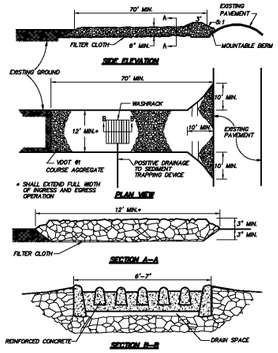



CE **STONE CONSTRUCTION ENTRANCE** 3.02-1

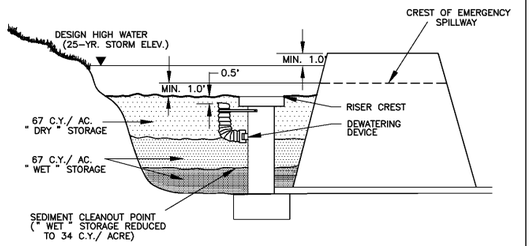
NO SCALE

## EROSION CONTROL LEGEND

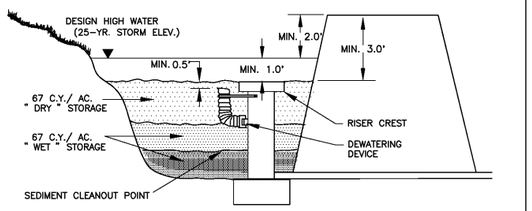
| | | * |
|---|---|---|
| CE | CONSTRUCTION ENTRANCE | 3.02 |
| STB | STRAW BALE BARRIER | 3.04 |
| SF | SILT FENCE | 3.05 |
| IP | INLET PROTECTION | 3.07 |
| CIP | CULVERT INLET PROTECTION | 3.08 |
| OP | OUTLET PROTECTION | 3.18 |
| DD | DIVERSION DIKE | 3.09 |
| FD | TEMPORARY FILL DIVERSION | 3.10 |
| ST | TEMPORARY SEDIMENT TRAP | 3.13 |
| SB | TEMPORARY SEDIMENT BASIN | 3.14 |
| CD | CHECK DAM | 3.20 |
| SAF | SAFETY FENCE (CHAINLINK) | 3.01 |
| TP | TEMPORARY TREE PROTECTION (PLASTIC FENCE) | 3.38-2 |
| TS | TEMPORARY SEEDING | 3.31 |
| PS | PERMANENT SEEDING | 3.32 |
| MU | MULCHING | 3.35 |
| TO | TOPSOILING | 3.30 |
| BM | SOIL STABILIZATION BLANKETS AND MATTING | 3.36 |
| | EXISTING DRAINAGE AREA LINE AND FLOW ARROWS | |

* "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" SPECIFICATION NUMBER

# SEDIMENT BASIN SCHEMATIC ELEVATIONS




## DESIGN ELEVATIONS WITH EMERGENCY SPILLWAY




## DESIGN ELEVATIONS WITHOUT EMERGENCY SPILLWAY

(RISER PASSES 25-YR. EVENT)

SB

SOURCE: VA. DSWC

PLATE. 3.14-2

### EROSION CONTROL SEQUENCE

1. A PRE-CONSTRUCTION CONFERENCE IS MANDATORY BEFORE ANY WORK IS DONE AT THE SITE. THE CONTRACTOR IS RESPONSIBLE FOR ARRANGING A MEETING WITH OWNER, ENGINEER AND COUNTY ENGINEER.
2. INSTALL STONE CONSTRUCTION ENTRANCE IN LOCATION SHOWN ON CONTRACT DRAWINGS.
3. INSTALL SILT FENCING AND INLET PROTECTION MEASURES FOR EXISTING STORM WATER PIPING SYSTEMS.
4. CLEAR, GRUB AND STRIP SITE. STOCKPILE TOPSOIL ON SITE. STABILIZE STOCKPILE WITH TEMPORARY SEEDING. PROVIDE SILT FENCE AROUND THE PERIMETER OF THE STOCKPILE.
5. GRADE BUILDING PADS AND BEGIN PLANT UPGRADE CONSTRUCTION.
6. COMPLETE SITEWORK CONSTRUCTION INCLUDING CULVERTS, PIPING INSTALLATION, INLET AND OUTLET PROTECTION, AND TEMPORARY AND PERMANENT SEEDING FOR STABILIZATION.
7. REPLACE TOPSOIL ON LANDSCAPE AREA. SEED AND MULCH DENUDED AREAS.
8. PLACE PAVEMENT AND STABILIZE ANY PROBLEM AREAS ON SITE.
9. REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH THE LATEST EDITION OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND AS REQUIRED BY ROANOKE COUNTY EROSION CONTROL OFFICERS. EROSION CONTROL MEASURES SHALL NOT BE REMOVED UNTIL ALL CONTRIBUTING AREAS HAVE BEEN PERMANENTLY STABILIZED.
10. STOCKPILE AREAS TO BE GRADED IN A MANNER TO ALLOW FOR POSITIVE DRAINAGE AS APPROVED BY ENGINEER, IN ACCORDANCE WITH EARTHWORK SECTION OF SPECIFICATIONS.

