



STORMWATER MANAGEMENT PLAN REPORT FOR ELDORADO SPRINGS

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STORMWATER MANAGEMENT PLAN REPORT for ELDORADO SPRINGS

The main objective of the following Narrative Report (Stormwater Management Plan; SWMP) is to prevent any contamination of the storm water while construction activity is taking place.

This document must be kept at the construction site at all times.

The Grading & Erosion Control Plans are considered part of this SWMP. These plans shall be kept at the site at all times. Modifications to the erosion control plan may be necessary from time to time based on site inspections. Any additions or deletions of erosion control measures should be documented on the site copy of the Grading & Erosion Control Plans.

SWMP Administrator Note:

It is ultimately the property owner's responsibility to ensure that the work at the site is in compliance with this SWMP, the Grading and Erosion Control Plan, and all applicable statutes and ordinances. For this project the overall property owner is responsible for installing, inspecting, and maintaining all erosion control measures and BMP's during the overlot grading process.

C.2 Narrative Site Description

Part I.B.1. Contents and Requirements - Site Description

a) Description of Construction Activities

Eldorado Springs includes 15.5 acres located in a portion of the southwest corner of Section 33, Township 14 South and in the northwest corner of Section 4, Township 15 South, Range 66 West of the 6th P.M. in El Paso County, Colorado. More specifically, the site is located near the southeast corner of Venetucci Boulevard and Bob Johnson Drive, south of the World Arena facility. The site is bounded by unplatted land to the east and west, single family residential Stratmoor Subdivision to the south, and Venetucci Boulevard to the north.

The site is currently undeveloped and drains from south to north over moderate slopes. Proposed development includes a multi-family apartment complex. Existing soils in the study area consist mostly of Schamber-Razor complex (SCS Map Unit Symbol 82 - Hydrologic Soil Group A) with a small portion being Nunn Clay loam (SCS Map Unit Symbol 59 - Hydrologic Soil Group C). The site is located in the Stratton Drainage Basin.

b) Proposed Sequence for Major Construction Activities

1) "Overlot" grading of entire site.

1. Install initial erosion control measures.
 - a. *Vehicle tracking control.*
 - b. *Perimeter silt fence.*
 - c. *Install curb socks in existing curb & gutter.*
 - d. *Install inlet protection on existing storm sewer inlets.*
2. Overlot grade the entire site.
 - a. *Strip and stockpile topsoil.*

- i. Install silt fence around stockpile.
 - b. *Overlot grade site.*
- 3. Install remaining site erosion control measures.
 - a. *Additional silt fence.*
 - b. *Hay bales & check dams.*
 - c. *Additional inlet protection on storm sewer inlets.*
 - d. *Crimp & mulch.*
 - e. *Seed.*
- 2) Site construction.**
 - 1. Wet utility installation (trench & backfill)
 - a. *Water.*
 - b. *Install sanitary, gas, & water service lines.*
 - c. *Storm Sewer.*
 - i. Install riprap protection at discharge points.
 - 2. Access drive and parking lot construction.
 - a. *Fine grade drive and parking areas.*
 - b. *Install curb and gutter*
 - c. *Install asphalt paving*
 - 3. Dry utility installation (trench & backfill)
 - a. *Electric, phone, & cable.*
 - 4. Install sidewalk
 - 5. Install any permanent common area landscaping.
- 3) Building construction.**
 - 1. Foundation excavation and construction.
 - a. *Install silt fence as needed around any stockpiles.*
 - 2. Utility service line hook-up into foundation.
 - 3. Structure framing.
 - 4. Finishing.
 - 5. Install permanent landscaping on lot.
- c) Estimates of Total Site Area, Clearing, Grading, Excavation, and/or Other Construction Activities

It is estimated that grading and building construction will impact approximately 15.0 acres of total disturbance.
- d) Description of Underlying Soils and Erosion Potentials

Existing soils in the study area consist mostly of Schamber-Razor complex (SCS Map Unit Symbol 82 - Hydrologic Soil Group A) with a small portion being Nunn Clay loam (SCS Map Unit Symbol 59 - Hydrologic Soil Group C).
- e) Description of Existing Vegetation

The existing vegetation consists of native grasses (majority) and some brush with approximately 60% site coverage.
- f) Location and Description of all Potential Pollution Sources

See Part I.B.5. (below).
- g) Location and Description of all Non-Stormwater Discharges

There are no known non-stormwater discharges on this site.
- h) Description of Receiving Water(s) or Storm Sewer Systems

The site drains into Fountain Creek. No portion of this site is within a F.E.M.A. designated floodplain per Flood Insurance Rate Map Community Panel No. 08041C0741 G, effective December 7, 2018. There are no known TMDL requirements.

C.3 Site Map

Part I.C.2 Stormwater Management Plan (SWMP – Contents: Site Map)

See the approved Grading & Erosion Control Plans for this site. These plans are considered part of this SWMP and shall be kept at the site at all times. Modifications to the erosion control plan may be necessary from time to time based on site inspections. Any additions or deletions of erosion control measures should be documented on the site copy of the Grading & Erosion Control Plans.

C.4 BMP's and Other Controls

Part I.B.3 Contents and Requirements – BMP's for Stormwater Pollution Prevention

a) Erosion and Sediment Controls

1) Structural Practices for Erosion and Sediment Control

- Use of filter fabric silt fencing at site perimeter locations and throughout the site (*before commencement of construction activities*). Silt fence shall also be located around dirt stockpiles.
- Vehicle tracking control devices at construction traffic ingress/egress points to prevent sediment tracking onto surrounding streets (*before commencement of construction activities*).
- All disturbed areas shall have crimped straw installed and shall be reseeded. A recommended seed mix and application rate is included below.

2) Non-structural Practices for Erosion and Sediment Control

Temporary or permanent seeding will be employed in all areas disturbed by construction activities that will remain dormant for greater than 60 days. Should excessive blowing of sediment become apparent, then the contractor shall water the site for dust control.

Recommended Seed Mix:

Table 14-12. Recommended Seed Mix for all other Soils in Upland Areas

Common Name (Variety)	Scientific Name	Growth Season	Growth Form	Seeds/Lb	Lbs PLS/ Acre Drilled	Lbs PLS/Acre Broadcast or Hydroseeded
Sheep fescue	<i>Festuca ovina</i>	Cool	Bunch	680,000	0.6	1.2
Canby bluegrass	<i>Poa canbyi</i>	Cool	Bunch	926,000	0.5	1.0
Thickspike wheatgrass (Critana)	<i>Elymus lanceolatus</i>	Cool	Bunch	154,000	5.7	11.4
Western wheatgrass (Arriba)	<i>Pascopyrum smithii</i>	Cool	Sod	110,000	7.9	15.8
Blue grama (Hachita)	<i>Chondrosium gracile</i>	Warm	Sod	825,000	1.1	2.2
Switchgrass (Pathfinder)	<i>Panicum virgatum</i>	Warm	Sod/ Brush	389,000	1.0	2.0
Side-oats grama (Butte)	<i>Boutelou curtipendula</i>	Warm	Sod	191,000	2.0	4.0
Annual rye	<i>Lolium multiflorum</i>	Cool	Cover crop	227,000	10.0	20.0
				TOTAL	<u>28.8</u>	<u>57.6</u>
Wildflowers						
Blanket flower	<i>Faillardia aristata</i>	---	---	132,000	0.25	0.50
Prairie coneflower	<i>Ratibida columnaris</i>	---	---	1,230,000	0.20	0.40
Purple prairie clover	<i>Petalostemum purpurea</i>	---	---	210,000	0.20	0.40
Gayfeather	<i>Liatris punctata</i>	---	---	138,000	0.06	0.12
Flax	<i>Linum lewisii</i>	---	---	293,000	0.20	0.40
Penstemon	<i>Penstemon strictus</i>	---	---	592,000	0.20	0.40
Yarrow	<i>Achillea millefolium</i>	---	---	2,770,000	0.03	0.06
				TOTAL	<u>1.14</u>	<u>2.28</u>

