EROSION AND SEDIMENT POLLUTION CONTROL PLAN

S.R. 2045 Section 02B
Culvert Replacement Project
over Tumble Brook

Upper Saucon Township
Lehigh County

May 10, 2005

prepared for:

prepared by:
TO: Lehigh County Conservation District
   Attn: Kim Zieger

DATE: 05/10/05

RE: S.R. 2045, Section 02B

MKA Proj. No. 01085-02

CC: Stanley Poplawski, PennDOT District 5-0

WE ARE TRANSMITTING TO YOU THE FOLLOWING ITEMS:

✓ Reports
   Prints ✓ Plans
   Specifications Copy of Letter Change Order Other

<table>
<thead>
<tr>
<th>Copies</th>
<th>Date</th>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>05/10/05</td>
<td>1</td>
<td>Erosion and Sediment Pollution Control Plans and Narrative</td>
</tr>
</tbody>
</table>

THESE ARE TRANSMITTED:

<table>
<thead>
<tr>
<th>Approved</th>
<th>For Your Use</th>
<th>As Requested</th>
<th>For Review</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Approved as Noted</td>
<td>Returned for Corrections</td>
<td>Rejected</td>
</tr>
</tbody>
</table>

Kim,

Enclosed is one copy of the Erosion and Sediment Pollution Control Plan and Narrative for the S.R. 2045, Section 02B Project. This project was formerly field viewed by your office.

Should you have any questions or require additional information, please contact me directly at 610-791-2700 or via e-mail at atoth@mctish.com.

Anthony P. Toth, M.S., AICP
Environmental Planner

McTish, Kunkel & Associates
2402 Sunshine Road, Allentown, PA 18103
Phone (610) 791-2700  Fax (610) 791-5425
www.mctish.com
EROSION AND SEDIMENT POLLUTION CONTROL PLAN

PROJECT NAME:  S.R. 2045 Section 02B  DATE: 05/10/05
------------------------------------------Culvert Replacement Project

LOCATION:  Upper Saucon Township, Lehigh County

OWNER:  PennDOT Engineering District 5-0
1713 Lehigh Street
Allentown, PA 18103

TELEPHONE:  (610) 798-4138
Donald E. Lerch, P.E., Assistant District Engineer - Design

PERSON(S) RESPONSIBLE FOR CONSTRUCTION AND MAINTENANCE OF EARTHMOVING OPERATIONS AND EROSION AND SEDIMENT POLLUTION CONTROLS:

PENNDOT DISTRICT 5-0 AND ITS SELECTED CONTRACTOR WILL BE RESPONSIBLE FOR CONSTRUCTION AND IMPLEMENTATION OF THE EROSION AND SEDIMENT POLLUTION CONTROL PLAN.

TELEPHONE:  (610) 791-6049
Stephen R. MacLean, P.E., Assistant District Engineer - Construction

EROSION AND SEDIMENTATION CONTROL PLAN PREPARATOR:

Anthony P. Toth, M.S., AICP
McTish, Kunkel & Associates
2402 Sunshine Road
Allentown, PA 18103

TELEPHONE:  (610) 791-2700
EROSION AND SEDIMENT POLLUTION CONTROL PLAN

102.4(b)(3) RECORD OF TRAINING AND EXPERIENCE IN EROSION AND SEDIMENT CONTROL METHODS AND TECHNIQUES

NAME OF PLAN PREPARER: Anthony P. Toth, M.S., AICP

FORMAL EDUCATION: Shippensburg University of Pennsylvania
Curriculum or program: Geo-Environmental Studies
Dates of attendance: From: 1989 to 1996
Degrees received: Master of Science, Bachelor of Arts

OTHER TRAINING:

- Former Erosion and Sedimentation Engineering Technician,
  Lehigh County Conservation District, 1996

- Erosion & Sediment Pollution Control Plan Designers Seminar
  Pennsylvania Department of Environmental Protection, March 2005

- Erosion & Sediment Pollution Control Plan Design Training
  Pennsylvania Department of Environmental Protection, October 2000

- Erosion & Sediment Pollution Control Plan Design Training
  Pennsylvania Department of Environmental Protection, February 1998