### STRUCTURAL PRACTICES

1. *Temporary Construction Entrance – 3.02*
   Temporary construction entrances shall be provided at the connection to the plant road. This entrance shall be maintained throughout construction.
2. *Silt Fence Barrier – 3.05.*
   Silt fence sediment barriers shall be installed downslope of areas with minimal grades to filter sediment-laden runoff from sheet flow as indicated.
3. *Storm Drain Inlet Protection – 3.07.*
   Storm drain inlet protection shall be placed at all stormwater inlets as shown.
4. *Outlet Protection – 3.18.*
   Riprap shall be placed at the outlet of all pipes as indicated.
5. *Soil Stabilization Blankets & Matting – 3.35.*
   Soil stabilization blankets & matting shall be installed in all roadside ditches and on all slopes above (south) of Influent Pump Station and below (north) of proposed Solids Handling Building.

### VEGETATIVE PRACTICES

1. *Topsoiling (Temporary Stockpile) – 3.30*
   Topsoil shall be stripped from areas to be graded and stockpiled for later spreading. Stockpile locations shall be located onsite and shall be stabilized with temporary vegetation.
2. *Temporary Seeding – 3.31*
   All denuded areas which will be left dormant for extended periods of time shall be seeded with fast germinating temporary vegetation immediately following grading of those areas. Selection of the seed mixture shall depend on the time of year it is applied.

### MANAGEMENT STRATEGIES

1. Construction shall be sequenced so that grading operations can begin and end as quickly as possible.
2. Temporary seeding or other stabilization shall follow immediately after grading.
3. Trenching for utilities and drainage shall be isolated from downstream conveyances in order to minimize perimeter controls.
4. All erosion and sediment control practices shall be maintained until they are no longer required to comply with the contract documents or state law.

### PERMANENT STABILIZATION

All non-paved areas disturbed by construction shall be stabilized with permanent seeding immediately following finish grading. Seeding shall be in accordance with Std. & Spec. 3.32, PERMANENT SEEDING. Seed type shall be as specified in Specification 02910 – Final Grading and Landscaping. Mulch (straw or fiber) shall be used on all seeded surfaces. In all seeding operations seed, fertilizer and lime shall be applied prior to mulching.

### MAINTENANCE

All erosion and sediment control measures shall be checked daily and after each run-off producing rainfall. The following items shall be checked in particular:

1. The gravel inlet protection shall be checked for sediment buildup which will prevent drainage. If the gravel is clogged by sediment, it shall be removed and cleaned or replaced.
2. The silt fence barrier shall be checked for undermining or deterioration of the fabric. Sediment shall be removed when the level of sediment deposition reaches half way to the top of the barrier.
3. The seeding areas shall be checked to ensure that a good stand is maintained. Areas shall be fertilized and reseeded as needed.
4. The culvert inlet protection shall be checked for sediment buildup. Aggregate shall be cleaned or replaced if clogged by sediment. Sediment shall be removed and the impoundment restored to its original dimensions when sediment has accumulated to one half of the design depth.

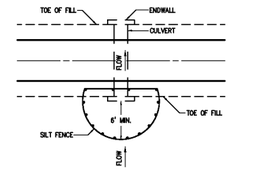
### LIME AND FERTILIZER MATERIALS AND APPLICATION RATES

*LIME*

2 TONS/ACRE PULVERIZED AGRICULTURAL GRADE LIMESTONE (90 lbs./1000 ft.²)

*FERTILIZER*

| | |
|---|---|
| MIXED GRASSES AND LEGUMES: | 1000 lbs./ACRE 10-20-10 OR EQUIVALENT NUTRIENTS (23 lbs./1000 ft.²) |
| LEGUME STANDS ONLY: | 1000 lbs./ACRE 5-20-10 (23 lbs./1000 ft.) IS PREFERRED; HOWEVER, 1000 lbs./ACRE OF 10-20-10 OR EQUIVALENT MAY BE USED. |
| GRASS STANDS ONLY: | 1000 lbs./ACRE 10-20-10 OR EQUIVALENT NUTRIENTS (23 lbs./1000 ft.²) |