3) Materials Handling and Spill Prevention

Spill prevention and containment measures shall be used at storage, and equipment fueling and servicing areas to prevent the pollution of any state waters, including wetlands. All spills shall be cleaned up immediately after discovery, or contained until appropriate cleanup methods can be employed. Manufacturer's recommended methods for spill cleanup shall be followed, along with proper disposal methods. The contractor shall follow the recommendations of the appropriate Hazard Communication Plan of the site construction manager, general contractor, or site superintendent.

Some spills may need to be reported to the Government immediately. Specifically, a release of any chemical, oil, petroleum product, sewage,

etc., which may enter waters of the U.S. (which include surface water, ground water, and dry gullies or storm sewers leading to surface water) must be reported.

Reportable Quantities

Material	Released To	Reportable Quantity
Engine oil, fuel hydraulic & brake fluid	Land	25 Gallons
Engine oil, fuel hydraulic & brake fluid	Water	Visible Sheen
Antifreeze	Land	100 lbs. (13 gallons)
Battery Acid	Land, Water	100 lbs.
Refrigerant	Air	1 lb.
Gasoline	Air, Land, Water	100 lbs.
Engine degreasers	Air, Land, Water	100 lbs.

Points of Contact in case of a reportable quantity release:

EPA National Response Center:

(800) 424-8802

Colorado Department of Public Health and Environment:

(877) 518-5608

Part I.B.5. Contents and Requirements – Other Controls

Identification of Potential Pollutant Sources

- All disturbed and stored soils
Topsoil shall be stockpiled and surrounded by silt fence as shown on the Grading and Erosion Control Plan in the Appendix of this report.
- Vehicle tracking of sediments
Construction vehicles will be exiting the site from unpaved surfaces and onto paved surfaces, which presents a significant possibility for sediment transport.
- Management of contaminated soils
There are no known contaminated soils on this site.
- Loading and unloading operations
Construction materials loading and unloading activities will exist on-site. Materials should be neatly placed in appropriate staging areas. Any materials that are subject to displacement from blowing wind should be adequately sheltered from the wind.
- Outdoor storage activities (building materials, fertilizers, chemicals, etc.)
The quantity of materials stored on the project site shall be limited, as much as practical, to that quantity required to perform the work in an orderly sequence. All materials stored on-site shall be stored in a neat, orderly manner, in their original containers, with original

manufacturer's labels. Materials shall not be stored in a location where they may be carried by stormwater runoff into a State Water at any time.

- Vehicle and equipment maintenance and fueling

Vehicle Fueling – there is no known vehicle fueling station to be installed or used on this site. However, it is anticipated that construction equipment may be refueled during construction. Spill prevention and containment measures shall be used at equipment fueling and servicing areas to prevent the pollution of any state waters, including wetlands. All spills shall be cleaned up immediately after discovery, or contained until appropriate cleanup methods can be employed. Manufacturer's recommended methods for spill cleanup shall be followed, along with proper disposal methods. The contractor shall follow the recommendations of the appropriate Hazard Communication Plan of the site construction manager, general contractor, or site superintendent. Vehicle refueling should be done in an area surrounded by an earthen berm to contain any fuel spills. Containment berming should be of sufficient size to safely contain a spill from the largest tank truck or other containment device located inside the possible spill area. In the event of a spill, a method of removal must be provided, such as application of sorbent materials and the use of a pump or vacuum truck. Any material removed from the spill site must be disposed of according to local, state, and federal standards. Stormwater and snowmelt runoff shall be diverted away from the containment berming area. Water that collects within the berming due to rainfall or snowmelt must be treated to meet standards before release from the spill area.

Vehicle Maintenance – from time to time it may be necessary for the contractor to perform maintenance on the construction equipment being used on the site. If possible, major repairs to construction equipment shall be done off-site. Basic vehicle maintenance shall be performed in the vehicle fueling area and all recommendations listed above shall be followed.

- Significant dust or particulate generating processes

Should excessive blowing of sediment become apparent, then the contractor shall water the site for dust control.

- Routine maintenance activities involving fertilizers, pesticides, detergents, fuels, solvents, oils, etc.

The application of fertilizers and pesticides (if used) should be done using the method and rates recommended by the manufacturer. These applications shall not cause runoff or potential damage to receiving bodies of water. Vehicle fuels and maintenance are described above.

- On-site waste management practices (waste piles, liquid wastes, dumpsters, etc.)

Contractors shall take steps to keep the site reasonably free from large amounts of construction debris during construction. All waste materials generated by construction activities shall be removed from the site. All wastes composed of building materials must be removed from the construction site for disposal in accordance with local and state regulatory requirements. No building material wastes or unused building materials shall be buried, dumped, or discharged at the site. Any waste materials stored in dumpsters shall be adequately covered to prevent blowing debris.

All wastes composed of building materials must be removed from the construction site for disposal in accordance with local and State regulatory requirements. No building material wastes or unused building materials shall be buried, dumped, or discharged at the site.

- Concrete truck/equipment washing, including the concrete truck chute and associated fixtures and equipment.

Concrete wash water shall not be discharged to or allowed to runoff to Waters of U.S., including any surface or subsurface storm drainage system or facilities. Any concrete wash water shall be done in a temporary pit on site. The area around this pit shall be protected with silt fence and the concrete inside the pit shall be removed when done.

- Non-industrial waste sources such as worker trash and portable toilets
Portable toilets located on the site shall be staked in place using t-posts to prevent them from tipping over during high winds.

- Other areas or procedures where potential spills can occur
Spill prevention and containment measures shall be used at storage, and equipment fueling and servicing areas to prevent the pollution of any State Waters, including wetlands. All spills shall be cleaned up immediately after discovery, or contained until appropriate cleanup methods can be employed. Manufacturer's recommended methods for spill cleanup shall be followed, along with proper disposal methods.

Some spills may need to be reported to the Government immediately. Specifically, a release of any chemical, oil, petroleum product, sewage, etc., which may enter waters of the U.S. (which include surface water, ground water, and dry gullies or storm sewers leading to surface water) must be reported.