- Hazardous Waste Management, Villanova University, Department of Civil and
  Environmental Engineering Graduate School, 1998

- DEP’s Land Recycling Program, Client Workshop
  Pennsylvania Department of Environmental Protection, 1998

- Environmental Impact Statements Case Studies
  PennDOT Bureau of Environmental Quality, 1998

- Pennsylvania’s Best Management Practices for Developing Areas
  Pennsylvania Department of Environmental Protection, 1998

- Soil Bioengineering for Streambank Stabilization, Rutgers University, 1997

- Pennsylvania’s Traffic Calming Handbook, PennDOT, 2002

EMPLOYMENT HISTORY:

Current Employer: McTish, Kunkel & Associates
(610) 791-2700

Former Employers: Lehigh County Conservation District
(610) 391-9583
Barry Isett & Associates
(610) 398-0904
EROSION AND SEDIMENT POLLUTION CONTROL PLANS PREPARED:

S.R. 22 Reconstruction Project, Lehigh and Northampton Counties
Airport Road Area Improvements Project, Lehigh and Northampton Counties
S.R. 81 Section SDC, New Interchange with S.R. 4007, Schuylkill County
S.R. 61 Reconstruction Project, Berks County
Lehigh Canal Restoration in Hugh Moore Park, Northampton County
Sumner Avenue Bridge, Lehigh County
Stroudsburg Junior High School, Monroe County
Saucon Valley Country Club Streambank Stabilization and Bioengineering Project, Lehigh County
Church Road Realignment, Montgomery County
Schaefer Run Bridge Temporary Stream Crossing, Lehigh County
Lincoln Avenue Underpass, Lehigh County
Columbia Street Bridge Replacement Project, Lehigh County
S.R. 248 Over Aquashicola Creek, Bridge Replacement Project, Carbon County
Dorney Park and Wildwater Kingdom, Stream Restoration Project, Lehigh County
Dorney Park and Wildwater Kingdom, Water Distribution Improvement Project, Lehigh County
Brookshire Subdivision, Lehigh and Berks Counties
Tobyhanna Pipeline Project, UGI Utilities Inc., Monroe County
Lafayette Street Reconstruction Project, Northampton County
S.R. 3011 Culvert Replacement Project, Wayne County
S.R. 3040 Culvert Replacement Project, Wayne County
S.R. 4033, Seg. 150, Culvert Replacement Project, Wayne County
S.R. 4033, Seg. 170, Culvert Replacement Project, Wayne County
S.R. 690 Culvert Replacement Project, Lackawanna County
S.R. 3004 Culvert Replacement Project, Luzerne County
Charles Nehf Recreational Trail Bridge over Coplay Creek, Lehigh County
S.R. 0611, Section MRB over Mud Run Bridge Replacement, Northampton County
Best Buy, New Access Driveway, Lehigh County
John B. Bartram Pedestrian Trail, Schuylkill County
Whispering Farms Subdivision, Lehigh County
F&M Subdivision, Lehigh County
S.R. 33, Bushkill Creek Stream Lining Project, Northampton County
Toyota Land Development Plan, Lycoming County
Jim Thorpe Signalization Project, Carbon County
S.R. 81, Section 256, Emergency Bridge Repair, Lackawanna County
S.R. 2045, Section 02B, Culvert Replacement Project
GENERAL STATEMENT OF THE PROJECT

LOCATION:

The project is located in Upper Saucon Township, Lehigh County where S.R. 2045 intersects with Tumble Brook. The existing bridge is located approximately 750 feet south of West Passer Road and 650 feet north of Mill Road.

PROJECT DESCRIPTION:

The project involves replacement of the existing structurally deficient and functionally obsolete concrete encased steel girder and floorbeam bridge with a dual cell box culvert. The new structure will be constructed on the same alignment and at the same location as the existing structure. Minor roadway approach work will also be completed as part of this project which will include pavement replacement and drainage improvements.

The project will be constructed in three (3) separate phases and will require approximately one month for completion. The roadway will be closed to traffic during construction. A temporary cofferdam will be utilized to allow for removal of the existing structure and construction of the new box culvert. Because of the potential for impacts to Bog Turtles, special construction staging will be implemented, including the demolition and removal of the existing bridge during the winter between October 15th - March 15th.

