EROSION AND SEDIMENT CONTROL/STORMWATER MANAGEMENT NARRATIVE

PROJECT PURPOSE:

Appalachian Power Company (APCO) is expanding an existing substation pad site that is approximately 150' x 200', for the purpose of enhancing electrical service in the City of Roanoke, VA. The project will add an extension to 250' to the west of the existing pad. Construction will begin in Fall of 2008. APCO's deadline for completion and substation activation is Fall of 2009.

PROPERTY:

The project property consists of APCO parcels with an area of 1.862 acres in the City of Roanoke. The site is bounded on the north by Salem Avenue NW, on the west by 8th Street SW, on the east by 7th Street SW and on the south by Rorer Avenue SW. The Contractor will be responsible for arranging for permit(s) or permission(s) for required borrow and/or spoil activities outside the limits of the APCO property. The Contractor will be responsible for acquiring all required construction permits from The City of Roanoke. The Contractor will be responsible for maintaining proper condition of the public streets and for any damage to any properties, utilities, or other features during construction.

EXISTING SITE CONDITIONS:

The site is currently used by APCO on the eastern portion as an existing substation. Access is provided by existing gravel drives off of 7th Street and Salem Avenue. There are existing overhead and underground power lines entering the tract from the north and east which branch out within the site - APCO will modify the existing network as necessary to accommodate the construction before the work begins. Contractor shall have all utilities located before any work begins.

SOILS:

The site is currently cleared and adjacent to an existing substation that slopes downward in the southwest corner. The subsurface generally consists of soft to stiff ELASTIC SILT (MH) transitioning to loose to dense Silty SAND (SM), Partially Weathered Rock the termination depth.

Preparation of the expansion subgrade should begin with the removal of topsoil and other inadequate material. The topsoil should be stockpiled, to be spread after final grading of the completed construction in all areas outside the station expansion, to facilitate the establishment of the vegetative erosion control cover. Soils, which have been tested for suitability as compacted fill, will be used to extend the existing pad. The final subgrade surface should be proofrolled during a period of good weather, not when the site is wet from recent precipitation. The geotechnical engineer should observe the proofrolling operation to identify areas which pump, rut, heave, or are otherwise unsuitable, and provide recommendations for the correction of these deficient areas.

PROJECT DESCRIPTION:

This phase of the project will consist of clearing and grubbing the project limits, stockpiling topsoil, building the pad with lifts of compacted soils, installing the retaining wall, grading the site, removing the spoil material, constructing the water quality measure, spreading topsoil in areas outside the extended pad, and final stabilization. Approximately 1.45 acres will be disturbed at the proposed pad expansion, as well as relocating the fence for the existing pad. All utilities will be located before starting work. Adequate erosion and sediment controls are shown on the plans, will be installed before any land disturbing activity, will be installed and maintained in accordance with the latest edition of the Virginia Erosion and Sediment Control Handbook, will be added to by the Contractor if needed, and will be removed after *project completion, site stabilization, and acceptance by APCO and the City of Roanoke.*

Topsoil will be removed and stockpiled onsite, with appropriate erosion and sediment control measures. When construction and grading is completed, the topsoil will be spread at a minimum depth of 4" in all disturbed areas that will not be covered with stone; final graded, and permanently stabilized using fertilizer, seed, and mulch (or blanket matting). Excess topsoil will be spread onsite or removed from the property and properly disposed of by the Contractor, erosion control measures being utilized as necessary.

The construction will consist of building a substation pad extension of 250' to the west of the existing pad. The existing substation security fence will remain undisturbed during construction, and the gravel substation pad surface and security fence around the pad extension shown on the plans will be installed by others at a later date. The substation building(s) and equipment will be installed by APCO at a later date.

There are some critical areas to be monitored. The cut slopes on the north and west sides of the site will have to be constructed in such a way as to install the retaining wall. The fill slope on the south side of the expansion will have to be 3H:1V, with such slope being necessary to keep the work within the APCO property. This fill slope will be stabilized using blanket matting, fertilizer, and seed, which should be sufficient to stabilize the slope.