C.5 Final Stabilization and Long-term Stormwater Management

Part I.B.4. Contents and Requirements – Final Stabilization and Long-term Stormwater Management

Permanent sediment control measures include paving of the parking lot and the installation of landscaping and reseeding with a native grass seed mix. The contractor shall consult the approved Landscape Plan for the proper location, species,

and installation methods for landscaping on the site. If the owner reasonably maintains the landscaping and reseeding, then it will provide good soil stability and sediment control. After these permanent measures are installed and final stabilization is achieved, then temporary measures can be removed. Final stabilization is considered achieved when all earth disturbing activities at the site have been completed and uniform vegetative cover has been established with a density of at least 70% of pre-disturbance levels and such cover is capable of adequately controlling soil erosion.

Soil erosion control measures for all slopes, channels, ditches, or any disturbed land area shall be completed within twenty-one (21) calendar days after final grading, or final earth disturbance, has been completed. Disturbed areas and stockpiles which are not at final grade but will remain dormant for longer than 30 days shall also be mulched within 21 days after interim grading. An area that is going to remain in an interim state for more than 60 days shall also be seeded. All temporary soil erosion control measures and BMP's shall be maintained until permanent soil erosion control measures are implemented.

All earth disturbances shall be designed, constructed, and completed in such a manner so that the exposed area of any disturbed land shall be limited to the shortest practical period of time.

C.6 Inspection and Maintenance Procedures

Part I.B.6. Contents and Requirements – Inspection and Maintenance

The site construction manager or site inspector responsible for these measures shall inspect them periodically and after every storm event. This report recommends that all erosion control measures on the site are inspected a minimum of once every 7 days OR every 14 days and within 24 hours of a significant rainfall event except during winter snow pack conditions where no melting is occurring or when all construction activities are completed.

Based on the results of an inspection, as necessary to properly document additional or modified BMPs designed to correct problems identified. Revisions to the SWPPP must be completed within seven (7) calendar days following the inspection.

Inspection Procedures

The inspection must include observation of the following:

- The construction site perimeter and discharge points (including discharges into a storm sewer system),
- All disturbed areas,
- Areas used for material storage that are exposed to precipitation,
- Other areas determined to have a significant potential for stormwater pollution, such as demolition areas or concrete washout areas,
- Erosion and sediment control measures identified in this SWMP or on the approved Grading and Erosion Control Plans,
- Any other structural BMP's that may require maintenance, such as secondary containment around fuel tanks or the condition of spill response kits.

Qualified Personnel

Inspections must be conducted by qualified personnel (provided by the operator or cooperatively by multiple operators). “Qualified personnel” means a person knowledgeable in the principles and practice of erosion and sediment controls who possesses the skills to assess conditions at the construction site that could impact stormwater quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of stormwater discharges from the construction activity.

BMP Maintenance

Any BMP’s found to no longer function as needed and designed or have the potential to fail without maintenance or modifications must be addressed as soon as possible to prevent discharge of pollutants. Inspection should also include preventative maintenance to proactively ensure continued operation.

BMP Replacement and Additions

See attached Detail sheets for specific maintenance and replacement requirements for individual BMP’s. Modifications to the erosion control plan and BMP’s may be necessary from time to time based on site inspections, if site conditions change, or if site conditions are found to be different than anticipated by the Grading and Erosion Control Plan. Any additions or deletions of erosion control measures should be documented on the site copy of the Grading & Erosion Control Plans.

Record Keeping

A sample BMP Checklist is included in the Appendix of this report. If the SWMP administrator wishes to use a different Inspection Log format, then the following information must be included:

1. The inspection date;
2. Names, titles, and qualifications of personnel making the inspection;
3. Weather information for the period since the last inspection (or since commencement of construction activity if the first inspection) including a best estimate of the beginning of each storm event, duration of each storm event, approximate amount of rainfall for each storm event (in inches), and whether any discharges occurred;
4. Weather information and a description of any discharges occurring at the time of the inspection;
5. Location(s) of discharges of sediment or other pollutants from the site;
6. Location(s) of BMPs that need to be maintained;
7. Location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location;
8. Location(s) where additional BMPs are needed that did not exist at the time of inspection; and
9. Corrective action required including implementation dates.

The inspection report must be signed.

Additionally, records of spills, leaks, or overflows that result in the discharge of pollutants must be documented and maintained. Information that should be recorded for all occurrences includes the time and date, weather conditions, reasons for the spill, etc.

Employee Training

It is recommended that the contractor/sub-contractor responsible for site construction be trained and certified as a Colorado Department of Transportation Erosion Control Supervisor or equivalent.

Persons responsible for ongoing maintenance and inspections of permanent stormwater quality improvements should be familiar with the Operations & Maintenance Manual provided.

APPENDIX

Hydrologic Soil Group—El Paso County Area, Colorado (ELDORADO SPRINGS)



Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
59	Nunn clay loam, 0 to 3 percent slopes	C	0.6	4.0%
82	Schamber-Razor complex, 8 to 50 percent slopes	A	14.7	96.0%
Totals for Area of Interest			15.3	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

National Flood Hazard Layer FIRMette



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **5/24/2019 at 2:39:54 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



38°47'17.89"N

104°47'53.13"W

0 250 500 1,000 1,500 2,000 Feet

1:6,000

38°46'49.84"N

104°47'15.68"W

**RECOMMENDED BMP MAINTENANCE INSPECTION
CHECKLIST**

Appendix C Inspection Checklist – Grading Erosion, and Stormwater Quality Controls

CITY OF COLORADO SPRINGS

DATE/TIME:
INSPECTOR:
TYPE OF INSPECTION: Self-Monitoring_____
Initial _____ Compliance_____ Follow-Up_____
Reconnaissance_____ Complaint_____ Final_____

SITE:	DATE OF PERMIT:
ADDRESS:	
CONTRACTOR:	OWNER/OWNER'S REPRESENTATIVE:
CONTACT:	CONTACT:
PHONE:	PHONE:
STAGE OF CONSTRUCTION: Initial BMP Installation/Prior to Construction_____ Clearing & Grubbing_____	
Rough Grading_____ Finish Grading_____ Utility Construction_____ Building Construction_____	
Final Stabilization_____	

OVERALL SITE INSPECTION	YES/NO/N.A.	REMARKS/ACTIONS
Is there any evidence of sediment leaving the construction site? If so, note areas.		
Have any adverse impacts such as flooding, structural damage, erosion, spillage, or accumulation of sediment, debris or litter occurred on or within public or private property, wetlands or surface waters –to include intermittent drainageways and the City's stormwater system (storm sewers, gutters, ditches, etc.)?		
Are the BMPs properly installed and maintained?		
Have the BMPs been placed as shown on approved plans?		
Are the BMPs functioning as intended?		
Is work being done according to approved plans and any phased construction schedule?		
Is the construction schedule on track?		
Are drainage channels and outlets adequately stabilized?		
Is there any evidence of discharges or spills of fuels, lubricants, chemicals, etc.?		

