Public Notice

U.S. Army Corps of Engineers

Baltimore District

PN-14-22

In Reply to Application Number CENAB-OP-RPA-2014-455-P12 (PA DOT – SR 0029, Section LEE – Emergency Slide)

Comment Period: April 2, 2014 to April 17, 2014

THE PURPOSE OF THIS PUBLIC NOTICE IS TO SOLICIT COMMENTS FROM THE PUBLIC REGARDING THE WORK DESCRIBED BELOW. NO DECISION HAS BEEN MADE AS TO WHETHER OR NOT A PERMIT WILL BE ISSUED AT THIS TIME.

This District has received an application for a Department of the Army permit pursuant to **Section 10 of the Rivers and Harbors Act of 1899 and/or Section 404 of the Clean Water Act (33. U.S.C. 1344)** as described below:

APPLICANT: Pennsylvania Department of Transportation
Engineering District 4-0
55 Keystone Industrial Park
Dunmore, Pennsylvania 18512
Attn: Mr. Jonathan Eboli

WATERWAY AND LOCATION OF THE PROPOSED WORK: The Pennsylvania Department of Transportation, Engineering District 4-0 (PA DOT 4-0) is proposing to reconstruct a 600 linear foot section of S.R. 0029 along Snake Creek, in Liberty Township, Susquehanna County, Pennsylvania.

PROPOSED WORK AND PURPOSE: PA DOT proposes to reconstruct 600 linear feet of S.R. 0029, on the existing alignment, because of an underlying slope failure, which PA DOT stated was caused by inadequate drainage and fluvial forces associated with the existing steep hillside slope, on the east side of the roadway. The project will address drainage in the affected area to prevent future settlement of the road and address the slope failure.

The project will include the reconstruction of S.R. 0029 with proposed drainage designed to reduce roadway runoff and overland flow to the slide area. The project will also include building an earthen berm at the toe of the landslide, requireing 995 linear feet of Snake Creek to be relocated approximately 60 feet to the east. The relocated stream width varies between 51 and 60 feet. The east side of the relocated Snake Creek channel will have a 3:1 side slope until tying into existing ground elevation. The western bank of the relocated Snake Creek channel will have 3:1 side slopes to at or slightly above the 100 year flood elevation of approximate 915 feet, where a 10-footwide bench will be constructed. An earthen berm with an initial 2:1 slope will be placed from elevation 915 to 940 feet. At elevation 940 feet the slope of the berm will flatten to between 3:1 to 5.7:1 and extend up to an elevation of 970 feet onto the existing rock embankment.

To protect the earthen berm from erosion during future flood events and to protect the western stream bank, a 10-foot rock veneer will be constructed with R-8 rock chocked with native material along the face of the berm. Along the eastern stream bank of the proposed relocated

stream bed, coir-logs with live stakes will be placed. To provide further stabilization for the channel, a cross vane will be placed near the beginning and end of the stream relocation, and J-Hook Vanes will be placed every 200 feet in the relocated stream channel.

The proposed project will result in the following wetland and waterway impacts:

WATERWAY	WATERSHED AREA (AC)	PERMANENT IMPACTS (linear ft/ square feet)	TEMPORARY IMPACTS (linear ft & square feet)
Snake Creek (perennial)	73.1 square miles	1101.6 / 72,258	0
W1 (Ephemeral)	7.5	130 /1721	0
WF (Ephemeral)	0.37	39 /150	0
Total	n/a	1271 /74,130	0

Permanent impacts are the result of the relocation of the channel and the placement of fill associated with the stabilization of the S.R. 0029 embankment.

WETLANDS	COWARDIN CLASSIFICATION	TEMPORARY IMPACTS (sq.ft./ac)	PERMANENT IMPACTS (sq.ft./ac)
WE	PEM		3221/0.07
WG	PEM		876/0.02
WJ	PEM		1762/.04
WQ	PEM	2808/0.065	0
WH	PSS/PFO	3949/0.091	0
Total	n/a	223/.0051	5859/0.13

Permanent impacts to wetlands are due to the placement of fill associated with the stabilization of the S.R. 0029 embankment. Temporary impacts to wetlands are associated with the temporary access road needed to access the embankment near the Snake Creek.

PA DOT has stated that alternatives to avoid impacts to wetlands were evaluated, however, avoidance to wetlands was not possible due to the placement of fill to stabilize the embankment. In addition the temporary roadway location was constrained by topography, astThe land was to steep to the north side of the slide to effectively access the embankment slope.

To compensate for the permanent loss of 0.13 acre of emergent wetlands, PA DOT is proposing to create 0.13 acre of emergent wetlands. The proposed wetland mitigation site would have functions and values equal to or greater than the wetland areas proposed to be lost due to project construction. A diversified planting scheme of native vegetative species will be used to create wetlands with food, cover, and nesting sites for indigenous wildlife in the project area. The wetland creation site is proposed to be located next to and expand an existing wetland on the south side of the project area. In addition to expanding the existing wetland and promoting habitat connectivity, the site design will allow the mitigation site to increase the overall health of the Snake Creek watershed by sediment trapping and flood flow alternation.

PA DOT will purchase the mitigation site and has proposed to protect the mitigation site in perpetuity by placing restrictive covenants on the site.

PA DOT is proposing to create 950 linear feet of stream channel as part of the relocation of Snake Run. This new channel is proposed to compensate for the permanent loss of 1101 linear feet of Snake Creek, a perennial stream. The relocated channel would provide for more aquatic habitat than the current existing channel. The new channel would include: 1) Coir logs, fascines and live stakes along the relocated stream channel to create a more naturalized stream channel; 2) Cross vanes located at the beginning and end of the stream location; 3) one J Hook (in the middle of the project); and 4) streamside landscaping to provide a natural stream buffer along the relocated channel.

All work is proposed to be completed in accordance with the enclosed plan(s). If you have any questions concerning this matter, please contact Mr. Michael Dombroskie at (814)235-0571 or mike.dombroskie@usace.army.mil.

The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit, which reasonable may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. All factors, which may be relevant to the proposal will be considered, including the cumulative effects thereof; among those are conservation, economic, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards, flood plain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, and consideration of property ownership and in general, the needs and welfare of the people.

The Corps of Engineers is soliciting comments from the public; Federal, State, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments provided will become part of the public record for this action. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity. Written comments concerning the work described above related to the factors listed above or other pertinent factors must be received by the District Engineer, U.S. Army Corps of Engineers, Baltimore District, 1631 South Atherton Street, State College, Pennsylvania 16801 within the comment period specified above.

ESSENTIAL FISH HABITAT: The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 04-267), requires all Federal agencies to consult with the National Marine Fisheries Service (NMFS) on all actions, or proposed actions, permitted, funded, or undertaken by the agency that may adversely effect Essential Fish Habitat (EFH). The Corps has determined this project will not affect any EFH.

WATER QUALITY CERTIFICATION: The applicant is required to obtain a water quality certification in accordance with Section 401 of the Clean Water Act from the **Pennsylvania Department of Environmental Protection**. The Section 401 certifying agency has a statutory limit of one year from the date of this public notice to make its decision.

COASTAL ZONE MANAGEMENT PROGRAMS: Where applicable, the applicant has certified in this application that the proposed activity complies with and will be conducted in a manner consistent with the approved Coastal Zone Management (CZM) Program. By this public notice, we are requesting the State concurrence or objection to the applicant's consistency statement. It should be noted that the CZM Program has a statutory limit of 6 months to make its consistency determination.

The applicant must obtain any State or local government permits which may be required.

A preliminary review of this application indicates that the proposed work will not affect Federal listed threatened or endangered species or their critical habitat, pursuant to Section 7 of the Endangered Species Act, as amended. On July 24, 2013, a Pennsylvania Natural Diversity Inventory (PNDI) review was completed to ensure compliance with the Federal Endangered Species Act. The review indicated that there was "No Known Impacts" to Federally Listed Endangered Species that would result from this proposal. As the evaluation of this application continues, additional information may become available which could modify this preliminary determination.

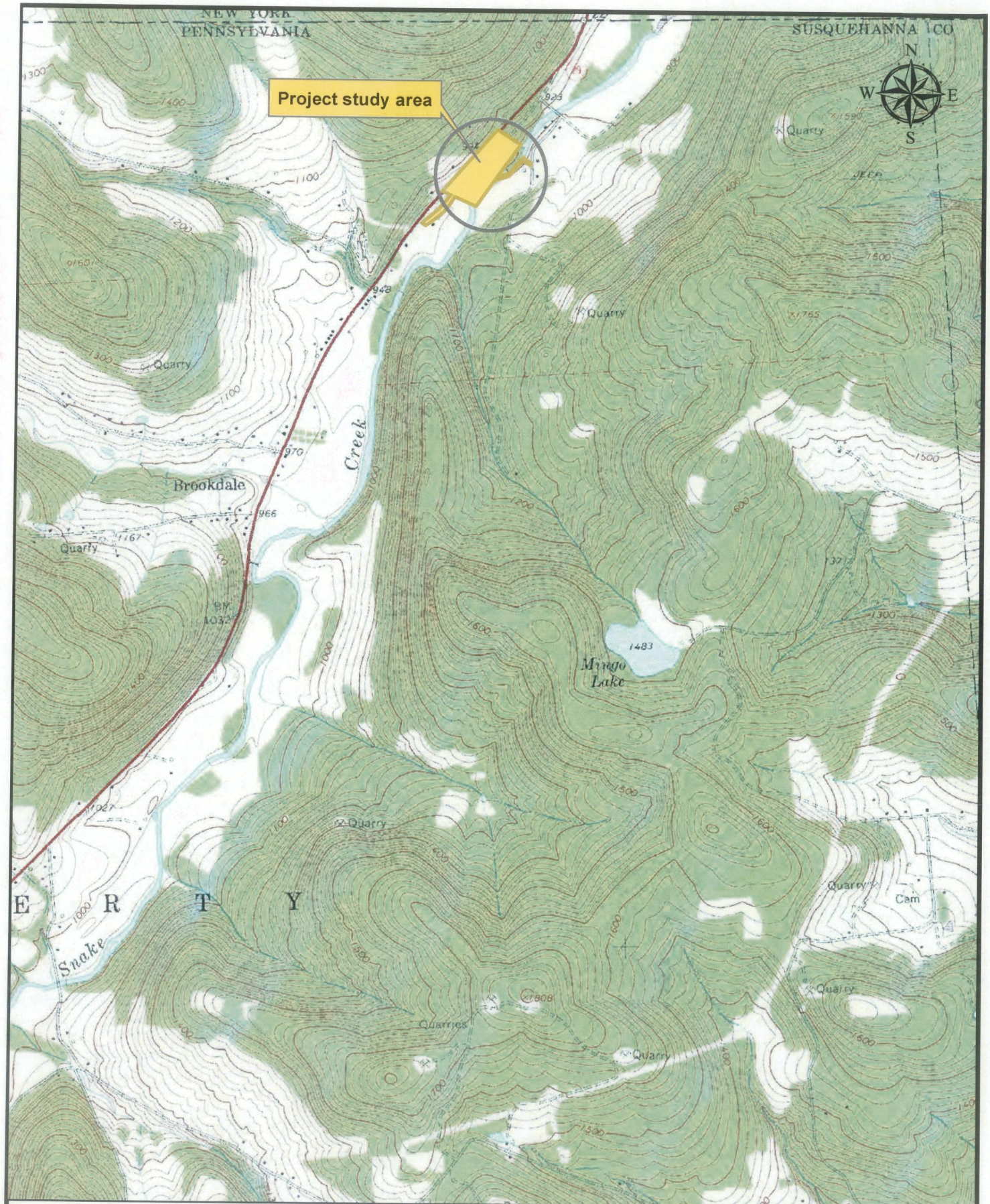
Review of the latest published version of the National Register of Historic Places indicates that no registered properties listed as eligible for inclusion, therein, are located at the site of the proposed work. Currently unknown archeological, scientific, prehistoric, or historical data may be lost or destroyed by the work to be accomplished under the request permit. However, the proposal was reviewed by PA DOT's in-house Archaeologist and Historian to ensure compliance with Section 106 of the National Historic Preservation Act. Their findings, dated July 24, 2013, were that there will be no proposed impacts to any archaeological or historic properties as a result of this project.

The evaluation of the impact of this project on the public interest will include application of the guidelines promulgated by the Administrator, U.S. Environmental Protection Agency, under authority of Section 404 of the Clean Water Act.

Any person who has an interest which may be adversely affected by the issuance of this permit may request a public hearing. The request, which must be in writing, must be received by the District Engineer, U.S. Army Corps of Engineers, Baltimore District, State College Field Office, 1631 South Atherton Street, State College, Pennsylvania 16801, within the comment period as specified above to receive consideration. Also it must clearly set forth the interest which may be adversely affected by this activity and the manner in which the interest may be adversely affected.

It is requested that you communicate this information concerning the proposed work to any persons know by you to be interested and not being known to this office, who did not receive a copy of this notice.

Wade B. Chandler
Chief, Pennsylvania Section
Regulatory Branch



Source: USGS Franklin Forks PA Quadrangle

0 500 1,000 2,000 3,000 4,000 Feet

1 inch = 2,000 feet

Figure 1: USGS Location Map

Route 0029 Slide

Liberty Township, Susquehanna County, PA

Note: Site locations and resource boundaries are approximate.

Gannett Fleming

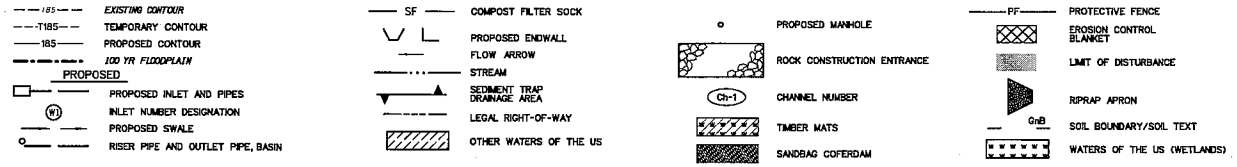
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	LEE	1 OF 16
	LIBERTY TOWNSHIP			

REVISION NUMBER	REVISIONS	DATE	BY

EROSION AND SEDIMENT POLLUTION CONTROL PLAN

SUSQUEHANNA COUNTY
SR 0029 SECTION LEE
TOTAL SHEETS 16

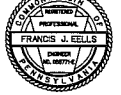
NOVEMBER 2013



NOTE: THE NPDES PERMIT BOUNDARY INCLUDES PAVED ROADWAY WITHIN LEGAL RIGHT-OF-WAY FROM STATION 03+50.00 TO STATION 19+50.00 IN CONJUCTION WITH ALL SHADED AREAS INDICATED AS DISTURBED AREAS.

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA



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DATE: 25-Nov-2013 11:48

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
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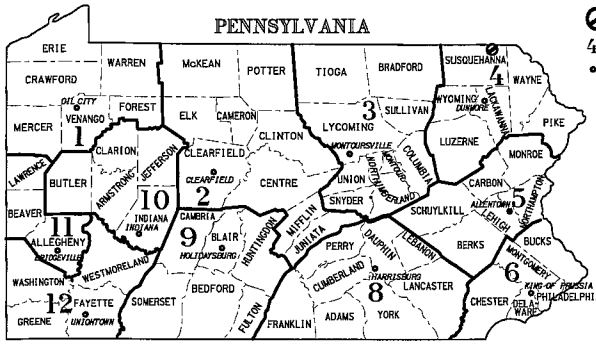
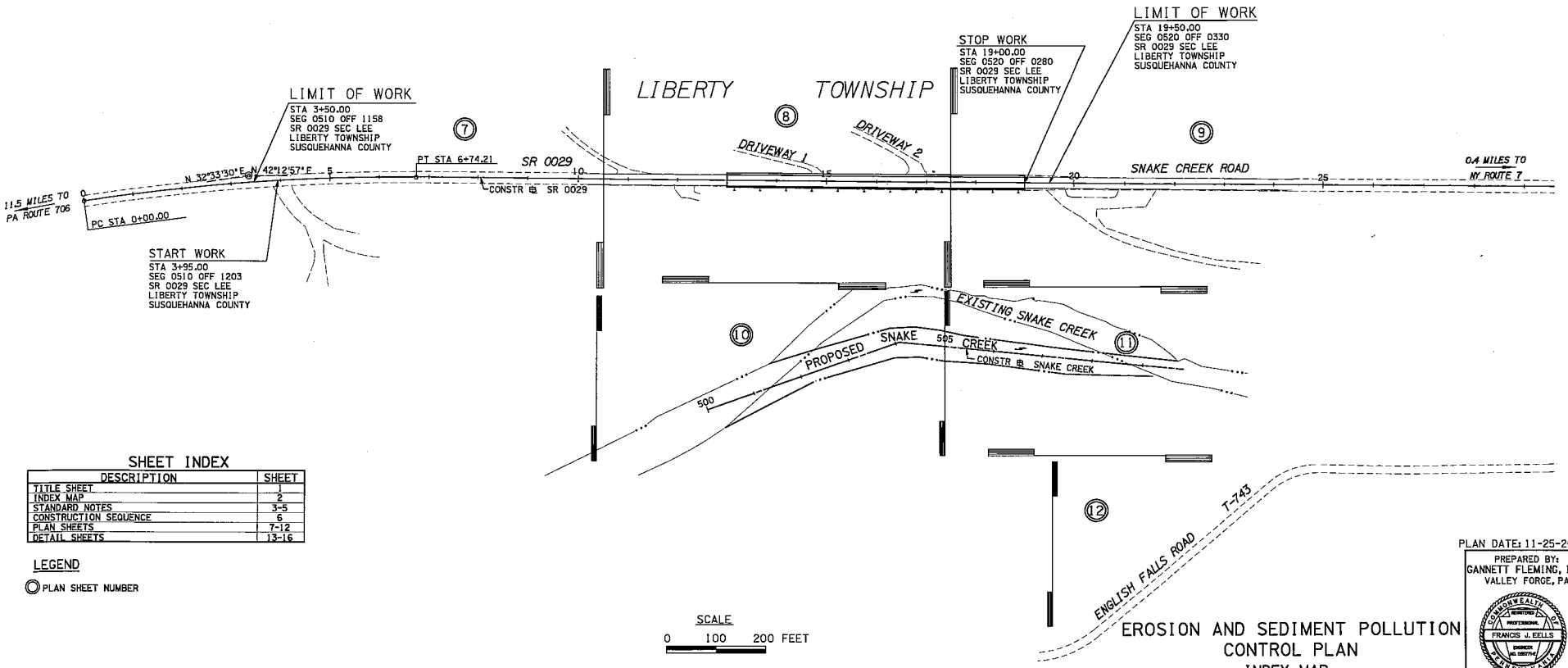
LIBERTY TOWNSHIP				

REVISION NUMBER	REVISIONS	DATE	BY





SHEET INDEX

LEGEND

⊙ PLAN SHEET NUMBER

SCALE

0 100 200 FEET

EROSION AND SEDIMENT POLLUTION CONTROL PLAN
INDEX MAP

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL FRANCIS J. EELLS ENGINEER NO. 080774E

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DATE: 25-Nov-2013 11:49

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	LEE	3 OF 16
LIBERTY TOWNSHIP				

REVISION NUMBER	REVISIONS	DATE	BY

STANDARD NOTES

1. ALL EARTH DISTURBANCES, INCLUDING CLEARING AND GRUBBING AS WELL AS CUTS AND FILLS SHALL BE DONE IN ACCORDANCE WITH THE APPROVED E&S PLAN. A COPY OF THE APPROVED DRAWINGS (STAMPED, SIGNED AND DATED BY THE REVIEWING AGENCY) MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES. THE REVIEWING AGENCY SHALL BE NOTIFIED OF ANY CHANGES TO THE APPROVED PLAN PRIOR TO IMPLEMENTATION OF THOSE CHANGES. THE REVIEWING AGENCY MAY REQUIRE A WRITTEN SUBMITTAL OF THOSE CHANGES FOR REVIEW AND APPROVAL AT ITS DISCRETION.

2. AT LEAST 7 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, INCLUDING CLEARING AND GRUBBING, THE OWNER AND/OR OPERATOR SHALL INVITE ALL CONTRACTORS, THE LANDOWNER, APPROPRIATE MUNICIPAL OFFICIALS, THE E&S PLAN PREPARER, THE PCSM PLAN PREPARER, THE LICENSED PROFESSIONAL RESPONSIBLE FOR OVERSIGHT OF CRITICAL STAGES OF IMPLEMENTATION OF THE PCSM PLAN, AND A REPRESENTATIVE FROM THE LOCAL CONSERVATION DISTRICT TO AN ON-SITE PRECONSTRUCTION MEETING.

3. 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.

4. ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE SEQUENCE PROVIDED ON THE PLAN DRAWINGS. DEVIATION FROM THAT SEQUENCE MUST BE APPROVED IN WRITING FROM THE LOCAL CONSERVATION DISTRICT OR BY THE DEPARTMENT PRIOR TO IMPLEMENTATION.

5. AREAS TO BE FILLED ARE TO BE CLEARED, GRUBBED, AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS AND OTHER OBJECTIONABLE MATERIAL.

6. 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.

7. AT NO TIME SHALL CONSTRUCTION VEHICLES BE ALLOWED TO ENTER AREAS OUTSIDE THE LIMIT OF DISTURBANCE BOUNDARIES SHOWN ON THE PLAN MAPS. THESE AREAS MUST BE CLEARLY MARKED AND FENCED OFF BEFORE CLEARING AND GRUBBING OPERATIONS BEGIN.

8. STOCKPILING SHALL NOT BE PERMITTED ON THIS PROJECT SITE. ANY EXCEVATED MATERIALS MUST BE REMOVED FROM SITE IMMEDIATELY.

9. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO MINIMIZE THE POTENTIAL FOR EROSION AND SEDIMENT POLLUTION AND NOTIFY THE LOCAL CONSERVATION DISTRICT AND/OR THE REGIONAL OFFICE OF THE DEPARTMENT.

10. 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.

11. ALL OFF-SITE WASTE AND BORROW AREAS MUST HAVE AN E&S PLAN APPROVED BY THE LOCAL CONSERVATION DISTRICT OR THE DEPARTMENT FULLY IMPLEMENTED PRIOR TO BEING ACTIVATED.

12. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ANY MATERIAL BROUGHT ON SITE 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.

13. ALL PUMPING OF WATER FROM ANY WORK AREA SHALL BE DONE ACCORDING TO THE PROCEDURE DESCRIBED IN THIS PLAN, OVER UNDISTURBED VEGETATED AREAS.

14. 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, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REMULCHING AND RENETTING MUST BE PERFORMED IMMEDIATELY. IF THE E&S BMPS FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPS, OR MODIFICATIONS OF THOSE INSTALLED WILL BE REQUIRED.

15. 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.

16. SEDIMENT TRACKED ONTO ANY PUBLIC ROADWAY OR SIDEWALK 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.

17. ALL SEDIMENT REMOVED FROM BMPS IS TO BE DISPOSED OF ON-SITE IN LANDSCAPED AREAS OUTSIDE OF STEEP SLOPES, WETLANDS, FLOODPLAINS OR DRAINAGE SWALES IF CONDITIONS ALLOW AND IMMEDIATELY STABALIZE WITH FORMULA L SEEDING, SOIL SUPPLEMENTS, AND STRAW MULCH. IF THE SEDIMENT CANNOT BE DISPOSED ON SITE IT IS TO BE REMOVED FROM THE SITE AND MUST BE RECYCLED IN ACCORDANCE WITH DEP'S SOLID WASTE REGULATIONS (25 PA CODE 260.1 ET SEQ., 271.1 ET SEQ., AND 287.1 ET SEQ.), AND/OR ANY ADDITIONAL LOCAL, STATE OR FEDERAL REGULATIONS. NO MATERIALS (USED OR UNUSED) SHALL BE BURNED, BURIED, DUMPED OR DISCHARGED AT THE SITE.

18. AREAS WHICH ARE TO BE TOPSOILED SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 3 TO 5 INCHES 6 TO 12 INCHES ON COMPACTED SOILS PRIOR TO PLACEMENT OF TOPSOIL. AREAS TO BE VEGETATED SHALL HAVE A MINIMUM 4 INCHES OF TOPSOIL IN PLACE PRIOR TO SEEDING AND MULCHING. FILL OUTSLOPES SHALL HAVE A MINIMUM OF 2 INCHES OF TOPSOIL.

19. ALL FILLS SHALL BE COMPACTED AS REQUIRED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES AND CONDUITS, ETC. SHALL BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.

20. ALL EARTHEN FILLS SHALL BE PLACED IN COMPACTED LAYERS NOT TO EXCEED 9 INCHES IN THICKNESS.

21. FILL MATERIALS SHALL BE FREE OF FROZEN PARTICLES, BRUSH, ROOTS, SOD, OR OTHER FOREIGN OR OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY FILLS.

22. FROZEN MATERIALS OR SOFT, MUCKY, OR HIGHLY COMPRESSIBLE MATERIALS SHALL NOT BE INCORPORATED INTO FILLS.

23. FILL SHALL NOT BE PLACED ON SATURATED OR FROZEN SURFACES.

24. SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHALL BE HANDLED IN ACCORDANCE WITH THE STANDARD AND SPECIFICATION FOR SUBSURFACE DRAIN OR OTHER APPROVED METHOD.

25. 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, SHALL BE BLANKETED ACCORDING TO THE STANDARDS OF THIS PLAN.

26. IMMEDIATELY AFTER EARTH DISTURBANCE ACTIVITIES CEASE IN ANY AREA OR SUBAREA OF THE PROJECT, THE OPERATOR 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.

27. 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.

28. E&S BMPS SHALL REMAIN FUNCTIONAL AS SUCH UNTIL ALL AREAS TRIBUTARY TO THEM ARE PERMANENTLY STABILIZED OR UNTIL THEY ARE REPLACED BY ANOTHER BMP APPROVED BY THE LOCAL CONSERVATION DISTRICT OR THE DEPARTMENT.

29. UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATOR SHALL CONTACT THE LOCAL CONSERVATION DISTRICT FOR AN INSPECTION PRIOR TO REMOVAL/CONVERSION OF THE E&S BMPS.

30. AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENT BMPS MUST BE REMOVED OR CONVERTED TO PERMANENT POST CONSTRUCTION STORMWATER MANAGEMENT BMPS. AREAS DISTURBED DURING REMOVAL OR CONVERSION 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.

31. UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATOR SHALL CONTACT THE LOCAL CONSERVATION DISTRICT TO SCHEDULE A FINAL INSPECTION.

32. FAILURE TO CORRECTLY INSTALL E&S BMPS, FAILURE TO PREVENT SEDIMENT-LADEN RUNOFF FROM LEAVING THE CONSTRUCTION SITE, OR FAILURE TO TAKE IMMEDIATE CORRECTIVE ACTION TO RESOLVE FAILURE OF E&S BMPS MAY RESULT IN ADMINISTRATIVE, CIVIL, AND/OR CRIMINAL PENALTIES BEING INSTITUTED BY THE DEPARTMENT AS DEFINED IN SECTION 602 OF THE PENNSYLVANIA CLEAN STREAMS LAW. THE CLEAN STREAMS LAW PROVIDES FOR UP TO $10,000 PER DAY IN CIVIL PENALTIES, UP TO $10,000 IN SUMMARY CRIMINAL PENALTIES, AND UP TO $25,000 IN MISDEMEANOR CRIMINAL PENALTIES FOR EACH VIOLATION.

