



## **STORMWATER MANAGEMENT PLAN**

**for**

### **BLACK FOREST OFFICE**

**The North Half of the NE Quarter of the SE Quarter of Section 7  
Township 12 South, Range 65 West of the 6<sup>th</sup> P.M.  
County of El Paso, State of Colorado  
12740 Black Forest Road  
Colorado Springs, Colorado 80908**

2N Civil Job No. 19015

September 11, 2020

Revised: December 3, 2020

#### **QUALIFIED STORMWATER MANAGER:**

Chris Richardson  
CMG Corporation  
6615 Vincent Dr.  
Colorado Springs, Colorado 80918

#### **PREPARED FOR:**

Black Forest, LLC  
8655 Table Butte Road  
Colorado Springs, Colorado 80908-1224

#### **CONTRACTOR:**

Chris Richardson  
CMG Corporation  
6615 Vincent Dr.  
Colorado Springs, Colorado 80918

Engineer:

2N Civil, LLC

6 Inverness Court East, Suite 125

Englewood, Colorado 80112

Contact: Ryan Eichele, PE, Project Manager

Todd West, PE Project Engineer

## TABLE OF CONTENTS

INTRODUCTION .....	3
SITE DESCRIPTION .....	3
<i>Location</i> .....	3
<i>Existing Site Conditions</i> .....	3
<i>Proposed Improvements</i> .....	3
<i>Description of Construction Activity</i> .....	4
<i>Description of Existing Ground Cover</i> .....	4
<i>Sequence for Major Activities</i> .....	4
<i>Existing Soils</i> .....	4
<i>Non-Storm Water Components of Discharge</i> .....	4
<i>Receiving Waters</i> .....	4
<i>Qualified Stormwater Manager</i> .....	4
<i>Potential Pollution Sources</i> .....	6
MATERIALS HANDLING AND SPILL PREVENTION .....	6
BMPs FOR STORM WATER POLLUTION PREVENTION .....	8
Initial Stage .....	8
Interim Stage.....	8
Final Stage.....	9
<i>Anticipated Timing/Phasing Schedule</i> .....	9
<i>BMP Schedule</i> .....	10
FINAL STABILIZATION AND LONG TERM STORMWATER MANAGEMENT .....	10
OTHER CONTROLS.....	11
INSPECTION AND MAINTENANCE .....	11
REFERENCES.....	14

### **APPENDIX A**

Vicinity Map  
Inspection Form Template

### **APPENDIX B**

GEC PLANS



## INTRODUCTION

This report is a Stormwater Management Plan (SWMP) for the project named **Black Forest Office** and has been prepared to meet the regulatory requirements of the Colorado Department of Health, Water Quality Control Division in compliance with the provisions of the Water Quality Control Act, and the Federal Water Pollution Control Act.

## SITE DESCRIPTION

### *Location*

The Black Hills Office property, addressed as 12740 Black Hills Road, is the north half of the Northeast Quarter of the Southeast Quarter of Section 7, Township 12 South, Range 65 West of the 6<sup>th</sup> Principle Meridian, County of El Paso, State of Colorado. Black Forest Road bounds the site on the east. Rural Residential development (Zoning RR-5) surrounds the site on the north, south, and west. An existing asphalt and gravel road provides access to the vacant parcel.

### *Existing Site Conditions*

The subject property contains approximately 4.83 acres. Sparse ground cover consists of native weeds with a few trees at the northeast corner of the site. A shallow ridgeline divides the site, directing the east portion of the site to the north, and the west portion of the site to the west.

There are no major drainage ways or irrigation facilities on the site.

### *Proposed Improvements*

The development will consist of a single story 4,400 sf office building with a full, walk-out basement of equal size with a 3,250-sf studio/shop building on the 4.77 acres. The office building will house the Owner's corporate functions for Metal Roof Innovations, Ltd. company (strategic planning, accounting, sales/marketing management). The estimated area of disturbance for the site is 1.90 acres or 83,023 sf.

An existing barn (currently under construction) was permitted under the A-5 zoning. Construction began in the spring of 2020. The barn will be re-purposed in use as a studio/shop to supplement the corporate functions. No manufacturing, warehousing, shipping, wholesale or retail sales will take place at this facility.

### *Drainage Basins*

#### *Existing Conditions*

The site historically drains north and west. The development of the site will occur on the upper portion of the lot, with the majority of the new impervious areas directed to a proposed detention facility that will intercept flow prior to discharge to the west.

#### *Proposed Conditions*

The development will implement Full Spectrum Detention (FSD) utilizing an Extended Detention Basin (EDB) to capture and treat runoff from the developed areas prior to discharge downstream. This design considers the water quality capture volume (WQCV), excess urban runoff volume (EURV), and 100-year

detention volume. Flow will be conveyed by curb and gutter to a storm inlet and reinforced concrete pipe to the pond, and grasses swales.

#### *Description of Construction Activity*

The project consists of the site being over-lot graded, utility installation, construction of a buildings and parking garage, and landscaping.

#### *Description of Existing Ground Cover*

The project site consists of the following ground cover and percentages. 40% - Disturbed Central shortgrass prairie, 30% - Reforestation Area, 25% - Disturbed Soil (Sandy), and 5% - Existing Asphalt. This information was gathered from a site visit by the Landscape Architect.

#### *Sequence for Major Activities*

The project will follow standard construction sequences, i.e., clearing and grubbing, rough grading, utility installation, final grading, asphalt paving, building construction, final pavement lift, and landscaping.

#### *Existing Soils*

The National Resources Conservation Service Web Soil Survey classifies the in situ soils as Hydrologic Group B, which exhibit a moderate infiltration rate when thoroughly wet.

#### *Non-Storm Water Components of Discharge*

It is not anticipated that there will not be any non-storm water discharge from this development.

#### *Receiving Waters*

The site is tributary to the upper reach of Kettle Creek drainage basin (FOMO3000), that flows from north to south approximately 1,500 feet west of the site. This basin was studied in 2015 and is included in the El Paso County drainage basin fee program. Based on the FEMA Map No. 08041C0315G with an effective date of 12/07/18 (included in the Appendix) the site is located within Zone X, areas of minimal flood hazard. No portion of the site is located within the 100 year floodplain. The upper reach of the Kettle Creek basin is sparsely developed and includes single family homes on large acreages.

#### *Qualified Stormwater Manager*

The Qualified Stormwater Manager is responsible for developing, implementing, maintaining, and revising the SWMP. The activities and responsibilities of the Manager shall address all aspects of the facility's SWMP and include, but are not limited to inspections, conducting any training required in implementing this SWMP, and providing any spill notifications to the appropriate authorities. The SWMP should be viewed as a "living document" that shall continuously be reviewed and modified as a part of the overall process of evaluation and managing stormwater quality issues at the site. The Qualified Stormwater Manager shall amend the SWMP when there is a change in design, construction, operation, or maintenance of the site which would require the implementation of new or revised BMP's or if the SWMP proves to be ineffective in achieving the general objectives of controlling pollutants in stormwater discharges associated with construction activity or when BMP's are no longer necessary and are removed.

The Qualified Stormwater Manager for the **Black Forest Office** project is:

Responsible Person (Title):      Qualified Stormwater Manager  
Currently Held By (Person):      Chris Richardson  
Telephone:                              719-573-0159\_  
Email Address:                        chris@cmgcorporation.com  
Organization:                        CMG Corporation  
Mailing Address:                    6615 Vincent Drive, Colorado Springs, CO 80918

If additional personnel will be performing specific tasks other than the Qualified Stormwater Manager (i.e. DMR Cognizant Official, Inspection Contact, etc.), they shall be noted here along with their specific responsibility (use additional pages as necessary):

Responsible Person (Title):      \_\_\_\_\_ Responsibility: \_\_\_\_\_  
Currently Held By (Person):      \_\_\_\_\_  
Telephone:                              \_\_\_\_\_  
Email Address:                        \_\_\_\_\_  
Organization:                        \_\_\_\_\_  
Mailing Address:                    \_\_\_\_\_

Responsible Person (Title):      \_\_\_\_\_ Responsibility: \_\_\_\_\_  
Currently Held By (Person):      \_\_\_\_\_  
Telephone:                              \_\_\_\_\_  
Email Address:                        \_\_\_\_\_  
Organization:                        \_\_\_\_\_  
Mailing Address:                    \_\_\_\_\_

This SWMP was prepared by 2N Civil, LLC as an authorized agent on behalf of the Permittee. 2N Civil, LLC is not responsible for administering this Stormwater Management Plan.

Name:                                    2N Civil, LLC  
Contact                                Todd West, PE  
Address:                               6 Inverness Court East, Suite 125  
   Englewood, Colorado 80112  
Telephone No:                    303-925-0544

### *Potential Pollution Sources*

An occasional spill while refueling equipment could occur at any location within the site. In addition to routine equipment maintenance, asphalt paving and concrete casting may cause pollutants to enter storm water runoff. These types of pollution shall be cleaned up immediately and disposed of as required using spill containment kits to meet local, state and federal guidelines. The contractor may be required to develop a Spill Plan if certain types and quantities of materials are used at a site.

Effective spill control includes both spill prevention and spill response measures and depends on proper employee training for spill response measures and may also include structural spill containment. Contractors shall use secondary containment measures around supplies stored outside to help reduce the likelihood of a spill or leak reaching the storm sewer system. Structural spill containment measures typically include temporary or permanent curbs or berms that surround a potential spill site. Berms may be constructed of concrete, earthen material, metal, synthetic liners, or other material that will safely contain the spill.

Equipment and/or vehicle washing is not permitted on the site. Concrete equipment may use the concrete washout area prior to departure from the site. Waste material generated during construction that could produce contaminated runoff if precipitation occurs should be covered or removed from the site. Trash and/or garbage shall be contained daily.

During the seeding phase, fertilizer storage may be present onsite. Fertilizer shall be covered or otherwise protected so that it cannot contaminate the site in a precipitation event. A more detailed explanation of Materials Handling and Spill Prevention follows this section.

## **MATERIALS HANDLING AND SPILL PREVENTION**

The following chart identifies the potential pollutant sources for this site and provides instruction to the contractor on how each source will be handled during construction.

<b>Material/ Potential Pollutant Source</b>	<b>Comments</b>
Solvents	Solvents need to be stored in leak-proof, tamper-proof containers and removed from the site when not in use.
Stains, Paints	Paints and stains may be stored inside the structure or within the Stabilized Staging Area. The contractor shall remove waste paints and stains from the site.
Fuels / Refueling of Equipment	On site fuel storage will not be required for this project. Occasional refueling of equipment will occur via a mobile fuel truck, and should take place away from storm or sanitary inlets and take place during dry weather, if possible.
Trash Containers	Trash containers shall be enclosed (lids) and emptied as needed. Dumpsters shall be placed inside the Limits of Construction.

Paving	Excess chemicals from paving shall be removed. Paving operations should not be performed immediately before an anticipated major storm event.
Concrete Curing Compound	Contractor shall remove remaining compound from site.
Concrete and Mortar Wash Waters	Concrete and mortar washout will use the designated concrete washout area.
Concrete Truck	All concrete washouts shall occur at the designated Concrete Washout Area (CWA) as shown on the SWMP Plan.
Sanitary Waste Management	Portable toilets may be contained within the Limits of Construction. Licensed sanitary services will ensure facilities are in working order at all times. Portable toilets will be secured at all four corners to prevent overturning. Portable toilets are not to be placed in any drainageway and at least 10' from the curb line and 50' from any storm inlet.
Sediment	Erosion from areas where soil is disturbed due to construction has a high potential of sediment and suspended solids transport. Sediment and erosion control measures including VTC, perimeter controls, Sediment Control Logs, and inlet protection, are included in this SWMP Plan and Report.
Soil and Material Stockpiles	Silt fencing shall be placed around the entire perimeter of the stockpile area to prevent sediment transport. The area shall be seeded and mulched once the stockpile area is no longer required.
Loading and Unloading Operations	Loading and unloading operations, as well as deliveries, shall be managed in such a way as to reduce tracking and moving materials that can contribute to pollutant transport.

Cleaning and fueling of machinery should take place in areas away from streams, storm or sanitary inlets and take place during dry weather, if possible. In fueling areas, spills shall be cleaned up with absorbents. In the event of a chemical spill, measures should be taken to ensure that water quality is not threatened. Medium to large sized spills shall immediately be contained with absorbents and inflatable berms. Spills or accidents shall be immediately reported to the Qualified Stormwater Manager and depending on the nature of the spill involved, the Fire Department, the Colorado Department of Health, El Paso County, downstream users, or other agencies may need to be notified. The Qualified Stormwater Manager shall log such events in the job's Log Book.

The contractor will be responsible for the fueling of his equipment and vehicle maintenance to ensure that the introduction of pollutants to the environment is extremely limited. The contractor is responsible for providing a Materials Handling guide to ensure compliance with CDPHE WQCD standards.

The storage of any chemicals, fuels, or other hazardous materials on site will not be permitted. If such storage is required, the Qualified Stormwater Manager shall be notified and this report revised to ensure compliance with the standards.

All chemical substances located on site shall be clearly identified and MSD sheets readily available.

This project does not anticipate using batch plants.

## **BMPs FOR STORM WATER POLLUTION PREVENTION**

All erosion control practices shall conform to the applicable El Paso County standards, the Colorado Department of Public Health and Environment Water Quality Control Division, and Urban Drainage and Flood Control District (UDFCD) standards. The contractor shall strictly adhere to the BMP details published by El Paso County and/or UDFCD. Any BMP measures not specifically detailed by the City or UDFCD shall be submitted for review and approval of the City.

The BMPs outlined below apply to one or more of the following construction phases: initial stage, the interim stage, and the final stage. The initial BMPs shall be installed at the outset of construction, prior to any land disturbance activities. Initial controls are placed on existing grades, but shall be based in part on proposed grading operations. The interim BMPs shall be installed during overlot grading, and road paving / concrete flatwork. Final stage BMPs shall be installed as one of the last steps in the construction process. At the completion of construction, the temporary BMPs will be removed. Figure 1 illustrates the project BMP schedule.

### **Initial Stage**

At the initial stage, silt fence (SF), also known as sediment control fence, and vehicle tracking control (VTC) shall be installed. Silt fencing is a temporary sediment barrier consisting of a filter fabric stretched across and attached to supporting posts. The bottom of the fence is entrenched into the soil per the detail included in the SWMP. Silt fence is required along the toe of the proposed fill slopes where sheet flow of storm water may occur. Silt fence shall be placed parallel to the contour at the base of a disturbed area to filter runoff. The fence shall be broken up into overlapping sections so that it can be placed along the contour and prevent a blow out of the fence due to the water not being able to escape during large rainfall events. Each end of the section should be turned upslope. Prior to construction activities, vehicle tracking control shall be located at each entrance/exit to the site's internal drive that will be used by construction traffic to reduce the potential of mud and dirt being carried offsite. Vehicle tracking control is a constructed stone stabilized pad of at least fifty (50) feet in length and is composed of coarse-aggregate rock to remove debris from the tires of the construction vehicles. If debris does get carried onto a public road, it shall be removed by the end of the day and transported to a controlled sediment disposal area. Water shall not be used as a means of cleaning the road. Instead, a street sweeping mechanism shall be used to collect the material and disposed of in accordance with applicable WQCD standards.

Sediment control logs (SCL) shall be placed in the existing/proposed swales, perpendicular to the flowline, to reduce the velocity of concentrated flow and trap sediment prior to discharge downstream. The SCL is a linear roll made of natural materials such as straw, coconut fiber, or other fibrous materials trenched into the ground and held with a wooden stake.

### **Interim Stage**

Several BMPs are installed during the interim stage. Additional silt fence shall be installed following the clearing and grubbing work as needed to control erosion and filter runoff.

Sediment control logs shall be promptly placed after construction of the shallow swale along the base of the slope of the track and field. The SCL shall be installed immediately following the shaping of the ditches and shall be maintained in good working order until the final vegetation or landscaping is established. Inlet protection (IP) shall be used on all operable inlets during construction to protect sediment-laden runoff from entering the storm drainage system. Rock berms will be used to protect the inlets. Rip rap outlet protection will be provided for all culverts and areas of concentrated flow to prevent erosion and scour.

Seeding and mulching (SM) will be applied to stabilize the exposed soils on all disturbed areas not covered by pavement or buildings. Refer to the landscape plans prepared by PWN Architects regarding specific seed mixes and/or materials to be installed on pervious surfaces.

A stabilized staging area (SSA) will be used for the construction trailer, parking, storage, and loading and unloading. The staging area will be placed near the site entrance on the existing asphalt play court. This location will serve to reduce the likelihood that vehicles frequently entering the site will come into contact any mud and disturbed earth that will take place over the remainder of the project area.

A Concrete Washout Area (CWA) shall be utilized to receive wash water from washing of tools and concrete mix chutes, masonry operations, liquid concrete waste from dump trucks, mobile batch mixers, or pump trucks. The concrete wash area is a shallow excavation with a small perimeter berm to isolate concrete truck washout operations. The washout area shall be combined with a vehicle tracking control pad to control tracking of mud. Surface discharge of concrete washout water from the construction site is strictly prohibited.

#### Final Stage

During the final stage, seeding and mulching will be utilized in areas of disturbed soil not covered by pavement or play pits, and where intermediate stage seeding has not already sufficiently covered. The combined use of these BMPs will serve to protect against wind erosion and as the native grass cover becomes established, provide long term stabilization of exposed soils. The seeding will also act to help reduce problems with invasive weeds. Permanent landscaping will be the final step in soil stabilization.