The pad expansion will be temporarily seeded to prevent erosion, if station construction is delayed more than thirty days beyond completion of final grading - this is considered unlikely, given the overall project schedule. All disturbed areas will be closely monitored until APCO and The City of Roanoke are satisfied that they have completely and satisfactorily stabilized,

The development project will not significantly alter the pre-development drainage pattern. The existing site and station pad slope down to the south and the pad extension will continue this pattern. The pad extension will slope down from north to south, following the pre-development grades in the area, and will be flatter (approximately 2%) than the existing surface gradient (ranging from 4% to 18%), which will slow runoff. The stone surface for the pad and its extension will mitigate any effects of site development (no impervious surface will be built). There are no existing drainage ditches and none needed for the project. All runoff uphill outside the station naturally sheet flows around the project area. Areas outside of the construction limits will remain undisturbed and sheet flow as they currently do.

Best Management Practices will be used to ensure water quality and quantity (BMP will be installed at the southern portion of the proposed pad extension). The BMP utilized will be a gravel infiltration trench. Raintanks or approved equal will be installed below the gravel trench for stormwater storage. The system was design to hold the 1-yr 24-hr storm event. *The outfall pipe from the BMP was sized to* allow all the water detained to outfall over a 24-hr time frame. It will outfall into the existing curb and gutter on the north side of Rorer Street. The majority of the proposed pad will drain to one of the BMPs. Any area bypassing the BMP will sheet flow through a green space approximately 15' wide prior to entering the street.

HAZARDOUS MATERIALS:

There are no known hazardous materials on this site. Discovery of any hazardous materials during construction will be communicated immediately to APCO, City of Roanoke, and the Virginia Dept. of Environmental Quality.

STORMWATER MANAGEMENT:

Stormwater management for this development will consist of grading the site so runoff will sheet flow to the south of the site. A portion of the runoff will be captured by one of three raintanks. These raintanks will act as water quality as well as storage. The system is design to ensure that the post-developed runoff is equal to or less than the pre-developed runoff.

WATER QUALITY:

Water Quality for this site was analyzed by the technology based method. To ensure that the quality was met, an additional criteria was also applied. The BMP system was designed and analyzed for the 1-yr 24 hr storm event. It should be noted that the gravel was considered 100% impervious when analyzing and sizing the BMPs. The BMP utilized for this site is a stone infiltration trench with raintank underneath to allow infiltration to the surround soils as well as provide storage for the site.

For the existing station, the impervious area will be reduced by approximate 14%. For the proposed station expansion, it was determined that an Infiltration Practice would best suit this project. The runoff will *drain through a stone filter into the raintanks. The outfall of the raintanks was designed to allow the runoff to (a) have an opportunity for the first flush to be absorb into the surrounding soils and (b) ensure that* the 2-yr 24 hour storm event be held in the raintanks and discharge over a 24 hour time period.

ADEQUATE CHANNEL:

Due to the limited information on the ultimate drainage system, the spread on the gutters were analyzed to ensure that the allowable spread was not exceeded. It should also be noted that, per the calculations, the post-developed runoff is less than the pre-developed runoff.

CONSTRUCTION SEQUENCE:

1. Obtain permit(s) and make notification(s).
2. Locate underground utilities and stakeout construction.
3. Install construction entrance, diversion dikes, sediment trap, and silt fences
4. Clear and grub the project limits, properly disposing of all trash and materials offsite.
5. Strip and stockpile topsoil, install erosion and sediment control measures, and stabilize.
6. Install retaining wall
7. Grade the finished pad and tie-in slopes.
8. Deposit and compact in lifts suitable soil fill material to build the pad extension.
9. Remove sediment trap and diversion dikes
10. Install the water quality measure
11. Remove excess dirt from site
12. Spread topsoil on all areas to be permanently seeded, fine-grade, and stabilize.
13. Monitor completed project until stabilization of all disturbed areas is complete.
14. Upon acceptance of the completed, stabilized site by APCO and City of Roanoke, remove and properly dispose of all erosion control measures and silt buildup.

EROSION AND SEDIMENT CONTROL MEASURES:

Unless otherwise indicated and approved, all vegetative and structural erosion and sediment control measures will be installed prior to any land-disturbing activities, inspected daily and after every rainfall, and serviced as needed to maintain all measures in peak performance, all in accordance with the latest edition of the Virginia Erosion and Sediment Control Handbook.