ENVIRONMENTAL DUE DILIGENCE DEFINITION

TAKEN FROM "INSTRUCTIONS FOR A GENERAL (PAG-2) OR INDIVIDUAL NPDES PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES', PREPARED BY THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, DATED MAY 2007

"INVESTIGATE TECHNIQUES, INCLUDING, BUT NOT LIMITED TO, VISUAL PROPERTY INSPECTIONS, ELECTRONIC DATA BASE SEARCHES, REVIEW OF PROPERTY OWNERSHIP, REVIEW OF PROPERTY USE HISTORY, SANBORN MAPS, ENVIRONMENTAL QUESTIONNAIRES, TRANSACTION SCREENS, ANALYTICAL TESTING, ENVIRONMENTAL ASSESSMENTS OR AUDITS. ANALYTICAL TESTING IS NOT A REQUIRED PART OF DUE DILIGENCE UNLESS VISUAL INSPECTION AND/OR REVIEW OF THE PAST LAND USE OF THE PROPERTY INDICATES THAT THE FILL MAY HAVE BEEN SUBJECTED TO A SPILL OR RELEASE OF REGULATED SUBSTANCE. IF THE FILL MAY HAVE BEEN AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE, IT MUST BE TESTED TO DETERMINE IF IT QUALIFIES AS CLEAN FILL. TESTING SHOULD BE PERFORMED IN ACCORDANCE WITH APPENDIX A OF THE DEPARTMENT'S POLICY 'MANAGEMENT OF FILL'."

CLEAN FILL DEFINITION

TAKEN FROM "INSTRUCTIONS FOR A GENERAL (PAG-2) OR INDIVIDUAL NPDES PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES', PREPARED BY THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, DATED MAY 2007

"UNCONTAMINATED, NON-WATER SOLUBLE, NON-COMPOSABLE, INERT, SOLID MATERIAL. THE TERM INCLUDES SOIL, ROCK, STONE, DREDGED MATERIAL, USED ASPHALT, AND BRICK, BLOCK OR CONCRETE FROM CONSTRUCTION AND DEMOLITION ACTIVITES THAT IS SEPARATE FROM OTHER WASTE AND IS RECOGNIZABLE AS SUCH. THE TERM DOES NOT INCLUDE MATERIALS PLACED IN OR ON THE WATERS OF THE COMMONWEALTH UNLESS OTHERWISE AUTHORIZED. (THE TERM 'USED ASPHALT' DOES NOT INCLUDE MILLED ASPHALT OR ASPHALT THAT HAS BEEN PROCESSED FOR RE-USE.)"

TRENCH EXCAVATION

1. LIMIT ADVANCE CLEARING AND GRUBBING OPERATIONS TO A DISTANCE EQUAL TO TWO TIMES THE LENGTH OF PIPE INSTALLATION THAT CAN BE COMPLETED IN ONE DAY.

2. WORK CREWS AND EQUIPMENT FOR TRENCHING, PLACEMENT OF PIPE, PLUG CONSTRUCTION AND BACKFILLING WILL BE SELF CONTAINED AND SEPERATE FROM CLEARING AND GRUBBING AND SITE RESTORATION AND STABILIZATION OPERATIONS.

3. ALL SOIL EXCAVATED FROM THE TRENCH WILL BE PLACED ON THE UPHILL SIDE OF THE TRENCH

4. LIMIT DAILY TRENCH EXCAVATION TO THE LENGTH OF PIPE PLACEMENT AND BACKFILLING THAT CAN BE COMPLETED THE SAME DAY.

5. WATER WHICH ACCUMULATES IN THE OPEN TRENCH WILL BE COMPLETELY REMOVED BY PUMPING, BEFORE PIPE PLACEMENT AND/OR BACKFILLING OCCURS. WATER REMOVED FROM TRENCH SHALL BE PUMPED THROUGH A FILTRATION DEVICE

6. ON THE DAY FOLLOWING PIPE PLACEMENT AND TRENCH BACKFILLING, THE DISTURBED AREA WILL BE GRADED TO FINAL CONTOURS AND APPROPRIATE TEMPORARY EROSION AND SEDIMENT POLLUTION CONTROL MEASURES/FACILITIES WILL BE INSTALLED. SEEDING AND MULCHING OF ALL DISTURBED AREAS WILL BE DONE AT THE END OF EACH WEEK.

RECEIVING STREAM

SNAKE CREEK - COLD WATER FISHERY, MIGRATORY FISHERY

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL FRANCIS J. ELLIS ENGINEER

SHEET 1 OF 3

EROSION AND SEDIMENT POLLUTION CONTROL PLAN

STANDARD NOTES

FILE: G:\SR 29 Side\Highway\E&S\Plans-DFV\SR29esgn01.dgn
DATE: 25-Nov-2013 11:50

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	LEE	4 OF 16
	LIBERTY TOWNSHIP			

REVISION NUMBER	REVISIONS	DATE	BY

SOIL USE LIMITATIONS AND RESOLUTIONS

MAP SYMBOL	SOIL	ROADS AND PARKING LOTS FOR SUBDIVISION	RESOLUTIONS	TRENCH	RESOLUTIONS	EMBANKMENTS	RESOLUTIONS
BfC2	BATH FLAGGY LOAM, 12 TO 20 PERCENT SLOPES, WELL DRAINED	VERY LIMITED; SLOPE, FROST ACTION, DEPTH TO SATURATED ZONE	8" SUBBASE; UNDER DRAIN	VERY LIMITED; DEPTH TO SATURATED ZONE, SLOPE, CUTBACKS CAVE	PIPE TRENCH INCLUDES STONE BASE; BORING TAKEN; WATER TABLE ESTABLISHED	VERY LIMITED; DEPTH TO SATURATED ZONE, SEEPAGE	HAY, MULCH < 8% SLOPE HAY MULCH WITH MULCH CONTOL NETTING 8-25% SLOPE EROSION CONTROL MAT >25% SLOPE
Ba	BARBOUR FINE SANDY LOAM, 0-3 PERCENT SLOPES, WELL DRAINED	VERY LIMITED; FLOODING, FROST ACTION, DEPTH TO SATURATED ZONE		VERY LIMITED; CUTBANKS CAVE, FLOODING, DEPTH TO SATURATED ZONE		SOMEWHAT LIMITED; SEEPAGE	
Mn	MIXED ALLUVIAL LAND, 0-8 PERCENT SLOPES, MODERATELY WELL DRAINED	VERY LIMITED; FLOODING, FROST ACTION, DEPTH TO SATURATED ZONE		VERY LIMITED; CUTBANKS CAVE, DEPTH TO SATURATED ZONE, FLOODING		VERY LIMITED; PIPING, DEPTH TO SATURATED ZONE, SEEPAGE	
Us	UNADILLA SILT LOAM, 0-5 PERCENT SLOPES, WELL DRAINED	VERY LIMITED; FROST ACTION		SOMEWHAT LIMITED; CUTBANKS CAVE		VERY LIMITED; PIPING	
MgD	MARDIN VERY STONY SILT LOAM, 8-25 PERCENT SLOPES, MODERATELY WELL DRAINED	VERY LIMITED; SLOPE, DEPTH TO SATURATED ZONE, FROST ACTION		VERY LIMITED; DEPTH TO SATURATED ZONE, SLOPE, CUTBANKS CAVE, DENSE LAYER		VERY LIMITED; DEPTH TO SATURATED ZONE, PIPING	
VsD	VOLUSIA VERY STONY SILT LOAM, 8-25 PERCENT SLOPES, SOMEWHAT POORLY DRAINED	VERY LIMITED; SLOPE, DEPTH TO SATURATED ZONE, FROST ACTION		VERY LIMITED; DEPTH TO SATURATED ZONE, SLOPE, CUTBANKS CAVE, DENSE LAYER		VERY LIMITED; DEPTH TO SATURATED ZONE, PIPING	

SUSQUEHANNA COUNTY SOILS

BfC2 - BATH FLAGGY LOAM, 12 TO 20 PERCENT SLOPES, WELL DRAINED

Ba - BARBOUR FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES, WELL DRAINED

Mn - MIXED ALLUVIAL LAND, 0 TO 8 PERCENT SLOPES, MODERATELY WELL DRAINED

Us - UNADILLA SILT LOAM, 0 TO 5 PERCENT SLOPES, WELL DRAINED

MgD- MARDIN VERY STONY SILT LOAM, 8 TO 25 PERCENT SLOPES, MODERATELY WELL DRAINED

VsD- VOLUSIA VERY STONY SILT LOAM, 8 TO 25 PERCENT SLOPES, SOMEWHAT POORLY DRAINED

SEEDING AND MULCHING NOTES

FORMULA B. THIS IS A REFINED LAWN TYPE, SOD FORMING GRASS FORMULA A LARGE PERCENTAGE OF KENTUCKY BLUEGRASS WITH PERENNIAL RYEGRASS AND RED FESCUES. THIS MIXTURE IS GENERALLY USED ON NON-STEEP SURFACES WHERE A MORE HIGHLY MAINTAINED AND MOWED SURFACE, SUCH AS LAWN, IS DESIRED. USE ONLY ON AREAS WHICH HAVE BEEN TOPSOILED.

FORMULA D. THIS IS A ROUGHER GRASS TYPE, SOD FORMING MIXTURE CONTAINING A LARGE PERCENTAGE OF TALL AND FINE FESCUES. THIS MIXTURE IS GENERALLY USED ON MOST HIGHWAY SLOPE AREAS NOT RECEIVING FORMULA C WHERE MOWING MAY OR MAY NOT BE DESIGNATED. IN NON-MOWED AREAS, THIS FORMULA WILL EVENTUALLY ALLOW INVASION AND SUCCESSION BY ADJACENT NATIVE WOODY PLANTS OR WILDFLOWERS. NORMALLY USED IN DRAINAGE CHANNELS OR SWALES REQUIRING PERNAMENT SEEDING.

FORMULA E. THIS IS A 100% CROP OF ANNUAL RYEGRASS WHICH IS GENERALLY USED TO QUICKLY STABILIZE EXPOSED SOIL SURFACES SINCE IT GENERALLY GERMINATES WITHIN 2 WEEKS WHEN THE CLIMATE CONDITIONS ARE FAVORABLE. SINCE THE LIFE CYCLE OF THIS GRASS AVERAGES 1 TO 2 YEARS, THIS FORMULA IS CONSIDERED MOST OFTEN FOR TEMPORARY USE ON UNFINISHED GRADED AREAS DURING CONSTRUCTION.

FORMULA L. THIS IS A FINE TEXTURED, SOD FORMING MIXTURE OF HARD FESCUE, RED FESCUE WITH A NURSE CROP OF ANNUAL RYEGRASS. THIS MIXTURE CAN BE USED ON LOW MAINTENANCE SLOPE AREAS WHICH WILL NOT BE NORMALLY MOWED AND ON FLATTER AREAS WHICH WILL NOT RECEIVE MORE THAN 2 MOWING CYCLES PER YEAR. MIXURE SHOULD NOT BE USED WHERE MOWING HEIGHT WILL BE LESS THAN 150 MM (6 IN). CUTTING LESS THAN 150 MM (6 IN) IS SEVERLEY DETRIMENTAL TO ESTABLISHMENT. MIXTURE HAS LIMITED SEEDHEAD PRODUCTION AND IS NOT VERY ADAPTIVE TO CONSISTENTLY WET SOIL CONDITIONS.

STRAW. THIS MATERIAL IS ONE OF THE BEST PREFERRED AND ONE OF THE LEAST EXPENSIVE MULCHES FOR MOST SEEDING OPERATIONS. USE ON ALL TOPSIOLED AREAS. STRAW NEEDS TO BE SECURED IN PLACE WITH EITHER APPROVED MULCH CONTROL BINDERS OR MULCH CONTROL NETTING TO PREVENT LOSS OF MATERIAL BY NATURAL WINDS OR BREEZES CAUSED BY VEHICULAR MOVEMENT.

HAY. THIS IS MORE APT TO INTRODUCE UNDESIRABLE WEED SEEDS BUT IS MORE ADAPTABLE TO STEEPER SLOPE CONDITIONS THAN STRAW. MAY HAVE WIDE USE IN WILDLIFE HABITAT AREA DEVELOPMENT TO INTRODUCE MORE DIVERSE PLANT TYPES. USE ON UNTOPSOILED AREAS.

CONT'D ON NEXT SHEET

PA ONE-CALL TOLL FREE TELEPHONE NO. 1-800-242-1776

PA ONE-CALL SERIAL NUMBER FOR KENNETT TOWNSHIP 0895559 AND 125530

PA ONE-CALL SERIAL NUMBER FOR EAST MARLBOROUGH TOWNSHIP 0895560

PA ONE-CALL SERIAL NUMBER FOR PENNSBURY TOWNSHIP 0895561

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

FRANCIS J. ELLIS

SHEET 2 OF 3

EROSION AND SEDIMENT POLLUTION CONTROL PLAN
STANDARD NOTES

FILE: G:\SR 29 Slide\Highway\E&S\Plans-DFV\SR29esgn02.dgn
DATE: 25-Nov-2013 11:51

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	LEE	5 OF 16
LIBERTY TOWNSHIP				

REVISION NUMBER	REVISIONS	DATE	BY

SEEDING AND MULCHING NOTES (CONT'D FROM PREVIOUS SHEET)

TABLE A

FORMULA AND SPECIES	% BY WEIGHT	MINIMUM % PURITY	MINIMUM % GERMINATION	MAXIMUM % WEED SEED	SEEDING RATE LBS. PER 1000 S.Y.
FORMULA B					42.0 TOTAL
◉ PERENNIAL RYEGRASS MIXTURE (LOLIUM PERENNE). A COMBINATION OF IMPROVED CERTIFIED VARIETIES WITH NO ONE VARIETY EXCEEDING 50% OF THE TOTAL RYEGRASS COMPONENT.	20	98	90	0.15	8.0
◉ CREEPING RED FESCUE OR CHEWINGS FESCUE.	30	98	85	0.15	12.0
◉ KENTUCKY BLUEGRASS MIXTURE (POA PRATENSIS). A COMBINATION OF IMPROVED CERTIFIED VARIETIES WITH NO ONE VARIETY EXCEEDING 25% OF THE TOTAL BLUEGRASS COMPONENT.	50	98	80	0.20	22.0
FORMULA D					50.0 TOTAL
◉ TALL FESCUE (FESTUCA ARUNDINACEA VAR. KENTUCKY 31)	70	97	85	0.15	35.0
◉ CREEPING RED FESCUE OR CHEWINGS FESCUE	20	98	85	0.15	10.0
◉ ANNUAL RYEGRASS (LOLIUM MULTIFLORUM)	10	98	90	0.15	5.0
FORMULA E					10.0 TOTAL
◉ ANNUAL RYEGRASS (LOLIUM MULTIFLORUM)	100	98	90	0.15	10.0
FORMULA L					48.0 TOTAL
◉ HARD FESCUE MIXTURE (FESTUCA LONGIFOLIA) A COMBINATION OF IMPROVED CERTIFIED VARIETIES WITH NO ONE VARIETY EXCEEDING 50% OF THE TOTAL HARD FESCUE COMPONENT.	57	98	85	0.15	27.5
◉ CREEPING RED FESCUE 9FESTUCA RUBRA RUBRA)	36	98	85	0.15	17.5
◉ ANNUAL RYEGRASS (LOLIUM MULTIFLORUM)	6	98	90	0.15	3.0
FORMULA BT-1					42.0 TOTAL
◉ CREEPING RED FESCUE 9FESTUCA RUBRA RUBRA)	70	98	85	0.15	30.0
◉ PERENNIAL RYEGRASS (LOLIUM PERENNE)	10	98	90	0.15	4.0
◉ REDTOP (AGROSTIS ALBA)	5	92	85	0.15	2.0
◉ BIRDSFOOT TREFOIL MIXTURE - NORCEN AND VIKING (LOTUS CORNICULATUS)	15	98	80*	0.10	6.0
FORMULA BT-2					46.0 TOTAL
◉ CREEPING RED FESCUE 9FESTUCA RUBRA RUBRA)	65	98	85	0.15	30.0
◉ PERENNIAL RYEGRASS (LOLIUM PERENNE)	9	98	90	0.15	4.0
◉ REDTOP (AGROSTIS ALBA)	4	92	85	0.15	2.0
◉ SWITCHGRASS (PANICUM VIRGATUM)	9	92	85	0.10	4.0
◉ BIRDSFOOT TREFOIL MIXTURE - NORCEN AND VIKING (LOTUS CORNICULATUS)	13	98	80*	0.10	6.0
SALT TOLERANT NATUALIZING MIXTURE					41.0 TOTAL
◉ HARD FESCUE (FESTUCA LONGOFOLIA)	10	96	85	0.15	4.1
◉ TALL FESCUE (FESTUCA ARUNDINACEA)	55	97	90	0.15	22.55
◉ SALTY ALKALIGRASS (PUCCINELLIA DISTANS)	30	99	90	0.15	12.3
◉ ANNUAL RYEGRASS (LOLIUM MULTIFLORUM)	5	98	90	.15	2.05

* MINIMUM OF 20% HARDSEED AND 60% NORMAL SPROUTS

SEEDING APPLICATION DATES *

GENERAL. SPREAD SEEDS WHERE INDICATED AND AT THE RATES SPECIFIED IN TABLE A, OR AS OTHERWISE INDICATED. SPREAD SEEDS WITHIN THE FOLLOWING DATES, OR AS OTHERWISE INDICATED OR DIRECTED.

- ◉ FORMULA B, D, L, BR-1 & BT-2 — MARCH 15 TO JUNE 1, AUGUST 1 TO OCTOBER 15
- ◉ SALT TOLERANT NATURALIZING MIXTURE — APRIL 1 TO MAY 31, AUGUST 15 TO OCTOBER 15
- ◉ FORUMLA E — MARCH 15 TO OCTOBER 15

WHEN PROJECT CONDITIONS WARRANT, SEEDING DATES MAY BE EXTENDED. IF EXTENDED, EITHER APPLY FULL TREATMENT OR APPLY ONLY 50% OF THE PERMANENT SEEDING AND SOIL SUPPLEMENTS AND APPLY THE REMAINING 50% WITHIN THE NEXT SEEDING DATES, AS DIRECTED IN WRITING BY ENGINEER.

ON TOPSOILED AREAS, WHERE TEMPORARY SEEDING OR MULCHING HAS BEEN APPLIED, USE TILLAGE AND SOIL SUPPLEMENTS PRIOR TO PERMANENT SEEDING.

ON NONTOPSOILED AREAS, WHERE TEMPORARY SEEDING OR MULCHING HAS BEEN APPLIED, PERMANENT SEED AND/OR SOIL SUPPLEMENTS MAY BE APPLIED WITHOUT TILLING.

ALL FINISHED SLOPES SHALL BE SEEDED AND/OR MULCHED IN APPROXIMATELY 15-FOOT INCREMENTS WITH PERMANENT IN-SEASON SEEDING AS INDICATED IN THE SEEDING SCHEDULE SHOWN IN TABLE B. THIS SHALL BE DONE IMMEDIATELY AFTER GRADING IS COMPLETED, AT THE FULL APPLICATION RATES SPECIFIED FOR SEED, SOIL SUPPLEMENTS, MULCH OR OTHER STABILIZATION METHODS.

ANY DISTURBED AREA ON WHICH ACTIVITY HAS CEASED AND WHICH WILL REMAIN EXPOSED FOR MORE THAN 20 DAYS MUST BE SEEDED AND MULCHED IMMEDIATELY. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE REDISTURBED WITHIN 1 YEAR MAY BE SEEDED AND MULCHED WITH A QUICK GROWING TEMPORARY SEEDING MIXTURE AND MULCH. DISTURBED AREAS WHICH ARE EITHER AT FINISHED GRADE OR WILL NOT BE REDISTURBED WITHIN 1 YEAR MUST BE SEEDED AND MULCHED WITH A PERMANENT SEED MIXTURE AND MULCH.

SOIL SUPPLEMENTS *

1. PULVERIZED AGRICULTURAL LIMESTONE.

CONFORMING TO THE REQUIREMENTS OF THE AGRICULTURAL LIMING MATERIALS ACT OF 1978, P.L. 15, NO. 9, AS AMENDED, CONFORMING TO THE CURRENT STATE SPECIFICATIONS NO. L-37 FOR GROUP 1, CLASS B, TYPE MO MATERIAL.

FURNISH MATERIAL HAVING AN EFFECTIVE NEUTRALIZING POWER OF NOT LESS THAN 64 WHEN CALCULATED, USING THE GUARANTEED CHEMICAL ANALYSIS AND FINENESS, IN ACCORDANCE WITH THE AGRICULTURAL LIMING MATERIALS RULES AND REGULATIONS (TITLE 7 PA. CODE, PART V, CHAPTER 108).

2. COMMERCIAL FERTILIZER.

CONFORMING TO THE REQUIREMENTS OF THE PENNSYLVANIA SOIL CONDITIONER AND PLANT GROWTH SUBSTANCE LAW, ACT OF DECEMBER 1, 1977, P.L. 258, NO. 86 (3P.S.68.2), AS AMENDED.

USE DRY FORMULATIONS OF 10-20-20 ANALYSIS FOR SEEDED AND SODDED AREAS. USE DRY FORMULATIONS OF 20-10-5 AND 16-8-16 ANALYSIS CONTROLLED RELEASE FOR TREE, SHRUB, AND VINE TYPE PLANTING OPERATIONS. USE DRY FORMULATIONS OF 19-6-12 ANALYSIS CONTROLLED RELEASE FOR HERBACEOUS WETLAND PLANTING OPERATIONS. USE OTHER ANALYSIS AS INDICATED OR SPECIFIED IN THE PROPOSAL.

DO NOT USE LIQUID FERTILIZER FORMULATIONS FOR THE FORMULA BT-1 OR FORMULA BT-2.

3. SLOW-RELEASE NITROGEN FERTILIZER.

CONFORMING TO THE REQUIREMENTS OF THE PENNSYLVANIA SOIL CONDITIONER AND PLANT GROWTH SUBSTANCE LAW, ACT OF DECEMBER 1, 1977, P.L.258, NO.86 (3P.S.68.2), AS AMENDED.

USE DRY FORMULATIONS OF EITHER 38-0-0 UREAFORM, 32-0-0 TO 38-0-0 SULFUR COATED UREA, 31-0-0 IBDU, OR ANOTHER ANALYSIS AS INDICATED; AND MEETING THE FOLLOWING REQUIREMENTS:

- ◉ 38-0-0 UREAFORM
  - TOTAL NITROGEN (TN) — 25.0% MINIMUM
  - COLD WATER INSOLUBLE NITROGEN (WIN) — 40.0% MINIMUM
  - ACTIVITY INDEX (AI)
  - UREA NITROGEN — 3.5% MINIMUM
- ◉ 32-0-0 TO 38-0-0 SULFUR COATED UREA WITH A 7-DAY DISSOLUTION RANGE OF 20% TO 30%
- ◉ 31-0-0 IBDU — COARSE GRADE (0.7 TO 2.5MM)
- ◉ WATER INSOLUBLE NITROGEN (WIN) — 27.0% MINIMUM
- ◉ OTHER ANALYSIS AS INDICATED.

SOIL SUPPLEMENTS APPLICATION RATES

SOIL SUPPLEMENTS.

UNIFORMLY APPLY SUPPLEMENTS TO THE AREAS TO BE SEEDED, EXCEPT AREAS TO BE SEEDED WITH FORMULA E. PROPERLY DOCUMENT BULK DELIVERY, AS SPECIFIED IN SECTION 804.2(A)2.

ON TOPSOILED AREAS, BLEND THE INITIAL SOIL SUPPLEMENTS INTO THE SOIL AT LEAST 2-INCHES, BY RAKING, DISKING, HARROWING, OR BY ANOTHER ACCEPTABLE METHOD. THE BLENDING OF THE SUPPLEMENTS INTO SOIL MAY BE PERFORMED DURING TILLAGE OPERATIONS.

PRIOR TO PROJECT COMPLETION, APPLY SLOW-RELEASE, NITROGEN FERTILIZER TO THE SURFACE OF AREAS THAT HAVE BEEN SEEDED WITH FORMULA B, D, L, W, BT1, BT-2 & SALT TOLERANT NATURALIZING MIXTURE.

APPLY SOIL SUPPLEMENTS AS FOLLOWS, UNLESS OTHERWISE INDICATED:

- PULVERIZED AGRICULTURAL LIMESTONE — 800 POUNDS PER 1,000 S.Y.
- 10-20-20 ANALYSIS COMMERCIAL FERTILIZER — 140 POUNDS PER 1,000 S.Y.
- 38-0-0 UREAFORM FERTILIZER OR 32-0-0 TO 38-0-0 SULFUR COATED UREA FERTILIZER OR 31-0-0 IBDU FERTILIZER — 50 POUNDS PER 1,000 S.Y. OR 59 TO 50 POUNDS PER 1,000 S.Y. AS DIRECTED OR 61 POUNDS PER 1,000 S.Y.

ON FORMULA BT-1, BT-2 AND SALT TOLERANT NATURALING MIXTURE, APPLY 10-20-20 ANALYSIS COMMECIAL FERTILIZER AT 140 POUNDS PER 1000 SQUARE YARDS.

*FOR INFORMATION ONLY

THE CONTRACTOR WILL BE RESPONSIBLE FOR THE PROPER CONSTRUCTION, STABILIZATION AND MAINTENANCE OF ALL EROSION AND SEDIMENTATION CONTROLS AND RELATED ITEMS INCLUDED IN THIS PERMIT.

MULCH TYPES *

MULCHES.

FREE FROM FOREIGN MATERIAL, COARSE STEMS, AND ANY SUBSTANCES TOXIC TO PLANT GROWTH. ALSO, FREE FROM MATURE SEED BEARING STALKS OR ROOTS OF PROHIBITED AND NOXIOUS WEEDS, BOTH AS DEFINED BY LAW.

WHEN REQUESTED, AND PRIOR TO PROJECT DELIVERY, FURNISH A CERTIFIED PHYSICAL AND CHEMICAL ANALYSIS FOR MULCHES.

USE MULCHES SEPARATELY OR, IF INDICATED, IN COMBINATION WITH WEED BARRIER MAT, AS SPECIFIED IN SECTION 808.2(Q), BUT DO NOT USE CRUSHED AGGREGATE WITH WEED BARRIER MAT.

1. SEEDED AREAS.
   EITHER ONE OR A COMBINATION OF THE FOLLOWING, AS SPECIFIED:

1.A HAY.
TIMOTHY HAY, MIXED CLOVER AND TIMOTHY HAY, OR OTHER ACCEPTABLE NATIVE OR FORAGE GRASSES, WELL- CURED TO LESS THAN 20% MOISTURE CONTENT, BY WEIGHT.

1.B STRAW.
EITHER WHEAT OR OAT STRAW, REASONABLY FREE OF VIABLE SEED, WELL CURED TO LESS THAN 20% MOISTURE CONTENT, BY WEIGHT.

MULCHING APPLICATION RATES *

MULCHING SEEDED AREAS.

PLACE MULCH, OF THE KIND INDICATED, IMMEDIATELY AFTER SEEDING OR WITHIN 48 HOURS AFTER SEEDING IS COMPLETED. UNLESS OTHERWISE INDICATED, PLACE ONLY STRAW OR WOOD FIBER OVER TOPSOILED AREAS. USE HAY, STRAW, OR WOOD FIBER IN OTHER AREAS, AS INDICATED OR SPECIFIED.