#### *Anticipated Timing/Phasing Schedule*

Project start date is planned for Spring 2021

Initial phase – Spring 2021 (2 day duration)

Interim phase – June 2021 (9 month duration)

Final phase, project completion – Winter 2021 / Spring 2022

### BMP Schedule

BMP	PROJECT STAGE		
	INITIAL At outset of construction, prior to any land disturbance activities	INTERIM During clearing and grubbing, earthwork operations	FINAL During last steps of construction process for long-term stabilization
Silt Fence		MAINTAINED	TO BE REMOVED
Vehicle Tracking Control		MAINTAINED	TO BE REMOVED
Sediment Control Logs		MAINTAINED	TO BE REMOVED
Inlet Protection			TO BE REMOVED
Seeding and Mulching			TO REMAIN
Stabilized Staging Area			TO BE REMOVED
Concrete Washout Area			TO BE REMOVED
Permanent Landscaping			

Figure 1 – Project BMP Schedule

## FINAL STABILIZATION AND LONG TERM STORMWATER MANAGEMENT

**Finally Stabilized** means that all ground surface disturbing activities at the site have been completed, and all disturbed areas have been either built on, paved, or a uniform vegetative cover has been established with an individual plant density of at least 70 percent of pre-disturbance levels, or equivalent permanent, physical erosion reduction methods have been employed. Re-seeding alone **does not** qualify.

An Extended Detention Basin will be installed to mitigate sediment and pollutant transfer to the receiving waters under developed conditions. The contractor will be responsible for any re-excavation of sediment and debris that collects in the basin depression required to ensure that the basin meets the design grades following construction. The storm lines shall also be cleaned and free of sediment once the site becomes stabilized.

Prior to the inactivation of the permit, the bottom of the basin must be stabilized and sediment shall be removed from the site's drainage system. Any sediment that collects in existing swales during construction operations shall be removed as part of the completion of the project to ensure that they function as designed.



Temporary erosion control measures consisting of silt fencing and inlet protection shall be removed from the site only after vegetative cover has been established as outlined above. Any remaining soil stockpiles will be seeded to prevent water and wind erosion. All streets, inlets, and drainage features shall be cleaned of sediment and debris following substantial completion. The site shall be cleaned up and any areas disturbed as a result of the BMP removal shall be seeded and mulched.

Permanent erosion control measures such as erosion control blanket shall be inspected and repaired if necessary. Erosion control logs placed in ditches may remain if it is the opinion of the designated Qualified Stormwater Manager that the logs are of continued effectiveness in slowing sediment transport in the roadside ditches.

This project does not rely on control measures that are owned or operated by another entity.

## OTHER CONTROLS

The potential for other pollution sources is small compared to sediment transport. The stabilized staging area (SSA) will need to be defined and then graded so that runoff will be contained and filtered. Any waste material found on-site generated by construction will be disposed of in a manner as to not cause pollutants in storm water discharges. In the event that waste is to be stored on-site, it shall be in an area located a minimum of 100 feet from all drainage courses whenever possible. Whenever waste is not stored in a non-porous container, it shall be in an area enclosed by a 12-inch high compacted earthen ridge. If the enclosed waste area is located on porous soil, the area shall be covered with a non-porous lining to prevent soil contamination. Whenever precipitation is predicted, the waste shall be covered with a non-porous cover and anchored on all sides to prevent its removal by wind in order to prevent precipitation from leaching out potential pollutants from the waste.

## INSPECTION AND MAINTENANCE

Inspections will be conducted at least every 14 days, and after any precipitation or snowmelt event, hydrant testing, or any other event that could cause surface erosion. Inspections will also be conducted on a weekly basis or as weather dictates for disturbed areas that exceed a 4:1 slope. All equipment, sediment and erosion control methods and site areas shall be identified and examined during inspections. In addition, a SWMP Log Book or accurate records are required during the construction processes. The Log Book shall include records of spills, leaks, along with the time/date, weather conditions, etc. The Log should also contain, but not be limited to, contacts with regulatory agencies and personnel, notes of employee activities, maintenance and repair of stormwater management controls, preventative maintenance activities, and inspection activities.

A sample Log Book template has been included in the Appendix for use by the Qualified Stormwater Manager. Additional information such as dated photographs, field notes, and drawings/maps shall be included where appropriate.

Inspections that indicate deficiencies of erosion control BMPs that are designated on the SWMP plan shall be corrected as soon as possible by the site superintendent and/or construction manager. Corrective measures that are undertaken shall be re-inspected to ensure the deficiency has been properly corrected.

Inspection and maintenance procedures for the BMPs presented in this report are included below:

**Silt Fence (SF) Maintenance Requirements:**

- ☐ The Qualified Stormwater Manager shall inspect silt fence daily and during and after any storm event and make repairs or clean out as necessary.
- ☐ Sediment accumulated upstream of silt fence shall be removed when the upstream sediment reaches a depth of 6-inches.

**Vehicle Tracking Control (VTC) Maintenance Requirements:**

The GES Manager shall inspect the VTC daily and during and after any storm event.

**Concrete Washout Area (CWA) Maintenance Requirements:**

- ☐ Vehicle Tracking Control is required at the access point to the concrete washout area.
- ☐ Inspect weekly and during and after any storm event. The concrete washout area shall be repaired and enlarged or cleaned out as necessary to maintain capacity for wasted concrete.
- ☐ At the end of construction, all concrete shall be removed from the site and disposed of at an approved waste site.

**Inlet Protection (IP) Maintenance Requirements:**

- ☐ The Qualified Stormwater Manager shall inspect inlet protection weekly and during and after any storm event and make repairs or clean out as necessary. More frequent inspections and repairs shall be required during winter conditions due to freeze/thaw problems.
- ☐ Inlet protection is to remain in place until the upstream disturbed area is stabilized.
- ☐ Sediment accumulated upstream of IP shall be removed when the sediment depth upstream of filter is within 5 inches of the crest.

**Sediment Control Log (SCL) Maintenance Requirements:**

- ☐ The sediment control log shall be trenched into the ground a minimum of 2 inches.
- ☐ The Qualified Stormwater Manager shall inspect sediment control logs daily and during and after any storm event and make repairs or clean out as necessary.

**Seeding (SE) and Mulching (MU) Maintenance Requirements:**

- ☐ Seeded and mulched areas shall be inspected for required coverage monthly for a period of two years following initial seeding. Repairs and re-seeding and mulching shall be undertaken after the first growing season for any areas failing to meet the required vegetation coverage.

**Stabilized Staging Area (SSA) Maintenance Requirements:**

Stabilized staging area shall be inspected weekly and during and after any storm event and repaired (by adding more granular material if the SSA extends beyond the existing paved sport court) or enlarged as necessary.

---

**Street Maintenance (SM).** Street Maintenance consists of cleaning mud and other debris which is tracked onto the roadway at a construction site. Removing all tracked mud from the streets reduces or eliminates sediment transport to downstream structures.

**Street Maintenance (SM) Maintenance Requirements:**

- ☐ Streets shall be free of mud and debris throughout the life of the project.
- ☐ Any mud tracked onto the street shall be cleaned using a vacuum type street sweeper, a brush-type street sweeper with dust control, or manually using shovels and brooms.
- ☐ Streets shall not be washed with water at any time.
- ☐ The GESM Manager shall inspect streets on a daily basis. The GESM Manager shall complete inspections hourly after a storm event and cleanup sediment as necessary.

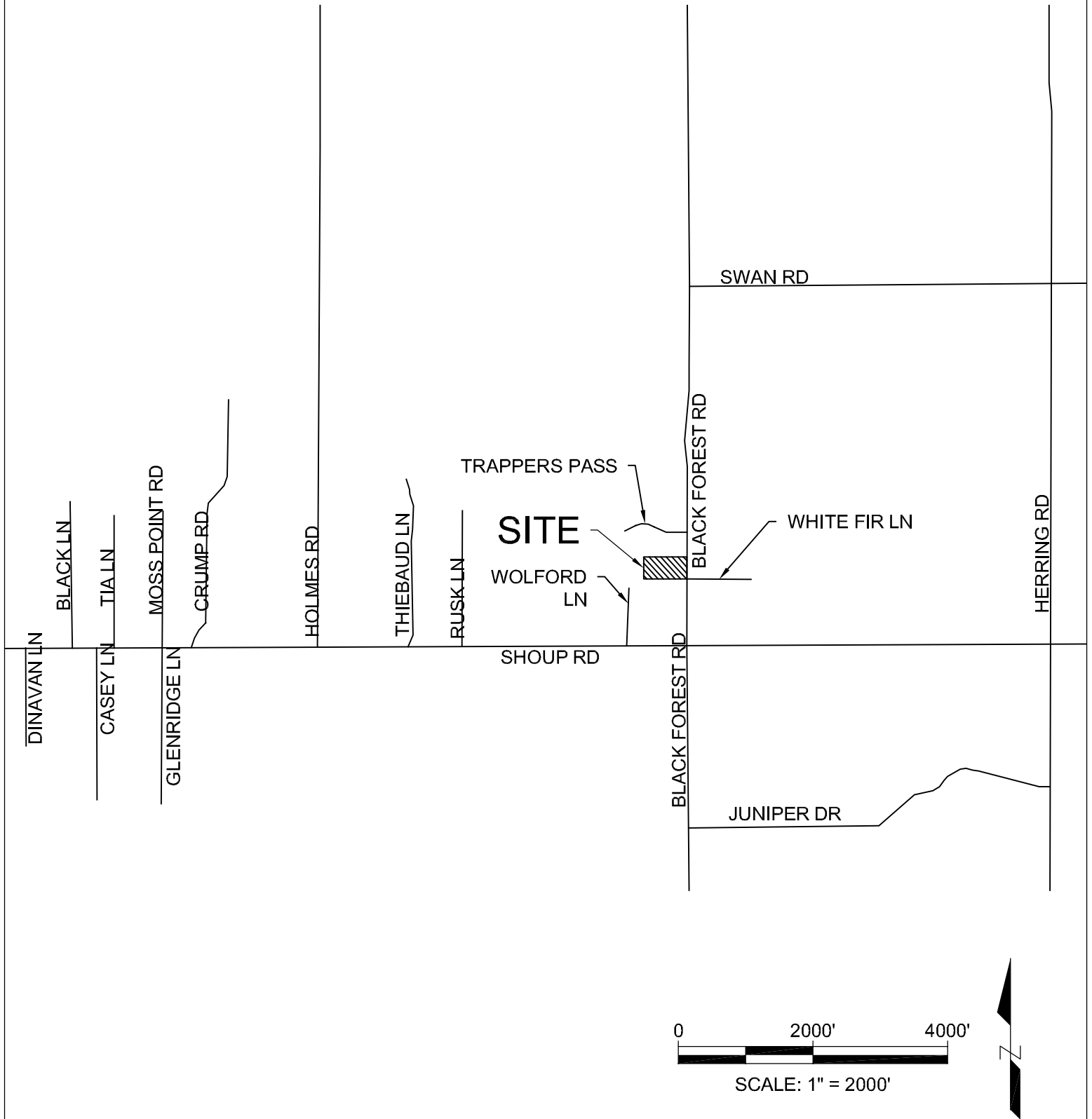
---

## REFERENCES

1. Colorado Discharge Permit System, Stormwater Discharges Associated with Construction Activity; Stormwater Management Plan (SWMP) – General Requirements, July 2012.
2. City of Colorado Springs Drainage Criteria Manual, Volume 2, November 1, 2002.
3. *Urban Drainage Criteria Manuals Volumes I-II*, 2001, *Volume III* 2010, Urban Drainage and Flood Control District.

## **APPENDIX A**

# VICINITY MAP



Project Number: 19015

J:\Projects\19\19015.dwg Site Plan\Vicinity Map.dwg

**2N Civil, LLC**

6 Inverness Ct. E., Suite 125  
Englewood, CO 80112

Phone 303-925-0544 Fax 303-925-0547  
www.2NCivil.com

**VICINITY MAP  
BLACK FOREST LLC**

Drawn By: TEW  
Checked By: EPT  
Revisions: 7-2-20

Page 1

**2N CIVIL**

## EROSION & SEDIMENT CONTROL MEASURES ACTIVE SITE INSPECTION REPORT

Project Name:		
Project Address/Location:		
Date:	Time:	Temp:
Weather (rain, snow, cloudy, windy, etc.):		
Contact:		
Inspection by:		
Signed:		

Construction Activities	Construction Sequence		
	Today	Planned for This Week	Planned for Next Week
Grading			
Excavation			
Utility Construction			
Foundations			
Structural Work			
Asphalt Paving			
Landscaping			

Erosion & Sediment Control Measures						
BMP	To Be Constructed	Good Condition (Functioning)	Requires Maintenance	Needs Replacement (Not Functional)	Per SWPPP	Comments
Seed / Sod						
Mulch						
Surface Roughening						
Erosion Blanket						
Diversion Swale / Berm						
Slope Drain						
Check Dams						
Outlet Protection						
Sediment Basin						
Silt Fence						
Straw Bales						
Vehicle Tracking Pad						
Inlet Protection						
Street Sweeping						

Required Compliance Action:

## **APPENDIX B**



GRADING, EROSION, AND SEDIMENT CONTROL PLANS FOR  
BLACK FOREST OFFICE

N1/2 NE1/4 SE1/4 SE1/4 OF SECTION 07, TOWNSHIP 12 SOUTH, RANGE 65 WEST OF  
THE 6TH P.M., EL PASO COUNTY, COLORADO

PROJECT TEAM

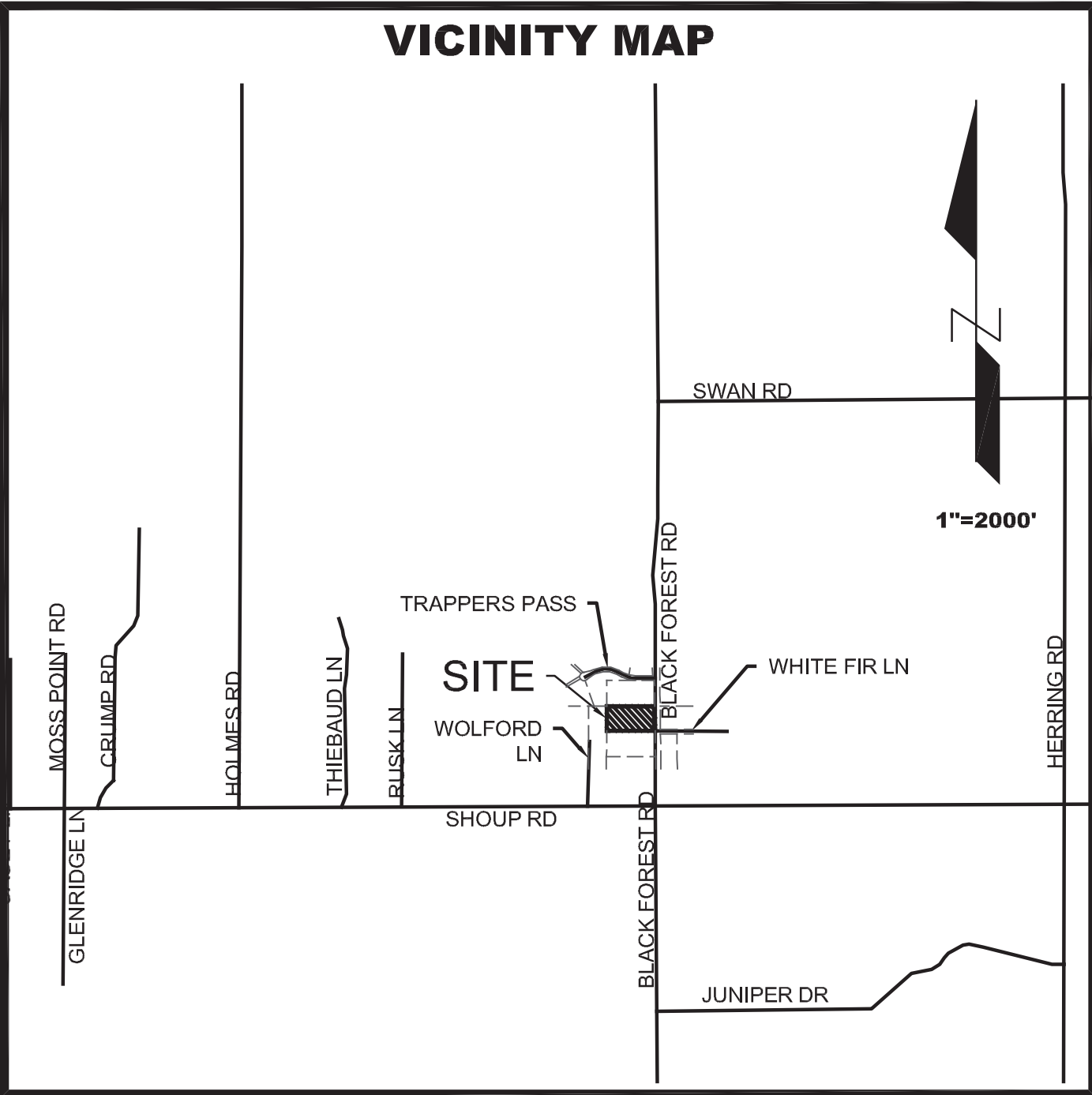
**OWNER**  
BLACK FOREST, LLC  
8655 TABLE BUTTE ROAD  
COLORADO SPRINGS, CO 80908

**LANDSCAPE ARCHITECT**  
PWN ARCHITECTS & PLANNERS  
4949 S SYRACUSE ST #320  
DENVER, CO 80237  
303.649.9880

**STORMWATER MANAGER**  
CHRIS RICHARDSON  
CMG CORPORATION  
6615 VINCENT DR.  
COLORADO SPRINGS, CO 80918

**CIVIL ENGINEER**  
2N CIVIL, LLC  
6 INVERNESS COURT EAST, SUITE 125  
ENGLEWOOD, CO 80112  
MR. TODD WEST  
303.925.0544

VICINITY MAP



SHEET INDEX

4	COVER SHEET
5	ESCD - INITIAL PHASE
6	ESCD - INTERIM PHASE
7	ESCD - FINAL PHASE
8-10	EROSION CONTROL DETAILS

BMP	PROJECT STAGE		
	INITIAL	INTERIM	FINAL
	At outset of construction, prior to any land disturbance activities	During clearing and grubbing, earthwork operations	During last steps of construction process for long-term stabilization
Silt Fence		MAINTAINED	TO BE REMOVED
Vehicle Tracking Control		MAINTAINED	TO BE REMOVED
Concrete Washout Area		MAINTAINED	TO BE REMOVED
Stabilized Staging Area		MAINTAINED	TO BE REMOVED
Sediment Control Log			TO BE REMOVED
Inlet Protect			TO BE REMOVED
Culvert Inlet Protection		MAINTAINED	TO BE REMOVED
Sediment Basin		MAINTAINED	TO BE REMOVED
Diversion Ditch		MAINTAINED	TO BE REMOVED
Erosion Control Blanket			TO REMAIN
Seeding and Mulching			TO REMAIN
Permanent Landscaping			

EROSION CONTROL PHASING NOTES:

- INITIAL STAGE BMPs SHALL BE INSTALLED AT THE OUTSET OF CONSTRUCTION, PRIOR TO ANY OTHER LAND-DISTURBING ACTIVITIES. INITIAL CONTROLS ARE TO BE PLACED ON EXISTING GRADES.
- CONTRACTOR TO ESTABLISH PERIMETER CONTROLS (IP, SF), VTC AND SSA PRIOR TO COMMENCING CONSTRUCTION.
- INTERIM STAGE BMPs SHALL BE BASED ON PROPOSED GRADES AND DRAINAGE FEATURES AND ARE INSTALLED AFTER INITIAL SITE CONSTRUCTION. FOR SOME BMPs SUCH AS INLET PROTECTION, INTERIM CONTROLS ARE INSTALLED AFTER THE CONSTRUCTION OF SITE INFRASTRUCTURE.
- FINAL STAGE BMPs SHALL BE INSTALLED AS ONE OF THE LAST STEPS IN THE CONSTRUCTION ACTIVITY, SUCH AS FINAL SEEDING AND MULCHING.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PHASE THE FINAL BMPs AS THE CONSTRUCTION PROGRESSES.