A Joint Permit Application in accordance with Chapter 105 is being submitted for all encroachments upon the watercourse and floodway.

1. THE EXISTING TOPOGRAPHIC FEATURES OF THE PROJECT SITE AND THE IMMEDIATE SURROUNDING AREA.

Existing topographic features of the project site and immediate surrounding area are shown on the plan drawings. The mapping is legible and includes a north arrow, covers a sufficient surrounding area, includes existing contours, existing improvements, existing streams, wetlands, and receiving watercourses. The map scale is 1”= 25’ and is shown on the plan.

A location map is provided (8½” x 11” copy of a USGS map with the project area indicated).

2. THE TYPES, DEPTH, SLOPE, LOCATIONS AND LIMITATIONS OF THE SOILS.

A copy of the Lehigh County Soil Survey map sheets 38 and 43 published by the U.S. Department of Agriculture with the project area indicated, is included in the narrative. The existing soil types have also been identified on the plans.

The soils located within the project area and their characteristics are listed on the following table.
Soil use limitations were studied in relation to the scope of this project. The re-vegetation strategy of the project was based on these soil conditions. The seed mixtures specified for permanent stabilization will propagate in these soils. It is highly recommended that several soil samples be taken and analyzed to determine the appropriate application rate for soil supplements.
## Soil Characteristics/Limitations

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Name</th>
<th>Slope (%)</th>
<th>Hydric Soil</th>
<th>Depth to High Water Table (ft)</th>
<th>Depth to Bedrock (ft)</th>
<th>Sinkhole Prone Soils</th>
<th>Suitability for Road Fill</th>
<th>Frost Heave</th>
<th>Suitability for Winter Grading</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lehigh County Soils</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NTB2</td>
<td>Norton silt loam</td>
<td>3-8</td>
<td>no</td>
<td>6</td>
<td>3.5</td>
<td>no</td>
<td>fair</td>
<td>medium</td>
<td>good</td>
</tr>
<tr>
<td>PeE3</td>
<td>Penn shaly silt loam</td>
<td>25-40</td>
<td>no</td>
<td>6</td>
<td>1 - 3</td>
<td>no</td>
<td>fair</td>
<td>medium</td>
<td>good</td>
</tr>
<tr>
<td>Aw</td>
<td>Atkins silt loam</td>
<td>level</td>
<td>yes</td>
<td>0 -1</td>
<td>3 - 35</td>
<td>no</td>
<td>poor</td>
<td>high</td>
<td>very poor</td>
</tr>
</tbody>
</table>

### Soil Descriptions and Resolutions

**Atkins silt loam** soils are nearly level to gently sloping. The surface layer and subsoil are mottled and are saturated with water most of the time. This soil is in low areas along creeks and small streams where it receives frequent overflow. It has slow to very slow surface drainage. Crops are seldom damaged by overflow, but the soil is suited to frequent tillage only if it has been adequately drained. Due to the high water table, trees on this soil have shallow roots and are subject to windthrow.

Norton silt loams, 3 to 8 percent slopes, are deep well drained soils of uplands. The soil is well suited to the general farm crops grown in the country, but, if it is tilled, it is subject to serious erosion. Contour stripcropping can be used to help control erosion on this soil and conserve moisture. Diversion terraces will remove excess surface water. The soil has moderate permeability in the subsoil and moderately slow permeability in the substratum. They have high moisture-holding capacity and are medium in natural fertility.

Penn shaly silt loam, 25 to 40 percent slopes, are moderately deep to shallow, well-drained soils of uplands. They are low in natural fertility. They respond well to lime and fertilizer but lack the ability to store large amounts of plant nutrients. Due to the steep slopes, the subsoil is exposed and there are gullies in many places. The galled spots need to be seeded, fertilized and mulched to control further erosion. This soil is better suited to trees than to pasture or tilled crops.