BMP MAINTENANCE CHECKLIST	YES/NO/N.A.	REMARKS/ACTIONS NECESSARY
CHECK DAM Has accumulated sediment and debris been removed per maintenance requirements?		
EROSION CONTROL BLANKET Is fabric damaged, loose or in need of repairs?		
INLET PROTECTION Is the inlet protection damaged, ineffective or in need of repairs? Has sediment been removed per maintenance requirements?		
MULCHING Distributed uniformly on all disturbed areas? Is the application rate adequate? Any evidence of mulch being blown or washed away? Has the mulched area been seeded, if necessary?		
SEDIMENT BASIN Is the sediment basin properly constructed and operational? Has sediment and debris been cleaned out of the basin?		
SILT FENCE Is the fence damaged, collapsed, unentrenched or ineffective? Has sediment been removed per maintenance requirements? Is the silt fence properly located?		
SLOPE DRAIN Is water bypassing or undercutting the inlet or pipe? Is erosion occurring at the outlet of the pipe?		
STRAW BALE BARRIER Are the straw bales damaged, ineffective or unentrenched? Has sediment been removed per maintenance requirements? Are the bales installed and positioned correctly?		

BMP MAINTENANCE CHECKLIST	YES/NO/N.A.	REMARKS/ACTIONS NECESSARY
<p>SURFACE ROUGHENING</p> <p>Is the roughening consistent/uniform on slopes??</p> <p>Any evidence of erosion?</p>		
<p>TEMPORARY SEEDING</p> <p>Are the seedbeds protected by mulch?</p> <p>Has any erosion occurred in the seeded area?</p> <p>Any evidence of vehicle tracking on seeded areas?</p>		
<p>TEMPORARY SWALES</p> <p>Has any sediment or debris been deposited within the swales?</p> <p>Have the slopes of the swale eroded or has damage occurred to the lining?</p> <p>Are the swales properly located?</p>		
<p>VEHICLE TRACKING</p> <p>Is gravel surface clogged with mud or sediment?</p> <p>Is the gravel surface sinking into the ground?</p> <p>Has sediment been tracked onto any roads and has it been cleaned up?</p> <p>Is inlet protection placed around curb inlets near construction entrance?</p>		
<p>OTHER</p>		

RECOMMENDED SPILL REPORT FORM

SPILL REPORT FORM

Project Name: _____

Date/Time of Spill: _____

Person Reporting Spill: _____

Material & Amount Spilled: _____

Location of Spill: _____

Amount of Spill Contamination into Waterway: _____

Describe Spill Source and Cause of Spill: _____

Describe Containment and Clean Up Actions Taken: _____

List Actions Taken to Prevent Future Spills: _____

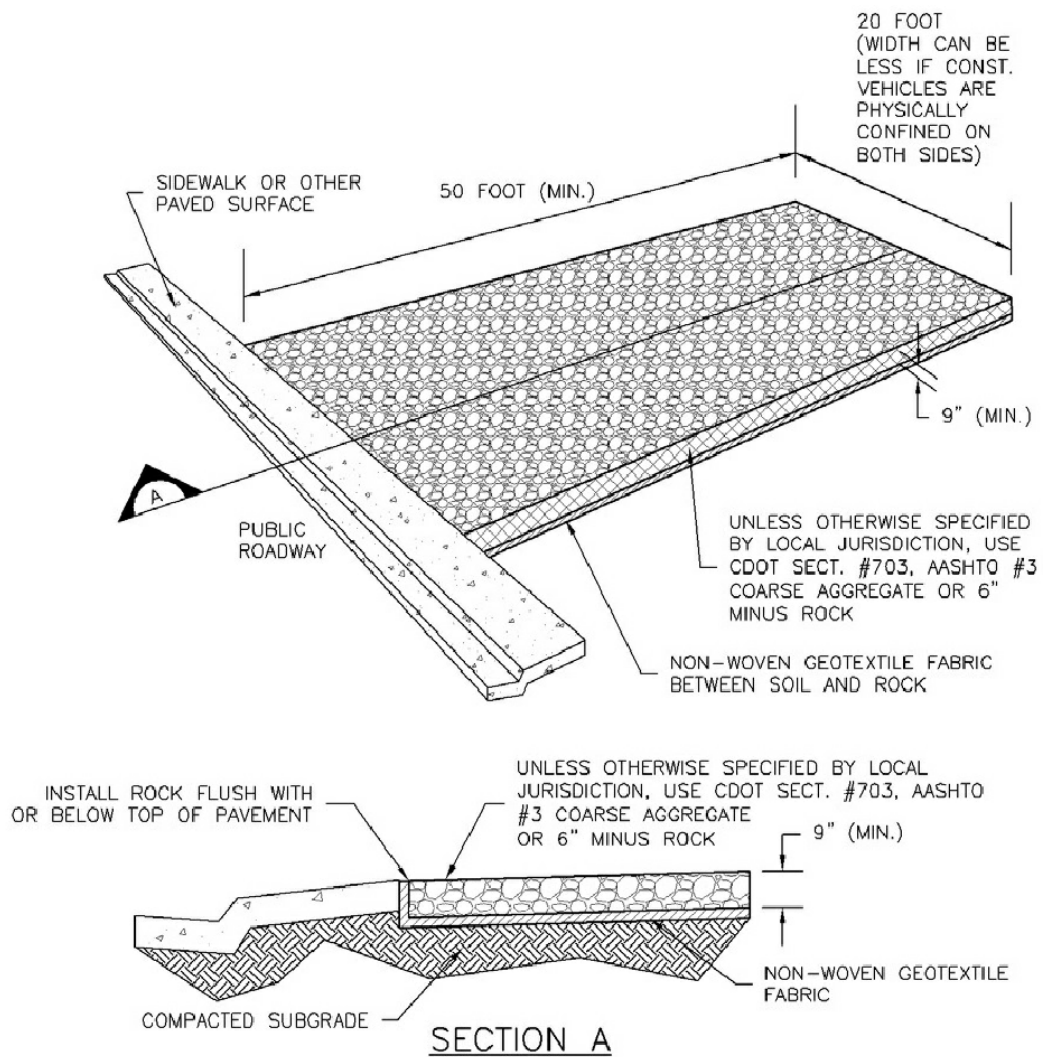
List Agencies Notified of Spill: _____

I understand under penalty of law that this document and any attachments were prepared under my direct supervision. Based on my inquiry of the person(s) with knowledge of the event or those responsible for gathering the information of the event, the information submitted is, to the best of knowledge and belief, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