SOIL TYPE NOTE:

- THE HYDROLOGIC SOILS GROUP (HSG) FOR THE AREA SHOWN WITHIN THE LIMIT OF CONSTRUCTION IS TYPE B. TYPE B SOILS EXHIBIT A MODERATE INFILTRATION RATE WHEN THOROUGHLY WET.

EXISTING VEGETATION:

- THE SITE CONSISTS OF THE FOLLOWING GROUND COVER AND PERCENTAGES. 40% - DISTURBED CENTRAL SHORTGRASS PRAIRIE, 30% - REFORESTATION AREA, 25% - DISTURBED SOIL, AND 5% - EXISTING ASPHALT.

ANTICIPATED TIMING/PHASING SCHEDULE:

Project start date is planned for: Spring 2021  
Initial phase – Spring 2021 (2 day duration)  
Interim phase – June 2021 (9 month duration)  
Final phase – Spring 2022

EARTHWORK NOTE:

- EARTHWORK QUANTITIES SHOWN ARE RAW NUMBERS AND HAVE NOT BEEN ADJUSTED TO ACCOUNT FOR SHRINK, SWELL, COMPACTION, UTILITY SPOILS, TOPSOIL, PLAY PIT EXCAVATION, ETC. THE VALUES REFLECT FINISH GRADE AND DO NOT ACCOUNT FOR ASPHALT/CONCRETE PAVING, PLAYPIT MATERIAL, CRUSHER FINES, SAND, SOD, ETC. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL EARTHWORK VALUES.

CUT REQUIRED: 7,485 CY  
FILL REQUIRED: 2,885 CY  
NET CUT REQUIRED: 4,600 CY

FLOODPLAIN STATEMENT:

BASED ON THE FEMA MAP NO. 08041C0315G WITH AN EFFECTIVE DATE OF 12/07/18 (INCLUDED IN THE APPENDIX) THE SITE IS LOCATED WITHIN ZONE X, AREAS OF MINIMAL FLOOD HAZARD. NO PORTION OF THE SITE IS LOCATED WITHIN THE 100 YEAR FLOODPLAIN.

- TRACKING OF SOILS AND CONSTRUCTION DEBRIS OFF-SITE SHALL BE MINIMIZED. MATERIALS TRACKED OFF-SITE SHALL BE CLEANED UP AND PROPERLY DISPOSED OF IMMEDIATELY.
- THE OWNER/DEVELOPER SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL CONSTRUCTION DEBRIS, DIRT, TRASH, ROCK, SEDIMENT, SOIL, AND SAND THAT MAY ACCUMULATE IN ROADS, STORM DRAINS AND OTHER DRAINAGE CONVEYANCE SYSTEMS AND STORMWATER APPURTENANCES AS A RESULT OF SITE DEVELOPMENT.
- 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.
- NO CHEMICAL(S) HAVING THE POTENTIAL TO BE RELEASED IN STORMWATER ARE TO BE STORED OR USED ONSITE UNLESS PERMISSION FOR THE USE OF SUCH CHEMICAL(S) IS GRANTED IN WRITING BY THE ECM ADMINISTRATOR. IN GRANTING APPROVAL FOR THE USE OF SUCH CHEMICAL(S), SPECIAL CONDITIONS AND MONITORING MAY BE REQUIRED.
- BULK STORAGE OF ALLOWED PETROLEUM PRODUCTS OR OTHER ALLOWED LIQUID CHEMICALS IN EXCESS OF 55 GALLONS SHALL REQUIRE ADEQUATE SECONDARY CONTAINMENT PROTECTION TO CONTAIN ALL SPILLS ONSITE AND TO PREVENT ANY SPILLED MATERIALS FROM ENTERING STATE WATERS, ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR OTHER FACILITIES.
- NO PERSON SHALL CAUSE THE IMPEDIMENT OF STORMWATER FLOW IN THE CURB AND GUTTER OR DITCH EXCEPT WITH APPROVED SEDIMENT CONTROL MEASURES.
- OWNER/DEVELOPER AND THEIR AGENTS SHALL COMPLY WITH THE "COLORADO WATER QUALITY CONTROL ACT" (TITLE 25, ARTICLE 8, CRS), AND THE "CLEAN WATER ACT" (33 USC 1344), IN ADDITION TO THE REQUIREMENTS OF THE LAND DEVELOPMENT CODE, DCM VOLUME II AND THE ECM APPENDIX I. ALL APPROPRIATE PERMITS MUST BE OBTAINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION (1041, NPDES, FLOODPLAIN, 404, FUGITIVE DUST, ETC.). IN THE EVENT OF CONFLICTS BETWEEN THESE REQUIREMENTS AND OTHER LAWS, RULES, OR REGULATIONS OF OTHER FEDERAL, STATE, LOCAL, OR COUNTY AGENCIES, THE MOST RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.
- ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE ONLY AT APPROVED CONSTRUCTION ACCESS POINTS.
- PRIOR TO CONSTRUCTION THE PERMITTEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES.
- A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND SHALL BE UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
- THE SOILS REPORT FOR THIS SITE HAS BEEN PREPARED BY ENTECH ENGINEERING, INC. AND SHALL BE CONSIDERED A PART OF THESE PLANS.
- AT LEAST TEN (10) DAYS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION, FOR PROJECTS THAT WILL DISTURB ONE (1) ACRE OR MORE, THE OWNER OR OPERATOR OF CONSTRUCTION ACTIVITY SHALL SUBMIT A PERMIT APPLICATION FOR STORMWATER DISCHARGE TO THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, WATER QUALITY DIVISION. THE APPLICATION CONTAINS CERTIFICATION OF COMPLETION OF A STORMWATER MANAGEMENT PLAN (SWMP), OF WHICH THIS GRADING AND EROSION CONTROL PLAN MAY BE A PART. FOR INFORMATION OR APPLICATION MATERIALS CONTACT:

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT  
WATER QUALITY CONTROL DIVISION  
WQCD – PERMITS  
4300 CHERRY CREEK DRIVE SOUTH  
DENVER, CO 80246-1530  
ATTN: PERMITS UNIT

CAUTION: NOTICE TO CONTRACTOR

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE LOCAL UTILITY LOCATION CENTER AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATIONS OF THE UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.



Know what's below.  
Call before you dig.

2N CIVIL

303.925.0544  
www.2ncivil.com



PREPARED FOR:  
BLACK FOREST, LLC  
12740 BLACK FOREST ROAD  
COLORADO SPRINGS, CO 80908

ESCD Cover Sheet  
CONSTRUCTION DOCUMENTS  
BLACK FOREST OFFICE  
COLORADO SPRINGS, COLORADO

DATE:  
BY:

REVISIONS:

PROJECT NUMBER: 19015  
ISSUED DATE: 12-03-2020  
DESIGNED BY: TEW  
REVIEWED BY: ROE

ESCD Cover  
Sheet

4

Design Engineer's Statement:

This grading and erosion control plan was prepared under my direction and supervision and is correct to the best of my knowledge and belief. Said plan has been prepared according to the criteria established by the County for grading and erosion control plans. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this plan.

*Todd West*  
Todd West, P.E. #37643

12-3-20  
Date

Owner/Developer's Statement:

I, the owner/developer have read and will comply with the requirements of the grading and erosion control plan.

Black Forest, LLC  
8655 Table Butte Road  
Colorado Springs, CO 80905

Date

El Paso County:

County plan review is provided only for general conformance with County Design Criteria. The County is not responsible for the accuracy and adequacy of the design, dimensions, and/or elevations which shall be confirmed at the job site. The County through the approval of this document assumes no responsibility for completeness and/or accuracy of this document.

Filed in accordance with the requirements of the El Paso County Land Development Code, Drainage Criteria Manual, Volumes 1 and 2, and Engineering Criteria Manual as amended.

In accordance with ECM Section 1.12, these construction documents will be valid for construction for a period of 2 years from the date signed by the El Paso County Engineer. If construction has not started within those 2 years, the plans will need to be resubmitted for approval, including payment of review fees at the Planning and Community Development Directors discretion.

Jennifer Irvine, P.E.  
County Engineer / ECM Administrator

Date



MATERIAL LEGEND

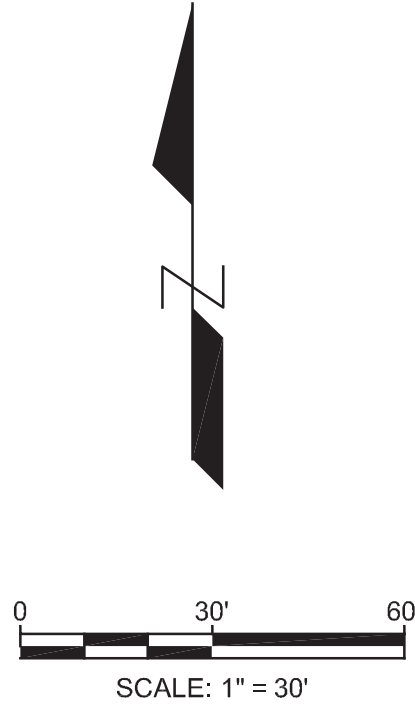
	EXISTING ASPHALT
	PROPOSED CONCRETE
	PROPOSED ASPHALT
	PROPOSED GRAVEL
	PROPOSED BUILDING
	PROPOSED LANDSCAPE ELEMENTS

LEGEND

	PROPERTY BOUNDARY
	EXISTING EASEMENT
	EXISTING SIGN
	EXISTING CURB & GUTTER
	EXISTING HYDRANT
	BUILDING SETBACK
	PROPOSED EASEMENT
	PROPOSED CURB AND GUTTER (CATCH)
	PROPOSED CURB AND GUTTER (SPILL)
	PROPOSED FENCE
	PROPOSED SIGN
	PROPOSED FIRE HYDRANT
	SURVEY CONTROL POINT
	FOUND PROPERTY CORNER

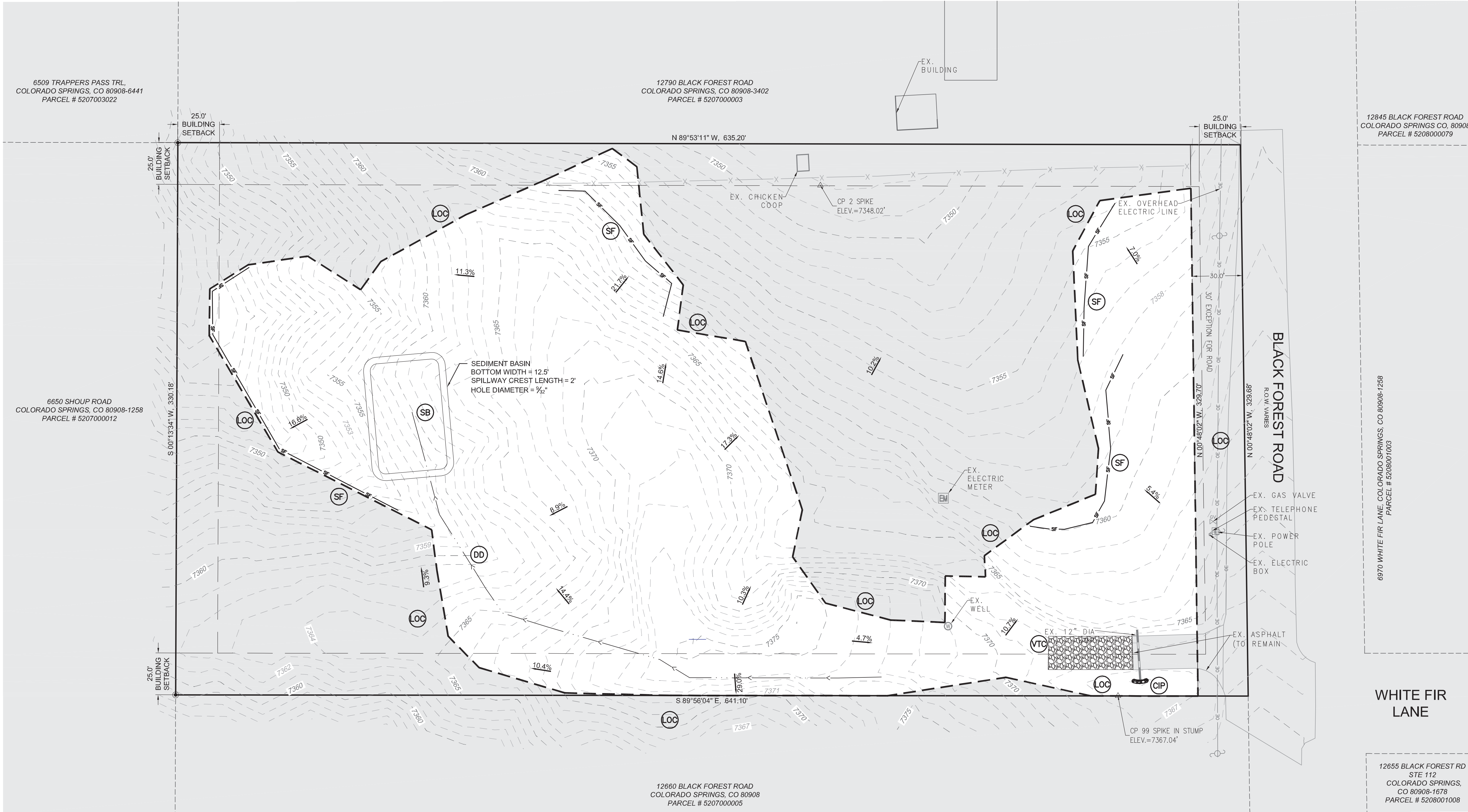
BMP LEGEND

	LIMITS OF CONSTRUCTION
	CULVERT INLET PROTECTION
	CONCRETE WASHOUT AREA
	DIVERSION DITCH
	EROSION CONTROL BLANKET
	INLET PROTECTION
	SEDIMENT CONTROL LOG
	SEEDING & MULCHING
	SILT FENCE
	STABILIZED STAGING AREA
	VEHICLE TRACKING CONTROL



EROSION CONTROL NOTES:

1. THE BMPs SHOWN ON THIS INITIAL STAGE ECSD DRAWING SHALL BE INSTALLED AT THE OUTSET OF CONSTRUCTION, PRIOR TO ANY OTHER LAND-DISTURBING ACTIVITIES. INITIAL CONTROLS ARE TO BE PLACED ON EXISTING GRADES, BUT SHALL BE BASED IN PART ON PROPOSED GRADING OPERATIONS.
2. REFER TO EROSION AND SEDIMENT CONTROL REPORT FOR THIS PROJECT FOR ADDITIONAL DETAILS AND STORMWATER MANAGEMENT REQUIREMENTS.
3. CONTRACTOR TO ESTABLISH PERIMETER CONTROLS, VTC AND SB PRIOR TO COMMENCING CLEARING AND GRUBBING.
4. SEDIMENT BASINS SHALL BE INSTALLED PRIOR TO ANY OTHER LAND DISTURBANCE ACTIVITY THAT RELIES ON BASIN AS A STORMWATER CONTROL.
5. SEE CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES SUCH AS EXTENDED DETENTION BASIN, CULVERTS, AND STORM DRAIN INLETS.
6. IF ANY BMP REQUIRES MODIFICATION, THE PLAN SHALL BE RED-LINED AND APPROVAL SHALL BE OBTAINED FROM THE COUNTY INSPECTOR PRIOR TO PROCEEDING, UNLESS IT IS AN EMERGENCY SITUATION THAT REQUIRES IMMEDIATE ATTENTION.
7. REMOVAL OF BMPs SHALL NOT OCCUR WITHOUT THE APPROVAL OF THE COUNTY INSPECTOR.