A comprehensive wetland investigation was conducted by McTish, Kunkel & Associates in accordance with the 1987 Federal Manual for Identifying and Delineating Wetlands. All wetlands identified within the project limits are indicated on the plan.
### SOIL RESOLUTIONS

<table>
<thead>
<tr>
<th>Limitation</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydric Soil</td>
<td>Delineate wetlands&lt;br&gt;Protect wetlands&lt;br&gt;Obtain required permits</td>
</tr>
<tr>
<td>High Water Table</td>
<td>Obtain fill material from other area of site&lt;br&gt;Obtain fill material from an off-site location&lt;br&gt;Select appropriate seed mixture&lt;br&gt;Provide drainage channels or underdrains</td>
</tr>
<tr>
<td>Low depth to Bedrock</td>
<td>Revise design to relocate&lt;br&gt;Excavate rippable rock or blast</td>
</tr>
<tr>
<td>Frost Heave/Poor Winter Grading</td>
<td>Limit dates of earthmoving&lt;br&gt;Obtain fill material from other area of site&lt;br&gt;Obtain fill material from an off-site location</td>
</tr>
<tr>
<td>Poor Road Fill</td>
<td>Revise design - relocate roadway&lt;br&gt;Obtain fill material from other area of site&lt;br&gt;Obtain fill material from an off-site location</td>
</tr>
<tr>
<td>Sinkhole Prone Soil</td>
<td>Mitigate Sinkhole&lt;br&gt;Line detention basins, waterways&lt;br&gt;Limit detention time in basin&lt;br&gt;Avoid impacts to those areas</td>
</tr>
</tbody>
</table>

3 **THE CHARACTERISTICS OF THE EARTH DISTURBANCE ACTIVITY, INCLUDING THE PAST, PRESENT AND PROPOSED LAND USES AND THE PROPOSED ALTERATION TO THE PROJECT SITE.**

The total project area is approximately 1.5 acres. The limit of disturbance is less than one (1) acre. The limits of earth disturbance activities are clearly delineated on the plans. There will be no earthmoving outside the project limits. No offsite vegetated areas will be utilized for filtration. There are no facilities outside the project limits which will be utilized for erosion and sediment pollution control. It will be the responsibility of the contractor to have an approved E&S plan for all proposed spoil or borrow areas outside the limits of this project.

Existing and proposed contours are shown on the plans. Existing contours are shown on the plans at two (1) foot intervals, and proposed contours are shown on the plans at one
(1) foot intervals.

Existing waterways & storm water management facilities are shown on the plans.

Proposed improvements are shown on the plans.

The plans include complete mapping symbols, including a north arrow, and a legend. The legend depicts proposed features relevant to the E&S plan.

Past, present and proposed land uses of the site are as follows: The project site is located along a watercourse and is intersected by a transportation corridor which traverses the watercourse via an existing steel girder bridge. The proposed use of the land will remain in transportation.

4. THE AMOUNT OF RUNOFF FROM THE PROJECT AREA AND THE UPSTREAM WATERSHED AREA.

The proposed project impacts will occur in a small area located immediately adjacent to the watercourse. Consequently, for the purpose of calculating the drainage area contributing to BMP’s, the drainage area is assumed to be limited to the project area. The total area within the limits of disturbance is less than one acre.

Hydrologic data for Tumble Brook at the S.R. 2045 crossing is provided below.

<table>
<thead>
<tr>
<th>Stream Name</th>
<th>Tumble Brook</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Area</td>
<td>2.9 square miles</td>
</tr>
<tr>
<td>Flood Discharge</td>
<td>Q10 354 cfs</td>
</tr>
<tr>
<td></td>
<td>Q25 496 cfs</td>
</tr>
<tr>
<td></td>
<td>Q50 621 cfs</td>
</tr>
<tr>
<td></td>
<td>Q100 763 cfs</td>
</tr>
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</table>

A FEMA Flood Insurance Study is available for the project area, however, the project area does not fall within a detailed study area.
5. **THE LOCATION OF WATERS OF THE COMMONWEALTH WHICH MAY RECEIVE RUNOFF WITHIN OR FROM THE PROJECT SITE AND THEIR CLASSIFICATION PURSUANT TO CHAPTER 93.**

Existing streams, wetlands and the FEMA 100 year floodway are shown on the plans. All site runoff will drain toward Tumble Brook, which is identified on the plans.

Tumble Brook is a tributary to the Saucon Creek. Tumble Brook is not classified in Pennsylvania Code Title 25, Chapter 93, however Saucon Creek is classified as cold water fishes (CWF).

