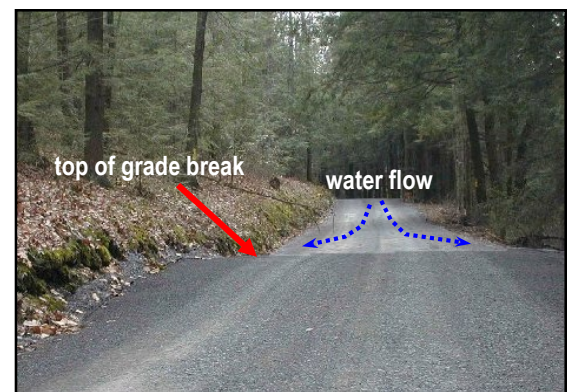
**Spacing:** On a long sloped road, multiple *grade breaks* may be used in succession to bleed water from the road and prevent the buildup of erosive volume and velocity. The degree of slope is the main determining factor in *grade break* spacing. Steeper slopes require *grade breaks* at closer intervals. However, site characteristics, such as available outlets and curves, will often influence the actual number and location of the grade breaks.

**Transitions:** It is important to gradually taper a *grade break* back into the main road. A *grade break* on a public road should not hinder traffic, yet should still function to divert water off of the road. A smooth *grade break* can be attained by lengthening the transitions away from the high point of the hump. However, be careful to maintain enough of a grade change to force water to leave the road surface. Generally, aggressive *grade breaks* will function longer, but they cannot be so aggressive that anticipated traffic bottoms out.

**Maintenance:** Grader operators must be instructed to maintain crown through a *grade break* without eliminating the crown or the *grade break*. Since grading operations traditionally strive to eliminate surface deviations, an uninformed operator may see a *grade break* as a surface irregularity or a source of road material for use in other areas. Mark grade breaks as you would other drainage features such as pipes.



**Compressed illustration showing road surface water drainage patterns at *grade break*. Maintaining crown through the *grade break* sheds flow to the road sides.**



**GRADE BREAK-** Notice the rise in the road and ditch along the upslope (left) side of the picture. A *grade break* in this terrain pairs well with a crosspipe.

### BROAD BASED DIPS:

A *broad based dip* is similar to a *grade break*, but instead conveys water across the road surface to a discharge area. *Broad based dips* are also effective road surface drainage structures and are covered in a separate technical bulletin.



# Technical Bulletin

## Stacked Stone Headwalls



PennState

1/2019



Center for Dirt and Gravel Road Studies

**Headwall or Endwall**– An integrated wall located at either end of drainage pipe or a stream crossing structure. A wall built at a pipe inlet is a **headwall**. A wall built at a pipe outlet is an **endwall**.



**Stable headwall with bankwall**



**Stable stacked stone endwall**

**PURPOSE** – Headwalls and Endwalls protect vulnerable pipe ends and support the road edge. In addition, these walls also serve to direct flow, to reduce erosion, and to visually identify pipes along the road. When properly constructed, a headwall can improve pipe efficiency and an endwall can stabilize a steep road bank.

**BENEFITS** – Properly installed headwalls and endwalls provide multiple maintenance and environmental benefits which are explained in the Center’s separate “Headwalls and Endwalls” technical bulletin. This bulletin focuses on the construction of these walls with the most common building material, natural stone.

### WHERE TO USE

- Use with all road drainage pipes, including crosspipes, through-pipes, bank pipes and driveway pipes.
- Use with all stream crossing structures, including pipes, box culverts, and bridges.

### CONSIDERATIONS

- Headwalls and Endwalls are an integral part of drainage pipes and road stream crossings.
- Natural stone headwalls and endwalls often combine both cost effectiveness and durability.
- The strength of a rock wall comes from the weight and friction of the interwoven stacked stones.
- The stability of a stacked wall results from tightly fitting stones, staggered joints, proper canter, and the use of sufficient “tie-ins” to compacted soil (multiple deadman anchors).

### Typical Requirements for headwalls and Endwalls constructed of stone

**Materials:** Any size and shape stone can be used. However, construction will be easier with rocks of a uniform thickness, flat on at least two sides, that can be handled by one person. Where native stone is unavailable in or near the road corridor, headwalls and endwalls can be constructed using purchased landscape stone or retaining wall blocks. Whether your stones are rectangular or irregularly shaped, the key to a durable dry-laid stone wall is to interlock the stones and to tie the stones to the soil behind the wall. Attention to detail during construction separates a good wall from a poor wall. Many of the stone walls constructed by the Civilian Conservation Corps (CCC) in the 1930s are still functioning today.