CAUTION: NOTICE TO CONTRACTOR

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE LOCAL UTILITY LOCATION CENTER AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATIONS OF THE UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.



BENCHMARK

SURVEY CONTROL POINTS AS SHOWN HEREON. ALL ELEVATIONS ARE BASED UPON NAVD88 VERTICAL DATUM.





MATERIAL LEGEND

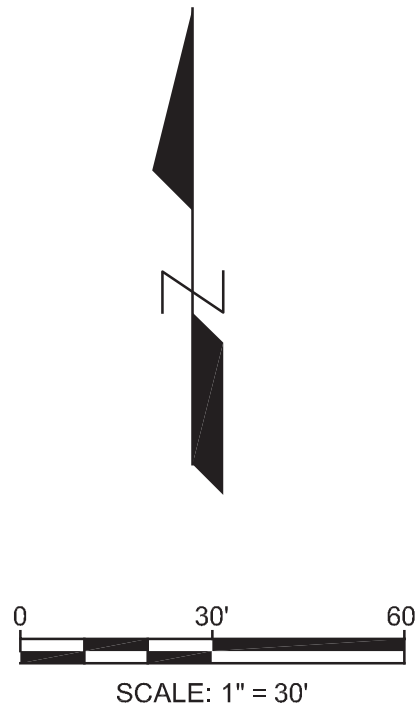
	EXISTING ASPHALT
	PROPOSED CONCRETE
	PROPOSED ASPHALT
	PROPOSED GRAVEL
	PROPOSED BUILDING
	PROPOSED LANDSCAPE ELEMENTS

LEGEND

	PROPERTY BOUNDARY
	EXISTING EASEMENT
	EXISTING SIGN
	EXISTING CURB & GUTTER
	EXISTING HYDRANT
	BUILDING SETBACK
	PROPOSED EASEMENT
	PROPOSED CURB AND GUTTER (CATCH)
	PROPOSED CURB AND GUTTER (SPILL)
	PROPOSED FENCE
	PROPOSED SIGN
	PROPOSED FIRE HYDRANT
	SURVEY CONTROL POINT
	FOUND PROPERTY CORNER

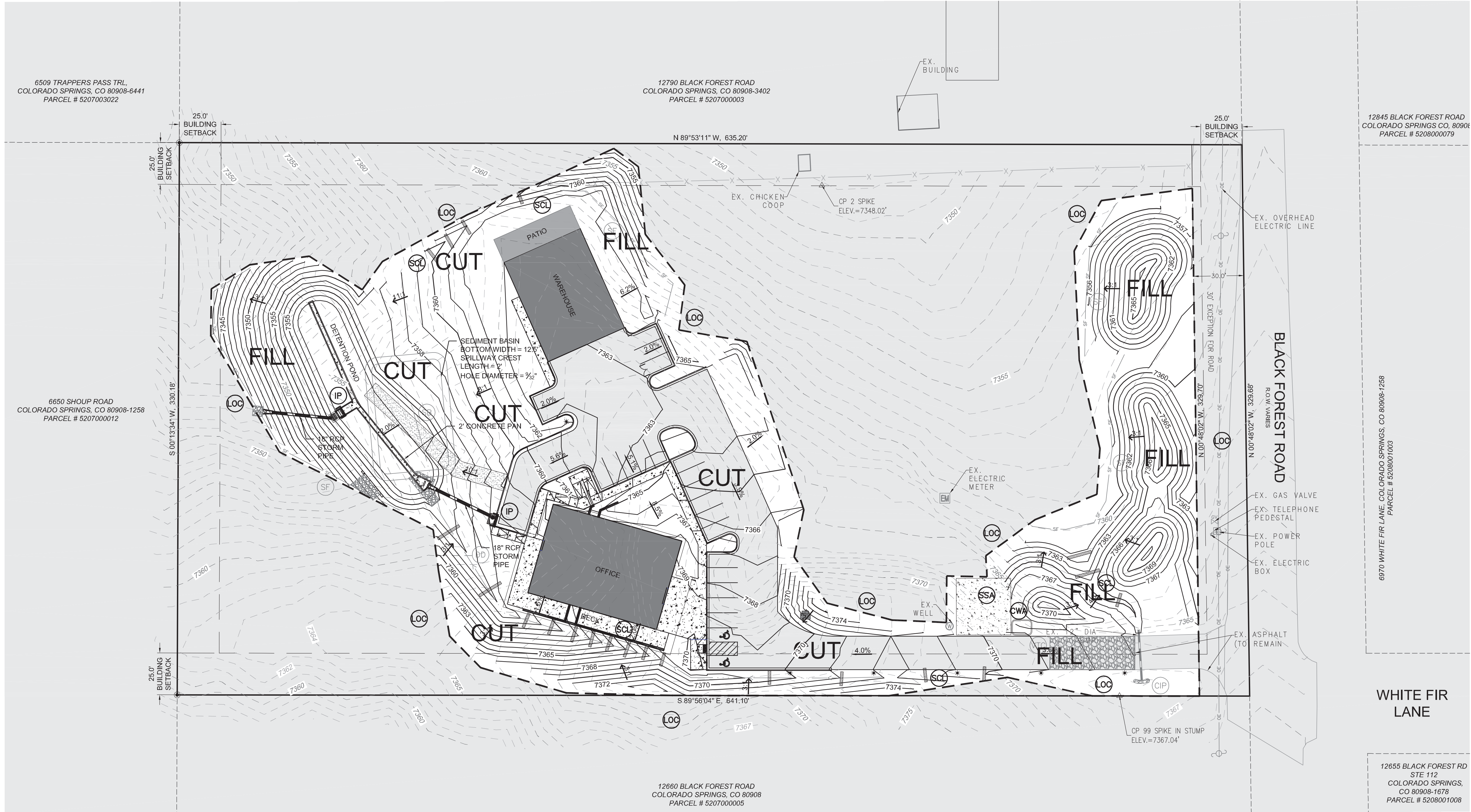
BMP LEGEND

	LIMITS OF CONSTRUCTION
	CULVERT INLET PROTECTION
	CONCRETE WASHOUT AREA
	DIVERSION DITCH
	EROSION CONTROL BLANKET
	INLET PROTECTION
	SEDIMENT CONTROL LOG
	SEEDING & MULCHING
	SILT FENCE
	STABILIZED STAGING AREA
	VEHICLE TRACKING CONTROL



EROSION CONTROL NOTES:

1. THE BMPS SHOWN ON THIS INTERIM STAGE ECSD DRAWING SHALL BE BASED ON PROPOSED GRADES AND DRAINAGE FEATURES AND ARE INSTALLED AFTER INITIAL SITE GRADING. FOR SOME BMPS SUCH AS INLET PROTECTION, INTERIM CONTROLS ARE INSTALLED AFTER THE CONSTRUCTION OF SITE INFRASTRUCTURE.
2. SHADED BMPS WERE INSTALLED IN INITIAL STAGE AND SHALL BE LEFT IN PLACE IN INTERIM STAGE.
3. SEE CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES SUCH AS EXTENDED DETENTION BASIN, CULVERTS, AND STORM DRAIN INLETS.
4. REFER TO EROSION AND SEDIMENT CONTROL REPORT FOR THIS PROJECT FOR ADDITIONAL DETAILS AND STORMWATER MANAGEMENT REQUIREMENTS.
5. ANY WASTE AND DISPOSAL ITEMS SHALL BE PROCESSED THROUGH THE STAGING AREA AND PROPERLY DISPOSED OF OFF-SITE.
6. IF ANY BMP REQUIRES MODIFICATION, THE PLAN SHALL BE RED-LINED AND APPROVAL SHALL BE OBTAINED FROM THE COUNTY INSPECTOR PRIOR TO PROCEEDING, UNLESS IT IS AN EMERGENCY SITUATION THAT REQUIRES IMMEDIATE ATTENTION.
7. REMOVAL OF BMPS SHALL NOT OCCUR WITHOUT THE APPROVAL OF THE COUNTY INSPECTOR.



CAUTION: NOTICE TO CONTRACTOR

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE LOCAL UTILITY LOCATION CENTER AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATIONS OF THE UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.



BENCHMARK

SURVEY CONTROL POINTS AS SHOWN HEREON. ALL ELEVATIONS ARE BASED UPON NAVD88 VERTICAL DATUM.

AREA OF DISTURBANCE = 93582.357 SQ. FT  
2.15 AC



303.925.0544  
www.2ncivil.com



PREPARED FOR:  
BLACK FOREST, LLC  
12740 BLACK FOREST ROAD  
COLORADO SPRINGS, CO 80908

ESCD -Interim Phase  
CONSTRUCTION DOCUMENTS  
BLACK FOREST OFFICE  
COLORADO SPRINGS, COLORADO

BY: DATE:

REVISIONS:  
1.  
2.  
3.  
4.

PROJECT NUMBER: 19015  
ISSUED DATE: 12-03-2020  
DESIGNED BY: TEW  
REVIEWED BY: RCE

ESCD -Interim  
Phase



MATERIAL LEGEND

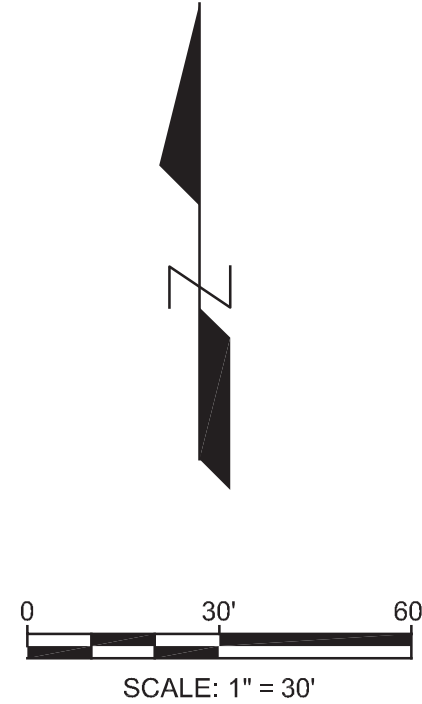
	EXISTING ASPHALT
	PROPOSED CONCRETE
	PROPOSED ASPHALT
	PROPOSED GRAVEL
	PROPOSED BUILDING
	PROPOSED LANDSCAPE ELEMENTS

LEGEND

	PROPERTY BOUNDARY
	EXISTING EASEMENT
	EXISTING SIGN
	EXISTING CURB & GUTTER
	EXISTING HYDRANT
	BUILDING SETBACK
	PROPOSED EASEMENT
	PROPOSED CURB AND GUTTER (CATCH)
	PROPOSED CURB AND GUTTER (SPILL)
	PROPOSED FENCE
	PROPOSED SIGN
	PROPOSED FIRE HYDRANT
	SURVEY CONTROL POINT
	FOUND PROPERTY CORNER

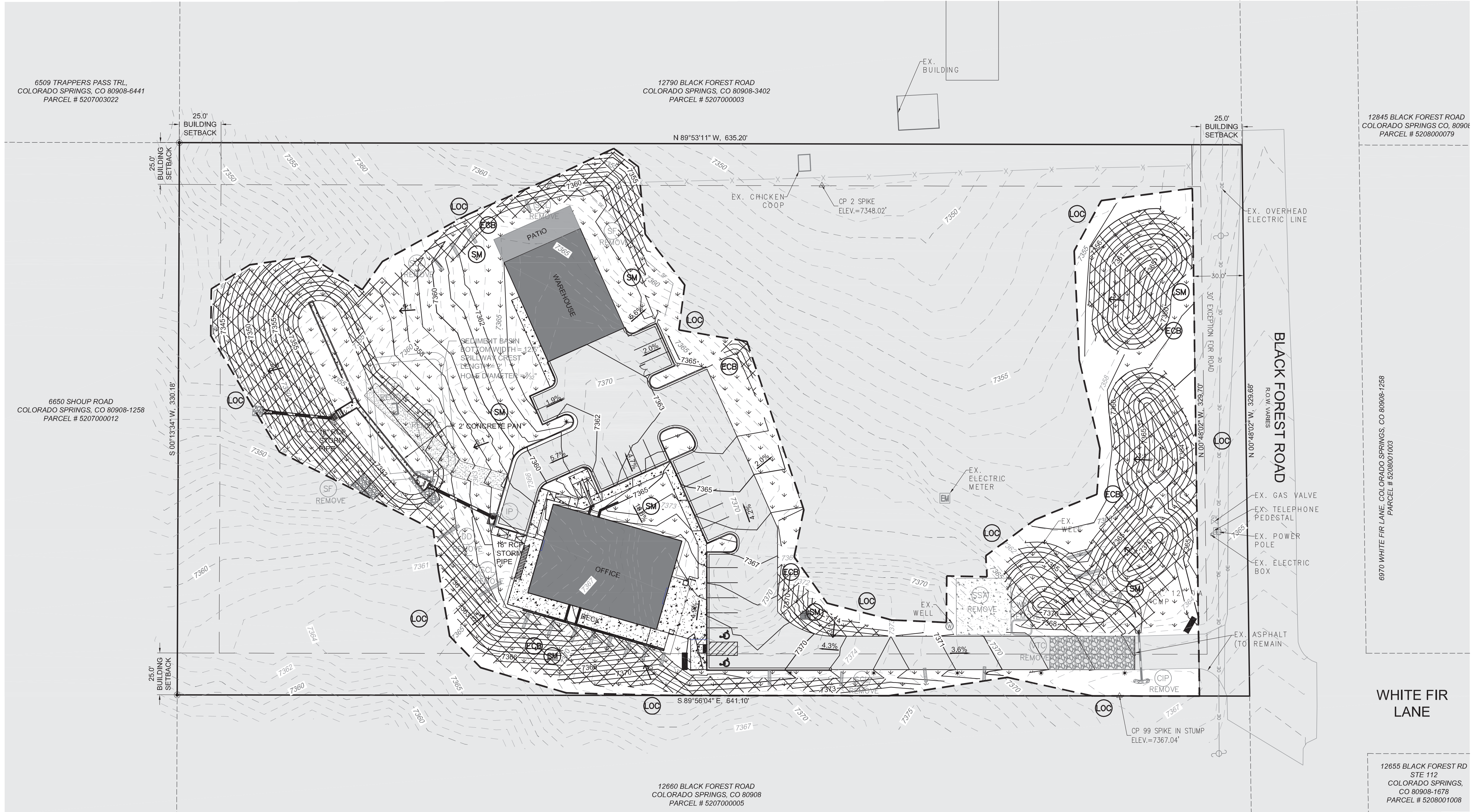
BMP LEGEND

	LIMITS OF CONSTRUCTION		CULVERT INLET PROTECTION
	CONCRETE WASHOUT AREA		DIVERSION DITCH
	EROSION CONTROL BLANKET		INLET PROTECTION
	SEDIMENT CONTROL LOG		SEEDING & MULCHING
	SILT FENCE		STABILIZED STAGING AREA
	VEHICLE TRACKING CONTROL		



EROSION CONTROL NOTES:

1. THE BMPs SHOWN ON THIS FINAL STAGE ECSD DRAWING SHALL BE INSTALLED AS ONE OF THE LAST STEPS IN THE CONSTRUCTION PROCESS, SUCH AS FINAL SEEDING AND MULCHING.
2. SHADED BMPs WERE INSTALLED IN INITIAL OR INTERIM ECSD PLAN AND, UNLESS OTHERWISE INDICATED, SHALL BE LEFT IN PLACE UNTIL REVEGETATION ESTABLISHMENT IS APPROVED BY THE COUNTY.
3. SEE CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES SUCH AS EXTENDED DETENTION BASIN, CULVERTS, AND STORM DRAIN INLETS.
4. STAGING AREAS SHALL BE RESTORED TO PROPOSED CONDITIONS AFTER CONSTRUCTION IS COMPLETE.
5. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PHASE THE FINAL BMPs AS THE CONSTRUCTION PHASES PROGRESS.
6. REFER TO EROSION AND SEDIMENT CONTROL REPORT FOR THIS PROJECT FOR ADDITIONAL DETAILS AND STORMWATER MANAGEMENT REQUIREMENTS.
7. IF ANY BMP REQUIRES MODIFICATION, THE PLAN SHALL BE RED-LINED AND APPROVAL SHALL BE OBTAINED FROM THE COUNTY INSPECTOR PRIOR TO PROCEEDING, UNLESS IT IS AN EMERGENCY SITUATION THAT REQUIRES IMMEDIATE ATTENTION.



CAUTION: NOTICE TO CONTRACTOR

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE LOCAL UTILITY LOCATION CENTER AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATIONS OF THE UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.



BENCHMARK

SURVEY CONTROL POINTS AS SHOWN HEREON. ALL ELEVATIONS ARE BASED UPON NAVD83 VERTICAL DATUM.



303.925.0544  
www.2ncivil.com



PREPARED FOR:  
BLACK FOREST, LLC  
12740 BLACK FOREST ROAD  
COLORADO SPRINGS, CO 80908

ESCD - Final Phase  
CONSTRUCTION DOCUMENTS  
BLACK FOREST OFFICE  
COLORADO SPRINGS, COLORADO

BY: DATE:

REVISIONS:

- 1.
- 2.
- 3.
- 4.