PLACE HAY OR STRAW UNIFORMLY, IN A CONTINUOUS BLANKET, AT A MINIMUM RATE OF 1,200 POUNDS PER 1,000 SQUARE YARDS, OR AS OTHERWISE INDICATED. IF DIRECTED, INCREASE THE RATE OF APPLICATION, DEPENDING UPON THE MATERIAL USED, SEASON, SOIL CONDITIONS, OR METHOD OF APPLICATION. AN ACCEPTABLE MECHANICAL BLOWER MAY BE USED TO APPLY MULCH. MACHINES WHICH CUT MULCH INTO SHORT PIECES WILL NOT BE PERMITTED. ANCHOR MULCH WITH SPECIFIED MULCH BINDERS APPLIED AT THE FOLLOWING RATES:

- ◉ RECYCLED CELLULOSE FIBER. 160 POUNDS PER 1,000 SQUARE YARDS
- ◉ WOOD FIBER. 160 POUNDS PER 1,000 SQUARE YARDS.
- ◉ NONASPHALTIC EMULSION. AT MANUFACTURER'S RECOMMENDED RATE
- ◉ POLYVINYL ACETATE.
- ◉ RECYCLED CELLULOSE FIBER/WOOD FIBER MIXTURE. 160 POUNDS PER 1,000 SQUARE YARDS.

APPLY WOOD FIBER MULCH HYDRAULICALLY IN ACCORDANCE WITH THE MANUFACTURER'S TANK- MIXING INSTRUCTION. IT MAY BE INCORPORATED AS AN INTEGRAL PART OF THE SLURRY AFTER THE SEED AND SOIL SUPPLEMENTS HAVE BEEN THOROUGHLY MIXED. APPLY UNIFORMLY AT THE RATE OF 320 POUNDS PER 1,000 SQUARE YARDS, UNLESS OTHERWISE INDICATED.

MULCH TEMPORARY SEEDED AREAS WITH HAY.

MULCHING PLANTED AREAS.

UNIFORMLY MULCH ENTIRE PLANT PIT BASINS, SHRUB BEDS, AND OTHER AREAS AS DIRECTED TO A LOOSE DEPTH OF 3-INCHES, OR AS INDICATED. DO NOT MULCH AREAS PLANTED WITH CROWNVETCH OR REFORESTATION AREAS.

PLACE MULCH EITHER BY HAND OR USING MECHANICAL SPREADING EQUIPMENT MANUFACTURED FOR THIS PURPOSE. TEST APPLICATION PROCEDURES TO ENSURE CONFORMANCE WITH DEPTH REQUIREMENTS. REDISTRIBUTE MULCH IN AREAS OF EXCESSIVE DEPTH. APPLY MULCH WITHIN 48 HOURS AFTER COMPLETION OF EACH PLANTED AREA.

MULCH CONTROL NETTING *

1. PLASTIC.
   A UNIFORMLY EXTRUDED, RECTANGULAR, PLASTIC MESH MEETING THE FOLLOWING REQUIREMENTS:
   - ◉ COLOR — BLACK, GREEN OR CLEAR
   - ◉ WEIGHT — 0.23 OUNCE PER SQUARE YARD, MINIMUM
   - ◉ MESH OPENING — NOMINAL 3/4-INCH X 3/4-INCH

2. COCONUT COIR.
   UNDYED, BIODEGRADABLE COCONUT COIR YARN WOVEN INTO A MESH MEETING THE FOLLOWING REQUIREMENTS
   - ◉ WEIGHT — 6 OUNCES PER SQUARE YARD. MINIMUM
   - ◉ MESH OPENING — NOMINAL 2-INCH X 2-INCH

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — FRANCIS J. ELLIS — ENGINEER — SEAL

SHEET 3 OF 3

EROSION AND SEDIMENT POLLUTION CONTROL PLAN
STANDARD NOTES

FILE: G:\SR 29 SIDE\Highway\E&S\Plans-DFV\SR29esgn03.dgn
DATE: 25-Nov-2013 11:52

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	LEE	6 OF 16
LIBERTY TOWNSHIP				

REVISION NUMBER	REVISIONS	DATE	BY

SEQUENCE OF CONSTRUCTION

THE PROJECT IS LOCATED IN LIBERTY TOWNSHIP, SUSQUEHANNA COUNTY, ALONG SR 0029, IN NORTH-CENTRAL SUSQUEHANNA COUNTY, APPROXIMATELY ONE-HALF MILE SOUTH OF THE NEW YORK STATE BORDER. THERE IS AN ACTIVE LANDSLIDE LOCATED ALONG SR 0029 THAT HAS DAMAGED THE ROADWAY. THE PRINCIPAL CAUSE OF THE LANDSLIDE IS CONTINUAL EROSION OF THE TOE OF THE SLOPE BY SNAKE CREEK, JUST DOWNSLOPE OF AND PARALLEL TO SR 0029. THE PROJECT PROPOSES TO RELOCATE 1025 FEET OF SNAKE CREEK APPROXIMATELY 60 FEET EAST FROM THE EXISTING TOE AND PROVIDE AN EARTH BERM AT THE TOE OF THE LANDSLIDE TO HOLD THE LANDSLIDE. IN CONJUNCTION WITH THE EARTH BERM AND STREAM RELOCATION, ROADWAY DRAINAGE WILL BE DIVERTED TO THE SOUTH AND PREVENTED FROM DISCHARGING INTO THE LANDSLIDE AREA.

NOTE:
AT LEAST 7 DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, THE OPERATOR SHALL INVITE ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES, THE LANDOWNER, ALL APPROPRIATE MUNICIPAL OFFICIALS, THE EROSION AND SEDIMENT CONTROL PLAN PREPARER, AND THE SUSQUEHANNA COUNTY CONSERVATION DISTRICT (SCCD) TO AN ON-SITE MEETING.

ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCESS 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.

STAGE 1-STREAM RELOCATION, ROADWAY DRAINAGE INSTALLATION AND WETLAND CONSTRUCTION:

1. CONSTRUCT ROCK CONSTRUCTION ENTRANCE AT BEGINNING OF TEMPORARY ACCESS ROAD OFF OF ENGLISH FALLS ROAD (T-743) AND CONSTRUCT ACCESS ROAD TO SNAKE CREEK, INSTALLING PROTECTIVE FENCE AROUND WETLANDS AND PLACING SILT SOCK.

2. PLACE SANDBAG COFFER DAM AT BOTH ENDS OF THE PROPOSED STREAM AS SHOWN TO BLOCK FLOW WHILE PERFORMING EARTHWORK.

3. EXCAVATE EARTHWORK FOR PROPOSED STREAM AND BENCH AS SHOWN ON WETLAND AND STREAM MITIGATION PLANS, CONSTRUCTING ENTIRE RIGHT BANK AND LEFT BANK R-8 ROCK VENEER UP TO ELEVATION 910 WITHIN LIMITS OF COFFER DAM PROTECTED AREA. HAVE PUMPED WATER FILTER BAG ON SITE IN ORDER TO CLEAN ANY WATER REMOVED FROM EXCAVATION AREA.

4. INSTALL STREAM STABILITY FEATURES AS SHOWN ON WETLAND AND STREAM MITIGATION PLANS WITHIN LIMITS OF COFFER DAM PROTECTED AREA INCLUDING THE J HOOK VANE, PORTIONS OF THE CROSS VANES, AND ALL RIGHT BANK STABILITY FEATURES, EROSION BLANKETING AND PROPOSED PLANTINGS.

5. CONSTRUCT ROCK CONSTRUCTION ENTRANCE AT BEGINNING OF TEMPORARY ACCESS ROAD OFF SR 0029 (SNAKE CREEK ROAD), CONSTRUCT ACCESS ROAD, INSTALLING TIMBER MATS, PROTECTIVE FENCE AROUND WETLANDS AND PLACING SILT SOCK.

6. REPOSITION SANDBAGS TO DIRECT STREAM INTO RELOCATED CHANNEL. REMOVE ENGLISH FALLS ROAD (T-743) TEMPORARY ACCESS ROAD, PROTECTIVE FENCING, SILT SOCK AND ROCK CONSTRUCTION ENTRANCE, IMMEDIATELY STABILIZING ANY AREAS DISTURBED DURING REMOVAL PROCESS.

NOTE: TASKS 5, 7 AND 8 CAN BE COMPLETED INDEPENDENT OF TASKS 1-4, BUT TASK 5 MUST OCCUR BEFORE TASK 6.

7. CONSTRUCT WETLAND MITIGATION SITE AND PORTION OF LEVEL SPREADER SOUTH OF TEMPORARY ACCESS ROAD FOLLOWING STEPS 1-3 OF "SEQUENCE OF OPERATIONS FOR WETLAND MITIGATION SITE" SHOWN ON WETLAND AND STREAM MITIGATION PLANS. (NOTE: FINAL WETLAND SITE PLANTINGS TO BE COMPLETED AFTER SIX MONTH HYDROLOGIC STABILIZATION PERIOD)

8. BUILD ALL DRAINAGE ALONG SR 0029, INCLUDING CHANNEL CH-1 AND INSTALL TURF REINFORCEMENT MAT IN CHANNEL IMMEDIATELY. TEMPORARILY EXTEND12"PIPE TO TIE TO GRADED PORTION OF WETLAND AND 24"PIPE TO TIE TO CONSTRUCTED PORTION OF LEVEL SPREADER SOUTH OF ACCESS ROAD. GRADE ACCESS ROAD TO ELEVATION ABOVE ADJACENT LEVEL SPREADER AND INSTALL MOUNTABLE GRAVEL BERM OVER TEMPORARY PIPES (AS IN ROCK CONSTRUCTION ENTRANCE DETAIL).

STAGE 2-BERM CONSTRUCTION:

1. CONSTRUCT ROCK REVETMENT, REMAINING LEFT BANK R-8 VENEER AND BANK UP TO ACCESS BENCH, AND SEDIMENT TRAPS 1 AND 2 AND OUTLET PIPES WHERE SHOWN. NOTE: OUTLET PIPES SHOULD BE DIRECTED ONTO CONSTRUCTED R-8 VENEER.

2. CONSTRUCT BERM AND STABILIZE IMMEDIATELY WITH EROSION CONTROL BLANKET.

3. ONCE CONTRIBUTING AREA TO SEDIMENT TRAPS 1 AND 2 IS STABILIZED, SCHEDULE SITE INSPECTION BY THE SUSQUEHANNA COUNTY CONSERVATION DISTRICT (SCCD).

4. AFTER APPROVAL FROM SCCD, REMOVE SEDIMENT TRAPS 1 AND 2, BRINGING AREAS TO PROPOSED GRADE USING R-8 AND CONSTRUCTING CROSS VANE EXTENSION AS SHOWN ON WETLAND AND STREAM MITIGATION PLANS. RE-GRADE ACCESS BENCH CROSS SLOPE TO SLOPE TOWARD STREAM, STABILIZING IMMEDIATELY WITH EROSION CONTROL MATTING.

5. REMOVE COFFERDAMS AND COMPLETE CROSS VANE INSTALLATION AS SHOWN ON WETLAND AND STREAM MITIGATION PLANS.

6. AFTER STABILIZATION IS COMPLETE, REMOVE TIMBER MATS, SILT SOCK AND PROTECTIVE FENCING ALONG THE SR 0029 TEMPORARY ACCESS ROAD FROM THE TEMPORARY PIPE CROSSING TO THE COMPLETED BERM AREA.

7. REMOVE TEMPORARY 24"PIPE EXTENSION, FINISH LEVEL SPREADER, DOWLING NEWLY CONSTRUCTED PORTION INTO PREVIOUSLY CONSTRUCTED PORTION AND CONNECTING 24"PERMANENT PIPE TO LEVEL SPREADER. COMPLETE WETLAND GRADING IN AREA OF ACCESS ROAD AND REMOVE 12 PIPE TEMPORARY EXTENSION.

NOTE: SR 0029 TEMPORARY ACCESS ROAD, PROTECTIVE FENCING AND SILT SOCK FROM SR 0029 TO THE WETLAND MITIGATION SITE TO REMAIN IN PLACE UNTIL FINAL WETLAND PLANTS ARE INSTALLED IN LATER STAGE.

STAGE 3-ROADWAY RECONSTRUCTION:

1. CONSTRUCT TEMPORARY DRIVEWAY CONNECTING DRIVEWAY 1 TO DRIVEWAY 2 (STATION 15+00, LT.). CONSTRUCTION MUST BE DONE IN ONE DAY DURING NON-RAIN EVENT. APPLY EROSION CONTROL BLANKET IMMEDIATELY TO ALL DISTURBED AREAS.

2. EXCAVATE EXISTING PAVEMENT TO BOTTOM OF SUBGRADE FROM STA 13+00 TO 19+00 OF SR 0029 (SNAKE CREEK ROAD).

3. CONSTRUCT PAVEMENT FROM STA 13+00 TO 19+00 AND TIE INTO EXISTING.

4. MAINTAIN TEMPORARY ACCESS TO PROPERTIES FOR OWNERS WHILE REGRADING DRIVEWAY 1 AND 2 TO TIE INTO PROPOSED SR 0029 (SNAKE CREEK ROAD) ELEVATIONS.

5. ONCE REGRADING IS COMPLETED, REMOVE TEMPORARY DRIVEWAY GRAVEL AND STABILIZE.

STAGE 4- WETLAND MITIGATION SITE PLANTING INSTALLATION:

1. ALLOW SIX MONTHS FOR SITE HYDROLOGY TO STABILIZE.

2. COMPLETE STEPS 5-6 OF "SEQUENCE OF OPERATIONS FOR WETLAND MITIGATION SITE" PER WETLAND AND STREAM MITIGATION PLAN, COMPLETING FINAL INSPECTIONS, CLEANING AND PLANTING.

3. REMOVE REMAINING SR 0029 TEMPORARY ACCESS ROAD AND TIMBER MATS.

4. REMOVE BMPS UPON COMPLETION AND STABILIZATION OF THE DISTURBED AREA TRIBUTARY TO EACH BMP. VEGETATED AREAS MUST ACHIEVE A MINIMUM UNIFORM 70% PERENNIAL VEGETATIVE COVER OR WHEN SUBBASE IS PLACED IN ROADWAY AREAS.

EROSION AND SEDIMENT POLLUTION CONTROL PLAN
CONSTRUCTION SEQUENCE

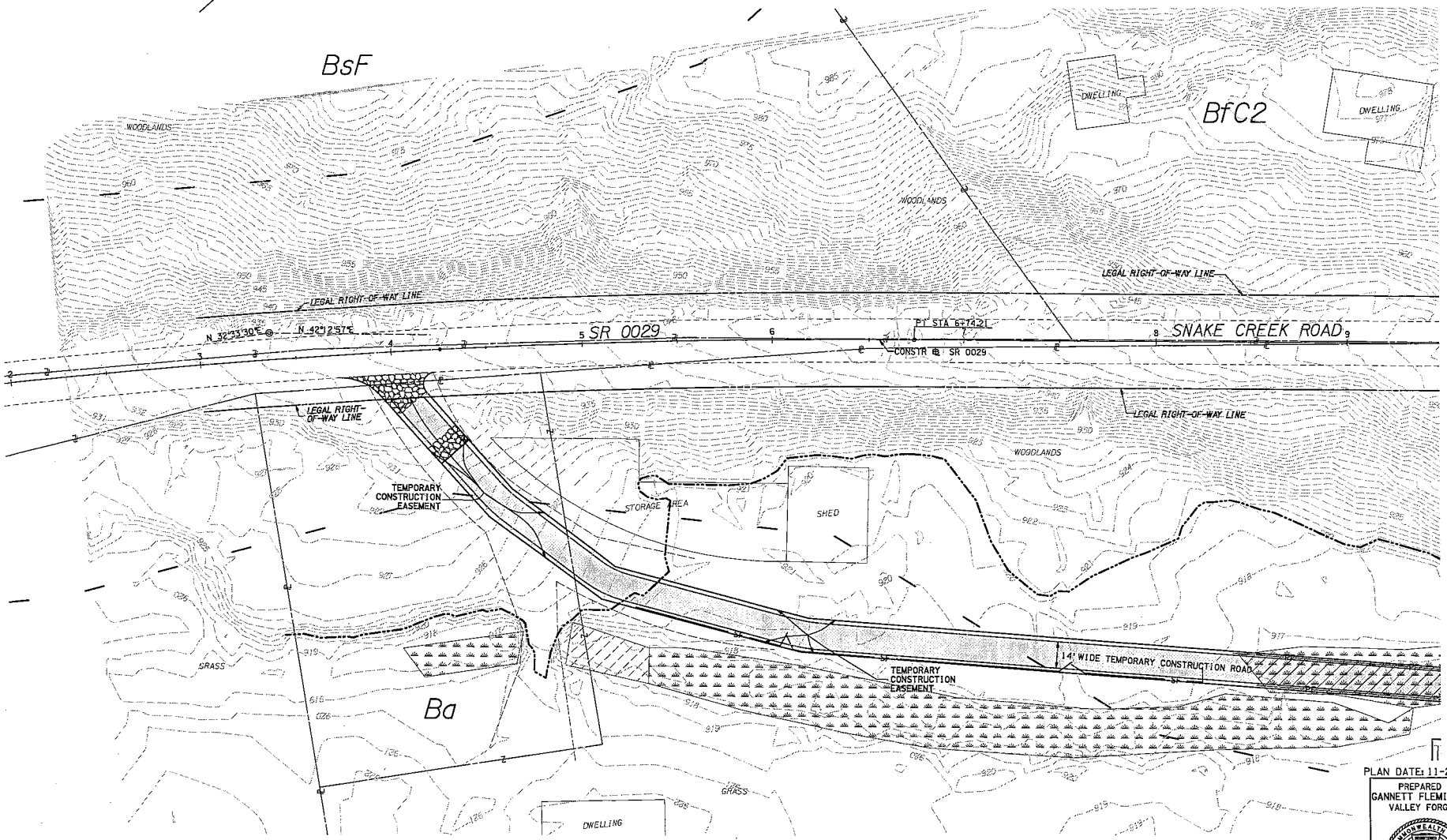
PLAN DATE: 11-25-2013
PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
FRANCIS J. EELLS
ENGINEER

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	LEE	7 OF 16
LIBERTY TOWNSHIP				

REVISION NUMBER	REVISIONS	DATE	BY

NOTE: THE NPDES PERMIT BOUNDARY INCLUDES PAVED ROADWAY WITHIN LEGAL RIGHT-OF-WAY FROM STATION 03+50.00 TO STATION 19+50.00 IN CONJUCTION WITH ALL SHADED AREAS INDICATED AS DISTURBED AREAS.



SEE SHEET 8

EROSION AND SEDIMENT POLLUTION CONTROL PLAN

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

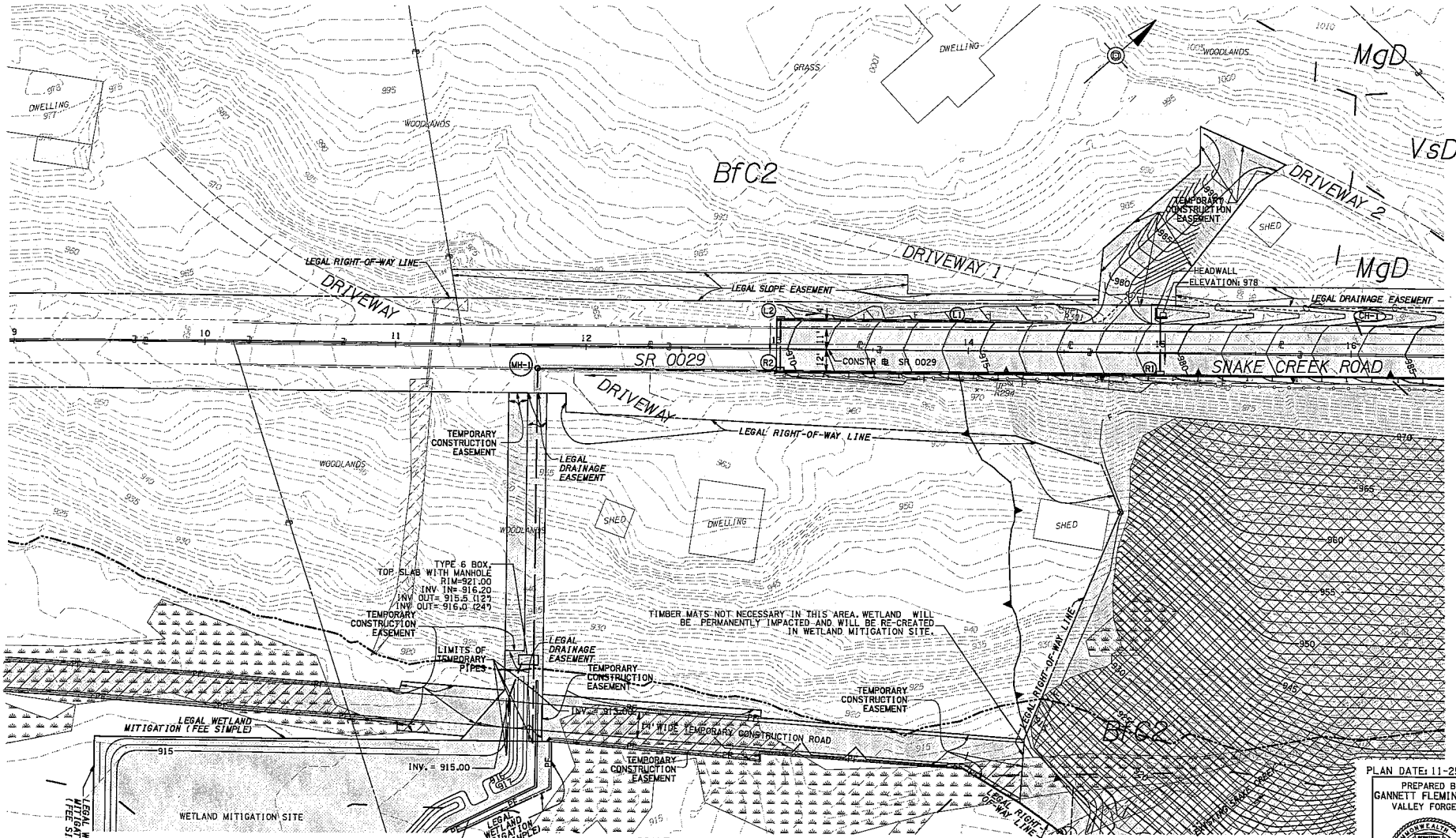
COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER FRANCIS J. EELLS

FILE: G:\SR 29 Slide\Highway\E&S\Plans-DFV\SR29es01.dgn
DATE: 25-Nov-2013 15:37

NOTE: THE NPDES PERMIT BOUNDARY INCLUDES PAVED ROADWAY WITHIN LEGAL RIGHT-OF-WAY FROM STATION 03+50.00 TO STATION 19+50.00 IN CONJUCTION WITH ALL SHADED AREAS INDICATED AS DISTURBED AREAS.

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	LEE	8 OF 16
LIBERTY TOWNSHIP				

REVISION NUMBER	REVISIONS	DATE	BY



SEE SHEET 7

SEE SHEET 9

SEE SHEET 10

EROSION AND SEDIMENT POLLUTION CONTROL PLAN

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

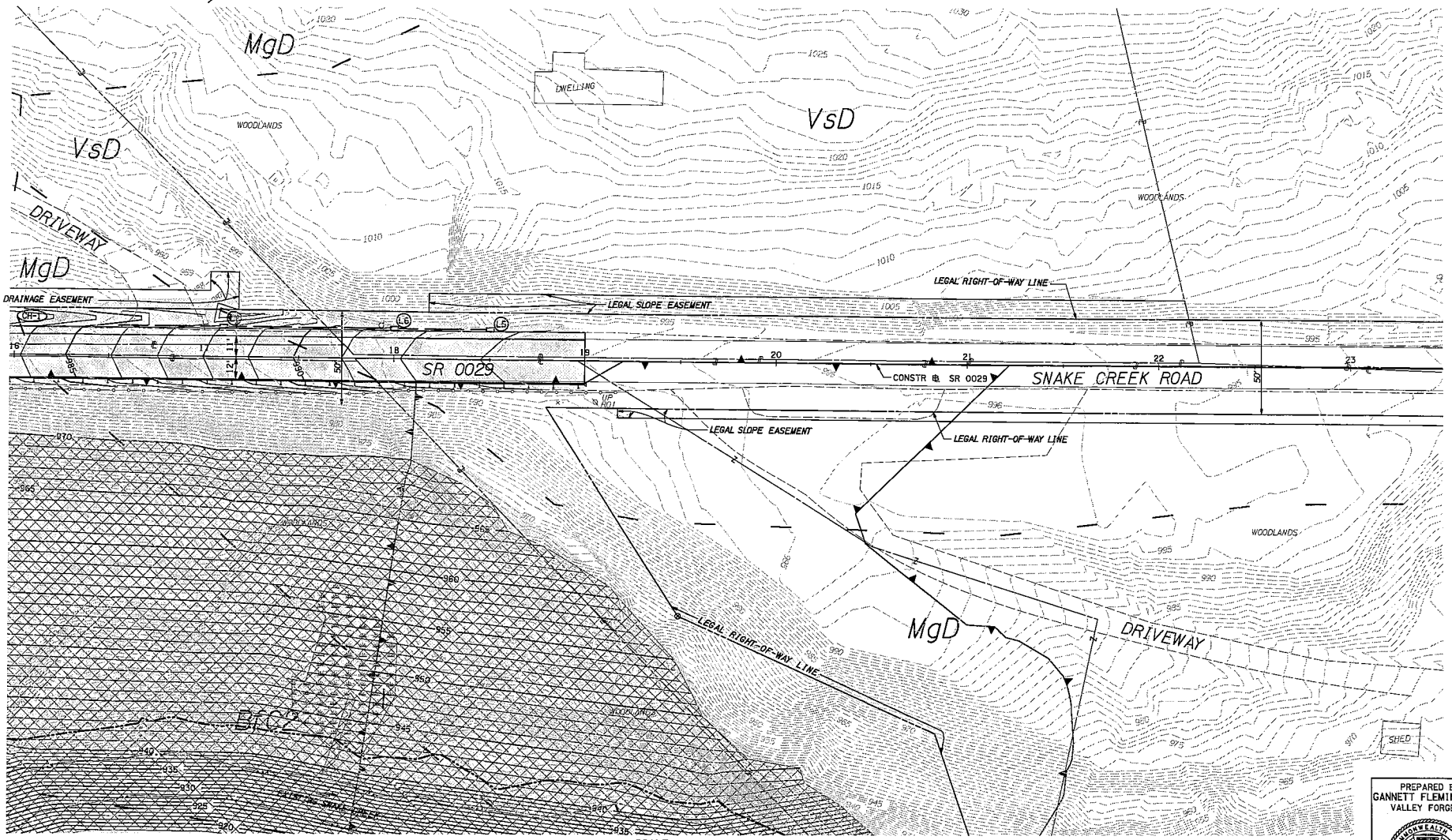
COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
FRANCIS J. EELLS
ENGINEER

FILE: G:\SR 29 Slide\Highway\E&S\Plans-DFV\SR29es02.dgn
DATE: 25-Nov-2013 15:39

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	LEE	9 OF 16
LIBERTY TOWNSHIP				

REVISION NUMBER	REVISIONS	DATE	BY

NOTE: THE NPDES PERMIT BOUNDARY INCLUDES PAVED ROADWAY WITHIN LEGAL RIGHT-OF-WAY FROM STATION 03+50.00 TO STATION 19+50.00 IN CONJUCTION WITH ALL SHADED AREAS INDICATED AS DISTURBED AREAS.