Erosion and sediment control shall be discussed by the Contractor and APCO prior to any land-disturbing activity so that limits of construction, erosion control measures, and project intentions are understood by both parties. Construction shall be sequenced so that grading operations can begin and end as quickly as possible. There will be no tracking of mud from the project site onto any public or private roads.

Structural Measures:

3.02 Construction Entrance:
A construction entrance shall be installed in the location shown on the plans and as detailed, to establish a place for removal of soil from construction traffic prior to leaving the site. The construction entrance *will be inspected and cleaned, when necessary, throughout the construction process, including the end of the work, when the construction entrance will be removed and the permanent aggregate driving* surfaces for the new access roads to the substation will be installed.

3.05 Silt Fence:
Silt fence shall be installed in the locations shown on the plans and as detailed, across the path of sheet flowing stormwater and on the downhill side of all disturbed areas, to intercept, filter out, and detain sediment and decrease flow velocities from small drainage areas. Silt fence shall be cleaned and either repaired or replaced throughout the construction process, whenever silt buildup behind the fence exceeds 9" depth. Silt fence will be removed when the uphill disturbed areas have stabilized to the satisfaction of APCO and City of Roanoke.

3.09 Temporary Diversion Dike:
The diversion dike is used for the control of stormwater. A diversion dike will be installed to the south of the disturbed area to divert stormwater to the sediment trap.

3.13 Temporary Sediment Trap:
The sediment trap will detain runoff from disturbed areas for enough time to allow most of the sediment to settle out. The proposed sediment trap will be part of the intermitted sediment barrier. The diversion dikes will drain into the sediment trap. Once the sediment trap is ready to be removed, the contractor is to ensure that the silt fences are installed.

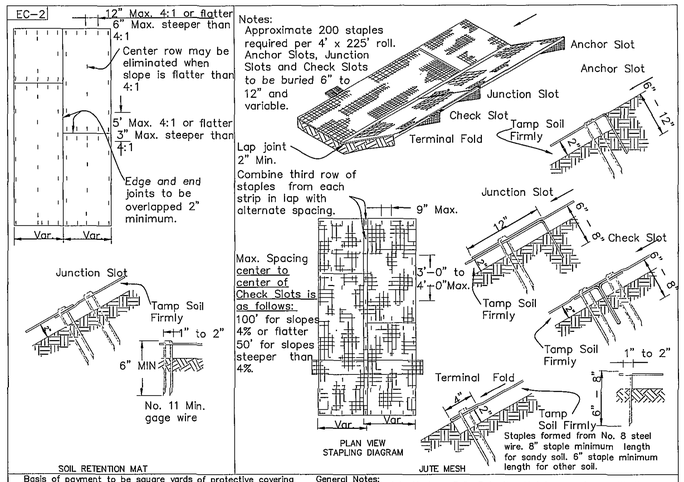
3.36 Soil Stabilization Blankets/Matting:
Soil stabilization blankets and matting shall be installed in the locations shown on the plans (all 3H:1V slopes and steeper) and as detailed, for the purpose of maintaining the slope, preventing erosion, and facilitating growth of a vegetative cover to stabilize the disturbed area. Blankets and matting will be installed as soon as final grade is achieved and will be repaired throughout the project until the disturbed areas have stabilized to the satisfaction of APCO and City of Roanoke.

Vegetative Measures:
Temporary seeding measures will be performed within seven (7) days in denuded areas that will remain dormant longer than thirty (30) days. Permanent seeding measures will be performed within seven (7) days in denuded areas that will remain dormant longer than one year. Temporary and permanent seeding measures will be performed in disturbed areas that have achieved final grades within seven (7) days. *Fertilizer shall be applied in accordance with these plans before any seeding is performed.*

3.31 Temporary Seeding:
Temporary seeding shall be performed in a disturbed area where construction is not yet complete, but is to be left denuded for over thirty (30) days. Refer to the plans.