PROJECT NUMBER:

ISSUED DATE:

DESIGNED BY:

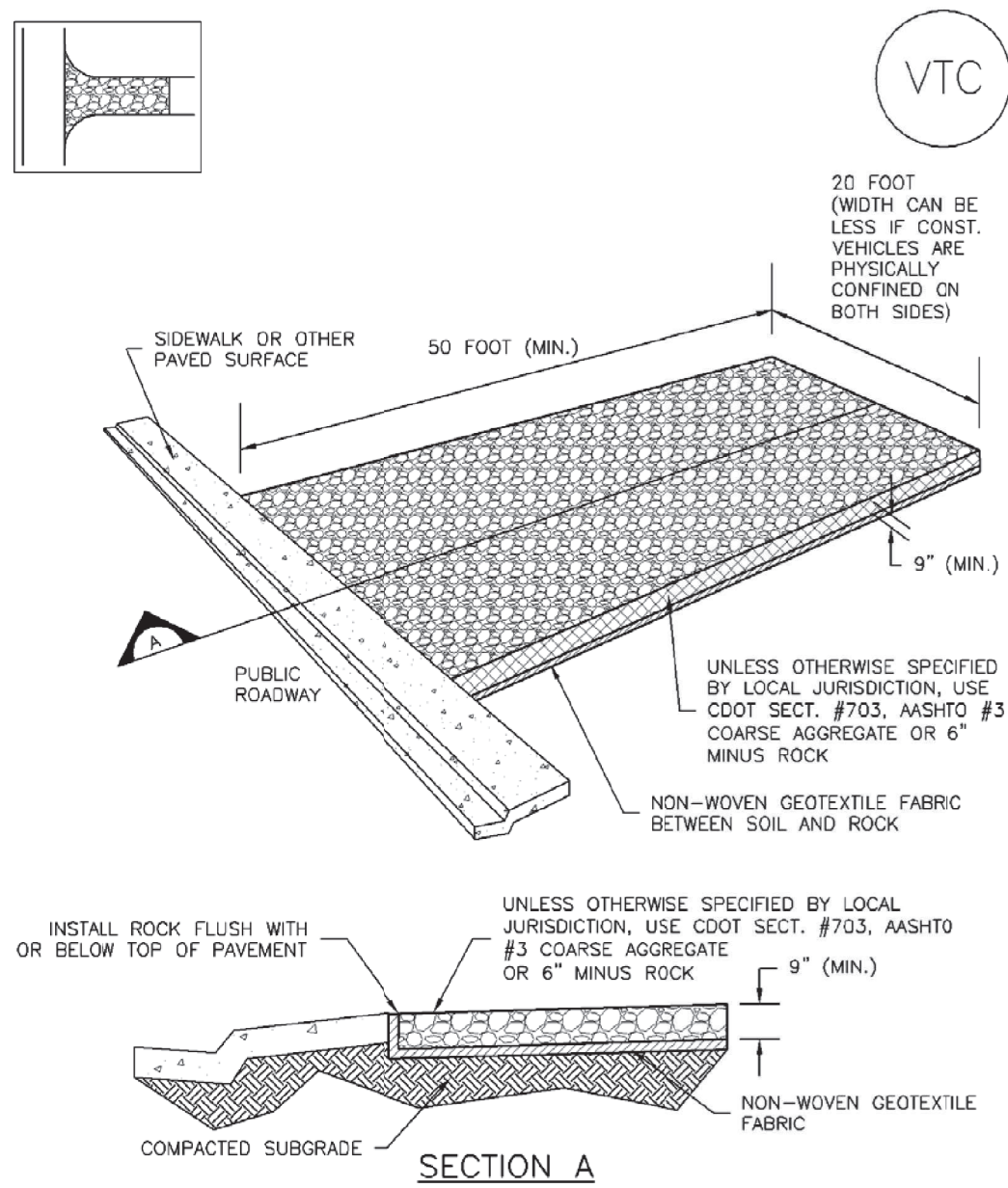
REVIEWED BY:

ESCD - Final  
Phase



J:\Projects\1911015\wq\Site Plans\ESCD Details 2.dwg 12/20/20

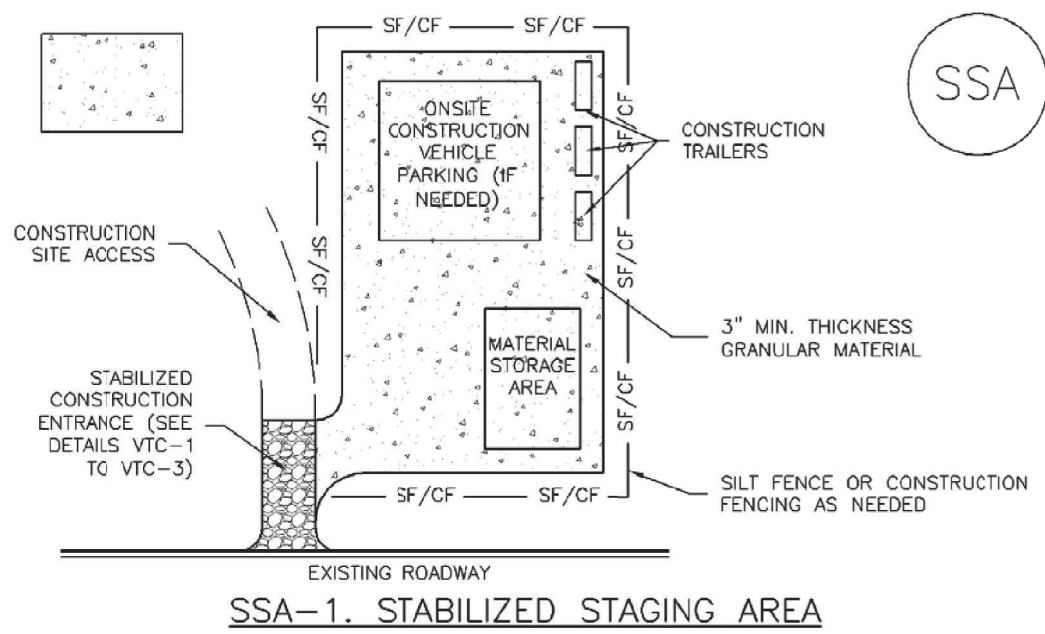
Vehicle Tracking Control (VTC) SM-4



VTC-1. AGGREGATE VEHICLE TRACKING CONTROL

November 2010 Urban Drainage and Flood Control District VTC-3  
Urban Storm Drainage Criteria Manual Volume 3

Stabilized Staging Area (SSA) SM-6



SSA-1. STABILIZED STAGING AREA

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

- STABILIZED STAGING AREA MAINTENANCE NOTES**
- 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.
  - FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
  - WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
  - ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY IF RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.

November 2010 Urban Drainage and Flood Control District SSA-3  
Urban Storm Drainage Criteria Manual Volume 3

SM-4 Vehicle Tracking Control (VTC)

STABILIZED CONSTRUCTION ENTRANCE/EXIT INSTALLATION NOTES

- SEE PLAN VIEW FOR:
  - LOCATION OF CONSTRUCTION ENTRANCE(S)/EXIT(S).
  - TYPE OF CONSTRUCTION ENTRANCE(S)/EXIT(S) (WITH/WITHOUT WHEEL WASH, CONSTRUCTION MAT OR TRM).
- CONSTRUCTION MAT OR TRM STABILIZED CONSTRUCTION ENTRANCES ARE ONLY TO BE USED ON SHORT DURATION PROJECTS (TYPICALLY RANGING FROM A WEEK TO A MONTH) WHERE THERE WILL BE LIMITED VEHICULAR ACCESS.
- A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE LOCATED AT ALL ACCESS POINTS WHERE VEHICLES ACCESS THE CONSTRUCTION SITE FROM PAVED RIGHT-OF-WAYS.
- STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
- A NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED UNDER THE STABILIZED CONSTRUCTION ENTRANCE/EXIT PRIOR TO THE PLACEMENT OF ROCK.
- UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

STABILIZED CONSTRUCTION ENTRANCE/EXIT MAINTENANCE NOTES

- 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.
- FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
- WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
- ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY TO THE STABILIZED ENTRANCE/EXIT TO MAINTAIN A CONSISTENT DEPTH.
- SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED THROUGHOUT THE DAY AND AT THE END OF THE DAY BY SHOVELING OR SWEEPING. SEDIMENT MAY NOT BE WASHED DOWN STORM SEWER DRAINS.

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 CITY OF BROOMFIELD, COLORADO, NOT AVAILABLE IN AUTOCAD)

VTC-6 Urban Drainage and Flood Control District November 2010  
Urban Storm Drainage Criteria Manual Volume 3

SM-6 Stabilized Staging Area (SSA)

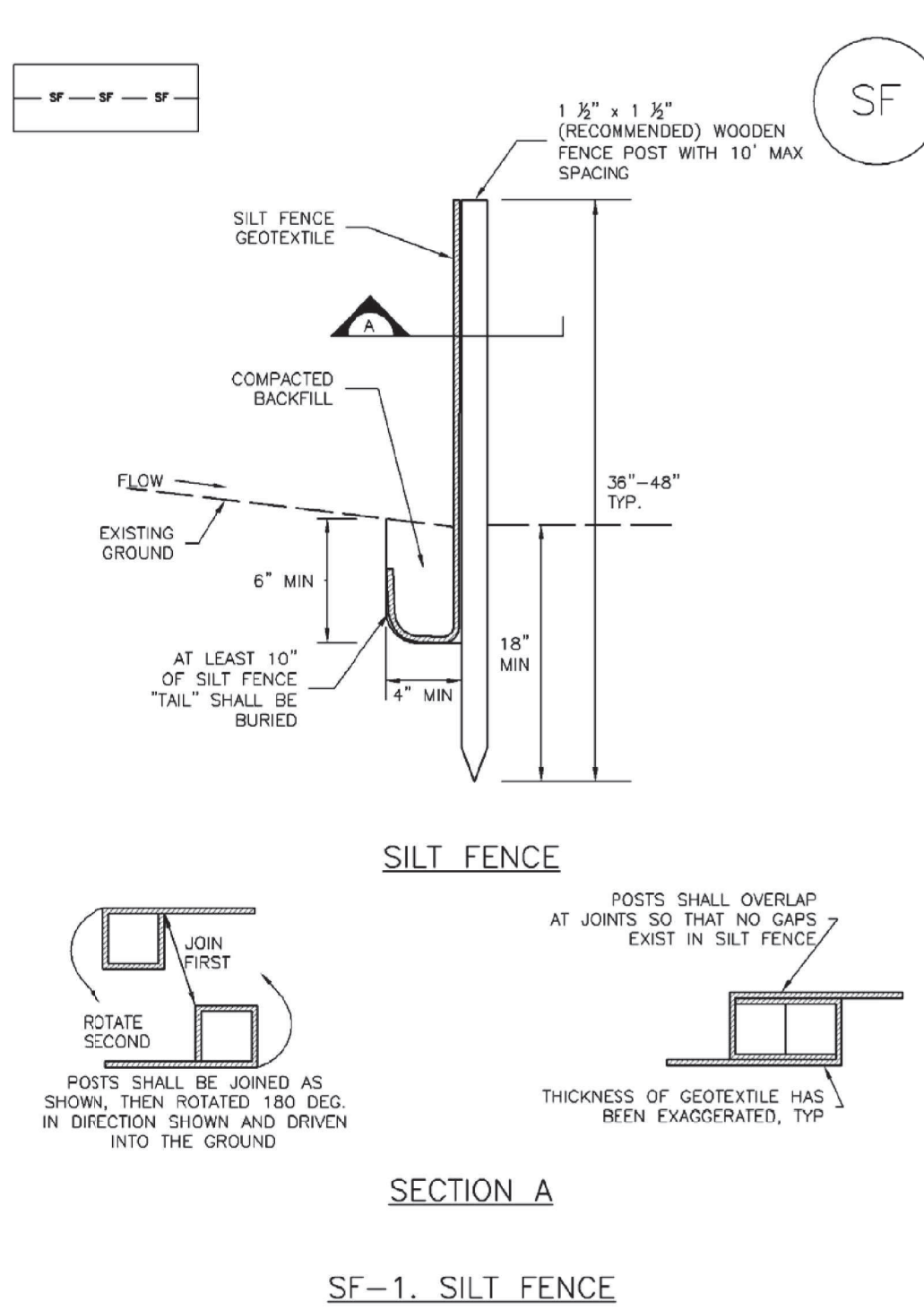
STABILIZED STAGING AREA MAINTENANCE NOTES

- STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING/LOADING OPERATIONS.
- 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, SEEDED 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)

SSA-4 Urban Drainage and Flood Control District November 2010  
Urban Storm Drainage Criteria Manual Volume 3

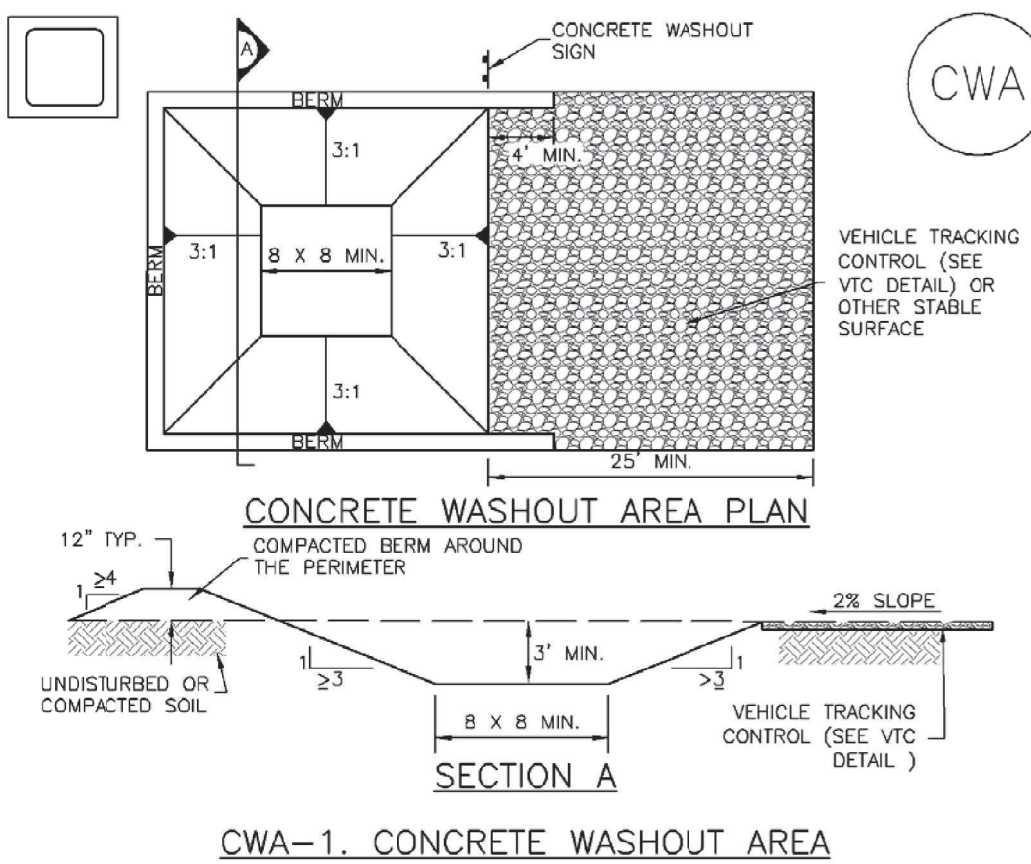
Silt Fence (SF) SC-1



SF-1. SILT FENCE

November 2010 Urban Drainage and Flood Control District SF-3  
Urban Storm Drainage Criteria Manual Volume 3

Concrete Washout Area (CWA) MM-1



CWA-1. CONCRETE WASHOUT AREA

CWA INSTALLATION NOTES

- SEE PLAN VIEW FOR:
  - CWA INSTALLATION LOCATION.
- DO NOT LOCATE AN UNLINED CWA WITHIN 400' OF ANY NATURAL DRAINAGE PATHWAY OR WATERBODY. DO NOT LOCATE WITHIN 1,000' OF ANY WELLS OR DRINKING WATER SOURCES. IF SITE CONSTRAINTS MAKE THIS INFEASIBLE, OR IF HIGHLY PERMEABLE SOILS EXIST ON SITE, THE CWA MUST BE INSTALLED WITH AN IMPERMEABLE LINER (16 MIL MIN. THICKNESS) OR SURFACE STORAGE ALTERNATIVES USING PREFABRICATED CONCRETE WASHOUT DEVICES OR A LINED ABOVE GROUND STORAGE ARE SHOULD BE USED.
- THE CWA SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE.
- CWA SHALL INCLUDE A FLAT SUBSURFACE PIT THAT IS AT LEAST 8' BY 8' SLOPES LEADING OUT OF THE SUBSURFACE PIT SHALL BE 3:1 OR FLATTER. THE PIT SHALL BE AT LEAST 3' DEEP.
- BERM SURROUNDING SIDES AND BACK OF THE CWA SHALL HAVE MINIMUM HEIGHT OF 1'.
- VEHICLE TRACKING PAD SHALL BE SLOPED 2% TOWARDS THE CWA.
- SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE CWA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CWA TO OPERATORS OF CONCRETE TRUCKS AND PUMP TRIGS.
- USE EXCAVATED MATERIAL FOR PERIMETER BERM CONSTRUCTION.