SCALE
0 25 50 FEET

EROSION AND SEDIMENT POLLUTION CONTROL PLAN

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
FRANCIS J. EELLS
ENGINEER

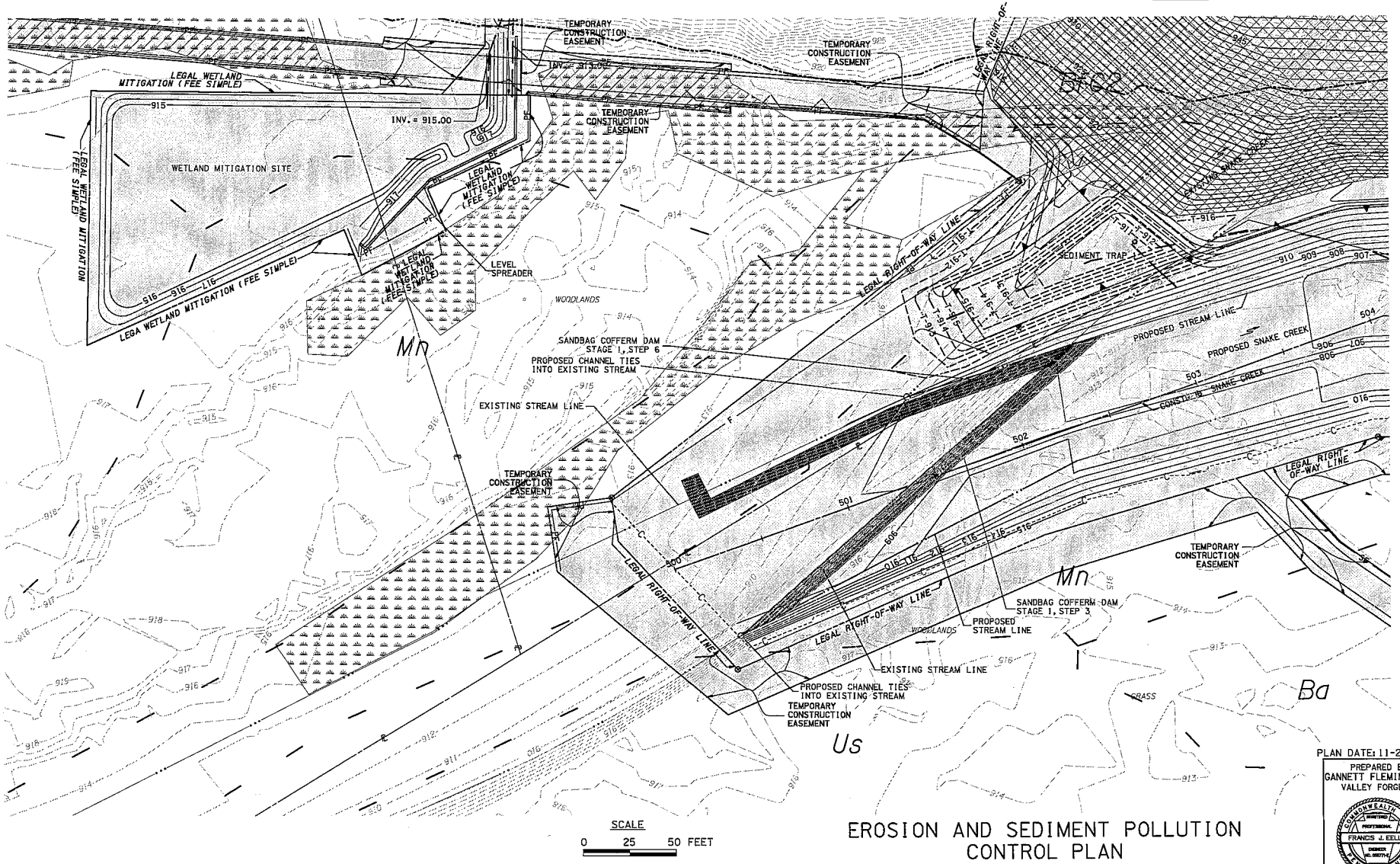
FILE: CA\SR 29 Slide\Highway\E&S\Plans-DFV\SR29es03.dgn
DATE: 25-Nov-2013 15:40

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	LEE	10 OF 16
	LIBERTY TOWNSHIP			

REVISION NUMBER	REVISIONS	DATE	BY

SEE SHEET 8

NOTE: THE NPDES PERMIT BOUNDARY INCLUDES PAVED ROADWAY WITHIN LEGAL RIGHT-OF-WAY FROM STATION 03+50.00 TO STATION 19+50.00 IN CONJUCTION WITH ALL SHADED AREAS INDICATED AS DISTURBED AREAS.



SEE SHEET 11

EROSION AND SEDIMENT POLLUTION CONTROL PLAN

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL ENGINEER
FRANCIS J. EELLS

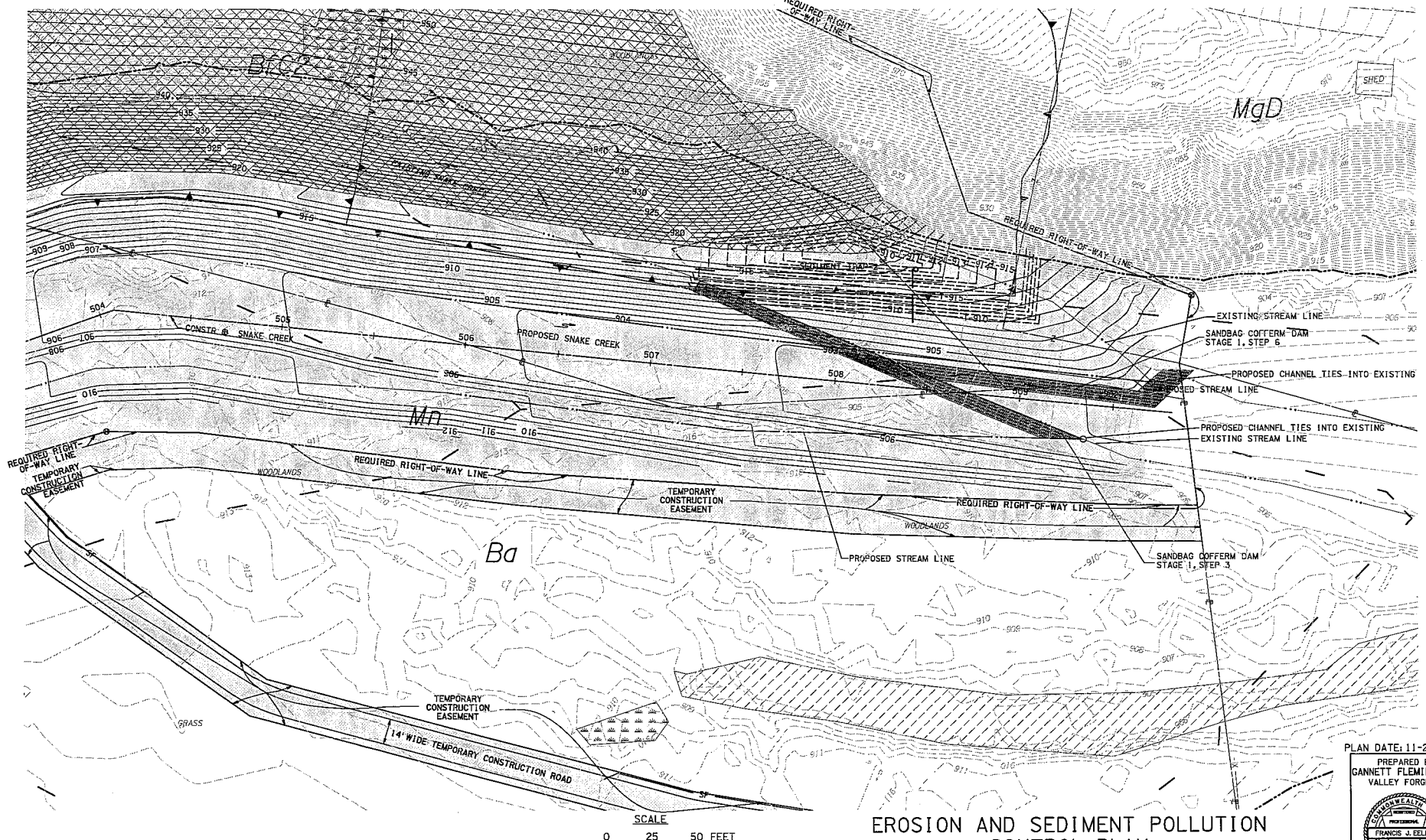
FILE: G:\SR 29 Slide\Highway\E&S\Plans-DFV\SR29es04.dgn
DATE: 25-Nov-2013 15:41

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	LEE	11 OF 16
	LIBERTY TOWNSHIP			

REVISION NUMBER	REVISIONS	DATE	BY

SEE SHEET 9

NOTE: THE NPDES PERMIT BOUNDARY INCLUDES PAVED ROADWAY WITHIN LEGAL RIGHT-OF-WAY FROM STATION 03+50.00 TO STATION 19+50.00 IN CONJUCTION WITH ALL SHADED AREAS INDICATED AS DISTURBED AREAS.



SCALE
0 25 50 FEET

SEE SHEET 10

SEE SHEET 12

EROSION AND SEDIMENT POLLUTION CONTROL PLAN

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL ENGINEER
FRANCIS J. EELLS
ENGINEER

FILE: G:\SR 29 Slide\Highway\E&S\Plans-DFV\SR29es05.dgn
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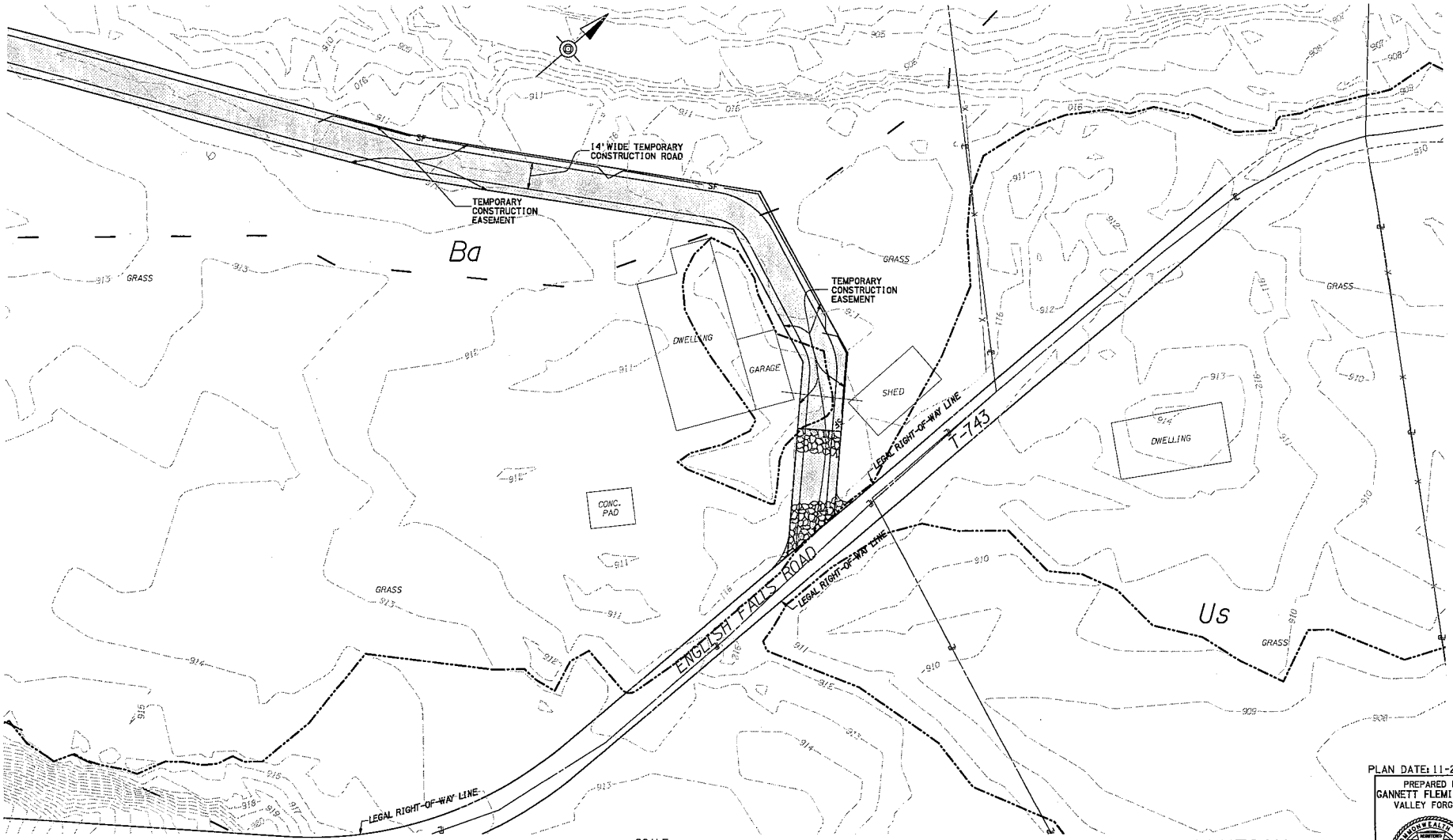
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	LEE	12 OF 16
	LIBERTY TOWNSHIP			

REVISION NUMBER	REVISIONS	DATE	BY

NOTE: THE NPDES PERMIT BOUNDARY INCLUDES PAVED ROADWAY WITHIN LEGAL RIGHT-OF-WAY FROM STATION 03+50.00 TO STATION 19+50.00 IN CONJUCTION WITH ALL SHADED AREAS INDICATED AS DISTURBED AREAS.

SEE SHEET 11



SCALE
0 25 50 FEET

EROSION AND SEDIMENT POLLUTION CONTROL PLAN

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL ENGINEER
FRANCIS J. ELLIS
ENGINEER
No. 060774-E

FILE: G:\SR 29 Slide\Highway\E&S\Plans-DFV\SR29es06.dgn
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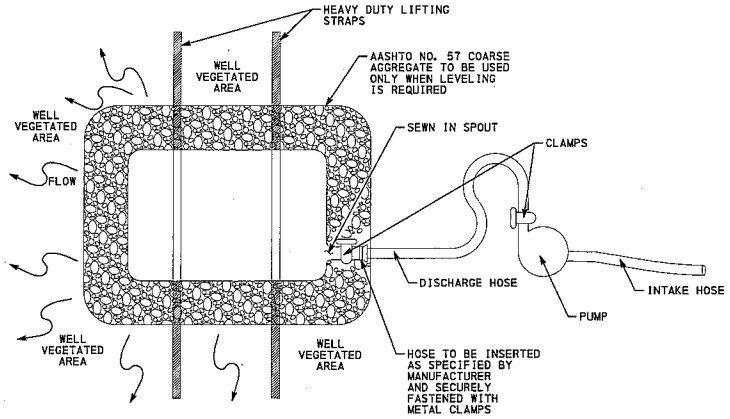
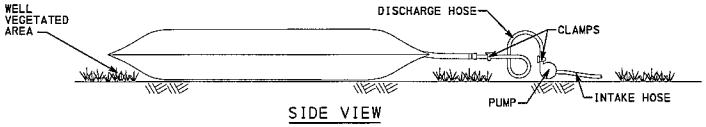
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA 109	0029	LEE	13 OF 16
	LIBERTY TOWNSHIP			

REVISION NUMBER	REVISIONS	DATE	BY



TOP VIEW



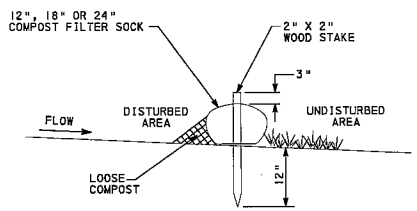
SIDE VIEW

NOTES

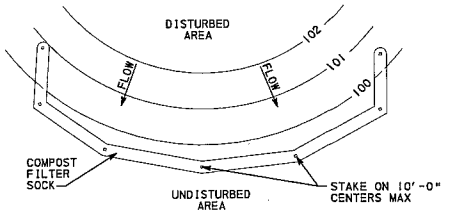
1. LOCATE BAG IN LEVEL AREAS (LESS THAN 5% GRADE). WHEN LEVEL AREAS ARE NOT AVAILABLE, PLACE AASHTO NO. 57 COARSE AGGREGATE TO LEVEL THE BAG.
2. LOCATE BAG IN A WELL VEGETATED AREA. DISCHARGE ONTO A STABLE, EROSION RESISTANT AREA. WHEN VEGETATED AREA IS NOT AVAILABLE, PROVIDE A GEOTEXTILE (CLASS 4, TYPE A) LINED FLOW PATH TO A STABLE EROSION RESISTANT RECEIVING WATER COURSE OR A WELL VEGETATED AREA.
3. LOCATE BAG IN AN AREA ACCESSIBLE BY EQUIPMENT FOR MAINTENANCE AND REMOVAL PURPOSES.
4. DO NOT INSERT MORE THAN ONE HOSE INTO A BAG.
5. REPLACE THE BAG WHEN 50% OF THE SEDIMENT CAPACITY HAS BEEN FILLED AND/OR WHEN THERE IS A FAILURE. THE ADDITIONAL BAGS WILL BE PAID AS EACH.
6. REMOVE AND PROPERLY DISPOSE OF THE PUMPED WATER FILTER BAGS. RESTORE THE AREA IN ACCORDANCE WITH THE SPECIFICATIONS IN PUBLICATION 408. DO NOT CUT FILTER BAG OR DISTRIBUTE AND SEED SEDIMENT.
7. DO NOT PERMIT DISCHARGE FROM THE BAG TO DRAIN BACK INTO WORK OR ACCESS AREAS OF THE PROJECT.
8. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN ( ) PARENTHESIS.
9. MAXIMUM PUMPING RATE FOR THE PROPOSED PUMPED WATER FILTER BAG IS 750 G.P.M OR 1/2 THE MANUFACTURER'S MAXIMUM, WHICHEVER IS LESS.

PUMPED WATER FILTER BAG

ITEM NO. 0855-0003



SECTION VIEW



PLAN VIEW

NOTES

1. REMOVE DEPOSITS WHEN SEDIMENT ACCUMULATION IS ONE THIRD THE HEIGHT OF THE EXPOSED COMPOST FILTER BERM OR ONE HALF OF THE EXPOSED COMPOST FILTER SOCK. REMOVED SEDIMENT SHALL BE DISPOSED OF IN ACCORDANCE WITH THE GENERAL NOTES OF THIS PLAN.
2. PLACE COMPOST FILTER SOCK/BERM ON LEVEL GRADE. EXTEND BOTH ENDS OF THE COMPOST FILTER SOCK/BERM AT LEAST 2400 (8'-0") UPSLOPE AT 45 DEGREES TO THE MAIN ALIGNMENT.
3. REPLACE BIODEGRADABLE FILTER SOCK AFTER 6 MONTHS; PHOTODEGRADABLE AFTER 12 MONTHS.

COMPOST FILTER SOCK

NTS

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

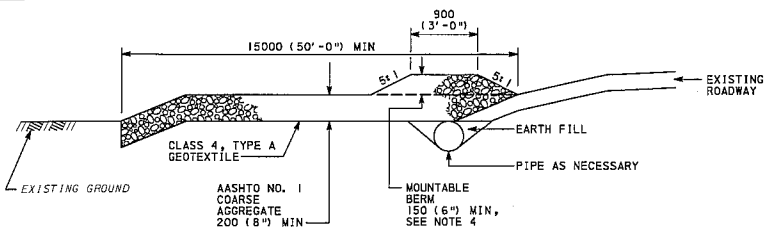
EROSION AND SEDIMENT POLLUTION CONTROL PLAN

MISCELLANEOUS DETAILS

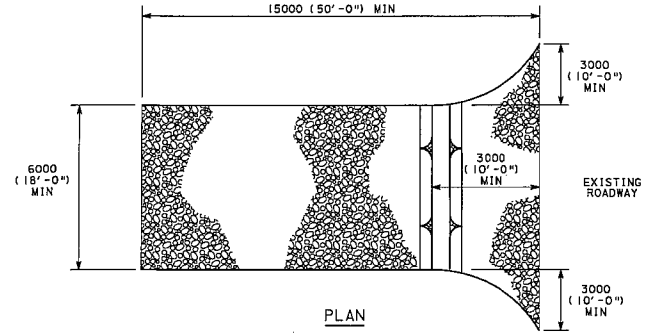
FILE: G:\SR 29 Slide\Highway\E&S\Plans-DFV\SR29esd101.dgn
DATE: 25-Nov-2013 12:13

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	LEE	14 OF 16
	LIBERTY TOWNSHIP			

REVISION NUMBER	REVISIONS	DATE	BY



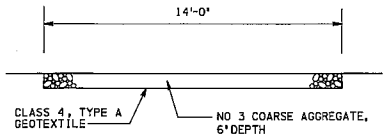
PROFILE



PLAN

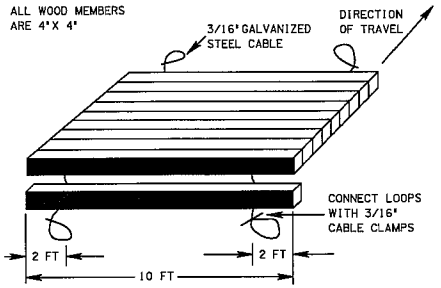
1. INSPECT THE ENTRANCE DAILY. REMOVE ALL SEDIMENT DEPOSITED ON THE PUBLIC ROADWAYS AND RETURN TO THE CONSTRUCTION SITE. WASHING OF THE ROADWAY WILL NOT BE PERMITTED.
2. MAINTAIN THE SPECIFIED ROCK CONSTRUCTION ENTRANCE THICKNESS. PLACE ADDITIONAL ROCK WHENEVER ROCK BECOMES CLOGGED WITH SEDIMENT.
3. MAINTAIN STOCKPILE OF AASHTO NO. 1 COARSE AGGREGATE.
4. CONSTRUCT A MOUNTABLE BERM ONLY WHEN 150 (6") MIN COVER CANNOT BE PROVIDED OVER THE PIPE.
5. SATISFACTORILY REMOVE MATERIALS AS PER SPECIFICATION IN SECTION 849 WHEN ROCK CONSTRUCTION ENTRANCE IS NO LONGER NEEDED.
6. PROVIDE GEOTEXTILE MATERIAL MEETING THE REQUIREMENTS OF PUBLICATION 408, SECTION 735. FURNISH AND INSTALL IN ACCORDANCE WITH SECTION 212. PROVIDE GEOTEXTILE ALONG ALL INTERFACE AREAS WITH GROUND CONTACT.
7. CONSTRUCT ROCK CONSTRUCTION ENTRANCE WITHIN THE RIGHT-OF-WAY OR EASEMENT AREAS. ENTRANCE MAY BE CONSTRUCTED ON A SKEW IF ADEQUATE PULL OUT SIGHT DISTANCE IS AVAILABLE.
8. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN () PARENTHESIS.

ROCK CONSTRUCTION ENTRANCE
NOT TO SCALE



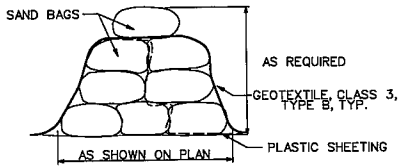
NOTE: TO BE INSTALLED ALONG ACCESS ROADWAY IN THE EVENT ACCESS ROADWAY BECOME EXCESSIVELY MUDDY AND IMPASSABLE.

TEMPORARY ACCESS ROADWAY
NOT TO SCALE

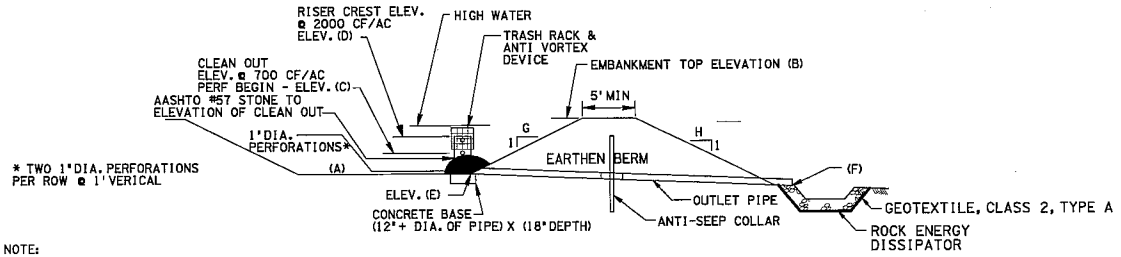


NOTE: A GEOTEXTILE UNDERLAYMENT SHALL BE USED UNDER THE WOOD MAT

TYPICAL WOOD MAT FOR WETLAND CROSSING
NOT TO SCALE
ITEM 9000-5500



SANDBAG COFFER DAM
ITEM 9000-5025
NOT TO SCALE



NOTE:

ONCE SEDIMENT REACHES THE ELEVATION LISTED IN COLUMN C IN THE TABLE BELOW, CLEAN OUT SEDIMENT AND DISPOSE OF AS DESCRIBED BELOW.

SEDIMENT REMOVED FROM BMPS IS TO BE DISPOSED OF ON-SITE IN LANDSCAPED AREAS OUTSIDE OF STEEP SLOPES, WETLANDS, FLOODPLAINS OR DRAINAGE SWALES IF CONDITIONS ALLOW AND IMMEDIATELY STABALIZE WITH FORMULA L SEEDING, SOIL SUPPLEMENTS, AND STRAW MULCH.

IF THE SEDIMENT CANNOT BE DISPOSED ON SITE IT IS TO BE REMOVED FROM THE SITE AND MUST BE RECYCLED IN ACCORDANCE WITH DEP'S SOLID WASTE REGULATIONS (25 PA CODE 260.1 ET SEQ., 271.1 ET SEQ., AND 287.1 ET SEQ.), AND/OR ANY ADDITIONAL LOCAL, STATE OR FEDERAL REGULATIONS. NO MATERIALS (USED OR UNUSED) SHALL BE BURNED, BURIED, DUMPED OR DISCHARGED AT THE SITE.