CIP **SILT FENCE CULVERT INLET PROTECTION** 3.08-1

NO SCALE

TABLE 3.35-A
ORGANIC MULCH MATERIALS AND APPLICATION RATES

| MULCHES: | RATES PER ACRE | RATES PER 1000 SQ. FT. | NOTES: |
|---|---|---|---|
| STRAW OR HAY | 1 1/2 – 2 TONS (MINIMUM 2 TONS FOR WINTER COVER) | 70–90 LBS. | FREE FROM WEEDS AND COARSE MATTER. MUST BE ANCHORED. SPREAD WITH MULCH BLOWER OR BY HAND. |
| FIBER MULCH | MINIMUM 1500 LBS. | 35 LBS. | DO NOT USE AS MULCH FOR WINTER COVER OR DURING HOT, DRY PERIODS.* APPLY AS SLURRY. |
| CORN STALKS | 4–6 TONS LBS. | 185–275 LBS. | CUT AS SHREDDED IN 4–6" LENGTHS. AIR–DRIED. DO NOT USE IN FINE TURF AREAS. APPLY WITH MULCH BLOWER OR BY HAND. |
| WOOD CHIPS | 4–6 TONS LBS. | 185–275 LBS. | FREE OF COARSE MATTER. AIR–DRIED. TREAT WITH 12 LBS. NITROGEN PER TON. DO NOT USE IN FINE TURF AREAS. APPLY WITH MULCH BLOWER, CHIP HANDLER, OR BY HAND. |
| BARK CHIPS OR SHREDDED BARK | 50–70 CU. YDS LBS. | 1–2 CU. YDS. | FREE OF COARSE MATTER. AIR–DRIED. DO NOT USE IN FINE TURF AREAS. APPLY WITH MULCH BLOWER, CHIP HANDLER, OR BY HAND. |

* WHEN FIBER MULCH IS THE ONLY AVAILABLE MULCH DURING PERIODS WHEN STRAW SHOULD BE USED, APPLY AT A MINIMUM RATE OF 2000 LBS./AC. OR 45 LBS./1000 SQ. FT.

## NARRATIVE

### PROJECT DESCRIPTION

Construct the improvements at the Water Pollution Control Plant in Roanoke County. The site is located off of Kindred Street.
The project will consist of the construction of the wet weather improvements at the plant, access roads, flood control berms and flood walls.
Approximately 8.9 ± acres of land disturbance will be required for this plant construction project.

### ADJACENT PROPERTY

This site borders privately owned land to the south and east.
The site borders the Roanoke River to the north and west.

### SOILS

The subsurface conditions at the site are primarily alluvial deposits of the Quaternary Age and/or existing fill overlying weathered rock and hard shale.

### CRITICAL EROSION AREAS

The critical erosion areas on this project are the outfalls from the storm water pipes and the steep slopes adjacent to the River.
Early establishment and proper maintenance of inlet protection and silt fence will prevent erosion and off-site sediment transport.
The early establishment of permanent seeding practices will be vital in controlling erosion and sediment transport in critical areas.

### EROSION AND SEDIMENT CONTROL MEASURES

Unless otherwise indicated, all vegetative and structural erosion and sediment control practices shall be constructed and maintained according to minimum standards and specifications of the *Virginia Erosion and Sediment Control Handbook*. The minimum standards of the VESCH shall be adhered to unless otherwise waived or approved by a variance by LOCAL authorities having jurisdiction.

### GENERAL EROSION AND SEDIMENT CONTROL NOTES

ES–1: Unless otherwise indicated, all vegetative and structural erosion and sediment control practices shall be constructed and maintained according to minimum standards and specifications of the *Virginia Erosion and Sediment Control Handbook* and Virginia Regulations VR 625–02–00 Erosion and Sediment Control Regulations.

ES–2: The local authority having jurisdiction shall be notified of the preconstruction conference . Local authorities having jurisdiction will make a continuing review and evaluation of the methods and effectiveness of the e.c. plan.

ES–3: All erosion and sediment control measures shall be placed prior to or as the first step in clearing, grading, or land disturbance.