6. **A NARRATIVE DESCRIPTION OF THE LOCATION AND TYPE OF PERIMETER AND ON-SITE BMPs USED BEFORE, DURING AND AFTER THE EARTH DISTURBANCE ACTIVITY.**

This project requires the stream to be segmentally diverted to permit the construction of the dual cell box culvert. A sandbag cofferdam will be placed at the upstream gravel bar to divert water to the north or south channel as required in each phase. A concrete median barrier cofferdam will also be placed to allow construction of one side of the box culvert at a time. After completion of one side, the cofferdams will be switched to allow construction of the other side. Riprap aprons will be placed on the upstream and downstream side of the culvert outlets. The existing roadway will function as the staging area and all equipment will work from the existing roadway.

The following temporary BMP’s will be used including: a sandbag coffer dam, a concrete median barrier coffer dam, a rock filter, silt fence, super silt fence and a pumped water filter bag.

The following permanent BMP’s include: rock lining placed along the culvert inlets and outlets, and permanent vegetative stabilization placed on all disturbed areas. All disturbed vegetated areas will be permanently stabilized by applying Formula L or Formula B seed and soil supplements.

Standard worksheets or detailed drawings have been provided for all temporary and permanent BMPs incorporated into this plan. The location of these facilities have been identified on the plan drawings. Construction specifications and installation procedures are located in the detail sheets of the plan drawings. Specifications for temporary and permanent vegetative surface stabilization are listed in the following tables.
TEMPORARY SEEDING SPECIFICATIONS

<table>
<thead>
<tr>
<th>Seed Type</th>
<th>Seeding Date</th>
<th>Seeding Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formula E*</td>
<td>March 15 to October 15</td>
<td>10 Lbs. Per 1000 SY</td>
</tr>
<tr>
<td>Hay or Straw Mulch**</td>
<td>October 15 to March 1</td>
<td>1200 Lbs. Per 1000 SY</td>
</tr>
</tbody>
</table>

* This seed type shall not be used in areas needing erosion protection after October 15, since it will die with the first frost and cease to protect.

** Hay or Straw shall be used in areas needing erosion protection during the winter months as specified.

Any disturbed area on which activity has ceased and which will remain exposed for more than 72 hours, during germinating periods, mulch must be applied at the recommended rates. Disturbed areas which are not at finished grade and which will be re-disturbed within one year may be stabilized in accordance with temporary seeding specifications. Disturbed areas which are either at finished grade or will not be re-disturbed within one year must be stabilized with permanent seeding.

Recommended permanent seeding for this site includes Formula(s) B, and L. Permanent seeding shall occur immediately after fine grading is completed. All areas of use for each seed formula will be shown on applicable typical sections. The schedule of seeding shall be as follows:
PERMANENT SEEDING SPECIFICATIONS

<table>
<thead>
<tr>
<th>Seed Type</th>
<th>% By Weight</th>
<th>Seeding Application Dates</th>
<th>Seeding Rate Lbs. per 1000 SY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formula B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perennial Ryegrass mixture</td>
<td>20</td>
<td>March 15 to June 1</td>
<td>4.0</td>
</tr>
<tr>
<td>Creeping Red Fescue</td>
<td>30</td>
<td>August 1 to October 15</td>
<td>6.0</td>
</tr>
<tr>
<td>Kentucky Bluegrass mixture</td>
<td>50</td>
<td></td>
<td>11.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21.0 Total</td>
<td></td>
</tr>
<tr>
<td>Formula L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hard Fescue Mixture</td>
<td>55</td>
<td>March 15 to June 1</td>
<td>13.0</td>
</tr>
<tr>
<td>Creeping Red Fescue</td>
<td>35</td>
<td>August 1 to October 15</td>
<td>8.5</td>
</tr>
<tr>
<td>Annual Ryegrass</td>
<td>10</td>
<td></td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24.0 Total</td>
<td></td>
</tr>
</tbody>
</table>

Note: The cutoff date for hydroseeding is November 15th.