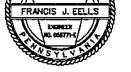
TRAP NO	LOCATION	(A) BOTTOM	(B) TOP OF BERM	(C) BEGIN PERF/ CLEANOUT	(D) RISER CREST	RISER DIA TYPE	ALL HOLES 1" NO. OF ROWS	ALL HOLES 1" NO. OF HOLES IN ROW	ALL HOLES 1" SPACE OF ROWS	OUTLET PIPE DIA TYPE	OUTLET PIPE LENGTH	(E) OUTLET PIPE INV IN	(F) OUTLET PIPE INV OUT	(G) BERM SLOPE	(H) BERM SLOPE
-	-	ELEV	ELEV	ELEV	ELEV	(IN)			(IN)	(IN)	(FT)	ELEV	ELEV		
1	SR 0029 14+90 RT	911.00	915.00	912.25	913.70	27 CMP	2	2	12	21 CMP	36	911.00	910.00	2	2
2	SR 0029 20+47 RT	910.00	915.00	911.85	913.50	15 CMP	2	2	12	12 CMP	30	910.00	909.00	2	2

DETAIL SEDIMENT TRAP
NOT TO SCALE
SEE RC-71M

EROSION AND SEDIMENT POLLUTION CONTROL PLAN
MISCELLANEOUS DETAILS

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA



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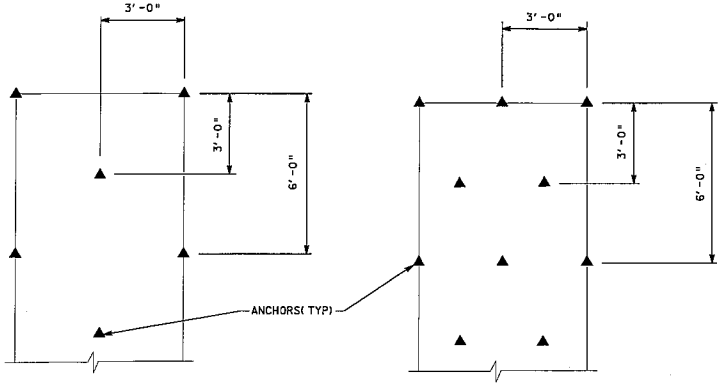
DATE: 25-Nov-2013 12:15

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	LEE	15 OF 16
	LIBERTY TOWNSHIP			

REVISION NUMBER	REVISIONS	DATE	BY

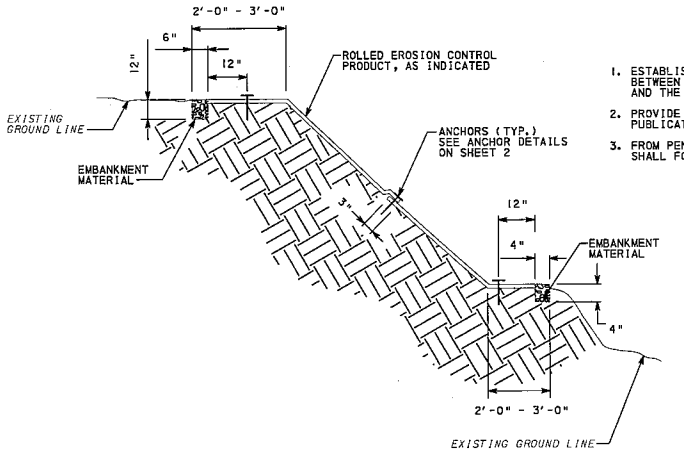


ANCHOR PATTERN FOR SLOPES FLATTER THAN 3:1

PLACE 1 ANCHOR/SY

ANCHOR PATTERN FOR SLOPES BETWEEN 3:1 AND 2:1 (INCLUDING 3:1)

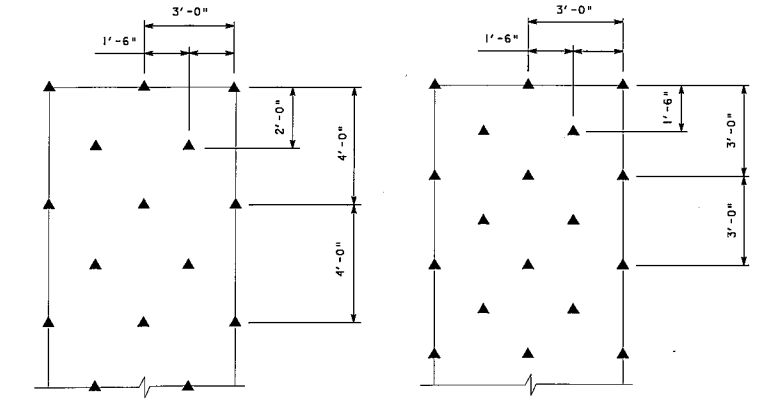
PLACE 1 1/2 ANCHORS/SY



TYPICAL SLOPE CROSS-SECTION

NOTES

1. ESTABLISH AND MAINTAIN CONTINUOUS CONTACT BETWEEN THE ROLLED EROSION CONTROL PRODUCTS AND THE SOIL.
2. PROVIDE ANCHORING DEVICES IN ACCORDANCE WITH PUBLICATION 408, SECTION 806.2(d).
3. FROM PENNDOT PUBLICATION #72M RC 73M. CONTRACTOR SHALL FOLLOW PROJECT APPLICABLE VERSION.



ANCHOR PATTERN FOR SLOPES BETWEEN 2:1 AND 1:1 (INCLUDING 2:1)

PLACE 2 ANCHORS/SY

ANCHOR PATTERN FOR 1:1 OR STEEPER

PLACE 2 1/2 ANCHORS/SY

ANCHOR PATTERNS FOR SLOPES

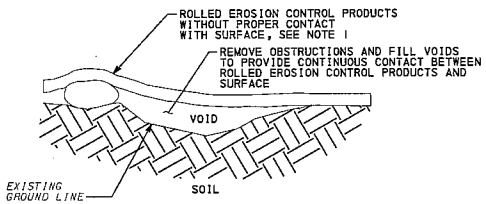


FIGURE 1

LACK OF CONTINUOUS CONTACT

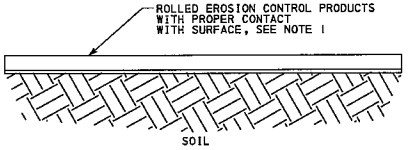


FIGURE 2

CONTINUOUS CONTACT

ROLLED EROSION CONTROL PRODUCTS (RECP)

EROSION AND SEDIMENT POLLUTION CONTROL PLAN
MISCELLANEOUS DETAILS

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
FRANCIS J. EELLS
ENGINEER

FILE: G:\SR 29 Slide\Highway\E&S\Plans-DFV\SR29esdi03.dgn
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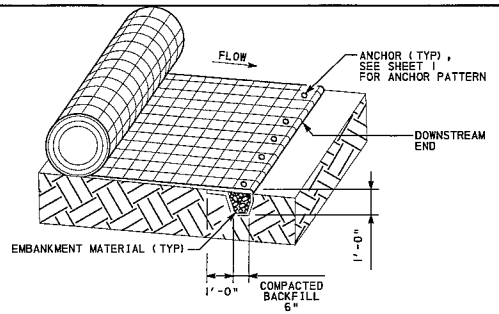
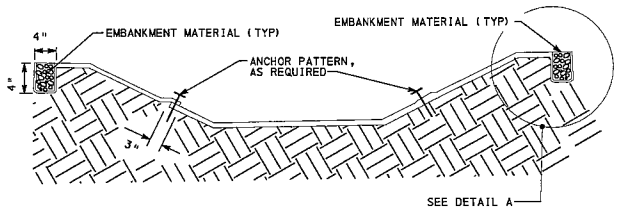
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	LEE	16 OF 16
	LIBERTY TOWNSHIP			

REVISION NUMBER	REVISIONS	DATE	BY



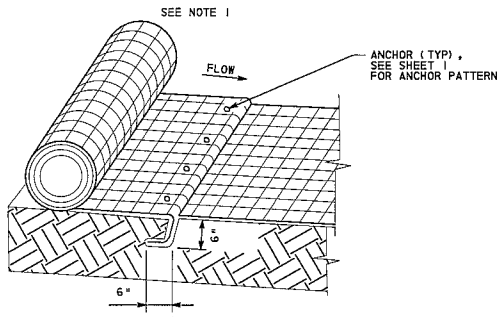
INITIAL ANCHOR TRENCH



TYPICAL TRAPEZOIDAL CHANNEL CROSS-SECTION

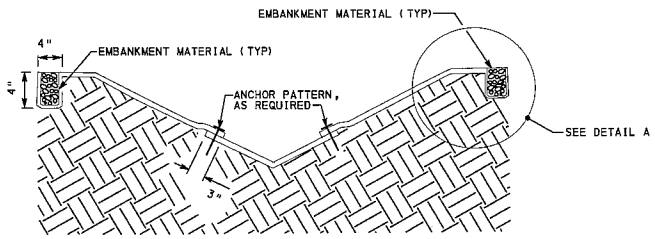
RECP CHANNEL INSTALLATION NOTES

1. EXCAVATE INITIAL ANCHOR TRENCH 1'-0" DEEP AND 6" WIDE ACROSS THE WIDTH OF THE CHANNEL TO PREVENT UNDERMINING OF THE ROLLED EROSION CONTROL PRODUCTS.
2. EXCAVATE INTERMITTENT CHECK SLOT 6" DEEP AND 6" WIDE ACROSS THE WIDTH OF THE CHANNEL AT 25'-0" TO 30'-0" ALONG THE LENGTH OF THE ROLLED EROSION CONTROL PRODUCTS TO PREVENT LOOSE SOIL FROM BEING TRANSPORTED DOWNSTREAM BENEATH THE ROLLED EROSION CONTROL PRODUCTS.
3. EXCAVATE TERMINAL ANCHOR TRENCH 1'-0" DEEP AND 6" WIDE ACROSS THE WIDTH OF THE CHANNEL TO ENSURE WATER FLOW TRANSITIONS SMOOTHLY ONTO THE ROLLED EROSION CONTROL PRODUCTS WITHOUT SEPARATION FROM THE SOIL.
4. EXTEND ROLLED EROSION CONTROL PRODUCTS 2'-0" - 3'-0" ABOVE THE CREST OF CHANNEL SIDE WHENEVER POSSIBLE.
5. PLACE 2 1/2 ANCHORS/SY.
6. PROVIDE ANCHORING DEVICES IN ACCORDANCE WITH SECTION 806.2(d) OF PUBLICATION 408.
7. FROM PENNDOT PUBLICATION #72M RC 73M, CONTRACTOR SHALL FOLLOW PROJECT APPLICABLE VERSION.

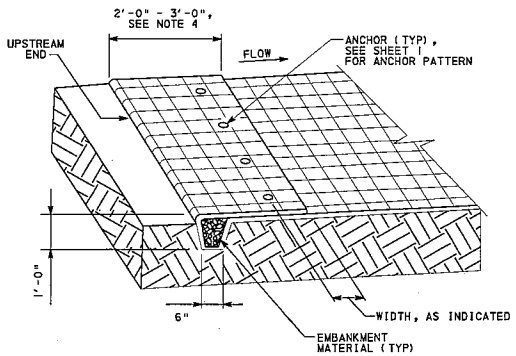


INTERMITTENT CHECK SLOT

SEE NOTE 2

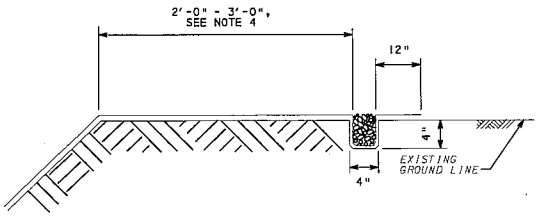


TYPICAL V-DITCH CROSS-SECTION



TERMINAL ANCHOR TRENCH

SEE NOTE 3



DETAIL A

ROLLED EROSION CONTROL PRODUCTS (RECP), CHANNEL INSTALLATION

EROSION AND SEDIMENT POLLUTION CONTROL PLAN
MISCELLANEOUS DETAILS

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL FRANCIS J. EELLS ENGINEER

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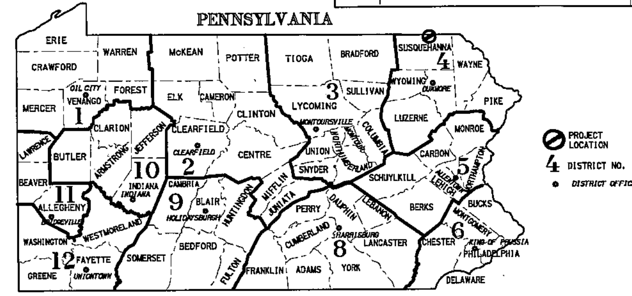
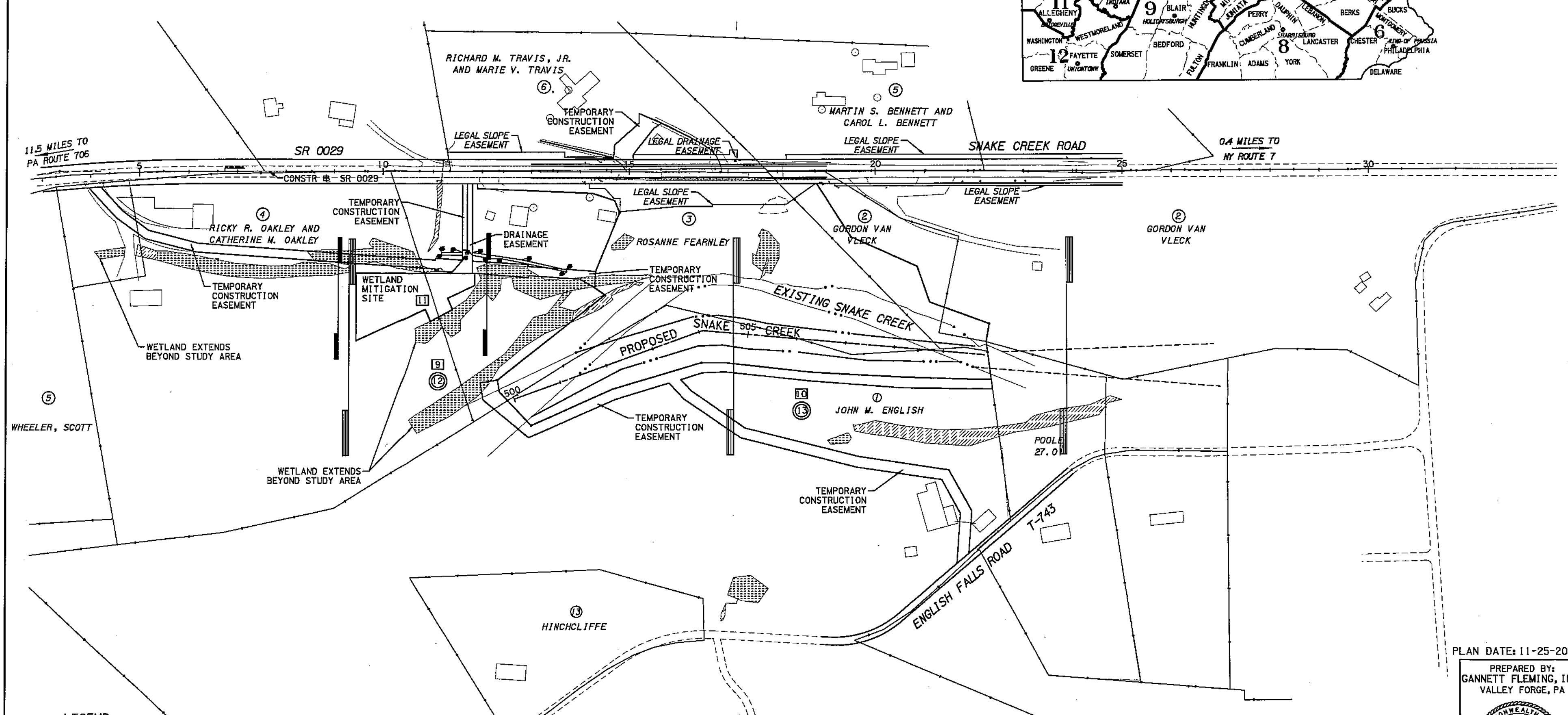
LIBERTY TOWNSHIP				
REVISION NUMBER	REVISIONS		DATE	BY

SHEET INDEX





LEGEND

- ◎ PLANTING PLAN SHEET NUMBER
- ☐ GRADING PLAN SHEET NUMBER
- ○ PARCEL IDENTIFICATION NUMBER

SCALE
0 100 200 FEET

INDEX MAP
WETLAND AND STREAM MITIGATION PLAN

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
FRANCIS J. EELLS
ENGINEER

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	EMG	2 OF 22

REVISION NUMBER	REVISIONS	DATE	BY

GENERAL NOTES FOR WETLAND MITIGATION SITE

THIS GRADING PLAN IS FOR EXCAVATION AND FINISH GRADING OF THE WETLAND MITIGATION SITE. THE CONTOURS AND THE SPOT ELEVATIONS FOR EACH OF THE SITE AREAS ARE DISPLAYED AS FINAL GRADING ELEVATIONS. REFER TO PUBLICATION 408 SPECIFICATIONS DATED 2000, SPECIAL PROVISIONS, DETAILS, AND CROSS SECTIONS PROVIDED WITH THESE PLANS FOR MORE DETAILED INFORMATION.

IF THE WETLAND MITIGATION SITE CONTAINS STANDING WATER AND SEDIMENT, DEWATER THE SITE BY PUMPING THE STANDING WATER INTO A FILTER BAG, IN ACCORDANCE WITH RC-70M, AWAY FROM THE SITE. CONTACT THE ENGINEER AND THE PENNDOT DISTRICT 4-0 ENVIRONMENTAL MANAGER PRIOR TO PUMPING. NO GRADING WORK OR TOPSOIL PLACEMENT IS TO BE PERFORMED UNTIL THE SITE IS COMPLETELY DEWATERED.

1. DO NOT OPERATE HEAVY MACHINERY BEYOND THE LIMIT OF DISTURBANCE LINE. DO NOT DISTURB ANY AREAS OUTSIDE OF THE DESIGNATED LINE.
2. ACCESS SITE(S) ONLY FROM THE DESIGNATED ROCK CONSTRUCTION ENTRANCE(S).
3. STRIP THE UPPER 2 FEET OF TOPSOIL. EXCAVATE THE PROPOSED MITIGATION AREA TO 20 INCHES BELOW THE FINISHED GRADE. INSTALL A 8" COMPACTED UNYIELDING SUBBASE OF FINE SAND, MAKING SURE THAT THE SUBBASE IS FREE OF ANY ROCKS, STICKS OR OTHER MATERIAL THAT MAY PIERCE THE GEOSYNTHETIC CLAY LINER (GCL) ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS FOR THE GCL. THE COMPACTED SUBBASE MUST BE FREE OF VOIDS, CRACKS, OR STANDING WATER. INSTALL THE GCL ALONG THE BOTTOM AND SIDE SLOPES OF THE PROPOSED MITIGATION AREA ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS. THE GCL MUST HAVE A BENTONITE CORE, REINFORCED BETWEEN TWO GEOTEXTILES AND LAMINATED TO PROVIDE PUNCTURE AND TENSILE STRENGTHS SUITABLE FOR LIQUID CONTAMINANT. TAKE SPECIAL CARE TO FOLLOW MANUFACTURER'S INSTRUCTIONS REGARDING THE OVERLAP ON CORNERS AND ENDS OF THE GCL PANELS. SUPPLEMENTAL BENTONITE IS NECESSARY ALONG THE EDGES OF THE GCL PANELS. ANCHOR THE TOP OF THE GCL IN A TRENCH PER THE MANUFACTURER'S SPECIFICATIONS.

   BACKFILL THE MITIGATION SITE WITH 12-14" OF TOPSOIL, TAKING CARE TO NOT PUNCTURE THE GCL DURING GRADING. GRADE THE BOTTOM OF THE MITIGATION SITE SO THAT TIRE OR TRACK RUTS ARE LEFT INTACT, BUT WITH A MINIMUM OF 12" OF TOPSOIL OVER THE GCL LINER. WHILE GRADING THE SITE, AVOID COMPACTING TOPSOIL AS MUCH AS POSSIBLE.
4. WASTE DISPOSAL AND CONSTRUCTION STAGING AREAS ARE THE RESPONSIBILITY OF THE CONTRACTOR AND SUBJECT TO THE APPROVAL OF PENNDOT DISTRICT 4-0. WASTED MATERIALS MUST NOT BE DISPOSED IN WATERS OF THE U.S.

THREE WORKING DAYS PRIOR TO EXCAVATION, THE CONTRACTOR MUST CONTACT THE PA ONE-CALL SYSTEM, INC., PHONE NO. 1-800-242-1776. LIBERTY TOWNSHIP - PA ONE CALL REF# 20123.

GENERAL NOTES FOR SNAKE CREEK STREAM MITIGATION GRADING PLAN AND WETLAND MITIGATION SITE

1. NO STREAM CONSTRUCTION MAY OCCUR BETWEEN MARCH 1, 2014 AND JUNE 15, 2014.
2. DO NOT OPERATE HEAVY MACHINERY OUTSIDE THE TEMPORARY CONSTRUCTION EASEMENT.
3. THE WASTE DISPOSAL AND CONSTRUCTION STAGING AREAS ARE THE RESPONSIBILITY OF THE CONTRACTOR AND SUBJECT TO THE APPROVAL OF PENNDOT. WASTED MATERIALS MUST NOT BE DISPOSED IN WATERS OF THE U.S.
4. TEMPORARY CONSTRUCTION EASEMENTS ARE REQUIRED ONLY UNTIL THE CONSTRUCTION OR WORK INDICATED BY THE PLAN IS COMPLETED UNLESS SOONER RELINQUISHED IN WRITING BY THE DEPARTMENT.
5. TEMPORARY CONSTRUCTION EASEMENTS ARE REQUIRED ONLY UNTIL THE CONSTRUCTION OR WORK INDICATED BY THE PLAN IS COMPLETED UNLESS SOONER RELINQUISHED IN WRITING BY THE DEPARTMENT.
6. THE DEPARTMENT HAS OBTAINED PERMISSION FOR THE CONTRACTOR TO PERFORM WORK OUTSIDE THE LEGAL RIGHT-OF-WAY. SEE THE "WETLANDS CONSTRUCTION AND MAINTENANCE AGREEMENT" ATTACHMENT TO THE CONTRACT PROPOSAL. TEMPORARY PROTECTIVE FENCE IS TO BE PLACED WHERE DIRECTED BY THE INSPECTOR IN CHARGE.
7. COORDINATE WITH PUBLIC UTILITIES TO IDENTIFY ANY BURIED LINES WITHIN THE CONSTRUCTION AREA INCLUDING CONSTRUCTION ENTRANCES AND TEMPORARY ROADS.
8. PROVIDE A FLAGMAN TO ESCORT CONSTRUCTION VEHICLES FROM SR 0029 TO AND FROM THE MITIGATION SITE.
9. MAINTENANCE OF THE ACCESS ROAD IS THE RESPONSIBILITY OF THE CONTRACTOR. THE ACCESS ROAD IS TO BE KEPT FREE OF DIRT AND MUD GENERATED BY VEHICLES ENTERING AND LEAVING THE CONSTRUCTION SITE. MAINTENANCE OF ACCESS ROAD INCLUDES THE RESTORATION OF ACCESS ROAD TO PRE-CONSTRUCTION CONDITIONS UPON COMPLETION OF CONSTRUCTION.
10. RESTORE THE AREA DISTURBED FOR THE TEMPORARY CONSTRUCTION ACCESS TO THE PRE-CONSTRUCTION CONDITION. REMOVE AND DISPOSE OF OFF-SITE GRAVEL, TIMBER MATS, ETC. REGRADE THE AREA TO MATCH EXISTING TOPOGRAPHY. TOPSOIL, FERTILIZE, SEED AND MULCH WITH A SEED MIXTURE TO APPROXIMATE EXISTING SURROUNDING VEGETATION.
11. REPLACE ANY TREES REMOVED FOR THE TEMPORARY CONSTRUCTION ACCESS WITH A TREE OF THE SAME SPECIES AND SIZE AT APPROXIMATELY THE SAME LOCATION.

GENERAL NOTES FOR WETLAND AND STREAM PLANTING PLANS:

1. NOTIFY PENNDOT DISTRICT 4-0 ENVIRONMENTAL MANAGER UPON COMPLETION OF FINAL GRADING. DO NOT BEGIN PLANTING AND SEEDING UNTIL THE ENVIRONMENTAL MANAGER HAS APPROVED THE GRADING WORK AND THE SITE HYDROLOGY. IF THE DESIRED SITE HYDROLOGY IS IN QUESTION, THE ENVIRONMENTAL MANAGER MAY REQUEST A PERIOD OF TIME DURING WHICH THE SITE IS OBSERVED IN ADDITION TO THE INITIAL SIX MONTHS. CHANGES TO THE FINAL GRADING MAY BE REQUESTED DURING THIS OBSERVATION PERIOD. THE ENVIRONMENTAL MANAGER WILL NOTIFY THE CONTRACTOR WHEN PLANTING AND SEEDING MAY BEGIN.
2. PLANT USING NATIVE LIVE PLANTS AND SEEDS FROM AN APPROVED WETLAND PLANT NURSERY (SEE SPECIAL PROVISIONS).
3. AFTER COMPLETION OF AND ACCEPTANCE OF FINAL GRADING FOR THE MITIGATION SITE AND STREAM RELOCATION, INSTALL PLANT MATERIALS LISTED IN THE PLANTING SHEDULE ACCORDING TO SECTIONS 808 AND 804, PENNDOT PUBLICATION 408, AND THE DETAILS IN THIS PLANTING PLAN. SEE NOTES FOR SPECIES SPACING AND DIRECTION WITHIN EACH PLANTING ZONE.
4. PLANT TREE AND SHRUB PLANTINGS ACCORDING TO THE STREAM MITIGATION PLANTING PLAN GROUPS. AVOID CLUSTERING TREE AND SHRUB GROUPS WITHIN A PARTICULAR AREA OF THE STREAM CORRIDOR.
5. SPREAD WETLAND SEED MIX AT A RATE OF 20 LBS/AC IN WETLAND AND ALL INTERIOR BERMS WITHIN THE SITE AT THE COMPLETION OF FINAL GRADING. SPREAD SEED UNIFORMLY USING A DROP OR BIN SEEDER AND PERFORM PERIODIC CHECKS OF THE EQUIPMENT TO ENSURE THAT THE SPECIFIED APPLICATION RATES WITHIN THE WETLAND ARE BEING MET.
6. SPREAD UPLAND SEED MIXTURE AT THE SPECIFIED RATE ON OTHER DISTURBED UPLAND AREAS. SPREAD SEED UNIFORMLY USING A DROP OR BIN SEEDER AND PERFORM PERIODIC CHECKS OF THE EQUIPMENT TO ENSURE THAT THE SPECIFIED APPLICATION RATES WITHIN THE UPLAND AREAS ARE BEING MET.
7. IF AFTER ONE FULL GROWING SEASON A VEGETATIVE COVER ANALYSIS INDICATES THAT LESS THAN 85% OF THE REPLACEMENT WETLAND IS COVERED BY HYDROPHYTIC VEGETATION, ADDITIONAL PLANTINGS AND SEEDING MAY BE REQUIRED. PENNDOT WILL MAKE THIS DETERMINATION WITH INPUT FROM PADEP AND USACOE.