ES–4: A copy of the approved erosion and sediment control plan shall be maintained on the site at all times.

ES–5: Prior to commencing land–disturbing activities in areas other than indicated on these plans (including, but not limited to, offsite borrow or waste area), submit a supplementary erosion control plan to the Architect/Engineer for review and approval.

ES–6: Provide additional erosion control measures necessary to prevent erosion and sedimentation as determined by the local authority having jurisdiction.

ES–7: All disturbed areas shall drain to approved sediment control measures at all times during land–disturbing activities and during site development.

ES–8: During dewatering operations, water shall be pumped into an approved filtering device.

ES–9: Inspect all erosion control measures daily and after each runoff–producing rainfall event. Any necessary repairs or cleanup to maintain the effectiveness of the erosion control devices shall be made immediately.

### MINIMUM STANDARDS

MS–1: Permanent soil stabilization shall be applied to denuded areas within seven 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.

MS–2: Temporary soil stockpiles shall be stabilized or protected with sediment trapping measures. Provide temporary protection and permanent stabilization of all soil stockpiles on site as well as soil transported from the project site.

MS–3: A permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved that in the opinion of the Architect/Engineer, is uniform, mature enough to survive and will inhibit erosion.

MS–4: Sediment basins and traps, perimeter dikes, sediment barriers and other measures intended to trap sediment shall be constructed as a first step in any land–disturbing activity and shall be made functional before upslope land disturbance or timbering takes place.

MS–5: Stabilization measures shall be applied to earthen structures such as dams, dikes and diversions immediately after installation.

MS–6: Surface runoff from disturbed areas that is comprised of flow from drainage areas greater than or equal to three acres shall be controlled to accommodate the anticipated sediment loading from the land–disturbing activity. The outfall device or system design shall take into account the total drainage area flowing through the disturbed area to be served by the basin.

MS–7: Cut and fill slopes shall be constructed in a manner that will minimize erosion. Slopes that are found to be eroding excessively within one year of permanent stabilization shall be provided with additional slope stabilizing measures until the problem is corrected.

MS–8: Concentrated runoff shall not flow down cut or fill slopes unless contained within an adequate temporary or permanent channel, flume or slope drain structure.

MS–9: Whenever water seeps from a slope face, adequate drainage or other protection shall be provided.

MS–10: All storm sewer inlets that are made operable during construction shall be protected so that sediment–laden water cannot enter the conveyance system without first being filtered or otherwise treated to remove sediment.

MS–11: Before stormwater conveyance channels are made operational, adequate outlet protection and any required temporary or permanent channel lining shall be installed in both the conveyance channel and receiving channel.

MS–12: When work in a live watercourse is performed, precautions shall be taken to minimize encroachment, control sediment transport and stabilize the work area to the greatest extent possible during construction. Nonerodible material shall be used for the construction of causeways and cofferdams. Earthen fill may be used for these structures if armored by nonerodible cover materials.

MS–13: When a live watercourse must be crossed by construction vehicles more than twice in any six–month period, a temporary stream crossing constructed of nonerodible material shall be provided.

MS–14: All applicable federal, state and local regulations pertaining to working in or crossing live watercourses shall be met.

MS–15: The bed and banks of a watercourse shall be stabilized immediately following after work in the watercourse is completed.

MS–16: Underground utility lines shall be installed in accordance with the standards in addition to other applicable criteria:

a. No more than 500 linear feet of trench shall be opened at one time.
b. Excavated material shall be placed on the uphill side of trenches.
c. Effluent from dewatering operations shall be filtered or passed through an approved sediment trapping device, or both, and discharged in a manner that does not adversely affect flowing streams or offsite property.
d. Restabilization shall be accomplished in accordance with these regulations.
e. Applicable safety regulations shall be complied with.

MS–17: Where construction vehicle access routes intersect paved public roads, provisions shall be make to minimize the transport of sediment by vehicular tracking onto the paved surface. Where sediment is transported onto a public road surface, the road shall be cleaned thoroughly at the end of each day. Sediment shall be removed from the roads by shoveling or sweeping and transported to a sediment control disposal area. Street washing shall be allowed only after sediment is removed in this manner.

MS–18: All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization or after the temporary measures are no longer needed, unless otherwise authorized by the local authority having jurisdiction. Trapped sediment and the disturbed soil areas resulting from the disposition of temporary measures shall be permanently stabilized to prevent further erosion and sedimentation.