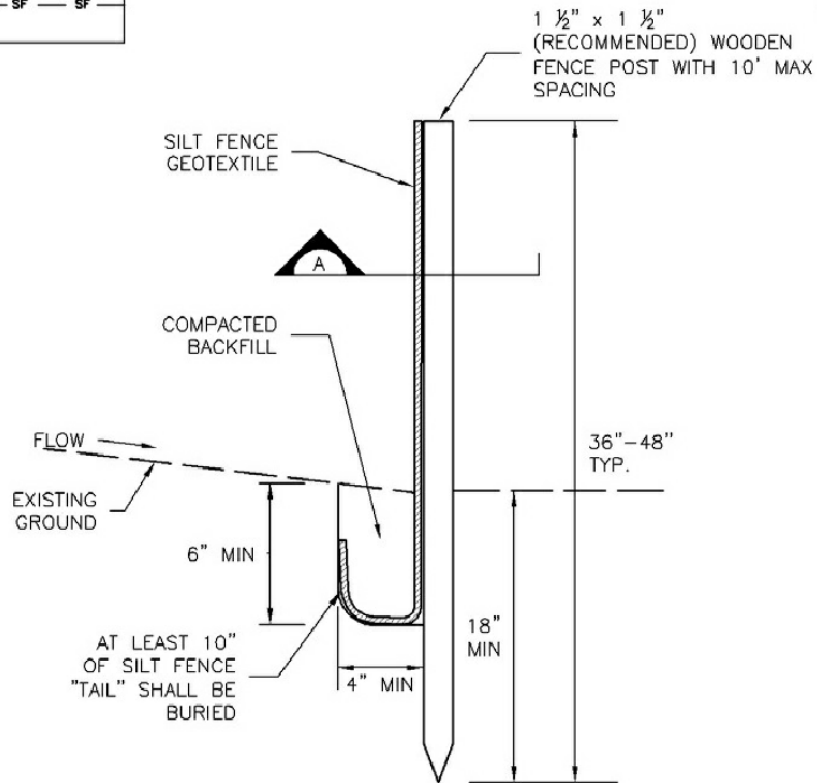
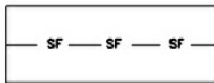
NR Administrator

Date

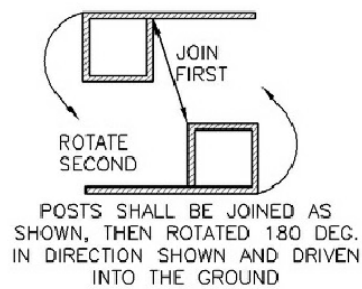
**INDIVIDUAL BMP CONSTRUCTION AND
MAINTENANCE DETAILS**



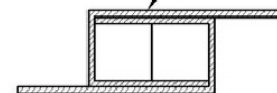
VEHICLE TRACKING CONTROL



SILT FENCE



POSTS SHALL OVERLAP
AT JOINTS SO THAT NO GAPS
EXIST IN SILT FENCE

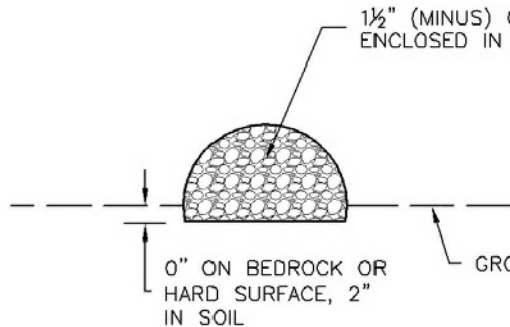


THICKNESS OF GEOTEXTILE HAS
BEEN EXAGGERATED, TYP

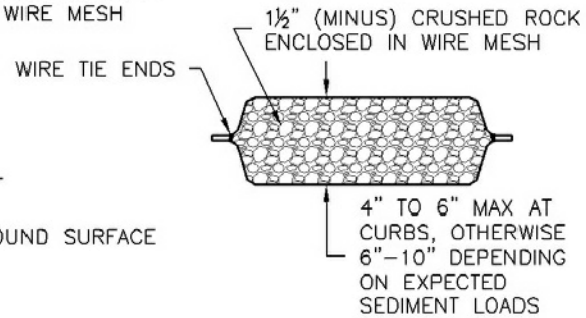
SECTION A



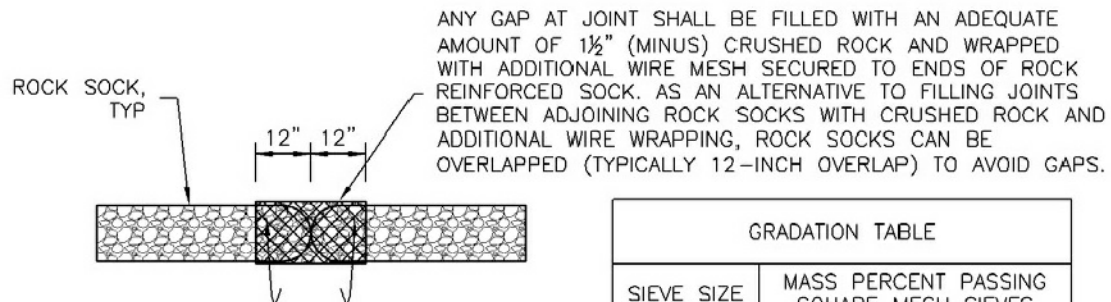
SILT FENCE



ROCK SOCK SECTION



ROCK SOCK PLAN



ROCK SOCK JOINTING

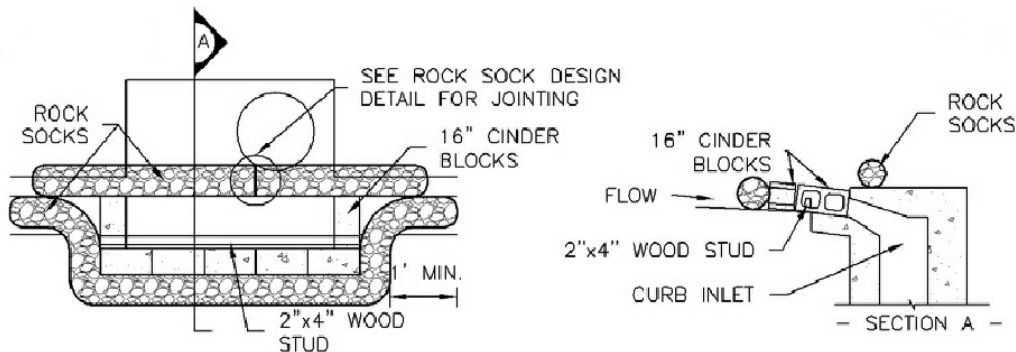
GRADATION TABLE	
SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
	NO. 4
2"	100
1 1/2"	90 - 100
1"	20 - 55
3/4"	0 - 15
3/8"	0 - 5
MATCHES SPECIFICATIONS FOR NO. 4 COARSE AGGREGATE FOR CONCRETE PER AASHTO M43. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES.	

ROCK SOCK INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
-LOCATION(S) OF ROCK SOCKS.
2. CRUSHED ROCK SHALL BE 1 1/2" (MINUS) IN SIZE WITH A FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON THIS SHEET (1 1/2" MINUS).
3. WIRE MESH SHALL BE FABRICATED OF 10 GAGE POULTRY MESH, OR EQUIVALENT, WITH A MAXIMUM OPENING OF 1/2", RECOMMENDED MINIMUM ROLL WIDTH OF 48"
4. WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT 6" CENTERS ALONG ALL JOINTS AND AT 2" CENTERS ON ENDS OF SOCKS.
5. SOME MUNICIPALITIES MAY ALLOW THE USE OF FILTER FABRIC AS AN ALTERNATIVE TO WIRE MESH FOR THE ROCK ENCLOSURE.