FLOOD PLAIN SEED MIX COMMON NAME	SCIENTIFIC NAME	MIX %
FOX SEDGE, PA ECOTYPE	*CAREX VULPINOIDEA*	20.0%
VIRGINIA WILD RYE, PA ECOTYPE	*ELYMUS VIRGINICUS*	20.0%
BIG BLUESTEM, NIAGARA	*ANDROPOGON GERARDII*	10.0%
INDIAN GRASS, 'PRAIRIE VIEW' IN ECOTYPE	*SORGASTRUM NUTANS*	10.0%
BLUNT BROOM SEDGE, PA ECOTYPE	*CAREX SCOPARIA*	7.0%
BLUE VERVAIN	*VERBENA HASTATA*	5.0%
SWITCHGRASS, 'SHELTER'	*PANICUM VIRGATUM*	5.0%
FRINGED (NODDING) SEDGE, PA ECOTYPE	*CAREX CRINITA*	4.0%
GRASS LEAVED GOLDENROD, PA ECOTYPE	*EUTHANIA GRAMINIFOLIA (SOLIDAGO G.)*	3.0%
COMMON SNEEZEWEED	*HELENIUM AUTUMNALE*	3.0%
PURPLE STEAMMED ASTER PUNICEUS	*ASTER PUNICEUS (SYMPHYOTRICHUM PUNICEUM)*	2.0%
AWL SEDGE, PA ECOTYPE	*CAREX STIPATA*	2.0%
BONESET, PA ECOTYPE	*EUPATORIUM PERFOLIATUM*	2.0%
OX EYE SUNFLOWER, PA ECOTYPE	*HELIOPSIS HELIANTHOIDES*	2.0%
JOE PYE WEED, PA ECOTYPE	*EUPATORIUM FISTULOSUM*	2.0%
SEEDBOX, PA ECOTYPE	*LUDWIGIA ALTERNIFOLIA*	1.0%
SWAMP MILKWEED, PA ECOTYPE	*ASCLEPIAS INCARNATA*	1.0%
WILD BERGAMOT	*MONARDA FISTULOSA*	1.0%

PLANT LIST

WETLAND TREES

ITEM #	KEY	COMMON NAME	SCIENTIFIC NAME	SIZE	INDICATOR STATUS	QUANTITY
XXXX-XXXX	PO	AMERICAN SYCAMORE	PLANTANUS OCCIDENTALIS	B&B	FACW	24
XXXX-XXXX	AR	RED MAPLE	ACER RUBRUM	B&B	FAC	32
XXXX-XXXX	BN	RIVER BIRCH	BETULA NIGRA	B&B	FACW	31

WETLAND SHRUBS

ITEM #	KEY	COMMON NAME	SCIENTIFIC NAME	SIZE	INDICATOR STATUS	QUANTITY
XXXX-XXXX	AS	SMOOTH ALDER	ALNUS SERRULATA	#3	OBL	33

SEQUENCE OF OPERATIONS FOR WETLAND MITIGATION SITE

RECEIVE APPROVAL FROM THE ENGINEER AND THE PENNDOT DISTRICT 4-0 ENVIRONMENTAL MANAGER FOR DEVIATIONS FROM THE SEQUENCE OF OPERATIONS. WETLAND CONSTRUCTION WILL INVOLVE TWO PHASES OF WORK, PHASE ONE GRADING AND PHASE TWO PLANTING UPON COMPLETION OF GRADING ACTIVITIES.

WETLAND MITIGATION SITE TO BE CONSTRUCTED WHEN SPECIFIED IN THE EROSION AND SEDIMENT POLLUTION CONTROL PLAN CONSTRUCTION SEQUENCE.

1. INSTALL ROCK CONSTRUCTION ENTRANCE AND TEMPORARY CONSTRUCTION ACCESS, SILT SOCK AND PROTECTIVE FENCE. (SEE EROSION AND SEDIMENT CONTROL PLAN).
2. OVER EXCAVATE THE MITIGATION SITE TO THE APPROPRIATE DEPTH SPECIFIED. INSTALL AND COMPACT SUBBASE. INSTALL GEOSYNTHETIC CLAY LINER (GCL) ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS. BACKFILL THE SITE WITH TOPSOIL TO BRING SITE TO FINAL GRADE.
3. IMMEDIATELY FOLLOWING COMPLETION OF GRADING, SEED WITH WETLAND SEED MIX AND AND STABILIZE SITE IMMEDIATELY.
4. ALLOW THE SITE HYDROLOGY TO STABILIZE FOR A MINIMUM PERIOD OF 6 MONTHS.
5. REVISIT SITE AFTER STABILIZATION PERIOD AND MAKE NECESSARY CHANGES / ALTERATIONS TO SITE GRADES AS DIRECTED BY THE INSPECTOR IN CHARGE AND PENNDOT DISTRICT 4-0 ENVIRONMENTAL MANAGER.
6. UPON APPROVAL OF SITE HYDROLOGY, RESEED WITH WETLAND SEED MIX AND PLANT AREA(S) AS OUTLINED IN THE GENERAL WETLAND PLANTING PLAN NOTES.

SEQUENCE OF OPERATIONS FOR WETLAND AND STREAM PLANTING PLANS:

1. PLANT CONTAINERIZED SHRUBS AND TREES AND UNROOTED WOODY CUTTINGS, AS INDICATED ON THE PLANTING PLAN. DO NOT USE HEAVY EQUIPMENT TO INSTALL THE PLANTS.
2. SEED THE WETLAND MITIGATION AREAS USING WETLAND SEED MIXES AT THE SPECIFIED RATE.
3. SEED THE UPLAND SLOPE AREA(S), AND OTHER DISTURBED UPLAND AREAS USING THE UPLAND SEED MIX AT THE SPECIFIED RATE.
4. CLEAN SITES OF ANY REMAINING DEBRIS.

WETLAND SEED MIX COMMON NAME	SCIENTIFIC NAME	SCHEDULE % OF MIX (BY NUMBER OF SEEDS)
GREEN BULRUSH	SCIRPUS ATROVIRENS	25.96
WOOL GRASS	SCIRPUS CYPERINUS	25.41
FOX SEDGE	CAREX VULPINOIDEA	16.48
CANADA MANNAGRASS	GLYCERIA CANADENSIS	7.68
BLUE VERVAIN	VERBENA HASTATA	7.63
REED MEADOWGRASS	GLYCERIA GRANDIS	6.02
FOWL MANNAGRASS	GLYCERIA STRIATA	5.70
DEER-TONGUE	PANICUM CLANDESTINUM	5.12

UPLAND SEED MIX COMMON NAME GRASS PORTION (19.1 kg)	SCIENTIFIC NAME	SCHEDULE % OF MIX (BY NUMBER OF SEEDS)
REDTOP	AGROSTIS ALBA	60.8
RED FESCUE	FESTUCA RUBRA	27.5
ANNUAL RYEGRASS	LOLIUM MULTIFLORUM	11.7

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER FRANCIS J. KELLS

GENERAL NOTES

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DATE: 25 Nov 2013 14:37

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	EMG	3 OF 22
	LIBERTY TOWNSHIP			

REVISION NUMBER	REVISIONS	DATE	BY

LIVE STAKE INSTALLATION

1. INSTALL THE MATERIALS THE SAME DAY THAT THEY ARE PREPARED. PROVIDE STAKES WITH A DIAMETER BETWEEN 0.5" AND 2" AND BETWEEN 2' AND 4' IN LENGTH. PROMPTLY PLACE LIVE STAKES NOT INSTALLED ON THE SAME DAY AS DELIVERY IN CONTROLLED AND PROTECTED STORAGE CONDITIONS UNTIL THEY CAN BE INSTALLED. STORE STAKES WHERE THEY WILL RECEIVE CONTINUOUS SHADE AND BE SHELTERED FROM THE WIND. STORE IN UNCONTAMINATED WATER TO PROTECT FROM DRYING. USE ALL LIVE STAKES WITHIN 2 DAYS OF HARVEST.

2. INSTALL LIVE STAKES USING A DEAD BLOW HAMMER, DRIVING THE LIVE STAKES INTO THE GROUND AT RIGHT ANGLES TO THE SLOPE. USE A DIGGING BAR TO MAKE A PILOT HOLE. INSTALL THE LIVE STAKES WITH THE BUDS ORIENTED UP. MINIMIZE DAMAGE TO THE LIVE STAKE BARK.

3. INSTALL 80 PERCENT OF THE LENGTH OF THE LIVE STAKE INTO THE GROUND AND FIRMLY PACK THE SOIL AROUND IT AFTER INSTALLATION. DO NOT SPLIT THE STAKES DURING INSTALLATION. REMOVE AND REPLACE STAKES THAT SPLIT. CUT OFF DAMAGED STAKE MATERIALS FOLLOWING INSTALLATION (MAXIMUM 3" - 4").

4. INSTALL STAKES 3' APART, ALTERNATE SPECIES.

COIR LOG INSTALLATION

1. DIG A SMALL TRENCH HALF THE DIAMETER OF THE LOG AS THE BASE OF THE STREAMBANK PARALLEL WITH THE STREAM

2. DRIVE STAKES ON EITHER SIDES OF THE LOG AT 2'-3' O.C. TO SECURE THEM.

EROSION CONTROL MATTING INSTALLATION

1. DIG A SMALL TRENCH AT THE TOP OF THE SLOPE AND LAY TOP END OF MATERIAL TO LINE IT, FOLDING THE EDGE UNDERNEATH OF ITSELF AND SECURE WITH JMD ROUND TOP BIO-PIN. FILL TRENCH TO PREVIOUS LEVEL.

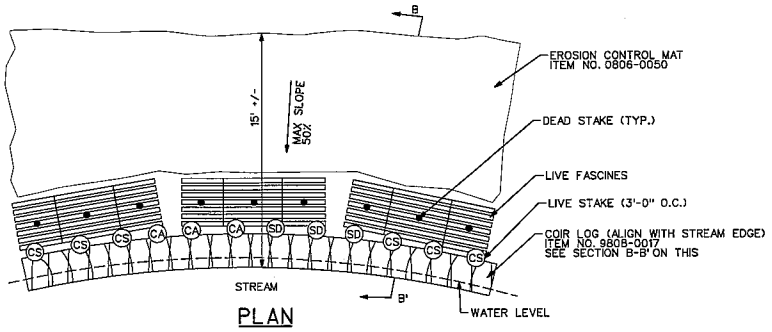
2. ROLL MATTRESS DOWNWARD TOWARD STREAM TO THE INTENDED DISTANCE.

3. SECURE IN PLACE WITH JMD ROUND BIO-PIN

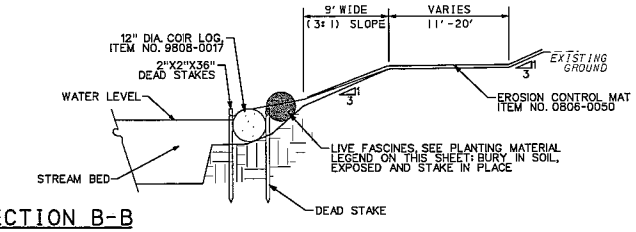
4. REPEAT STEPS 1 - 3, OVERLAPPING THE EDGE OF THE MATTRESS UPWIND ABOVE.

PLANTING MATERIAL

LIVE STAKES, ITEM NO. 9808-0001 - CORNUS AMOMUM - SILKY DOGWOOD
9808-0002 - CORNUS STOLONIFERA - RED OSIER DOGWOOD



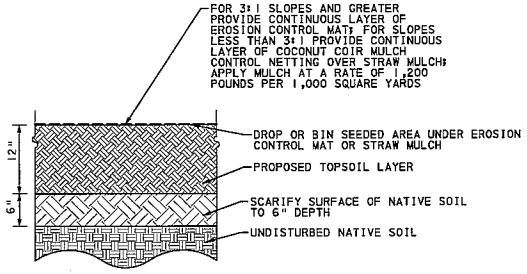
PLAN



SECTION B-B

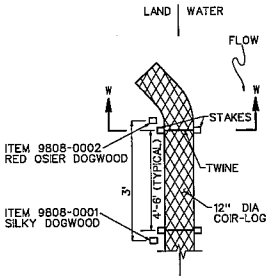
STREAM EDGE DETAIL

N.T.S.

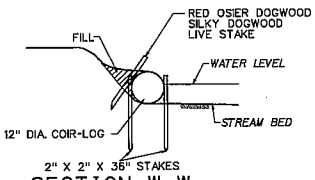


FLOOD PLAIN SEEDING DETAIL

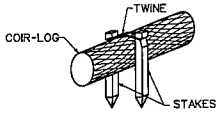
ITEM 9804-0001
N.T.S.



PLAN

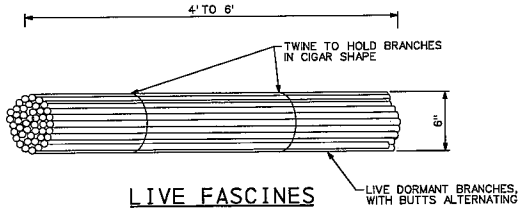


SECTION W-W



ISOMETRIC VIEW

COIR-LOG
ITEM 9808-0017
N.T.S.



LIVE FASCINES

ITEM 9808-0010
ITEM 9808-0011
ITEM 9808-0012

N.T.S.

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

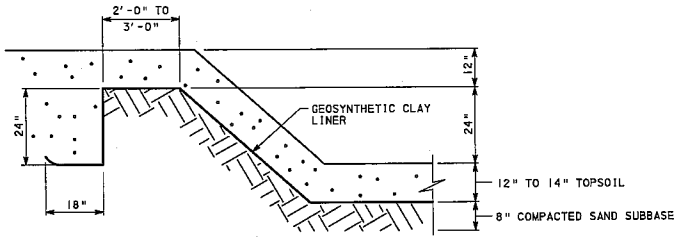
COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
FRANCIS J. ELLS
ENGINEER

MISCELLANEOUS DETAILS

FILE: G:\SR 29 Slide\Environmental Mitigation\SR29emdr01.dgn
DATE: 25-Nov-2013 14:53

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	EMG	4 OF 22
	LIBERTY TOWNSHIP			

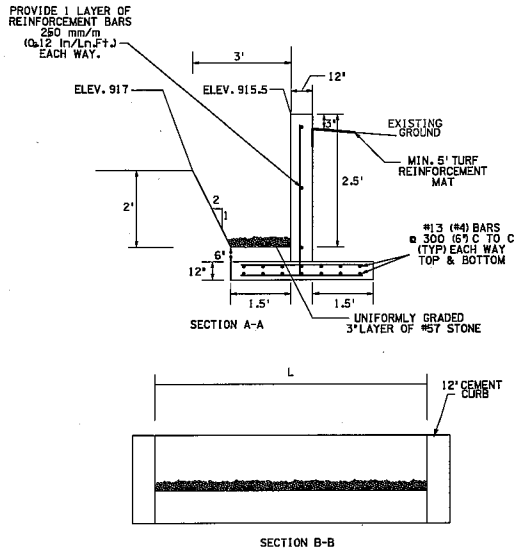
REVISION NUMBER	REVISIONS	DATE	BY

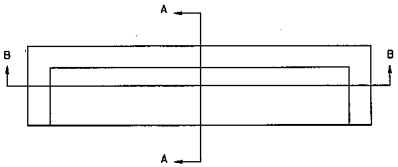


WETLAND CROSS-SECTION
NOT TO SCALE

GEOSYNTHETIC CLAY LINER (GCL) NOTES:

1. THE SURFACE OF THE EXCAVATED WETLAND AREA MUST BE PREPARED ACCORDING TO MANUFACTURER SPECIFICATIONS FOR THE GCL. THE GROUND SURFACE SHOULD BE VOID OF ROCKS AND WOODY MATERIAL CAPABLE OF PUNCTURING THE GCL.
2. A GEOSYNTHETIC CLAY LINER WILL BE INSTALLED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS. THE GCL MUST HAVE A BENTONITE CORE, REINFORCED BETWEEN TWO GEOTEXTILES AND LAMINATED TO PROVIDE PUNCTURE AND TENSILE STRENGTHS SUITABLE FOR LIQUID CONTAINMENT.
3. INSTALL GCL ACROSS THE BOTTOM AND UP THE SIDE SLOPES OF THE WETLAND AREA ACCORDING TO PLANS AND DETAILS.





LEVEL SPREADER

SR 0029 SURVEY AND CONSTR. ℄
STA 11+05 TO 11+77

ITEM 9605-0001
N. T. S

MISCELLANEOUS DETAILS

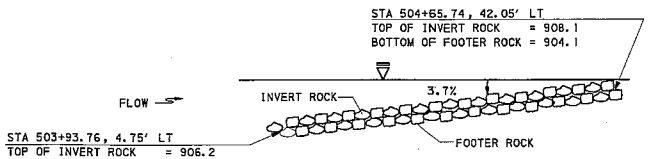
PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

COMMONWEALTH OF PENNSYLVANIA
REGISTERED
PROFESSIONAL
FRANCIS J. CELLS
ENGINEER
PENNSYLVANIA

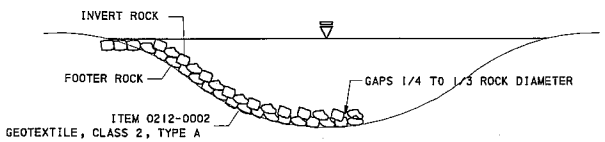
FILE: G:\SR 29 Slide\Envir\Mitigation\SR29emd102.dgn
DATE: 25-Nov-2013 14:54

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	EMG	5 OF 22
LIBERTY TOWNSHIP				

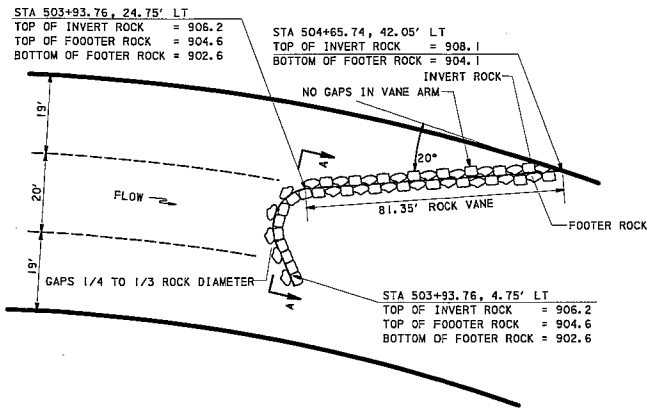
REVISION NUMBER	REVISIONS	DATE	BY



PROFILE VIEW



SECTION A-A



PLAN VIEW

ITEM NAME	CLASS 4 EXCAVATION	GEOTEXTILE, CLASS 2, TYPE A	ROCK, CLASS R-7
UNIT	CY	SY	CY
QUANTITY			

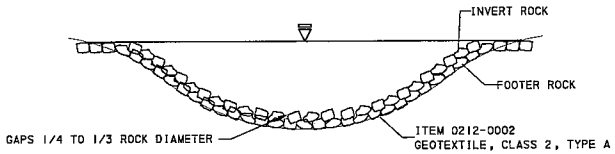
LUMP SUM QUANTITIES

ITEM 9850-0002
FOR INFORMATION ONLY

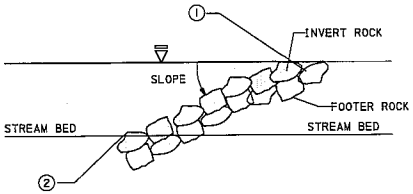
NOTE: ALL VERTICAL AND HORIZONTAL VOIDS BETWEEN THE VANE INVERT ROCKS AND THE FOOTER ROCKS ARE TO BE FIRMLY PACKED WITH THE SMALLER R-7 ROCK AND 2-A STONE AND EXISTING STREAMBED MATERIAL AS DIRECTED.

J-HOOK VANE

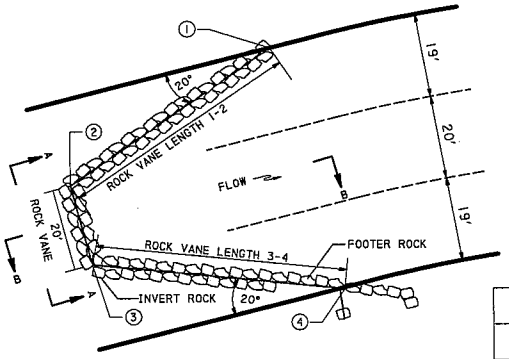
STA 503+90
ITEM 9850-0002
N.T.S.



SECTION A-A



SECTION B-B



PLAN VIEW

NOTE: ALL VERTICAL AND HORIZONTAL VOIDS BETWEEN THE VANE INVERT ROCKS AND THE FOOTER ROCKS ARE TO BE FIRMLY PACKED WITH THE SMALLER R-7 ROCK AND 2-A STONE AND EXISTING STREAMBED MATERIAL AS DIRECTED.

ITEM NAME	CLASS 4 EXCAVATION	GEOTEXTILE, CLASS 2, TYPE A	ROCK, CLASS R-7
UNIT	CY	SY	CY
QUANTITY			

LUMP SUM QUANTITIES

ITEM 9850-0001
FOR INFORMATION ONLY

CROSS VANE	POINT	STATION	TOP OF INVERT ROCK	BOTTOM OF FOOTER ROCK	ROCK VANE LENGTH	SLOPE
			ELEV	ELEV	FT	%
1	1	502+02.16, 52.25' LT	910.6	906.6	55.56	5.4
	2	501+50.00, 33.19' LT	908.1	904.5		
	3	501+50.00, 13.19' LT	908.1	904.5	62.86	4.8
	4	502+09.94, 5.77' RT	910.2	906.2		
2	1	509+30.58, 20.39' LT	905.3	901.3	58.43	5.1
	2	508+25.00, 3.50' LT	902.7	899.1		
	3	508+25.00, 16.50' RT	902.7	899.1	48.18	6.2
	4	509+20.47, 34.50' RT	905.0	901.0		

CROSS-VANE

(1) ITEM 9850-0001 AT STA 501+50
(2) ITEM 9850-0002 AT STA 508+75

N.T.S.

MISCELLANEOUS DETAILS

PLAN DATE: 11-25-2013

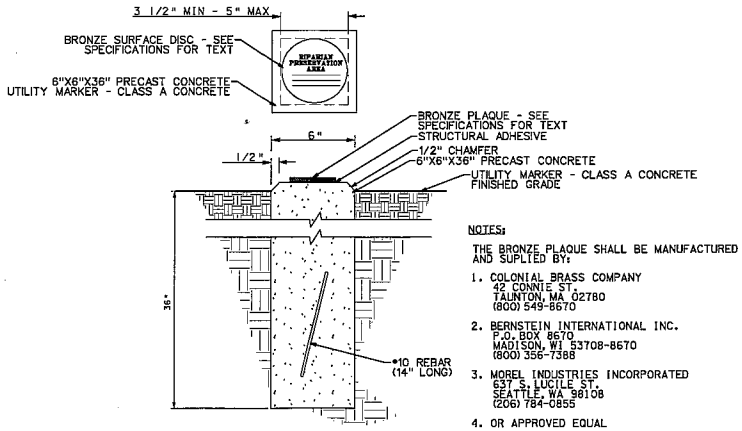
PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
FRANCIS J. EELLS
ENGINEER

FILE: G:\SR 29 Slide\Envir\Mitigation\SR29emdt03.dgn
DATE: 25-Nov-2013 12:30

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	EMG	6 OF 22
	LIBERTY TOWNSHIP			

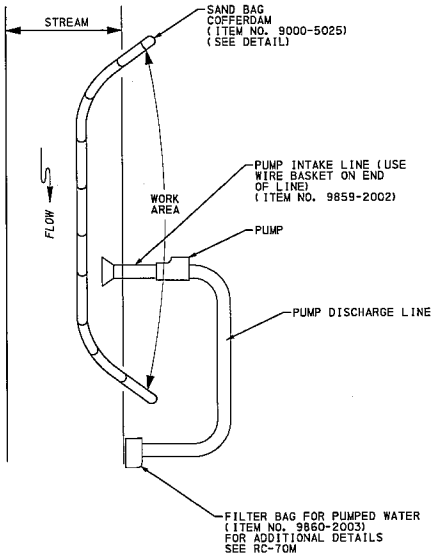
REVISION NUMBER	REVISIONS	DATE	BY



SECTION

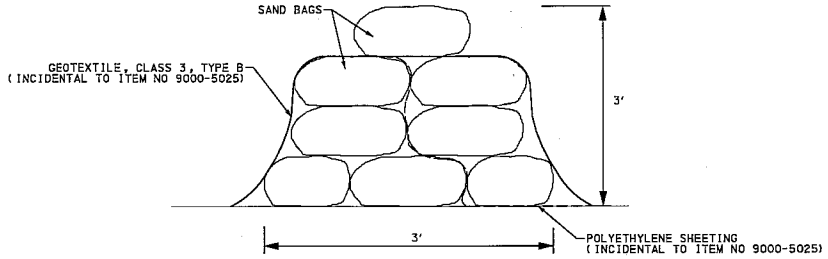
RIPARIAN PRESERVATION AREA MARKER

ITEM NO 9800-2002
N. T. S.



TYPICAL PUMP OUTLET PLAN

N. T. S.



SAND BAG COFFERDAM

ITEM NO 9000-5025
N. T. S.

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

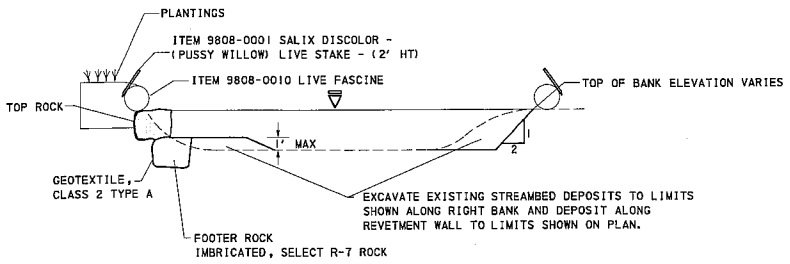
COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
FRANCIS J. ELLS
ENGINEER

MISCELLANEOUS DETAILS

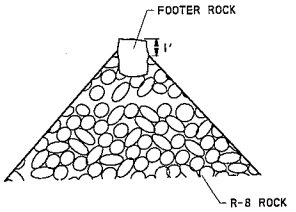
FILE: G:\SR 29 Slide\Envir\Mitigation\SR29emd104.dgn
DATE: 25-Nov-2013 15:11

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	EMG	7 OF 22
	LIBERTY TOWNSHIP			

REVISION NUMBER	REVISIONS	DATE	BY



ROCK REVETMENT DETAIL



CROSS VANE EXTENSION SECTION A-A

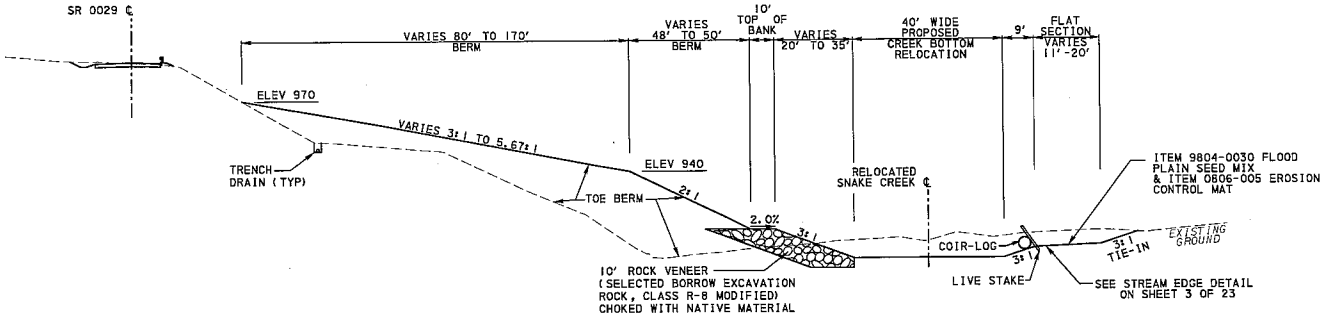
ITEM NAME	CLASS 2 EXCAVATION	GEOTEXTILE, CLASS 2, TYPE A	ROCK, CLASS R-7
UNIT	CY	SY	CY
QUANTITY			

LUMP SUM QUANTITIES

ITEM 9850-0004
FOR INFORMATION ONLY

ROCK REVETMENT

ITEM 9850-0004
STA 500+40 TO 502+00 SNAKE CREEK ℄
N.T.S.