MS–19: Properties and waterways downstream from development sites shall be protected from sediment deposition, erosion and damage due to increases in volume, velocity and peak flow rate of stormwater runoff for the stated frequency storm of 24–hour duration in accordance with the following standards and criteria:

a. Concentrated stormwater runoff leaving a development site shall be discharged directly into an adequate natural or man–made receiving channel, pipe or storm sewer system. For those sites where runoff is discharged into a pipe or pipe system, downstream stability analyses at the outfall of the pipe or pipe system shall be performed.
b. Adequacy of all channels and pipes shall be verified in the following manner:
   (1) The applicant shall demonstrate that the total drainage area to the point of analysis within the channel is one hundred times greater than the contributing drainage area of the project in question.
   (2) Natural channels shall be analyzed by the use of a two–year frequency storm to verify that stormwater will not overtop channel banks nor cause erosion of channel bed or banks.
   (3) All previously constructed man–made channels shall be analyzed by the use of a ten–year frequency storm to verify that stormwater will not overtop its banks and by the use of a two–year storm to demonstrate that stormwater will not cause erosion of channel bed or banks.
   (4) Pipes and storm sewer systems shall be analyzed by the use of a ten–year frequency storm to verify that stormwater will be contained within the pipe or system.
c. If existing natural receiving channels or previously constructed man–made channels or pipes are not adequate, the applicant shall:
   (1) Improve the channels to a condition where a ten–year frequency storm will not overtop the banks and a two–year frequency storm will not cause erosion to the channel bed or banks; or
   (2) Improve the pipe or pipe system to a condition where the ten–year frequency storm is contained within the appurtenances; or
   (3) Develop a site design that will not cause the pre–development peak runoff rate from a two–year storm to increase when runoff outfalls into a natural channel or will not cause the pre–development peak runoff rate from a ten–year storm to increase when runoff outfalls into a man–made channel.
   (4) Provide a combination of channel improvement, stormwater detention/retention or other measures which is satisfactory to the plan approving authority to prevent downstream erosion.
d. The applicant shall provide evidence of permission to make the improvements.
e. All hydrologic analyses shall be based on the existing watershed characteristics and the ultimate development condition of the subject project.
f. If the applicant chooses an option that includes stormwater detention/retention, he shall obtain approval from the locality of a plan for maintenance of the detention facilities. The plan shall set forth the maintenance requirements of the facility and the person responsible for performing the maintenance.
g. Increased volumes of sheet flows that may cause erosion or sedimentation on adjacent property shall be diverted to a stable outlet, adequate channel or detention facility.
h. In applying these stormwater management criteria, individual lots in a residential subdivision development shall not be considered to be separate development projects. Instead, the residential subdivision development, as a whole, shall be considered to be a single development project. Hydrologic parameters that reflect the ultimate subdivision development shall be used in all engineering calculations.
i. Proposed commercial or industrial subdivisions shall apply these stormwater management criteria to the development as a whole. Hydrologic parameters that reflect the ultimate subdivision development shall be used in all engineering calculations.

| NO. | ISSUED FOR | DATE | BY |
|---|---|---|---|
| | RECORD DRAWNGS | MAR 2008 | RLT |
| | CONSTRUCTION | MAR 2004 | RLT |
| | REGULATORY APPROVAL | NOV 2003 | RLT |
| | PRELIMINARY DESIGN | NOV 2002 | RLT |

DESIGNED H & S
DRAWN H & S
CHECKED
PROJ. ENGR. H & S
APPROVED

THIS DOCUMENT ORIGINALLY ISSUED FOR CONSTRUCTION AND SEALED BY ROBERT S. DIFIORE, SEAL NO. 22759

THIS DOCUMENT ORIGINALLY ISSUED FOR CONSTRUCTION AND SEALED BY RONALD L. TAYLOR, SEAL NO. 024649

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CITY OF ROANOKE
VIRGINIA

REGIONAL WATER POLLUTION CONTROL PLANT
WET WEATHER IMPROVEMENTS

MISCELLANEOUS STANDARD DETAILS

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

DATE JULY 2003
H & S JOB NUMBER 30788A
CONTRACT NUMBER A
DRAWING NUMBER D2

PLOT DATE 11/21/03 @ 8:52am FILE= H:\30788\30788A\STD-DWGS\d02 by RDTOULA XREFs=30788a\mtec\30786tb,