November 2010 Urban Drainage and Flood Control District CWA-3  
Urban Storm Drainage Criteria Manual Volume 3

SC-1 Silt Fence (SF)

SILT FENCE INSTALLATION NOTES

- SILT FENCE MUST BE PLACED AWAY FROM THE TOE OF THE SLOPE TO ALLOW FOR WATER PONDING. SILT FENCE AT THE TOE OF A SLOPE SHOULD BE INSTALLED IN A FLAT LOCATION AT LEAST SEVERAL FEET (2-5 FT) FROM THE TOE OF THE SLOPE TO ALLOW ROOM FOR PONDING AND DEPOSITION.
- A UNIFORM 6" X 4" ANCHOR TRENCH SHALL BE EXCAVATED USING TRENCHER OR SILT FENCE INSTALLATION DEVICE. NO ROAD GRADERS, BACKHOES, OR SIMILAR EQUIPMENT SHALL BE USED.
- COMPACT ANCHOR TRENCH BY HAND WITH A "JUMPING JACK" OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.
- SILT FENCE SHALL BE PULLED TIGHT AS IT IS ANCHORED TO THE STAKES. THERE SHOULD BE NO NOTICEABLE SAG BETWEEN STAKES AFTER IT HAS BEEN ANCHORED TO THE STAKES.
- SILT FENCE FABRIC SHALL BE ANCHORED TO THE STAKES USING 1" HEAVY DUTY STAPLES OR NAILS WITH 1" HEADS. STAPLES AND NAILS SHOULD BE PLACED 3" ALONG THE FABRIC DOWN THE STAKE.
- AT THE END OF A RUN OF SILT FENCE ALONG A CONTOUR, THE SILT FENCE SHOULD BE TURNED PERPENDICULAR TO THE CONTOUR TO CREATE A "J-HOOK." THE "J-HOOK" EXTENDING PERPENDICULAR TO THE CONTOUR SHOULD BE OF SUFFICIENT LENGTH TO KEEP RUNOFF FROM FLOWING AROUND THE END OF THE SILT FENCE (TYPICALLY 10' - 20').
- SILT FENCE SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

SILT FENCE MAINTENANCE NOTES

- 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.
- FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
- WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
- SEDIMENT ACCUMULATED UPSTREAM OF THE SILT FENCE SHALL BE REMOVED AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP. TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY 6".
- REPAIR OR REPLACE SILT FENCE WHEN THERE ARE SIGNS OF WEAR, SUCH AS SAGGING, TEARING, OR COLLAPSE.
- SILT FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION, OR IS REPLACED BY AN EQUIVALENT PERIMETER SEDIMENT CONTROL BMP.
- WHEN SILT FENCE IS REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, 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.

SF-4 Urban Drainage and Flood Control District November 2010  
Urban Storm Drainage Criteria Manual Volume 3

MM-1 Concrete Washout Area (CWA)

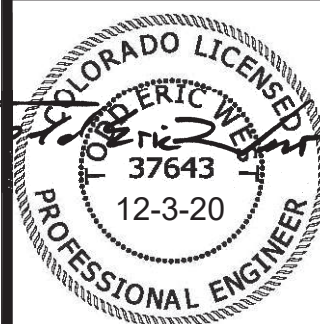
CWA MAINTENANCE NOTES

- 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.
- FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
- WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
- THE CWA SHALL BE REPAIRED, CLEANED, OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR CONCRETE WASTE. CONCRETE MATERIALS, ACCUMULATED IN PIT, SHALL BE REMOVED ONCE THE MATERIALS HAVE REACHED A DEPTH OF 2'.
- CONCRETE WASHOUT WATER, WASTED PIECES OF CONCRETE AND ALL OTHER DEBRIS IN THE SUBSURFACE PIT SHALL BE TRANSPORTED FROM THE JOB SITE IN A WATER-TIGHT CONTAINER AND DISPOSED OF PROPERLY.
- THE CWA SHALL REMAIN IN PLACE UNTIL ALL CONCRETE FOR THE PROJECT IS PLACED.
- WHEN THE CWA IS REMOVED, COVER THE DISTURBED AREA WITH TOP SOIL, SEED AND MULCH OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND THE CITY OF 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.

CWA-4 Urban Drainage and Flood Control District November 2010  
Urban Storm Drainage Criteria Manual Volume 3



PREPARED FOR:  
BLACK FOREST, LLC  
12740 BLACK FOREST ROAD  
COLORADO SPRINGS, CO 80908

ESCD Details 1  
CONSTRUCTION DOCUMENTS  
BLACK FOREST OFFICE  
COLORADO SPRINGS, COLORADO

BY: DATE:

REVISIONS:

19015 12-03-2020

PROJECT NUMBER:  
ISSUED DATE:  
DESIGNED BY:  
REVIEWED BY:

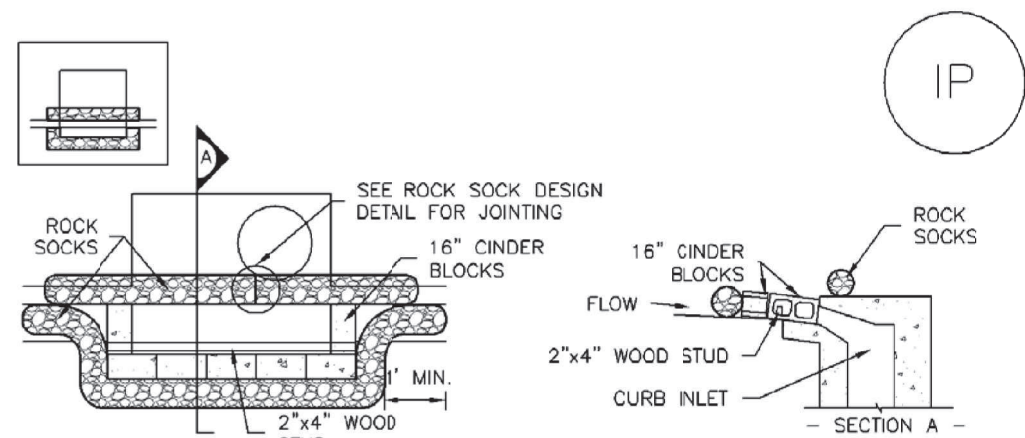
ESCD Details 1



J:\Projects\1911015\mg\Site Plans\ESCD Details 2.dwg 12/20/2020

SC-6

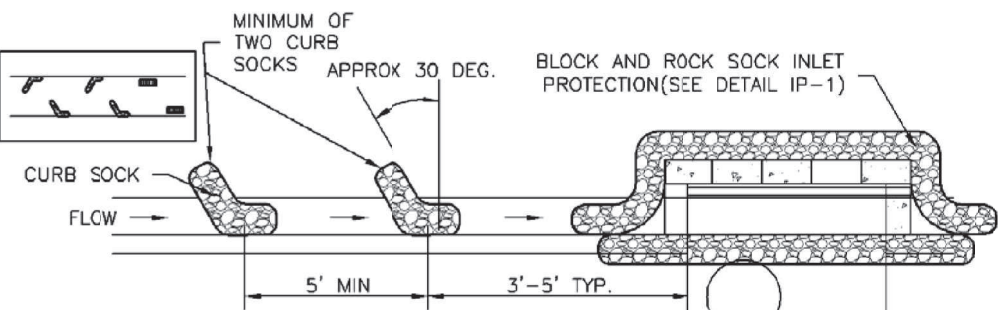
Inlet Protection (IP)



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 JOINED TOGETHER IN ACCORDANCE WITH ROCK SOCK DESIGN DETAIL.



IP-2. CURB ROCK SOCKS UPSTREAM OF INLET PROTECTION

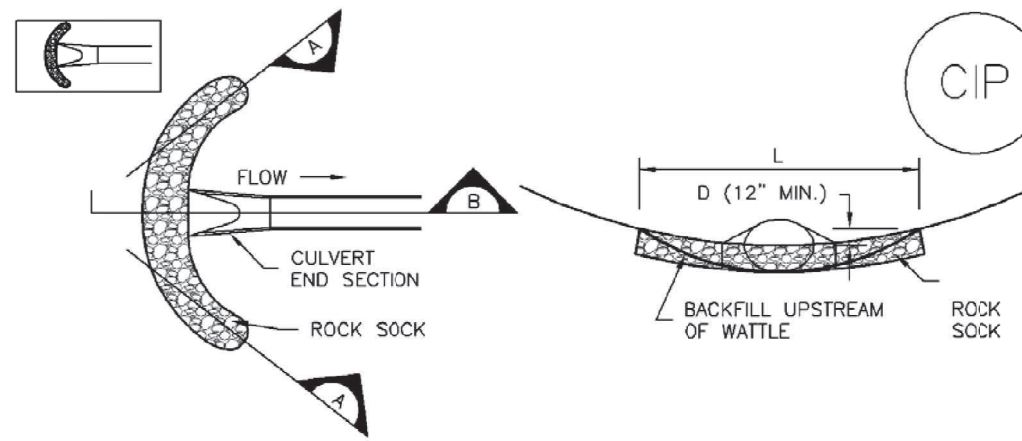
CURB ROCK SOCK INLET PROTECTION INSTALLATION NOTES

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 III SERIES ARE REQUIRED UPSTREAM OF ON-GRADE INLETS.

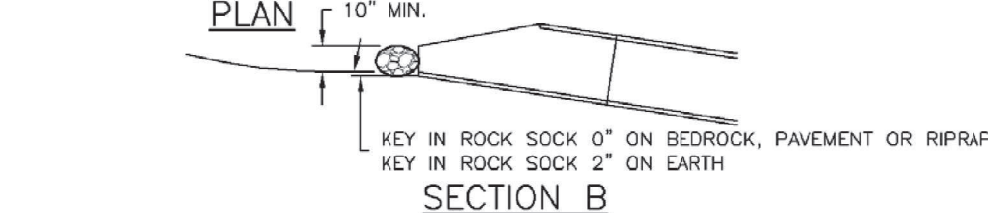
IP-4 Urban Drainage and Flood Control District August 2013  
Urban Storm Drainage Criteria Manual Volume 3

Inlet Protection (IP)

SC-6



CULVERT INLET PROTECTION SECTION A



CIP-1. CULVERT INLET PROTECTION

CULVERT INLET PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR -LOCATION OF CULVERT INLET PROTECTION.
2. SEE ROCK SOCK DESIGN DETAIL FOR ROCK GRADATION REQUIREMENTS AND JOINING DETAIL.

CULVERT INLET 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.
4. SEDIMENT ACCUMULATED UPSTREAM OF THE CULVERT SHALL BE REMOVED WHEN THE SEDIMENT DEPTH IS  $\frac{1}{2}$  THE HEIGHT OF THE ROCK SOCK.
5. CULVERT INLET PROTECTION SHALL REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS PERMANENTLY STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

(DETAILS ADAPTED FROM AURORA, 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.

August 2013 Urban Drainage and Flood Control District IP-7  
Urban Storm Drainage Criteria Manual Volume 3

SC-6

Inlet Protection (IP)

GENERAL INLET PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR:  
-LOCATION OF INLET PROTECTION.  
-TYPE OF INLET PROTECTION (IP.1, IP.2, IP.3, IP.4, IP.5, IP.6)
2. INLET PROTECTION SHALL BE INSTALLED PROMPTLY AFTER INLET CONSTRUCTION OR PAVING IS COMPLETE (TYPICALLY WITHIN 48 HOURS). IF A RAINFALL/RUNOFF EVENT IS FORECAST, INSTALL INLET PROTECTION PRIOR TO ONSET OF EVENT.
3. 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.

INLET 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.
4. SEDIMENT ACCUMULATED UPSTREAM OF INLET PROTECTION SHALL BE REMOVED AS NECESSARY TO MAINTAIN BMP EFFECTIVENESS, TYPICALLY WHEN STORAGE VOLUME REACHES 50% OF CAPACITY, A DEPTH OF 6" WHEN SILT FENCE IS USED, OR  $\frac{1}{4}$  OF THE HEIGHT FOR STRAW BALES.
5. INLET PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS PERMANENTLY STABILIZED, UNLESS THE LOCAL JURISDICTION APPROVES EARLIER REMOVAL OF INLET PROTECTION IN STREETS.
6. WHEN INLET PROTECTION AT AREA INLETS IS REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED, OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, 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.

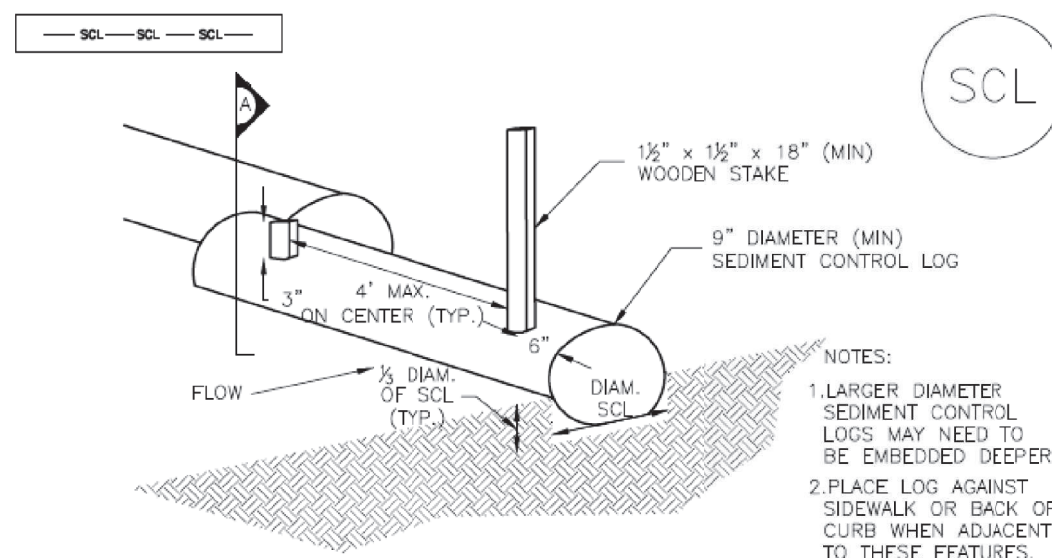
NOTE: THE DETAILS INCLUDED WITH THIS FACT SHEET SHOW COMMONLY USED, CONVENTIONAL METHODS OF INLET PROTECTION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY PROPRIETARY INLET PROTECTION METHODS ON THE MARKET. UDFCD NEITHER ENDORSES NOR DISAPPROVES USE OF PROPRIETARY INLET PROTECTION; HOWEVER, IN THE EVENT PROPRIETARY METHODS ARE USED, THE APPROPRIATE DETAIL FROM THE MANUFACTURER MUST BE INCLUDED IN THE SWMP AND THE BMP MUST BE INSTALLED AND MAINTAINED AS SHOWN IN THE MANUFACTURER'S DETAILS.

NOTE: SOME MUNICIPALITIES DISCOURAGE OR PROHIBIT THE USE OF STRAW BALES FOR INLET PROTECTION. CHECK WITH LOCAL JURISDICTION TO DETERMINE IF STRAW BALE INLET PROTECTION IS ACCEPTABLE.

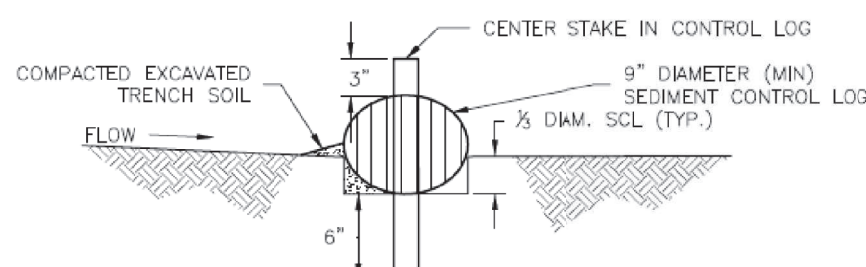
IP-8 Urban Drainage and Flood Control District August 2013  
Urban Storm Drainage Criteria Manual Volume 3

Sediment Control Log (SCL)

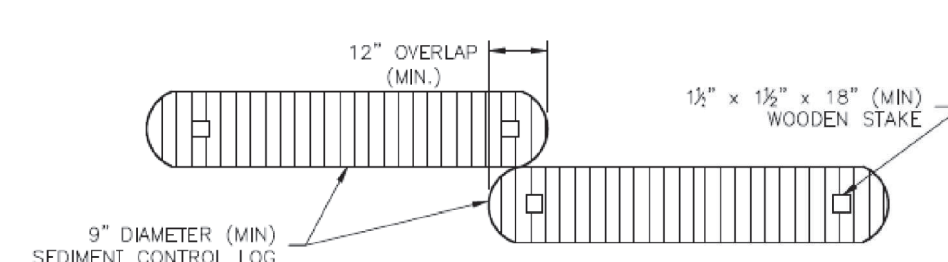
SC-2



TRENCHED SEDIMENT CONTROL LOG



TRENCHED SEDIMENT CONTROL LOG SECTION A



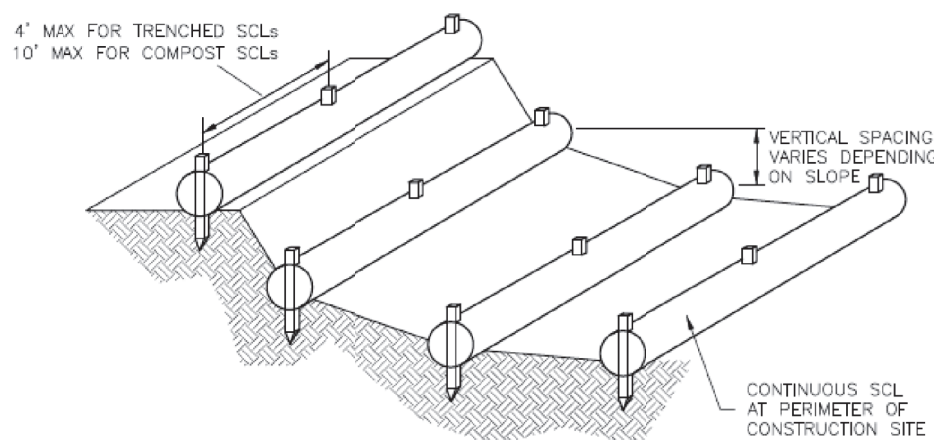
LOG JOINTS

SCL-1. TRENCHED SEDIMENT CONTROL LOG

November 2015 Urban Drainage and Flood Control District SCL-3  
Urban Storm Drainage Criteria Manual Volume 3