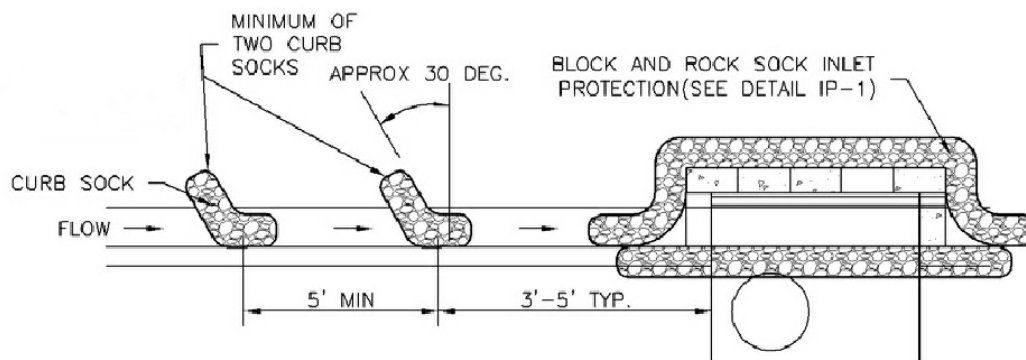
ROCK SOCK



IP-1. BLOCK AND ROCK SOCK SUMP OR ON GRADE INLET PROTECTION

BLOCK AND CURB SOCK INLET PROTECTION INSTALLATION NOTES

1. SEE ROCK SOCK DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.
2. CONCRETE "CINDER" BLOCKS SHALL BE LAID ON THEIR SIDES AROUND THE INLET IN A SINGLE ROW, ABUTTING ONE ANOTHER WITH THE OPEN END FACING AWAY FROM THE CURB.
3. GRAVEL BAGS SHALL BE PLACED AROUND CONCRETE BLOCKS, CLOSELY ABUTTING ONE ANOTHER AND JOINTED TOGETHER IN ACCORDANCE WITH ROCK SOCK DESIGN DETAIL.



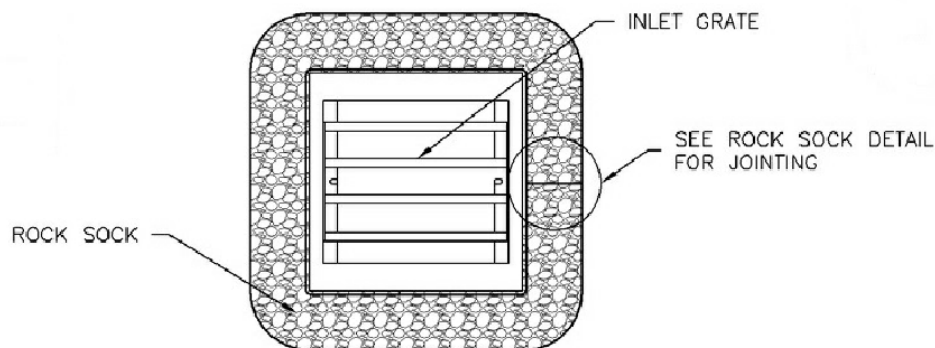
IP-2. CURB ROCK SOCKS UPSTREAM OF INLET PROTECTION

CURB ROCK SOCK INLET PROTECTION INSTALLATION NOTES

1. SEE ROCK SOCK DESIGN DETAIL INSTALLATION REQUIREMENTS.
2. PLACEMENT OF THE SOCK SHALL BE APPROXIMATELY 30 DEGREES FROM PERPENDICULAR IN THE OPPOSITE DIRECTION OF FLOW.
3. SOCKS ARE TO BE FLUSH WITH THE CURB AND SPACED A MINIMUM OF 5 FEET APART.
4. AT LEAST TWO CURB SOCKS IN SERIES ARE REQUIRED UPSTREAM OF ON-GRADE INLETS.



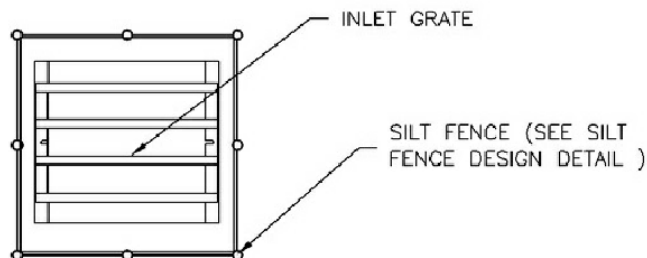
INLET PROTECTION



IP-3. ROCK SOCK SUMP/AREA INLET PROTECTION

ROCK SOCK SUMP/AREA INLET PROTECTION INSTALLATION NOTES

1. SEE ROCK SOCK DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.
2. STRAW WATTLES/SEDIMENT CONTROL LOGS MAY BE USED IN PLACE OF ROCK SOCKS FOR INLETS IN PERVIOUS AREAS. INSTALL PER SEDIMENT CONTROL LOG DETAIL.