SOIL SUPPLEMENTS AND MULCHING RATES

<table>
<thead>
<tr>
<th>Limestone Lbs. per 1000 SY</th>
<th>Fertilizer Lbs. per 1000 SY</th>
<th>Mulching Straw Lbs. per 1000 SY</th>
</tr>
</thead>
<tbody>
<tr>
<td>800</td>
<td>140</td>
<td>1200 or 3 tons per acre</td>
</tr>
</tbody>
</table>

7. A SEQUENCE OF BMP INSTALLATION AND REMOVAL IN RELATION TO THE SCHEDULING OF EARTH DISTURBANCE ACTIVITIES, PRIOR TO, DURING AND AFTER EARTH DISTURBANCE ACTIVITIES.

Construction sequence: All Earth disturbance activities shall proceed in accordance with the following sequence. Each stage shall be completed before any following stage is initiated. Clearing and grubbing shall be limited only to those areas described in each stage.

Pre-Construction

1. All applicable permits and approvals required for this project shall be secured prior to the start of construction. Copies of permits, plans and approvals shall be kept on-site at all times. Any wetland areas identified on the plans shall be protected by
placing orange construction fencing around their perimeter.

2. PA-1 call must be notified prior to any earthmoving activity.

3. The Contractor shall contact the Lehigh County Conservation District and the Pennsylvania Fish and Boat Commission to schedule a pre-construction conference.

4. The contractor shall submit written notification to the County Conservation District at least 48 hours prior to the start of construction.

5. Alternatives to the staging or specifications given in this plan must first be approved by the Conservation District prior to implementation.

6. Non-designated waste/borrow areas must have an approved Erosion and Sedimentation Control Plan.

**Phase 1 (to be completed between October 15\textsuperscript{th} and March 15\textsuperscript{th})**

1. All work is to be completed from the existing bridge and/or the existing roadway. No equipment is permitted within the streambed and/or streambank. All work is to be completed within the time period of October 15\textsuperscript{th} through March 15\textsuperscript{th}, in accordance with the stipulations provided by the United States Fish and Wildlife Service for the protection of potential Bog Turtle habitat in the project area.

2. Close the roadway and set up the long term detour in accordance with the approved traffic control plan.

3. Mobilize equipment to the project site. The existing roadway will function as the staging area for all equipment and materials.

4. Demolish and remove the upstream and downstream abutment walls. Demolish and remove the three (3) remnant piers located immediately upstream of the bridge. Excavate and remove the existing asphalt from the bridge. Remove the bridge beams. Excavate and remove the two (2) abutment walls. All excavated materials will be hauled off-site.

**Phase 2**

1. Mobilize equipment and materials to the project site. The existing roadway will function as the staging area for all equipment and materials.

2. Construct the cofferdam within the existing stream channel as indicated for Phase 2 work. Placement of the cofferdam shall take place from the existing roadway.
3. Place the super silt fence, silt fence, and temporary protective fence as indicated for Phase 2 work. The super silt fence must be securely attached or directly abutting the cofferdam so that no Bog Turtles can migrate in or out of the work zone.

4. After the fencing has been placed, a USF&WS qualified bog turtle surveyor will thoroughly inspect the enclosed Phase 2 work area to ensure it is clear of bog turtles. No other work can commence until this step is completed.

5. Place the rock filter within the existing roadside channel near Sta. 15+90 Rt.

6. Place the sandbag cofferdam within the stream at the upstream gravel bar as indicated for Phase 2 so that the flow is limited to the northern portion of the stream channel. The sandbag must be manually constructed and all materials walked to its placement location. No excavation equipment is permitted along or within the stream at this location.

7. Set up the pumped water filter bag where indicated for Phase 2 in the event that the work zone needs to be dewatered. All dewatering of the work area must pass through the pumped water filter bag. There is to be no direct discharge of pumped water to the stream without prior removal of suspended sediments.

8. Begin excavation of the trench necessary for placement of the southern half of the proposed box culvert progressing from downstream to upstream. Place coarse aggregate bedding material as required. Place sections of the precast concrete box culvert and post-tension.

9. Excavate the area required to construct the southern wingwalls on the upstream and downstream side of the culvert. Excavate the area required to construct the southern half of the concrete apron on the upstream and downstream side of the culvert.