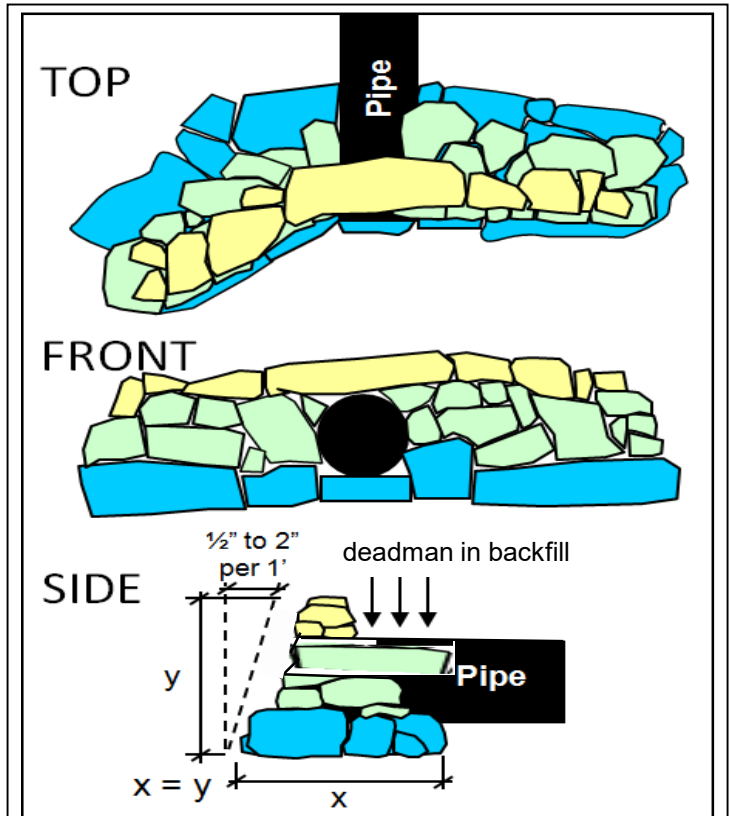
**Equipment:** Gloves, a shovel, a hand tamper and an eye for detail are all that is needed. A pick or a prybar are handy to have. A sledgehammer may help to adjust embedded stones. However, a backhoe and a skilled operator can save time and labor when large rocks are available. Don’t forget your safety equipment.

## Stone Headwall Construction

1. If necessary, excavate around the pipe end to make room for the wall. Walls typically extend 2-3 times the diameter of the pipe on each side of the pipe. The base of the wall should be level with, or lower than, the bottom of the pipe inlet.
2. Use rocks with flat sides in the face of the wall. Use the largest available stones for the base course and slightly smaller stones in consecutive courses. Take care to stagger the joints and slightly cant the wall toward the road in each successive course. Periodically install a longer stone into the wall face with the long axis perpendicular to the face of the wall. Compact this “deadman” stone into the wall backfill.
3. Backfill and compact behind the wall in layers as it is built. Use material that is damp enough for compaction and free of large roots and clumps of organic material.
4. Build the wall to the top of the pipe. Place a large capstone over the top of the pipe to bridge the two halves of the wall together and protect the pipe. If a large stone is unavailable, continue to build the wall to attain a stable span of smaller stone over the pipe, alternating the joints in the rock.

## Important Considerations

- Be aware that the size and shape of headwalls will vary based on pipe size, road and pipe alignment, stream or ditch alignment, and approach velocities.
- On roads with linear grade, construct headwalls to “plug” the inboard ditch and to turn flow into the pipe.
- Integrate a bankwall into the headwall design where unstable slopes exist at the pipe inlet.
- Be sure that the wall backfill is sufficiently compacted behind the wall and around the “deadman” anchors.
- Headwalls can be reinforced by placing fabric between successive layers of rock, and tying the fabric into the backfill, creating a geosynthetic “deadman.” This technique may be especially useful when working with rounded stone or landscape block.
- Consider identifying pipe ends with a reflective post or similar marker.



Plan views of a stone headwall. Note that the base width should be equal to the height, the face should be sloped or canted back, seams should be overlapped like bricks, and “deadman” anchors should be mixed throughout.



A properly constructed natural stone headwall can last for decades.