Sediment Control Log (SCL)

SC-2



SCL-3. SEDIMENT CONTROL LOGS TO CONTROL SLOPE LENGTH

November 2015 Urban Drainage and Flood Control District SCL-5  
Urban Storm Drainage Criteria Manual Volume 3

SC-2

Sediment Control Log (SCL)

SEDIMENT CONTROL LOG INSTALLATION NOTES

1. SEE PLAN VIEW FOR LOCATION AND LENGTH OF SEDIMENT CONTROL LOGS.
2. SEDIMENT CONTROL LOGS THAT ACT AS A PERIMETER CONTROL SHALL BE INSTALLED PRIOR TO ANY UPGRADE LAND-DISTURBING ACTIVITIES.
3. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR OR COCONUT FIBER, AND SHALL BE FREE OF ANY NOXIOUS WEED SEEDS OR DEFECTS INCLUDING RIPS, HOLES AND OBVIOUS WEAR.
4. SEDIMENT CONTROL LOGS MAY BE USED AS SMALL CHECK DAMS IN DITCHES AND SWALES. HOWEVER, THEY SHOULD NOT BE USED IN PERENNIAL STREAMS.
5. IT IS RECOMMENDED THAT SEDIMENT CONTROL LOGS BE TRENCHED INTO THE GROUND TO A DEPTH OF APPROXIMATELY  $\frac{1}{2}$  OF THE DIAMETER OF THE LOG. IF TRENCHING TO THIS DEPTH IS NOT FEASIBLE AND/OR DESIRABLE (SHORT TERM INSTALLATION WITH DESIRE NOT TO DAMAGE LANDSCAPE) A LESSER TRENCHING DEPTH MAY BE ACCEPTABLE WITH MORE ROBUST STAKING. COMPOST LOGS THAT ARE 8 LB/FT DO NOT NEED TO BE TRENCHED.
6. THE UPHILL SIDE OF THE SEDIMENT CONTROL LOG SHALL BE BACKFILLED WITH SOIL OR FILTER MATERIAL THAT IS FREE OF ROCKS AND DEBRIS. THE SOIL SHALL BE TIGHTLY COMPACTED INTO THE SHAPE OF A RIGHT TRIANGLE USING A SHOVEL OR WEIGHTED LAWN ROLLER OR BLOWN IN PLACE.
7. FOLLOW MANUFACTURERS' GUIDANCE FOR STAKING. IF MANUFACTURERS' INSTRUCTIONS DO NOT SPECIFY SPACING, STAKES SHALL BE PLACED ON 4' CENTERS AND EMBEDDED A MINIMUM OF 6" INTO THE GROUND. 3" OF THE STAKE SHALL PROTRUDE FROM THE TOP OF THE LOG. STAKES THAT ARE BROKEN PRIOR TO INSTALLATION SHALL BE REPLACED. COMPOST LOGS SHOULD BE STAKED 10' ON CENTER.

SEDIMENT CONTROL LOG 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. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOG SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP. TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY  $\frac{1}{2}$  OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.
5. SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION. COMPOST FROM COMPOST LOGS MAY BE LEFT IN PLACE AS LONG AS BAGS ARE REMOVED AND THE AREA SEEDED. IF DISTURBED AREAS EXIST AFTER REMOVAL, THEY SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

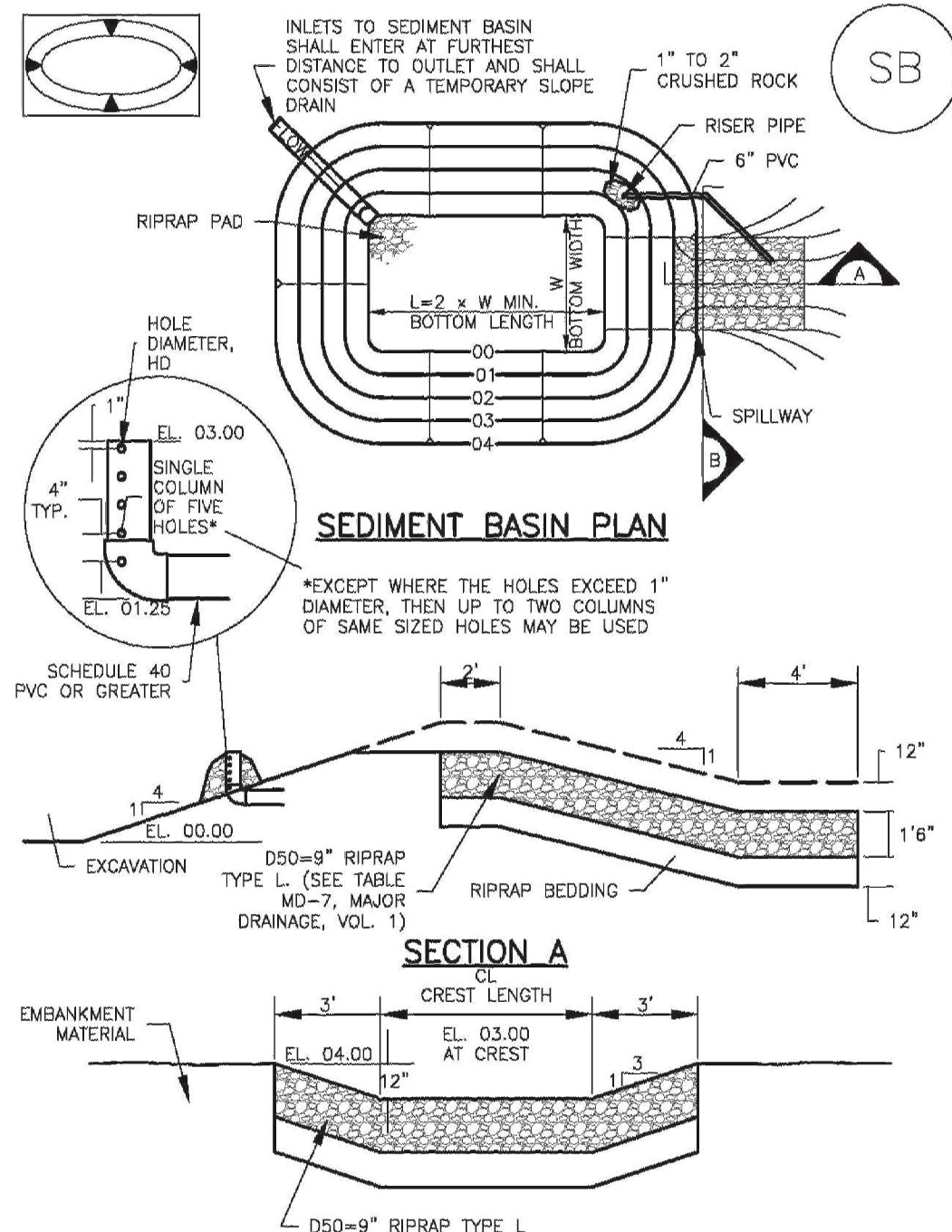
(DETAILS ADAPTED FROM TOWN OF PARKER, COLORADO, JEFFERSON COUNTY, COLORADO, DOUGLAS COUNTY, COLORADO, AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

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.

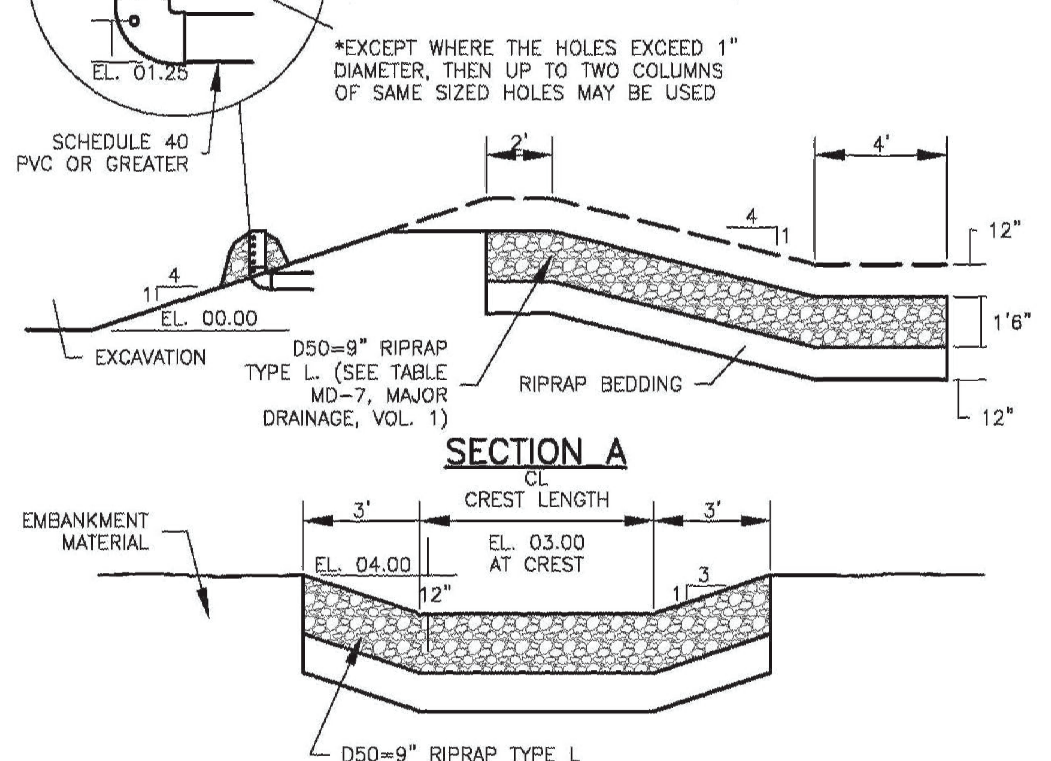
SCL-6 Urban Drainage and Flood Control District November 2015  
Urban Storm Drainage Criteria Manual Volume 3

Sediment Basin (SB)

SC-7



SEDIMENT BASIN PLAN



August 2013 Urban Drainage and Flood Control District SB-5  
Urban Storm Drainage Criteria Manual Volume 3

SC-7

Sediment Basin (SB)

TABLE SB-1. SIZING INFORMATION FOR STANDARD SEDIMENT BASIN				
Upstream Drainage Area (rounded to nearest acre), (ac)	Basin Bottom Width (W), (ft)	Spillway Crest Length (CL), (ft)	Hole Diameter (HD), (in)	
1	12 1/2	2	3/4	1/4
2	21	3	3/4	1/4
3	28	3	3/4	1/4
4	33 1/2	3	3/4	1/4
5	38 1/2	6	3/4	1/4
6	43	9	3/4	1/4
7	47 1/2	11	3/4	1/4
8	51	12	3/4	1/4
9	55	13	3/4	1/4
10	58 1/2	15	3/4	1/4
11	61	16	3/4	1/4
12	64	17	3/4	1/4
13	67 1/2	19	1 1/4	1/4
14	70 1/2	21	1 1/4	1/4
15	73 1/2	22	1 1/4	1/4

SEDIMENT BASIN INSTALLATION NOTES

1. SEE PLAN VIEW FOR:  
-LOCATION OF SEDIMENT BASIN.  
-TYPE OF BASIN (STANDARD BASIN OR NONSTANDARD BASIN).  
-FOR STANDARD BASIN, BOTTOM WIDTH W, CREST LENGTH CL, AND HOLE DIAMETER, HD.  
-FOR NONSTANDARD BASIN, SEE CONSTRUCTION DRAWINGS FOR DESIGN OF BASIN INCLUDING RISER HEIGHT H, NUMBER OF COLUMNS N, HOLE DIAMETER HD AND PIPE DIAMETER D.
2. FOR STANDARD BASIN, BOTTOM DIMENSION MAY BE MODIFIED AS LONG AS BOTTOM AREA IS NOT REDUCED.
3. SEDIMENT BASINS SHALL BE INSTALLED PRIOR TO ANY OTHER LAND-DISTURBING ACTIVITY THAT RELIES ON BASINS AS A STORMWATER CONTROL.
4. EMBANKMENT MATERIAL SHALL CONSIST OF SOIL FREE OF DEBRIS, ORGANIC MATERIAL, AND ROCKS OR CONCRETE GREATER THAN 3 INCHES AND SHALL HAVE A MINIMUM OF 15 PERCENT BY WEIGHT PASSING THE NO. 200 SIEVE.
5. EMBANKMENT MATERIAL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D698.
6. PIPE SCH 40 OR GREATER SHALL BE USED.
7. THE DETAILS SHOWN ON THESE SHEETS PERTAIN TO STANDARD SEDIMENT BASIN(S) FOR DRAINAGE AREAS LESS THAN 15 ACRES. SEE CONSTRUCTION DRAWINGS FOR EMBANKMENT, STORAGE VOLUME, SPILLWAY, OUTLET, AND OUTLET PROTECTION DETAILS FOR ANY SEDIMENT BASIN(S) THAT HAVE BEEN INDIVIDUALLY DESIGNED FOR DRAINAGE AREAS LARGER THAN 15 ACRES.

SB-6 Urban Drainage and Flood Control District August 2013  
Urban Storm Drainage Criteria Manual Volume 3

2N CIVIL

303.925.0544  
www.2ncivil.com



PREPARED FOR:  
BLACK FOREST, LLC  
12746 BLACK FOREST ROAD  
COLORADO SPRINGS, CO 80908

ESCD Details 2  
CONSTRUCTION DOCUMENTS  
BLACK FOREST OFFICE  
COLORADO SPRINGS, COLORADO

DATE:  
BY:

REVISIONS:  
1.  
2.  
3.  
4.

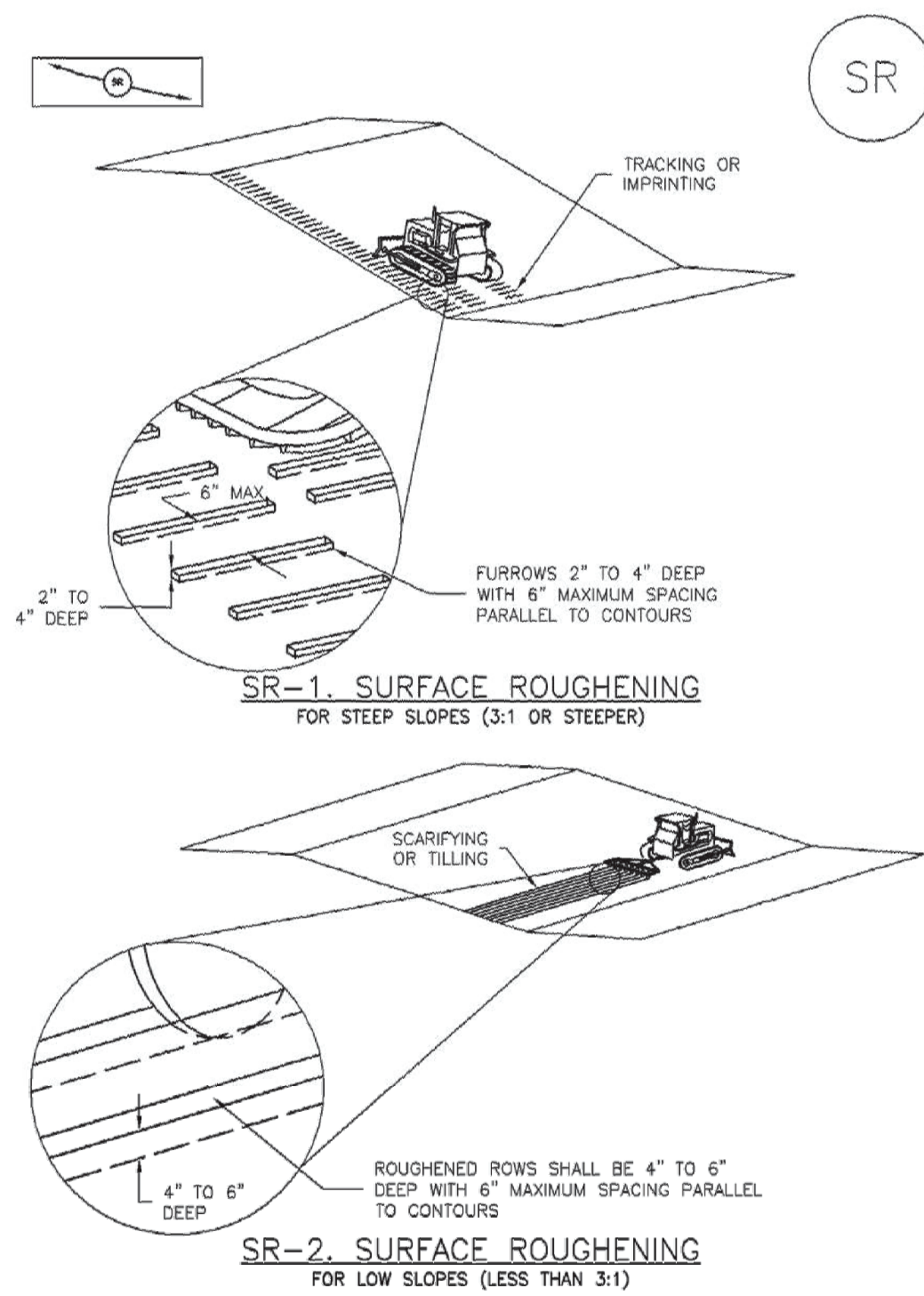
PROJECT NUMBER: 19015  
ISSUED DATE: 12-03-2020  
DESIGNED BY: TEW  
REVIEWED BY: RCE

ESCD Details 2



## Surface Roughening (SR)

EC-1



November 2010 Urban Drainage and Flood Control District  
Urban Storm Drainage Criteria Manual Volume 3

SR-3

EC-1

## Surface Roughening (SR)

### SURFACE ROUGHENING INSTALLATION NOTES

- SEE PLAN VIEW FOR:  
-LOCATION(S) OF SURFACE ROUGHENING.
- SURFACE ROUGHENING SHALL BE PROVIDED PROMPTLY AFTER COMPLETION OF FINISHED GRADING (FOR AREAS NOT RECEIVING TOPSOIL) OR PRIOR TO TOPSOIL PLACEMENT OR ANY FORECASTED RAIN EVENT.
- AREAS WHERE BUILDING FOUNDATIONS, PAVEMENT, OR SOD WILL BE PLACED WITHOUT DELAY IN THE CONSTRUCTION SEQUENCE, SURFACE ROUGHENING IS NOT REQUIRED.
- DISTURBED SURFACES SHALL BE ROUGHENED USING RIPPING OR TILLING EQUIPMENT ON THE CONTOUR OR TRACKING UP AND DOWN A SLOPE USING EQUIPMENT TREADS.
- A FARMING DISK SHALL NOT BE USED FOR SURFACE ROUGHENING.