10. Form and pour the concrete footers for the southern wingwalls.

11. Form and pour the southern wingwalls.

12. Form and pour the southern half of the upstream and downstream concrete apron.

13. Place the rock lining on the southern half of the upstream and downstream ends of the box culvert.

14. Backfill the southern half of the culvert and bring grade to subgrade elevations as required.
Phase 3

1. Adjust the cofferdam within the existing stream channel as indicated for Phase 3, ensuring that the cofferdam is abutting against the newly placed box culvert. Remove the unused sections of the concrete median barrier. Placement of the cofferdam shall occur from the top of the newly placed box culvert.

2. Adjust the sandbag cofferdam within the stream at the upstream gravel bar as indicated for Phase 3 so that the flow is limited to the southern portion of the stream channel. The sandbag must be manually constructed and all materials walked to its placement location. No excavation equipment is permitted along or within the stream at this location.

3. Adjust and place the super silt fence, silt fence, and temporary protective fence as indicated for Phase 3 work. The super silt fence must be securely attached or directly abutting the cofferdam so that no Bog Turtles can migrate in or out of the work zone.

4. After the fencing has been placed, a USF&WS qualified bog turtle surveyor will thoroughly inspect the enclosed Phase 3 work area to ensure it is clear of bog turtles. No other work can commence until this step is completed.

5. Set up the pumped water filter bag where indicated for Phase 3 in the event that the work zone needs to be dewatered. All dewatering of the work area must pass through the pumped water filter bag. There is to be no direct discharge of pumped water to the stream without prior removal of suspended sediments.

6. Begin excavation of the trench necessary for placement of the northern half of the proposed box culvert progressing from downstream to upstream. Place coarse aggregate bedding material as required. Place sections of the precast concrete box culvert and post-tension.

7. Excavate the area required to construct the northern wingwalls on the upstream and downstream side of the culvert. Excavate the area required to construct the northern half of the concrete apron on the upstream and downstream side of the culvert.

8. Form and pour the concrete footers for the northern wingwalls.

9. Form and pour the northern wingwalls.

10. Form and pour the northern half of the upstream and downstream concrete apron.

11. Place the rock lining on the northern half of the upstream and downstream ends of the box culvert.
12. Remove the temporary cofferdam and the sandbag cofferdam from the stream.

13. Backfill the northern half of the culvert and bring grade to subgrade elevations as required to reconstruct the roadway.

14. Excavate and remove existing pavement as required within the work area.

15. Place subbase material to the required grade. Complete paving operations for the construction of the roadway section.

16. Install guiderail where indicated on the plan.

17. Fine grade the areas adjacent to the wingwalls and roadway and apply topsoil where required.

18. Stabilize remaining disturbed areas by applying Formula B or Formula L seed and soil supplements. Immediately apply a layer of mulch to all seeded areas.

19. Upon final stabilization, all temporary BMP’s may be removed.

8. SUPPORTING CALCULATIONS

Design information for all BMPs is included in the narrative. Standard worksheets are included where applicable.

9. PLAN DRAWINGS

Plan drawings are provided with this narrative which indicate the location of all proposed temporary and permanent BMPs. Construction details and specifications for the proposed BMPs are included on the E&S detail sheets. The drawings including a complete legend.
10. A MAINTENANCE PROGRAM WHICH PROVIDES FOR INSPECTION OF BMPs ON A WEEKLY BASIS AND AFTER EACH MEASURABLE RAINFALL EVENT, INCLUDING THE REPAIR OF BMPs TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.

The contractor is responsible for the installation and maintenance of all permanent and temporary erosion and sedimentation control facilities until final stabilization has been achieved. A maintenance program for E&S control facilities is provided below as well as on the detail sheets.

During the life of the contract, comply with all requirements outlined within the approved erosion and sediment pollution control plan (E&SPCP). Maintain, replace, reinstall and/or clean all E&SPC devices called for in the E&SPCP.

BMP’s for In-Channel Work
Whenever possible, work should be scheduled for low flow seasons. Normal flow should be conveyed past the work area by means of a bypass channel, pipe, pump, or cofferdam. All such bypasses should be completed and stabilized prior to diverting flow.