3.32 Permanent Seeding:
Permanent seeding will establish a permanent, long-lived, perennial vegetative cover in rough-graded areas that will remain dormant for a year and in areas that have been topsoiled and fine-graded. Refer to the plans.

3.35 Mulching:
Mulching is the application of plant residues or other suitable, acceptable materials to disturbed surfaces which have been seeded, to prevent erosion, reduce overland flow velocities, and protect seed until it germinates and the vegetative cover is established.



General Notes:
Basis of payment to be square yards of protective covering *complete in place. Protective covering is to be located as* indicated on the plans in accordance with the dimensions specified on typical section.
"T-Top" staples or other manufacturer's design approved by the Engineer may be substituted for the staples shown.

Jute Mesh or Soil Retention Mat in accordance with the Specifications may be used at the option of the contractor. Width of material may vary from minimum dimension by increments of 4 OR 5 FEET.

PROTECTIVE COVERING INSTALLATION CRITERIA

VIRGINIA DEPARTMENT OF TRANSPORTATION

114.02	USED ON ALL SLOPES 3:1 AND STEEPER	SPECIFICATION REFERENCE 244 606

Specifications: Use SI Geosolutions "Landlok CS2" or equivalent. Erosion control blanket to consist of 70% wheat straw and 30% mattress grade coconut fiber mechanically bound and covered on both sides by netting.

EROSION AND SEDIMENT CONTROL DEVICES:

PERIMETER EROSION AND SEDIMENT CONTROL DEVICES SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITY. AS CONSTRUCTION PROCEEDS, ALL ADDITIONAL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE INSTALLED AS SOON AS POSSIBLE. EROSION AND SEDIMENT CONTROL DEVICES AS SHOWN ON THE PLAN ARE A MINIMUM AND THE PROJECT CONDITION MAY DICTATE ADDITIONAL CONTROL. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE PER THE LATEST EDITION OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND SHALL BE INSTALLED BY CONTRACTOR.

EROSION AND SEDIMENT CONTROL MAINTENANCE:

THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL EROSION CONTROL DEVICES FOR THE DURATION OF THE PROJECT. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE CHECKED WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL TO INSURE THAT ALL DEVICES ARE IN PLACE AND FUNCTIONING AS REQUIRED. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE MAINTAINED PER THE LATEST EDITION OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK OR VIRGINIA DEPARTMENT OF TRANSPORTATION. IN GENERAL, IF THE SILT BUILT UP BEHIND A BARRIER BECOMES AS DEEP AS 9 INCHES, THE SILT IS TO BE REMOVED AND THE BARRIER REPAIRED OR REPLACED. AFTER COMPLETION OF THE PROJECT, AND PERMANENT SEEDING HAS BEEN ESTABLISHED, EROSION CONTROL DEVICES AND ANY SILT BUILT UP SHALL BE REMOVED. DISTURBED AREAS DUE TO THIS CLEANUP OPERATION SHALL BE REPAIRED, RESEEDED AND REMULCHED.

SEEDING SPECIFICATIONS:

(TS) TEMPORARY SEEDING-

09 /01 - 02 /15 - 50 /50 MIX OF ANNUAL RYE GRASS AND CEREAL (WINTER) RYE (50-100 LBS. PER ACRE)
02 /16 - 04 /30 - ANNUAL RYEGRASS (60-100 LBS. PER ACRE)
05 /01 - 08 /31 - GERMAN MILLET (50 LBS. PER ACRE)