TYPICAL SECTION B-B
BERM & RELOCATED CREEK

NOT TO SCALE

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

MISCELLANEOUS DETAILS

FILE: C:\SR 29 Slide\Envir\Mitigation\SR29emd105.dgn
DATE: 25-Nov-2013 13:20

FILE: G:\SR 29 Slide\Envir\Mitigation\SR29tab1.dgn
DATE: 25-Nov-2013 15:08

SEE SHEET

TABULATION OF QUANTITIES
WETLAND AND STREAM MITIGATION PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	EMG	8 OF 22
	LIBERTY TOWNSHIP			

REVISIONS	DATE	BY

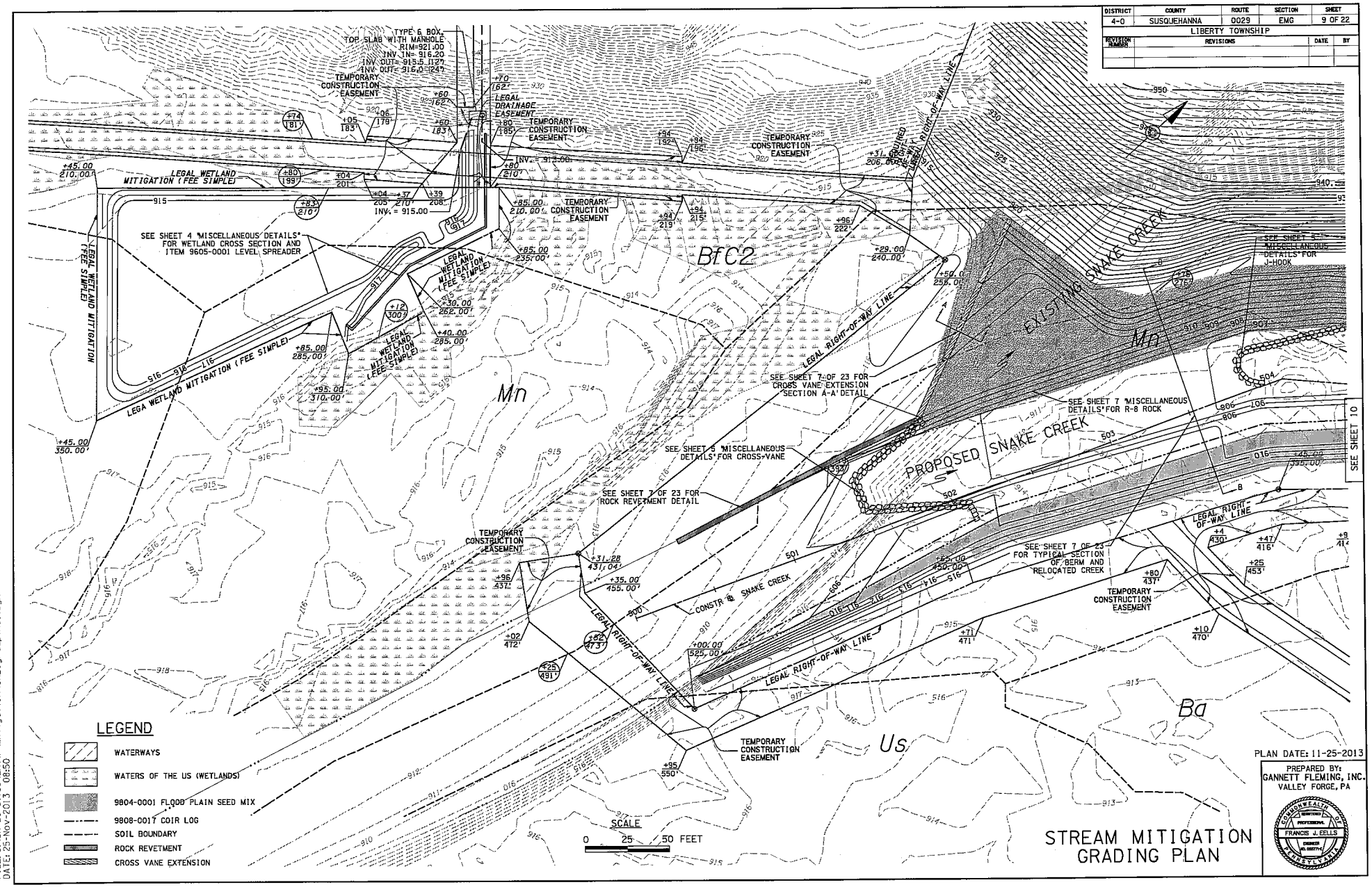
BASELINE / STATIONS	SIDE	REMARKS	ITEM NUMBER EACH	2808 XXXX EACH	2808 3130 EACH	2808 3071 EACH	2808 3270 EACH	2806 0052 M2	2806 0050 M2	2805 0022 TONNE	2803 0001 M3	2626 0030 M3	2605 2620 EACH	2605 2600 EACH	2605 2190 EACH	2601 0340 M	2350 0110 M2	2212 0002 M2	2204 0150 M3	2204 0001 M3	2203 0001 M3
SNAKE CREEK BASELINE																					
500+30 - 500+90	RT			5			4														
501+03 - 501+47	RT					5															
501+54 - 501+92	RT				4																
502+04 - 502+21	RT			2																	
502+37 - 502+52	RT				4																
502+35 - 502+77	RT						4														
502+65 - 502+95	RT					6															
503+10 - 503+55	RT			4																	
503+09 - 503+70	RT					6															
503+90 - 504+52	RT			4																	
504+79 - 505+14	RT			6																	
505+23 - 505+98	RT					6															
505+27 - 506+03	RT				5																
506+11 - 506+40	RT					6															
506+30 - 506+90	RT						5														
506+50 - 507+13	RT				6																
506+52 - 506+97	RT			4																	
507+36 - 507+97	RT			6																	
507+20 - 508+08	RT				8																
508+14 - 508+65	RT					9															
508+73 - 509+34	RT			6																	
508+78 - 509+42	RT						6														

SEE SHEET

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

COMMONWEALTH OF PENNSYLVANIA
FRANCIS J. ELLIS
REGISTERED PROFESSIONAL ENGINEER



DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	EMG	9 OF 22
LIBERTY TOWNSHIP				

REVISION NUMBER	REVISIONS	DATE	BY

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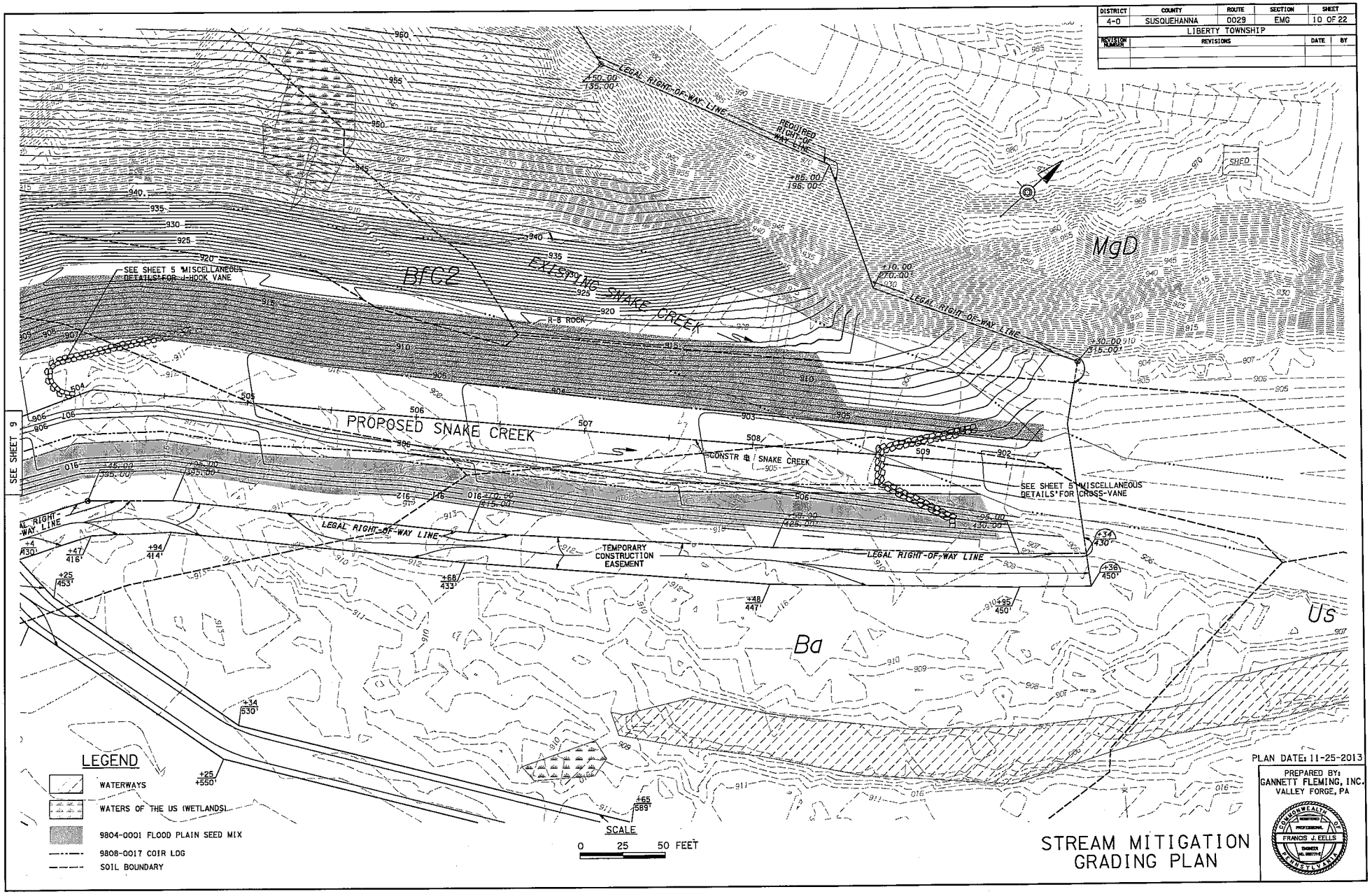
DATE: 25-Nov-2013 08:50



DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	EMG	10 OF 22
LIBERTY TOWNSHIP				

REVISION NUMBER	REVISIONS	DATE	BY

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

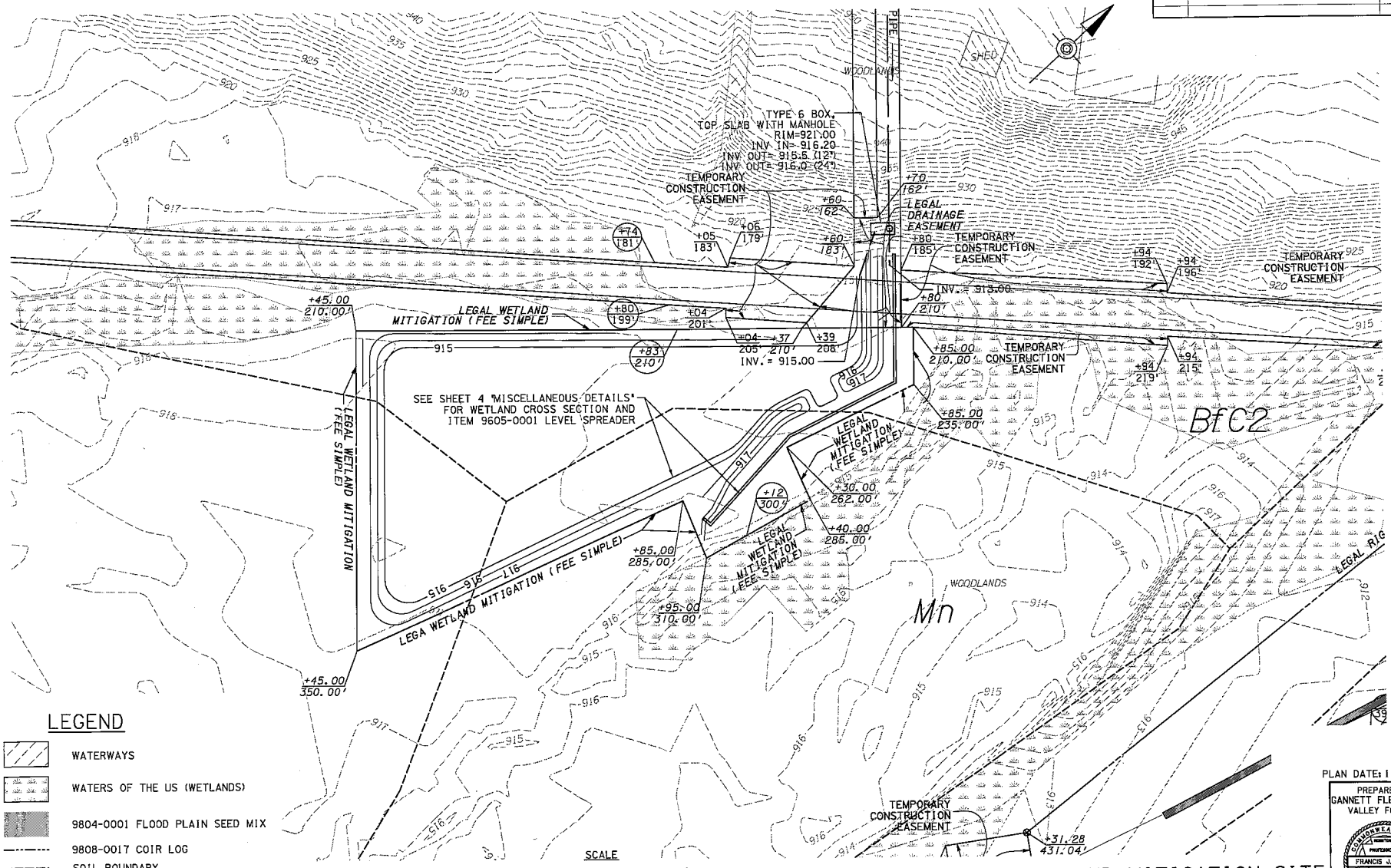
COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL FRANCIS J. EELLS ENGINEER

STREAM MITIGATION GRADING PLAN

FILE: G:\SR 29 Slide\Env\r\Mitigation\SR29gradpln02.dgn
DATE: 25-Nov-2013 09:42

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	EMG	11 OF 22
LIBERTY TOWNSHIP				

REVISION NUMBER	REVISIONS	DATE	BY



LEGEND

- WATERWAYS
- WATERS OF THE US (WETLANDS)
- 9804-0001 FLOOD PLAIN SEED MIX
- 9808-0017 COIR LOG
- SOIL BOUNDARY

SCALE
0 10 20 FEET

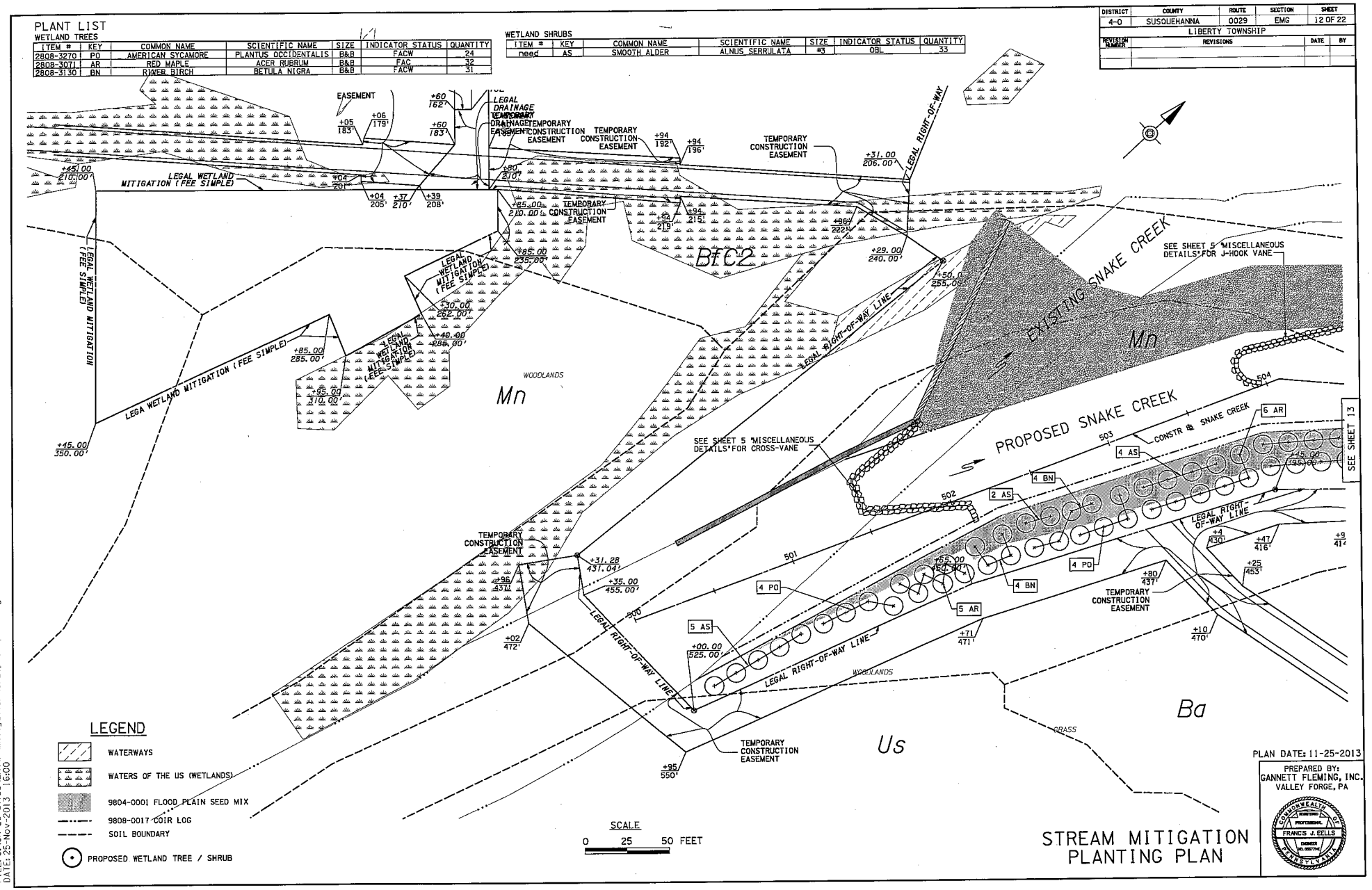
WETLAND MITIGATION SITE GRADING PLAN

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL FRANCIS J. ELLS ENGINEER

FILE: G:\SR 29 Slide\Envir\Mitigation\SR29gradpln03.dgn
DATE: 25-Nov-2013 09:52


PLANT LIST
WETLAND TREES
ITEM # | KEY | COMMON NAME | SCIENTIFIC NAME | SIZE | INDICATOR STATUS | QUANTITY
2808-3270 | PO | AMERICAN SYCAMORE | PLANTUS OCCIDENTALIS | B&B | FACW | 24
2808-3071 | AR | RED MAPLE | ACER RUBRUM | B&B | FAC | 32
2808-3130 | BN | RIVER BIRCH | BETULA NIGRA | B&B | FACW | 31
WETLAND SHRUBS
ITEM # | KEY | COMMON NAME | SCIENTIFIC NAME | SIZE | INDICATOR STATUS | QUANTITY
need | AS | SMOOTH ALDER | ALNUS SERRULATA | #3 | OBL | 33
DISTRICT | COUNTY | ROUTE | SECTION | SHEET
4-0 | SUSQUEHANNA | 0029 | EMG | 12 OF 22
LIBERTY TOWNSHIP
REVISION NUMBER | REVISIONS | DATE | BY
LEGAL WETLAND MITIGATION (FEE SIMPLE)
LEGAL DRAINAGE EASEMENT
TEMPORARY CONSTRUCTION EASEMENT
EASEMENT
LEGAL RIGHT-OF-WAY
LEGAL RIGHT-OF-WAY LINE
EXISTING SNAKE CREEK
PROPOSED SNAKE CREEK
CONSTR SNAKE CREEK
SEE SHEET 5 MISCELLANEOUS DETAILS FOR J-HOOK VANE
SEE SHEET 5 MISCELLANEOUS DETAILS FOR CROSS-VANE
SEE SHEET 13
WOODLANDS
GRASS
BtC2
Mn
Ba
Us
LEGEND
WATERWAYS
WATERS OF THE US (WETLANDS)
9804-0001 FLOOD PLAIN SEED MIX
9808-0017 COIR LOG
SOIL BOUNDARY
PROPOSED WETLAND TREE / SHRUB
SCALE
0 25 50 FEET
PLAN DATE: 11-25-2013
PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA
FRANCIS J. EELLS
STREAM MITIGATION
PLANTING PLAN
FILE: GASR 29 Slide\Envir\Mitigation\SR29plantpln01.dgn
DATE: 25-Nov-2013 16:00

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
4-0	SUSQUEHANNA	0029	EMG	13 OF 22
	LIBERTY TOWNSHIP			

REVISION NUMBER	REVISIONS	DATE	BY

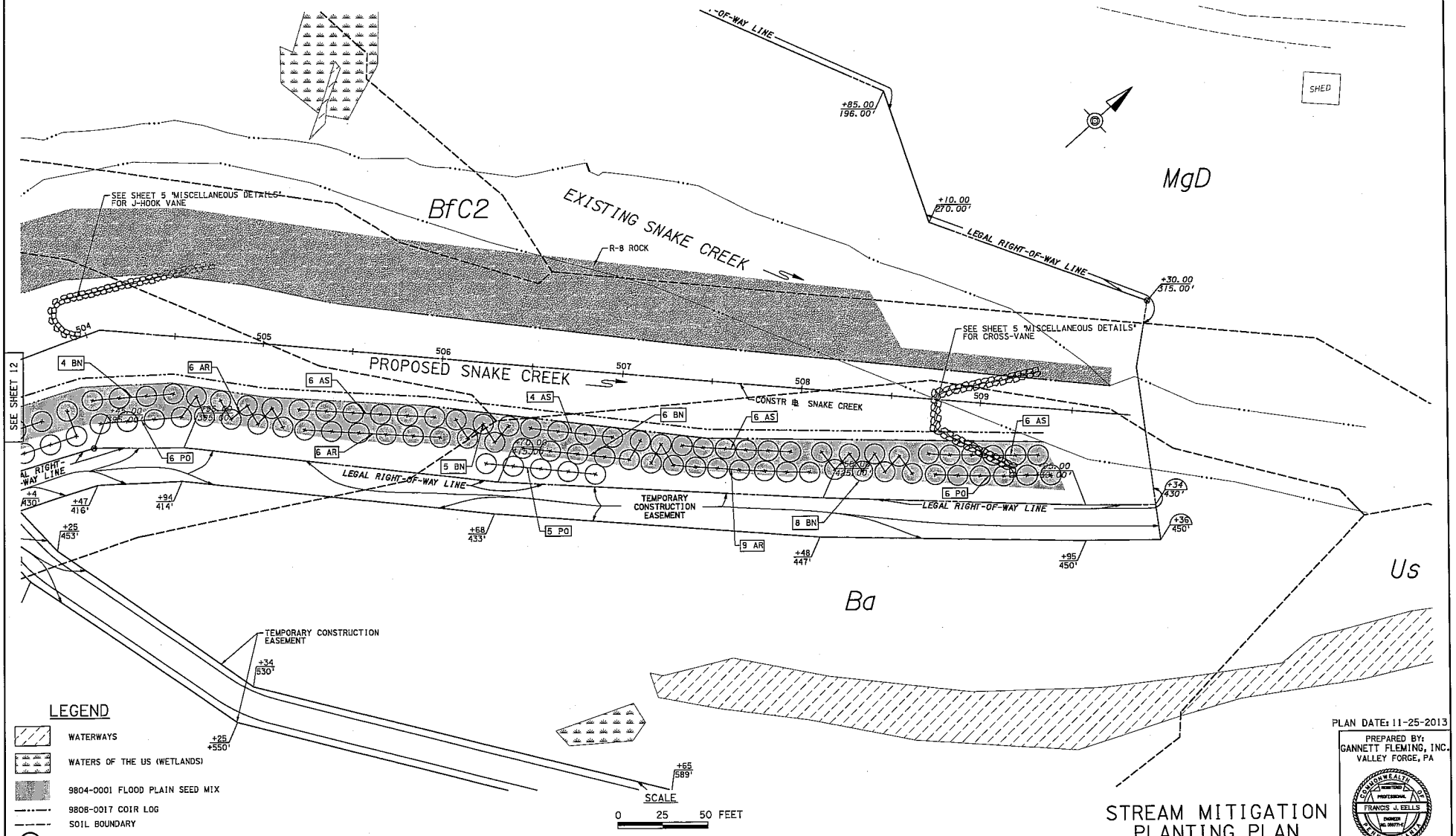
PLANT LIST

WETLAND TREES

ITEM #	KEY	COMMON NAME	SCIENTIFIC NAME	SIZE	INDICATOR STATUS	QUANTITY
2808-3270	PO	AMERICAN SYCAMORE	PLANTUS OCCIDENTALIS	B&B	FACW	24
2808-3071	AR	RED MAPLE	ACER RUBRUM	B&B	FAC	32
2808-3130	BN	RIVER BIRCH	BETULA NIGRA	B&B	FACW	31

WETLAND SHRUBS

ITEM #	KEY	COMMON NAME	SCIENTIFIC NAME	SIZE	INDICATOR STATUS	QUANTITY
need	AS	SMOOTH ALDER	ALNUS SERRULATA	#3	OBL	33



LEGEND

- WATERWAYS
- WATERS OF THE US (WETLANDS)
- 9804-0001 FLOOD PLAIN SEED MIX
- 9808-0017 COIR LOG
- SOIL BOUNDARY
- PROPOSED WETLAND TREE / SHRUB