Any in-channel excavations should be done from the top of banks wherever possible. Where this is not possible, a temporary crossing should be provided for any equipment working from within the channel. Upon completion, all channel entrances should be restored to pre-construction configurations, as much as possible, and stabilized.

All excavated channel materials that will be subsequently used as backfill should be placed in a temporary stockpile located outside the channel. A sediment barrier should be installed between the storage pile and the stream channel. All excavated materials that will not be used on site must be immediately removed to a disposal site having an approved erosion and sediment pollution control plan.

Any pumped water from excavated areas must be filtered prior to discharging into waters of the Commonwealth. The use of filter bags is another acceptable method if located on a relatively flat (< 5% slope), well-vegetated area. The bag should be designed to trap particles larger than 150 microns. The pump discharge hose shall be inserted into the bags in the manner specified by the manufacturer and securely clamped. When the bag has been filled to ½ its total capacity, it should be replaced with a new bag and properly disposed. Wherever well-vegetated areas are not available, a geotextile underlayment should be used. Consideration should be given to how the bag will be accessed and removed once it has been 1/2 filled with sediment.

All disturbed areas within the existing channel should be completed and stabilized before flow is redirected into it. Suitable protection should be provided for the stream channel.
from any disturbed areas that have not yet achieved stabilization.

**Filter fabric fence:** Remove accumulated sediment as necessary to maintain functionality of the silt barrier fence. In any case, remove deposits when sediment accumulation reaches one third of the above ground compacted backfill material. Adhere to the manufacturer’s recommendations relative to required geotextile replacement due to weathering. Rock filter outlets should be installed along the silt barrier fence at points of frequent failures and where required by the E&SPCP.

**Rock filters:** Rock filters should be inspected weekly and after each runoff event. Clogged filter stone (AASHTO #57) should be replaced. Sediments must be removed when accumulations reach ½ the height of the filters. Immediately upon stabilization of each channel, remove accumulated sediment, remove rock filter, and stabilize disturbed areas.

**Pumped water filter bags:** Replace filter bag once sediment reaches one half maximum capacity, or if bag is ripped or torn. Extra filter bags must be maintained on site for this purpose. Remove and disposed of sediment in an approved manner.

**Replanting and overseeding:** If vegetation covers less than 40% of the soil surface, lime, fertilizer and seed in accordance with current recommendations for new seedings. If vegetation covers more than 40% but less than 70% of the soil surface, lime, fertilizer and overseed in accordance with current recommendations.

Should any measures contained within this plan prove incapable of adequately removing sediment from on-site flows prior to discharge, additional measures must be immediately implemented by the contractor. In this event, the contractor shall contact the Conservation District. The contractor is responsible for the installation and maintenance of all permanent and temporary erosion and sedimentation control facilities until final stabilization has been achieved. A maintenance program for E&S control facilities is provided below as well as on the detail sheets.

Until the site is stabilized, all erosion and sedimentation controls must be maintained properly. Maintenance must include inspection of all erosion and sedimentation controls after each storm event and on a weekly basis. All preventative and remedial maintenance work, including clean out, replacement, regrading, re-seeding etc., must be performed immediately.
11. PROCEDURES WHICH ENSURE THAT THE PROPER MEASURES FOR THE RECYCLING OR DISPOSAL OF MATERIALS ASSOCIATED WITH OR FROM THE PROJECT SITE WILL BE UNDERTAKEN IN ACCORDANCE WITH DEPARTMENT REGULATIONS.

The contractor shall remove from the site, recycle, or dispose of all building materials and wastes in accordance with the department's solid waste management regulations at 25 pa code 260.1 et seq., 271.1 et seq., and 287.1 et seq. The contractor shall not illegally bury, dump or discharge any building material or wastes at the site.

The Pennsylvania Department of Transportation is responsible for the permanent maintenance, which shall include the proper upkeep of grassed areas and the continual cleaning of all storm sewer facilities to ensure they are functioning as designed.

These plans and narrative have been prepared by McTish, Kunkel & Associates, Consulting Engineers, Allentown, Pa. in accordance with the Pennsylvania Department of Environmental Protection Erosion and Sediment Pollution Control Program Manual, March 2000.

NOTE: A copy of this Narrative and the Erosion and Sedimentation Control Plan shall remain on site at all times.