FERTILIZER - 600 LBS. 10-20-10/ACRE
LIME - 2 TONS/ACRE

(PS) PERMANENT SEEDING-

SEASONAL SPECIFICATION - PER ACRE

O3/01 THRU 05/15 128 LBS. KENTUCKY 31 FESCUE
2 LBS. RED TOP GRASS
20 LBS. ANNUAL RYE

05/16 THRU 08/15 128 LBS. KENTUCKY 31 FESCUE
2 LBS. RED TOP GRASS
20 LBS. FOXTAIL MILLET

08/16 THRU 09/15 128 LBS. KENTUCKY 31 FESCUE
2 LBS. RED TOP GRASS
20 LBS. ANNUAL RYE

11/01 THRU 02/28 128 LBS. KENTUCKY 31 FESCUE
2 LBS. RED TOP GRASS
20 LBS. WINTER RYE

FERTILIZER - ALL SEASONS - 1000 LBS. 10-20-10/ACRE
LIME - ALL SEASONS - 2 TONS/ACRE

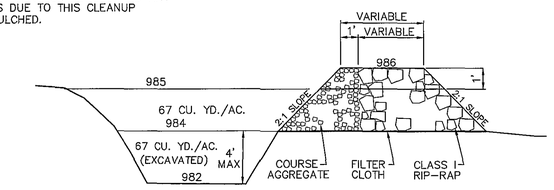
(MU) * A MULCH COVER IS REQUIRED ON EVERY SEEDING

* STRAW AT 80 BALES PER ACRE OR AN APPROVED MANUFACTURED MULCH/STABILIZATION MATERIAL

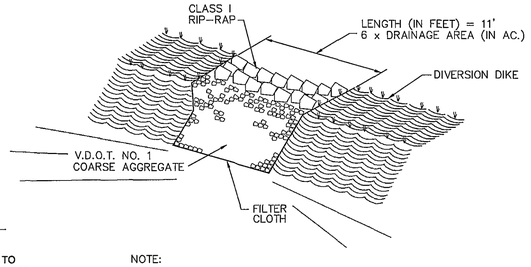
VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS MINIMUM STANDARD #1

PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN 7 DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE.

TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN 30 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.



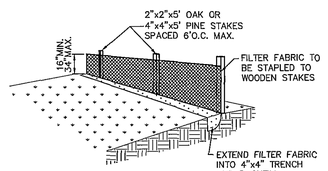
CROSS – SECTION



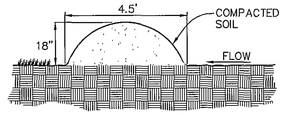
NOTE:
COARSE AGGREGATE SHALL BE VDOT #3, #357, OR #5

SEDIMENT TRAP OUTLET

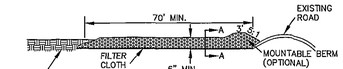
TEMPORARY SEDIMENT TRAP
N.T.S.



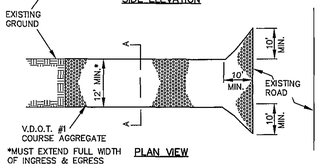
(SF) SILT FENCE
(WITHOUT WIRE SUPPORT)
N.T.S.



TEMPORARY DIVERSION DIKE
N.T.S.

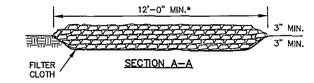


SIDE ELEVATION



*MUST EXTEND FULL WIDTH OF INGRESS & EGRESS

PLAN VIEW



SECTION A–A

(CE) CONSTRUCTION ENTRANCE
N.T.S.

CONTRACTOR WILL MODIFY SIZE AND SHAPE OF CONSTRUCTION ENTRANCE AS NEEDED TO ACCOMMODATE REQUIRED TURNING MOVEMENTS OF CONSTRUCTION TRAFFIC INTO AND OUT OF THE PROJECT SITE AND MEET THE PURPOSE OF THE CONSTRUCTION ENTRANCE.

COMMONWEALTH OF VIRGINIA
MICHAEL D. WILSON
Lic. No. 044203
07/17/08
PROFESSIONAL ENGINEER

HURT AND PROFFITT, INC. PROJECT NO. 20080140
G.L. NO. 260-07-A5.3
FILE. NO. G-12176

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OLD DWG : STD DWG :

APPALACHIAN POWER COMPANY

7th STREET STATION EXPANSION

CITY OF ROANOKE VIRGINIA

EROSION AND SEDIMENT CONTROL DETAILS

NO	DATE	REVISION DESCRIPTION	DR	ENG	CK	ISSUE#

SCALE: AS NOTED	DR: NRH/JWG	ENG: MDW	CH: FHJ/RAH
AEP AMERICAN ELECTRIC POWER	WO#:	APPD: MDW	DATE: 07/17/08
1 RIVERSIDE PLAZA COLUMBUS, OH 43215	DWG. NO. 5 OF 10		REV