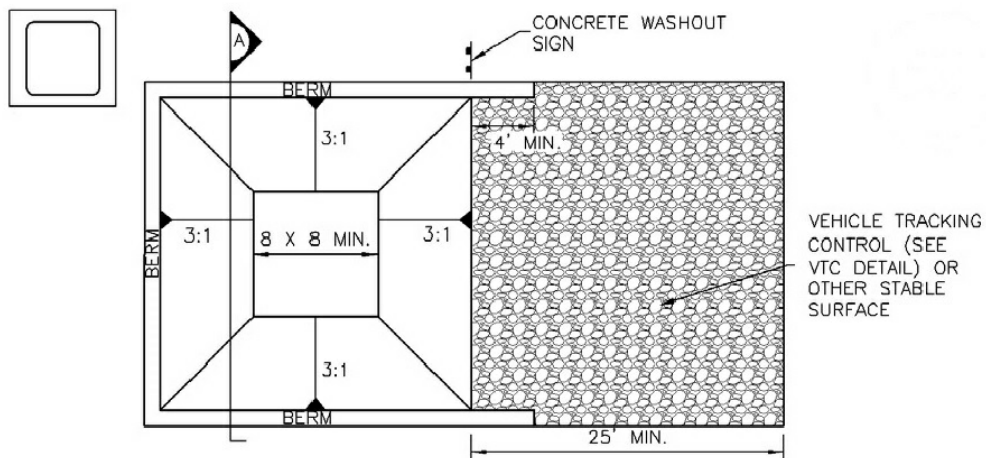
IP-4. SILT FENCE FOR SUMP INLET PROTECTION

SILT FENCE INLET PROTECTION INSTALLATION NOTES

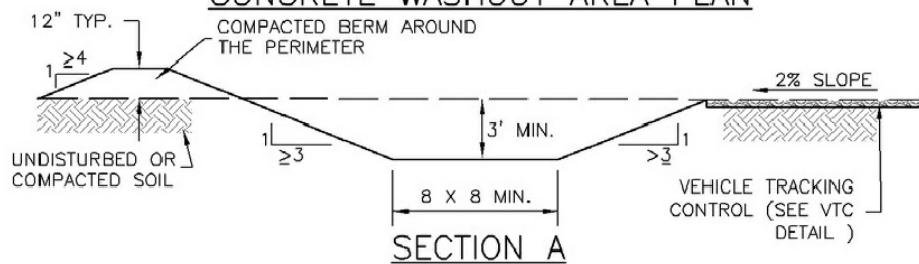
1. SEE SILT FENCE DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.
2. POSTS SHALL BE PLACED AT EACH CORNER OF THE INLET AND AROUND THE EDGES AT A MAXIMUM SPACING OF 3 FEET.
3. STRAW WATTLES/SEDIMENT CONTROL LOGS MAY BE USED IN PLACE OF SILT FENCE FOR INLETS IN PERVIOUS AREAS. INSTALL PER SEDIMENT CONTROL LOG DETAIL.



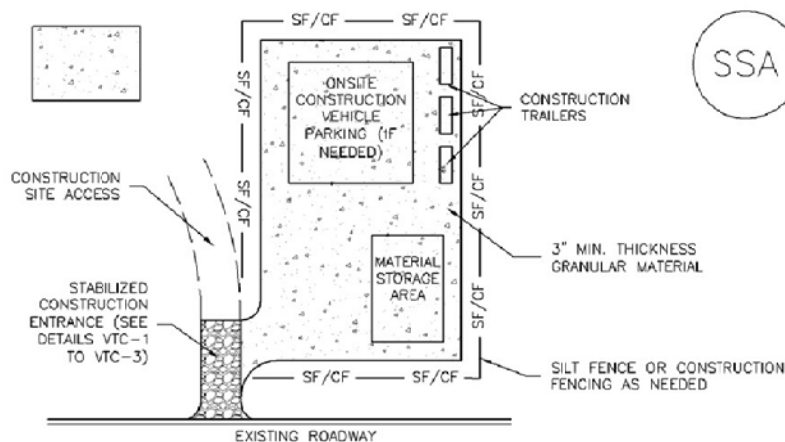
INLET PROTECTION



CONCRETE WASHOUT AREA PLAN



CONCRETE WASHOUT DETAIL



SSA-1. STABILIZED STAGING AREA

STABILIZED STAGING AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR
-LOCATION OF STAGING AREA(S).
-CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.
2. STABILIZED STAGING AREA SHOULD BE APPROPRIATE FOR THE NEEDS OF THE SITE. OVERSIZING RESULTS IN A LARGER AREA TO STABILIZE FOLLOWING CONSTRUCTION.
3. STAGING AREA SHALL BE STABILIZED PRIOR TO OTHER OPERATIONS ON THE SITE.
4. THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM 3" THICK GRANULAR MATERIAL.
5. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.
6. ADDITIONAL PERIMETER BMPs MAY BE REQUIRED INCLUDING BUT NOT LIMITED TO SILT FENCE AND CONSTRUCTION FENCING.

STABILIZED STAGING AREA MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY IF RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.

STABILIZED STAGING AREA MAINTENANCE NOTES

5. STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING/LOADING OPERATIONS.
6. THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY THE LOCAL JURISDICTION, USED ON SITE, AND THE AREA COVERED WITH TOPSOIL, SEEDS AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.

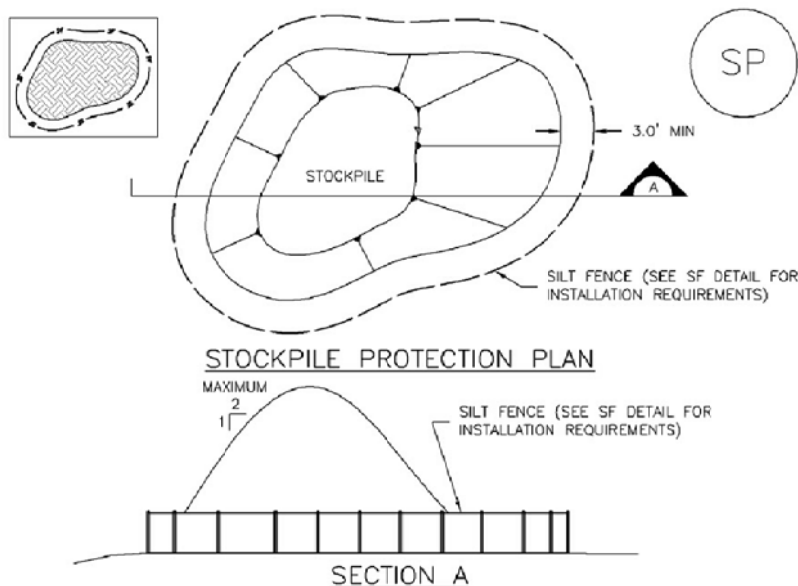
NOTE: MANY MUNICIPALITIES PROHIBIT THE USE OF RECYCLED CONCRETE AS GRANULAR MATERIAL FOR STABILIZED STAGING AREAS DUE TO DIFFICULTIES WITH RE-ESTABLISHMENT OF VEGETATION IN AREAS WHERE RECYCLED CONCRETE WAS PLACED.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO, NOT AVAILABLE IN AUTOCAD)



STABILIZED STAGING AREA



SP-1. STOCKPILE PROTECTION

STOCKPILE PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
-LOCATION OF STOCKPILES.
-TYPE OF STOCKPILE PROTECTION.
2. INSTALL PERIMETER CONTROLS IN ACCORDANCE WITH THEIR RESPECTIVE DESIGN DETAILS. SILT FENCE IS SHOWN IN THE STOCKPILE PROTECTION DETAILS; HOWEVER, OTHER TYPES OF PERIMETER CONTROLS INCLUDING SEDIMENT CONTROL LOGS OR ROCK SOCKS MAY BE SUITABLE IN SOME CIRCUMSTANCES. CONSIDERATIONS FOR DETERMINING THE APPROPRIATE TYPE OF PERIMETER CONTROL FOR A STOCKPILE INCLUDE WHETHER THE STOCKPILE IS LOCATED ON A PERVIOUS OR IMPERVIOUS SURFACE, THE RELATIVE HEIGHTS OF THE PERIMETER CONTROL AND STOCKPILE, THE ABILITY OF THE PERIMETER CONTROL TO CONTAIN THE STOCKPILE WITHOUT FAILING IN THE EVENT THAT MATERIAL FROM THE STOCKPILE SHIFTS OR SLUMPS AGAINST THE PERIMETER, AND OTHER FACTORS.
3. STABILIZE THE STOCKPILE SURFACE WITH SURFACE ROUGHENING, TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS, OR SOIL BINDERS. SOILS STOCKPILED FOR AN EXTENDED PERIOD (TYPICALLY FOR MORE THAN 60 DAYS) SHOULD BE SEEDDED AND MULCHED WITH A TEMPORARY GRASS COVER ONCE THE STOCKPILE IS PLACED (TYPICALLY WITHIN 14 DAYS). USE OF MULCH ONLY OR A SOIL BINDER IS ACCEPTABLE IF THE STOCKPILE WILL BE IN PLACE FOR A MORE LIMITED TIME PERIOD (TYPICALLY 30-60 DAYS).
4. FOR TEMPORARY STOCKPILES ON THE INTERIOR PORTION OF A CONSTRUCTION SITE, WHERE OTHER DOWNGRADE CONTROLS, INCLUDING PERIMETER CONTROL, ARE IN PLACE, STOCKPILE PERIMETER CONTROLS MAY NOT BE REQUIRED.