PLAN DATE: 11-25-2013

PREPARED BY:
GANNETT FLEMING, INC.
VALLEY FORGE, PA

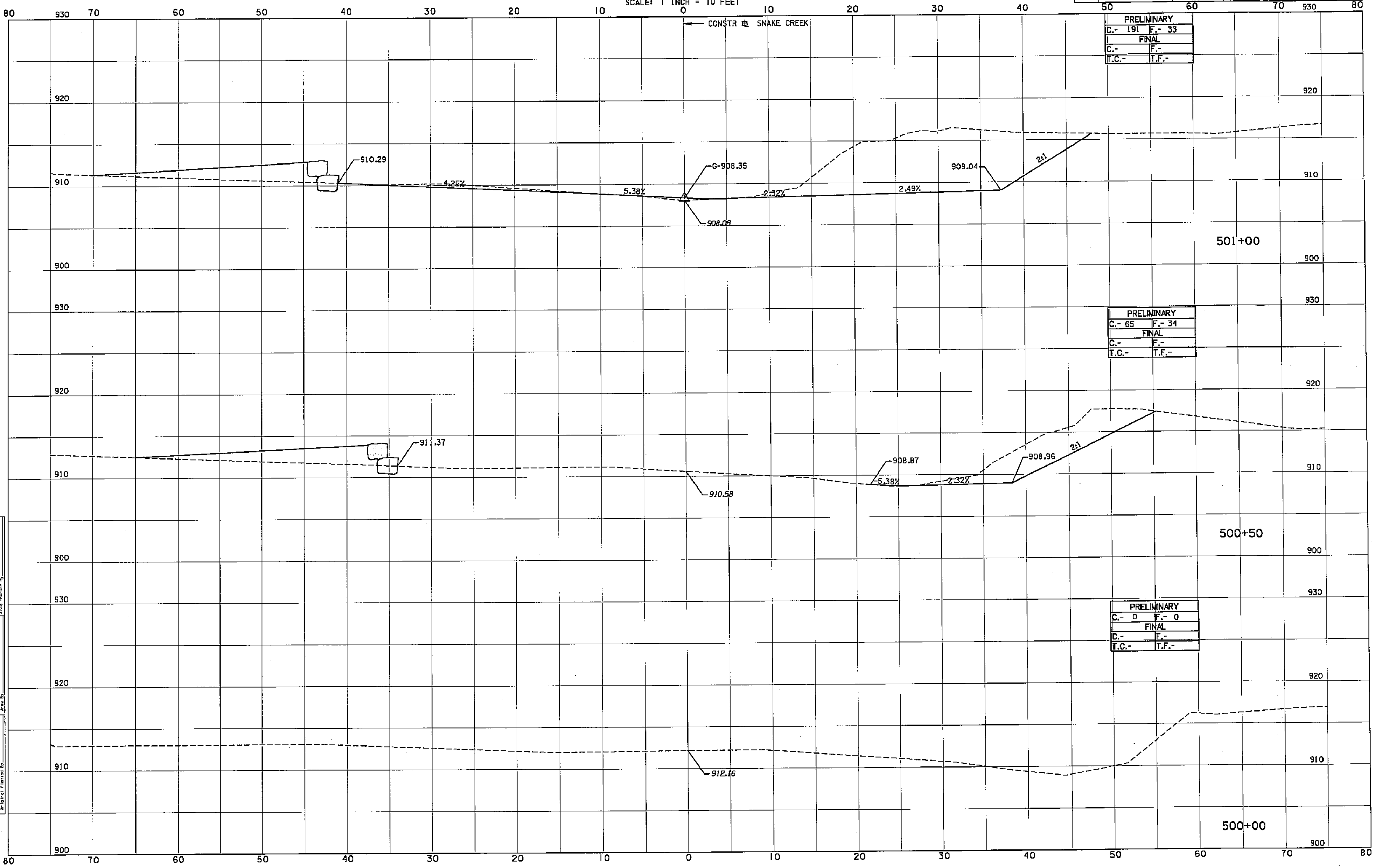
COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — FRANCIS J. BELLS — ENGINEER NO. 059771-E

STREAM MITIGATION PLANTING PLAN

FILE: G:\SR 29 Slide\Envir\Mitigation\SR29plantplan02.dgn
DATE: 25-Nov-2013 09:02

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
CROSS SECTIONS
SCALE: 1 INCH = 10 FEET

Dist.	County	Route	Sect.	Prelim. Bk. No.	Final Bk. No.	Sheet No.
4	SUSQUEHANNA	0029	LEE			14 OF 22

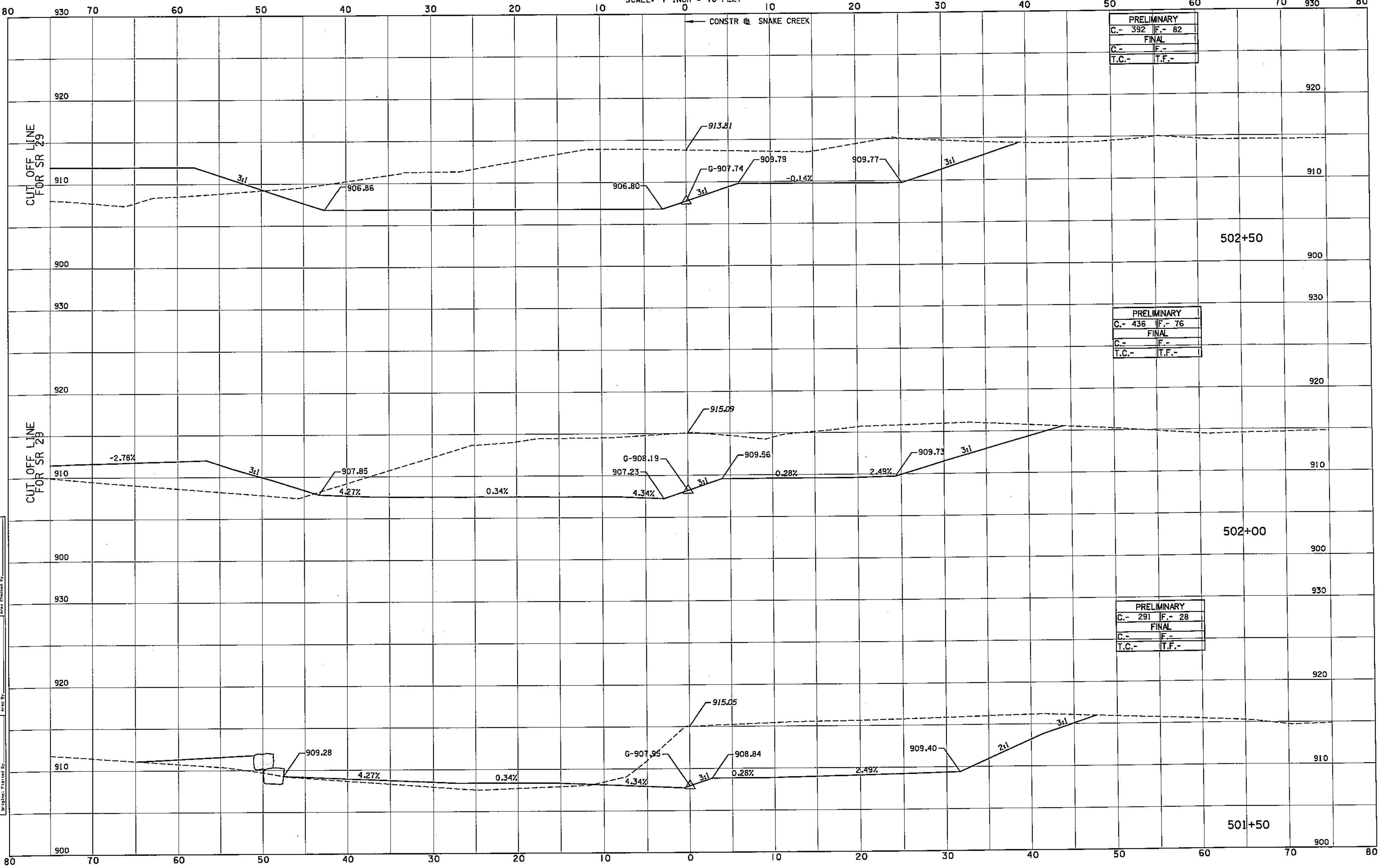


PLOTTED:
OPERATOR:
FILE NAME:

Application No.
Route No.
Original Plotted By
Original Checked By
Template By
Area By
Finals Plotted By
Finals Checked By
Area By
Area Checked By

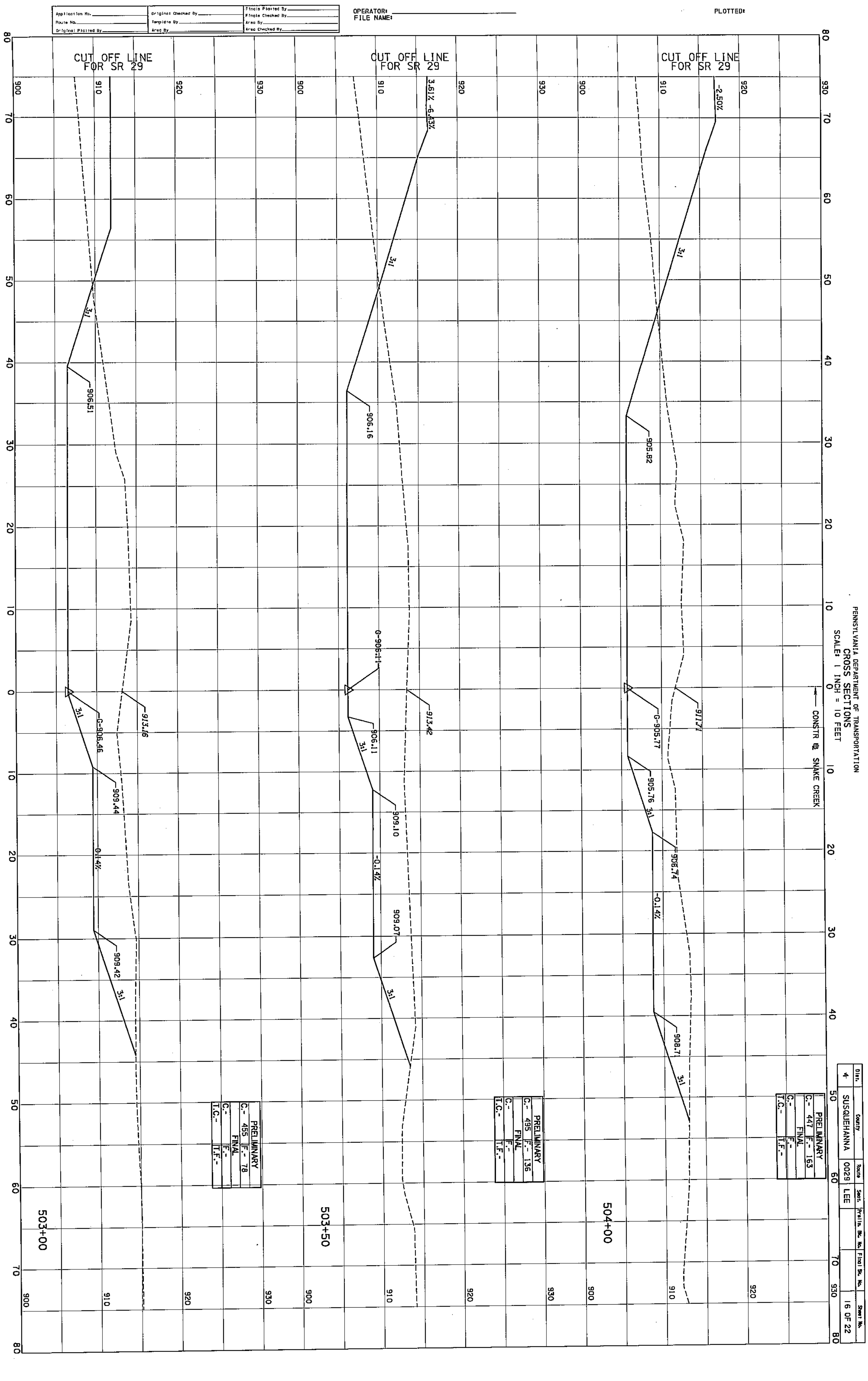
PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
CROSS SECTIONS
SCALE: 1 INCH = 10 FEET

Dist.	County	Route	Sect.	Prelim. Bk. No.	Final Bk. No.	Sheet No.
4	SUSQUEHANNA	0029	LEE			15 OF 22



OPERATOR:
FILE NAME:
PLOTTED:

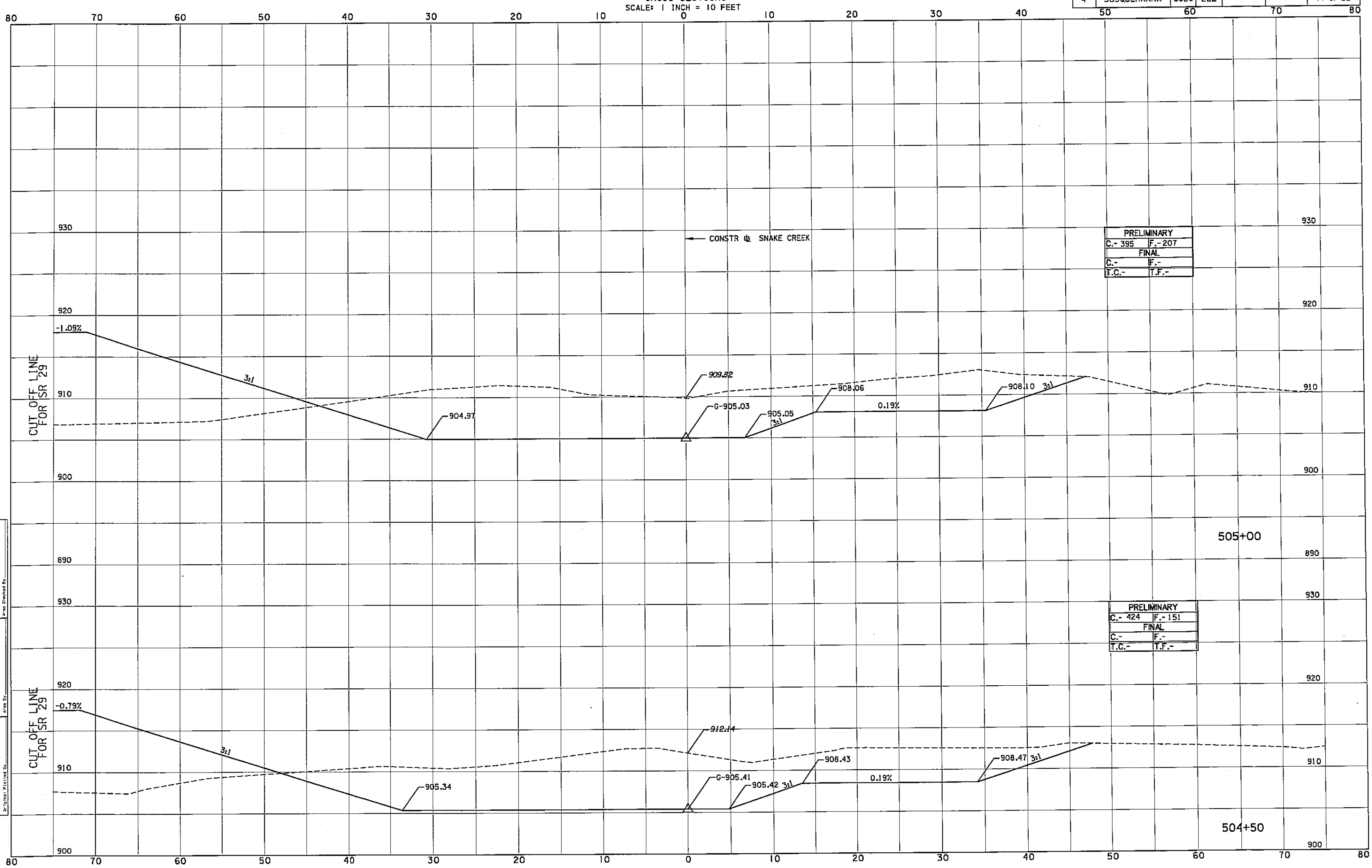
Application No.	Original Checked By	Finals Plotted By
Route No.	Template By	Finals Checked By
Original Plotted By	Area By	Area By
		Area Checked By



Application No.
Route No.
Original Plotted By
Original Checked By
Template By
Area By
Finals Plotted By
Finals Checked By
Area By
Area Checked By
OPERATOR:
FILE NAME:
PLOTTED:
CUT OFF LINE FOR SR 29
CUT OFF LINE FOR SR 29
CUT OFF LINE FOR SR 29
PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
CROSS SECTIONS
SCALE: 1 INCH = 10 FEET
CONSTR ℄ SNAKE CREEK
3.61% -6.43%
-2.50%
3:1
906.51
906.16
905.82
G-906.11
G-906.46
G-905.77
913.76
913.42
911.71
906.11
905.76
909.44
909.10
908.74
-0.14%
909.07
909.42
908.71
PRELIMINARY
C.- 455 F.- 78
FINAL
C.- F.-
T.C.- T.F.-
PRELIMINARY
C.- 495 F.- 136
FINAL
C.- F.-
T.C.- T.F.-
PRELIMINARY
C.- 447 F.- 163
FINAL
C.- F.-
T.C.- T.F.-
503+00
503+50
504+00
Dist. 4
County SUSQUEHANNA
Route 0029
Sect. LEE
Prelim. Bk. No.
Final Bk. No.
Sheet No. 16 OF 22

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
CROSS SECTIONS
SCALE: 1 INCH = 10 FEET

Dist.	County	Route	Sect.	Prelim. Bk. No.	Final Bk. No.	Sheet No.
4	SUSQUEHANNA	0029	LEE			17 OF 22



PLOTTED:
OPERATOR:
FILE NAME:

Application No. Route No. Original Plotted By Original Checked By Template By Area By Finals Plotted By Finals Checked By Area By Area Checked By

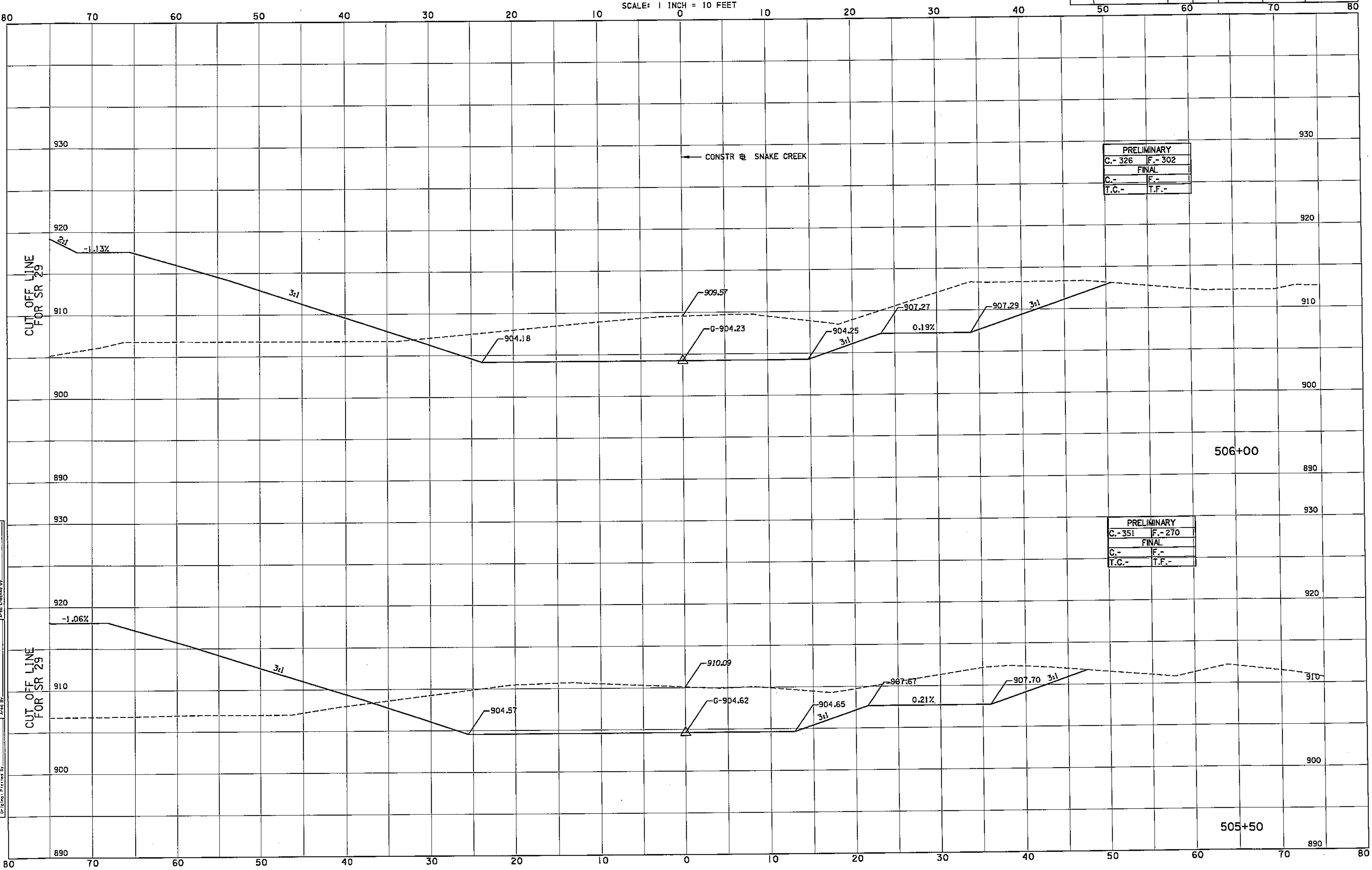
PLOTTED:

OPERATOR:
FILE NAME:

Application No.	Original Checked By	Finals Plotted By
Route No.	Template By	Finals Checked By
Original Plotted By	Area By	Area By
		Area Checked By

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
CROSS SECTIONS
SCALE: 1 INCH = 10 FEET

Dist.	County	Route	Sect.	Prelim. Bk. No.	Final Bk. No.	Sheet No.
4	SUSQUEHANNA	0029	LEE			18 OF 22



PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS

SCALE: 1 INCH = 10 FEET

Dist.	County	Route	Sect.	Prelim. Bk. No.	Final Bk. No.	Sheet No.
4-	SUSQUEHANNA	0029	LEE			19 OF 22

PLOTTED:

OPERATOR:
FILE NAME:

Final Plotted By:
Final Checked By:
Final By:
Final Checked By:
Original Checked By:
Template By:
Area By:
Original Plotted By:
Application No.:
Route No.:

80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80

930
920
910
900
890

← CONSTR ℄ SNAKE CREEK

PRELIMINARY	
C.-232	F.- 377
FINAL	
C.-	F.-
T.C.-	T.F.-

CUT OFF LINE FOR SR 29

2:1 -1.34% 3:1 903.44 G-903.48 907.06 903.51 3:1 0.19% 906.53 906.55 3:1

507+00

PRELIMINARY	
C.- 241	F.- 333
FINAL	
C.-	F.-
T.C.-	T.F.-

CUT OFF LINE FOR SR 29

2:1 -1.19% 3:1 903.81 G-903.85 906.89 903.88 3:1 0.19% 906.90 906.90 3:1

506+50

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS

SCALE: 1 INCH = 10 FEET

Dist.	County	Route	Sect.	Prelim. Bk. No.	Final Bk. No.	Sheet No.
4	SUSQUEHANNA	0029	LEE			20 OF 22

PLOTTED=

OPERATOR=
FILE NAME=

Finals Plotted By
Finals Checked By
Area By
Area Checked By

Original Checked By
Template By
Area By

Application No.
Route No.
Original Plotted By

80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80

930
920
910
900
890

CONSTR ℄ SNAKE CREEK

PRELIMINARY	
C.-201	F.-254
FINAL	
C.-	F.-
T.C.-	T.F.-

CUT OFF LINE FOR SR 29

6:1 -1.23% 3:1 4:1

902.78 905.23 C-902.82 902.84 3:1 905.25 0.45% 7:1 905.48 3:1

508+00

PRELIMINARY	
C.-213	F.-320
FINAL	
C.-	F.-
T.C.-	T.F.-

CUT OFF LINE FOR SR 29

4:1 -1.08% 3:1 4:1

903.09 906.64 C-903.12 903.15 3:1 906.14 0.19% 906.18 3:1

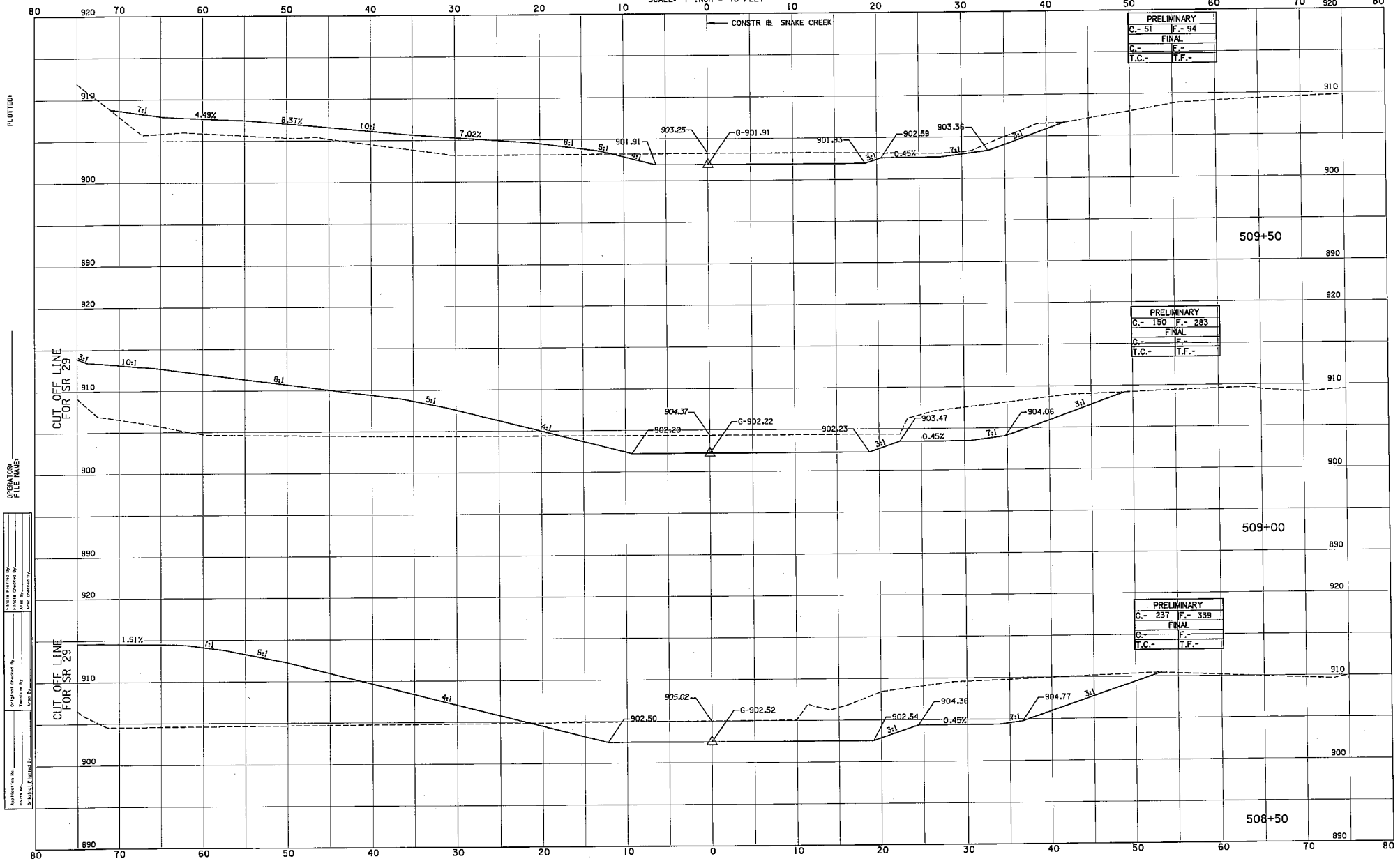
507+50

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS

SCALE: 1 INCH = 10 FEET

Dist.	County	Route	Sect.	Prelim. Bk. No.	Final Bk. No.	Sheet No.
4	SUSQUEHANNA	0029	LEE			21 OF 22



PLOTTED:

ORIENTATION
FILE NAME:

Finals Plotted By
Finals Checked By
Area By
Area Checked By
Original Checked By
Template By
Area By
Original Plotted By
Application No.
Route No.

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS

SCALE: 1 INCH = 10 FEET

Dist.	County	Route	Sect.	Prelim. Bk. No.	Final Bk. No.	Sheet No.
4-	SUSQUEHANNA	0029	LEE			22 OF 22

PLOTTED:

OPERATOR:
FILE NAME:

Finals Plotted By:
Finals Checked By:
Area By:
Area Checked By:

Original Checked By:
Template By:
Area By:

Application No.:
Route No.:
Original Plotted By:

80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80

920

910

900

890

← CONSTR ℄ SNAKE CREEK

901.33

PRELIMINARY	
C.- 0	F.- 0
FINAL	
C.-	F.-
T.C.-	T.F.-

509+82