STOCKPILE PROTECTION MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

STOCKPILE PROTECTION MAINTENANCE NOTES

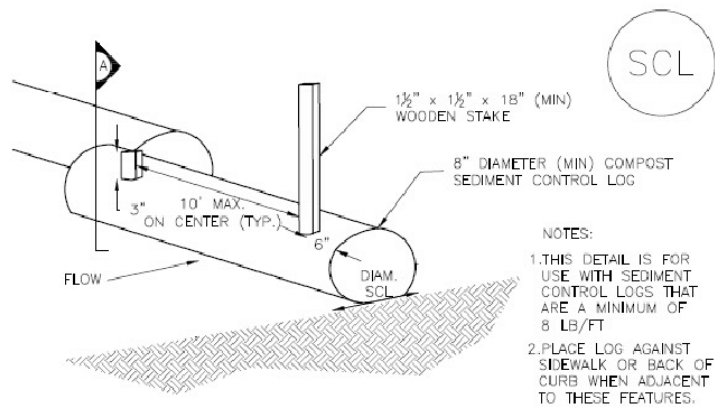
4. IF PERIMETER PROTECTION MUST BE MOVED TO ACCESS SOIL STOCKPILE, REPLACE PERIMETER CONTROLS BY THE END OF THE WORKDAY.
5. STOCKPILE PERIMETER CONTROLS CAN BE REMOVED ONCE ALL THE MATERIAL FROM THE STOCKPILE HAS BEEN USED.

(DETAILS ADAPTED FROM PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

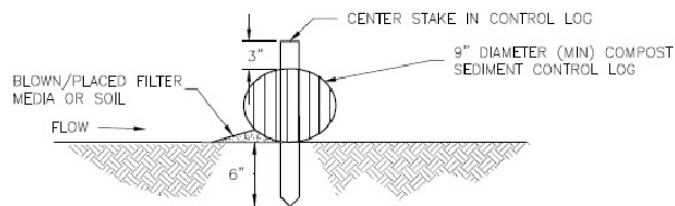
NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.



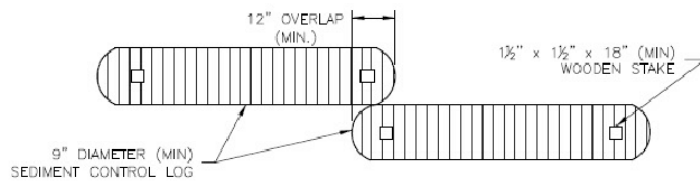
STOCKPILE PROTECTION



COMPOST SEDIMENT CONTROL LOG (WEIGHTED)



SECTION A COMPOST SEDIMENT CONTROL LOG

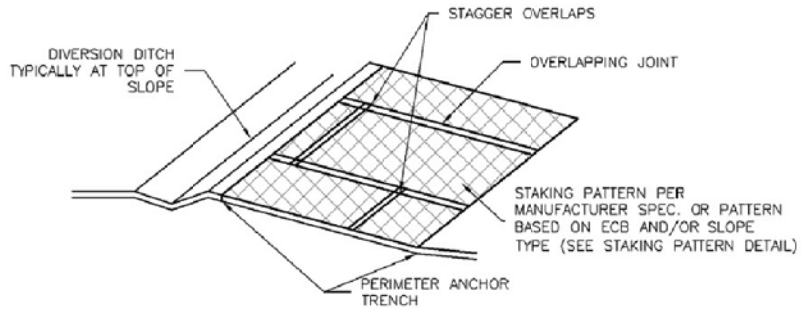


LOG JOINTS

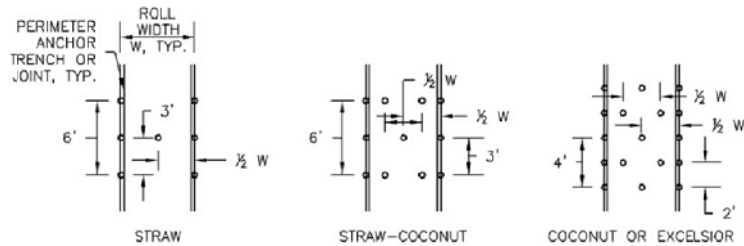
SCL-2. COMPOST SEDIMENT CONTROL LOG (WEIGHTED)



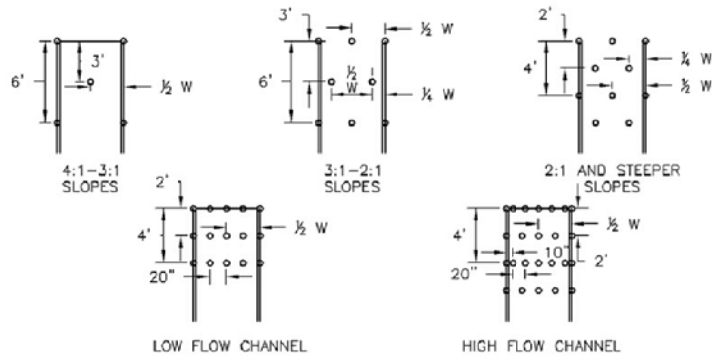
SEDIMENT CONTROL LOG



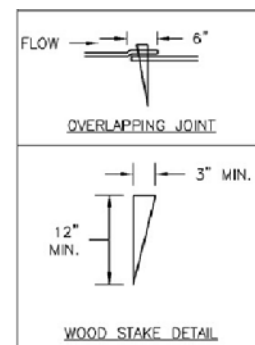
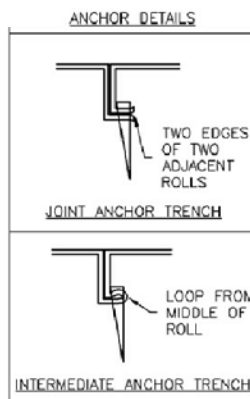
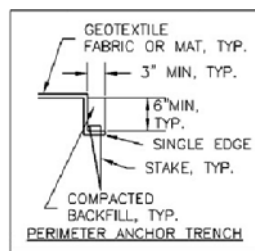
ECB-3. OUTSIDE OF DRAINAGEWAY



STAKING PATTERNS BY ECB TYPE



STAKING PATTERNS BY SLOPE OR CHANNEL TYPE



EROSION CONTROL BLANKET