### SURFACE ROUGHENING MAINTENANCE NOTES

- 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.
- FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
- WHERE BMPs HAVE FAILED, REPAIR OR REPLACE UPON DISCOVERY OF THE FAILURE.
- VEHICLES AND EQUIPMENT SHALL NOT BE DRIVEN OVER AREAS THAT HAVE BEEN SURFACE ROUGHENED.
- IN NON-TURF GRASS FINISHED AREAS, SEEDING AND MULCHING SHALL TAKE PLACE DIRECTLY OVER SURFACE ROUGHENED AREAS WITHOUT FIRST SMOOTHING OUT THE SURFACE.
- IN AREAS NOT SEEDED AND MULCHED AFTER SURFACE ROUGHENING, SURFACES SHALL BE RE-ROUGHENED AS NECESSARY TO MAINTAIN GROOVE DEPTH AND SMOOTH OVER ROLL EROSION.

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

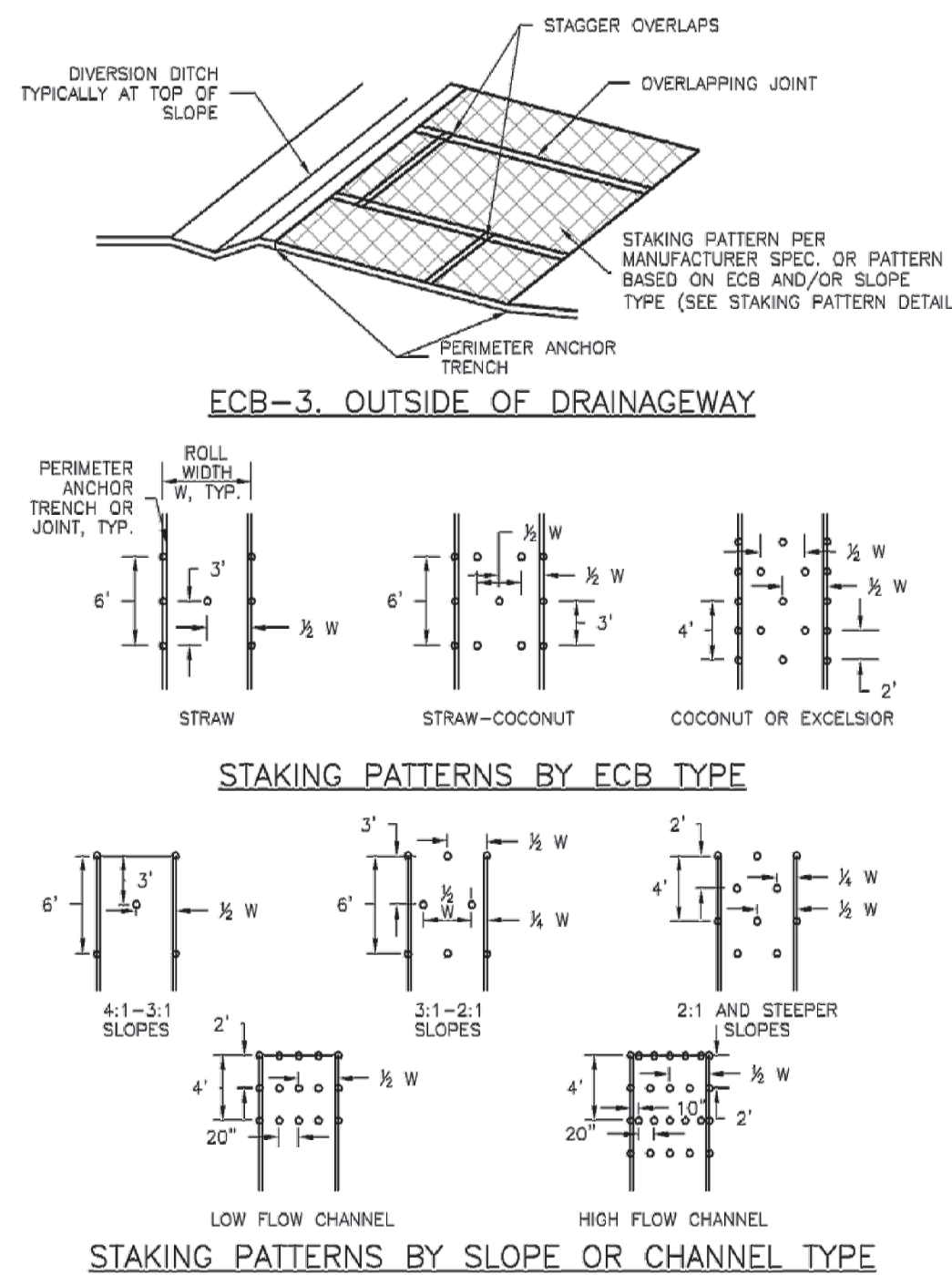
NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

November 2010 Urban Drainage and Flood Control District  
Urban Storm Drainage Criteria Manual Volume 3

SR-4

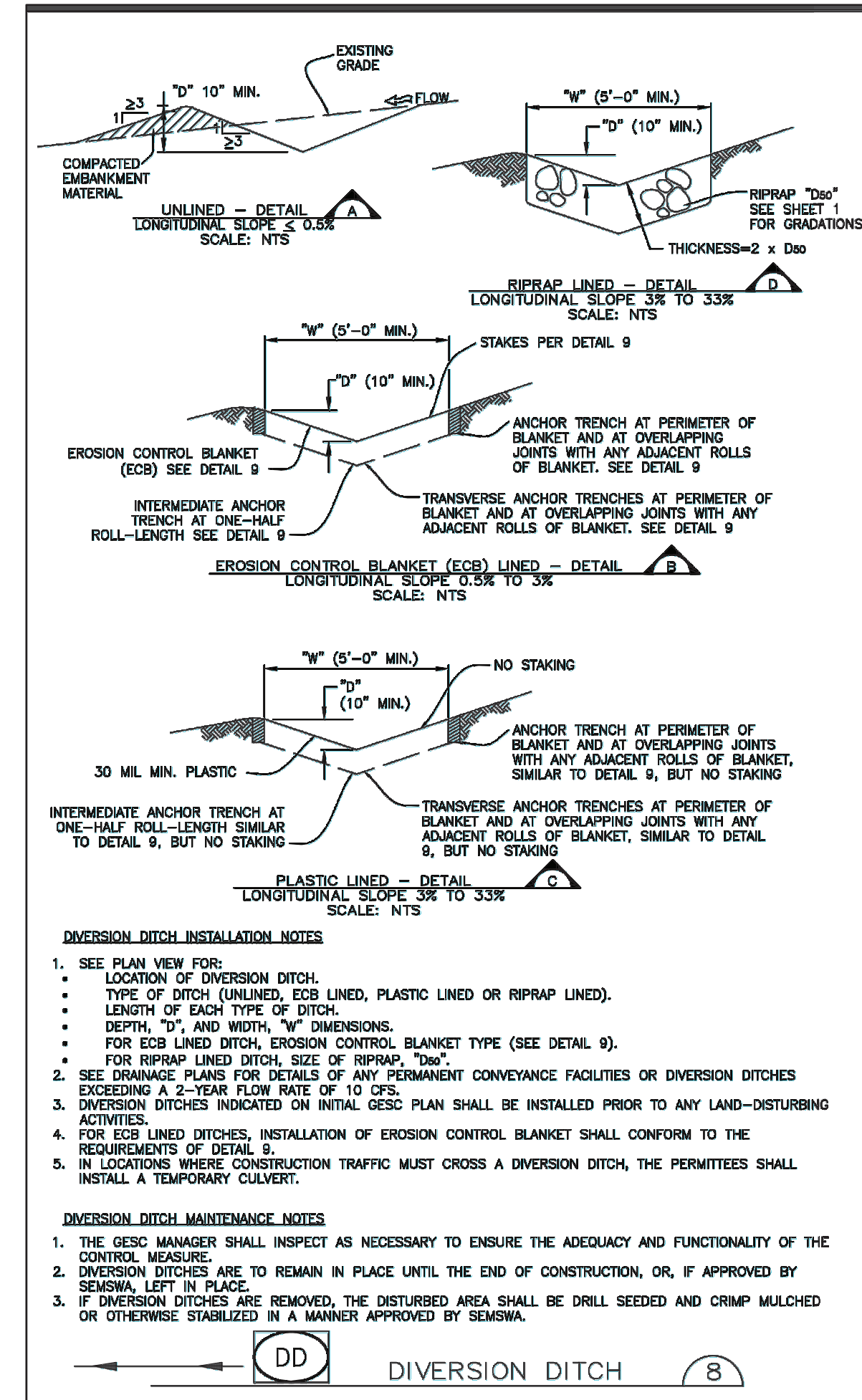
## Rolled Erosion Control Products (RECP)

EC-6



November 2010 Urban Drainage and Flood Control District  
Urban Storm Drainage Criteria Manual Volume 3

RECP-7



## EC-2 Temporary and Permanent Seeding (TS/PS)

## Temporary and Permanent Seeding (TS/PS)

Seeding dates for the highest success probability of perennial species along the Front Range are generally in the spring from April through early May and in the fall after the first of September until the ground freezes. If the area is irrigated, seeding may occur in summer months, as well. See Table TS/PS-3 for appropriate seeding dates.

Table TS/PS-1. Minimum Drill Seeding Rates for Various Temporary Annual Grasses

Species* (Common name)	Growth Season*	Pounds of Pure Live Seed (PLS)/acre*	Planting Depth (Inches)
1. Oats	Cool	35 - 50	1 - 2
2. Spring wheat	Cool	25 - 35	1 - 2
3. Spring barley	Cool	25 - 35	1 - 2
4. Annual ryegrass	Cool	10 - 15	½
5. Millet	Warm	3 - 15	½ - ¾
6. Sudangrass	Warm	5-10	½ - ¾
7. Sorghum	Warm	5-10	½ - ¾
8. Winter wheat	Cool	20-35	1 - 2
9. Winter barley	Cool	20-35	1 - 2
10. Winter rye	Cool	20-35	1 - 2
11. Triticale	Cool	25-40	1 - 2

\* Successful seeding of annual grass resulting in adequate plant growth will usually produce enough dead-plant residue to provide protection from wind and water erosion for an additional year. This assumes that the cover is not disturbed or moved closer than 8 inches.

Hydraulic seeding may be substituted for drilling only where slopes are steeper than 3:1 or where access limitations exist. When hydraulic seeding is used, hydraulic mulching should be applied as a separate operation, when practical, to prevent the seeds from being encapsulated in the mulch.

\* See Table TS/PS-3 for seeding dates. Irrigation, if consistently applied, may extend the use of cool season species during the summer months.

\* Seeding rates should be doubled if seed is broadcast, or increased by 50 percent if done using a Brillion Drill or by hydraulic seeding.

June 2012 Urban Drainage and Flood Control District  
Urban Storm Drainage Criteria Manual Volume 3

TS/PS-3

## EC-2 Temporary and Permanent Seeding (TS/PS)

Table TS/PS-2. Minimum Drill Seeding Rates for Perennial Grasses

Common* Name	Botanical Name	Growth Season*	Growth Form	Seeds/ Pound	Pounds of PLS/acre
<b>Alkalali Soil Seed Mix</b>					
Alkali sacaton	<i>Sporobolus airoides</i>	Cool	Bunch	1,750,000	0.25
Basin wildrye	<i>Elymus cinereus</i>	Cool	Bunch	165,000	2.5
Sodar streambank wheatgrass	<i>Agropyron riparium 'Sodar'</i>	Cool	Sod	170,000	2.5
Jose tall wheatgrass	<i>Agropyron elongatum 'Jose'</i>	Cool	Bunch	79,000	7.0
Arriba western wheatgrass	<i>Agropyron smithii 'Arriba'</i>	Cool	Sod	110,000	5.5
<b>Total</b>					<b>17.75</b>
<b>Fertile Loamy Soil Seed Mix</b>					
Ephraim crested wheatgrass	<i>Agropyron cristatum 'Ephraim'</i>	Cool	Sod	175,000	2.0
Dural hard fescue	<i>Festuca ovina 'duriuscula'</i>	Cool	Bunch	565,000	1.0
Lincoln smooth brome	<i>Bromus inermis leys 'Lincoln'</i>	Cool	Sod	130,000	3.0
Sodar streambank wheatgrass	<i>Agropyron riparium 'Sodar'</i>	Cool	Sod	170,000	2.5
Arriba western wheatgrass	<i>Agropyron smithii 'Arriba'</i>	Cool	Sod	110,000	7.0
<b>Total</b>					<b>15.5</b>
<b>High Water Table Soil Seed Mix</b>					
Meadow foxtail	<i>Alopecurus pratensis</i>	Cool	Sod	900,000	0.5
Redtop	<i>Agrostis alba</i>	Warm	Open sod	5,000,000	0.25
Reed canarygrass	<i>Phalaris arundinacea</i>	Cool	Sod	68,000	0.5
Lincoln smooth brome	<i>Bromus inermis leys 'Lincoln'</i>	Cool	Sod	130,000	3.0
Pathfinder switchgrass	<i>Panicum virgatum 'Pathfinder'</i>	Warm	Sod	389,000	1.0
Alkali tall wheatgrass	<i>Agropyron elongatum 'Alkali'</i>	Cool	Bunch	79,000	5.5
<b>Total</b>					<b>10.75</b>
<b>Transition Turf Seed Mix*</b>					
Ruebens Canadian blugrass	<i>Poa compressa 'Ruebens'</i>	Cool	Sod	2,500,000	0.5
Dural hard fescue	<i>Festuca ovina 'duriuscula'</i>	Cool	Bunch	565,000	1.0
Citation perennial ryegrass	<i>Lolium perenne 'Citation'</i>	Cool	Sod	247,000	3.0
Lincoln smooth brome	<i>Bromus inermis leys 'Lincoln'</i>	Cool	Sod	130,000	3.0
<b>Total</b>					<b>7.5</b>

June 2012 Urban Drainage and Flood Control District  
Urban Storm Drainage Criteria Manual Volume 3

TS/PS-4

## Temporary and Permanent Seeding (TS/PS)

Table TS/PS-2. Minimum Drill Seeding Rates for Perennial Grasses (cont.)

Common Name	Botanical Name	Growth Season*	Growth Form	Seeds/ Pound	Pounds of PLS/acre
<b>Sandy Soil Seed Mix</b>					
Blue grama	<i>Bouteloua gracilis</i>	Warm	Sod-forming bunchgrasses	825,000	0.5
Camper little bluestem	<i>Setitachyrium scoparium 'Camper'</i>	Warm	Bunch	240,000	1.0
Prairie sandreed	<i>Calamovilfa longifolia</i>	Warm	Open sod	274,000	1.0
Sand dropseed	<i>Sporobolus cryptandrus</i>	Cool	Bunch	5,298,000	0.25
Vaughn sideoasis grama	<i>Bouteloua curtipendula 'Vaughn'</i>	Warm	Sod	191,000	2.0
Arriba western wheatgrass	<i>Agropyron smithii 'Arriba'</i>	Cool	Sod	110,000	5.5
<b>Total</b>					<b>10.25</b>
<b>Heavy Clay, Rocky Foothill Seed Mix</b>					
Ephraim crested wheatgrass <sup>d</sup>	<i>Agropyron cristatum 'Ephraim'</i>	Cool	Sod	175,000	1.5
Oahe Intermediate wheatgrass	<i>Agropyron intermedium 'Oahe'</i>	Cool	Sod	115,000	5.5
Vaughn sideoasis grama <sup>e</sup>	<i>Bouteloua curtipendula 'Vaughn'</i>	Warm	Sod	191,000	2.0
Lincoln smooth brome	<i>Bromus inermis leys 'Lincoln'</i>	Cool	Sod	130,000	3.0
Arriba western wheatgrass	<i>Agropyron smithii 'Arriba'</i>	Cool	Sod	110,000	5.5
<b>Total</b>					<b>17.5</b>

\* All of the above seeding mixes and rates are based on drill seeding followed by crimped straw mulch. These rates should be doubled if seed is broadcast and should be increased by 50 percent if the seeding is done using a Brillion Drill or is applied through hydraulic seeding. Hydraulic seeding may be substituted for drilling only where slopes are steeper than 3:1. If hydraulic seeding is used, hydraulic mulching should be done as a separate operation.

<sup>b</sup> See Table TS/PS-3 for seeding dates.

<sup>c</sup> If site is to be irrigated, the transition turf seed rates should be doubled.

<sup>d</sup> Crested wheatgrass should not be used on slopes steeper than 6H to 1V.

<sup>e</sup> Can substitute 0.5 lbs PLS of blue grama for the 2.0 lbs PLS of Vaughn sideoasis grama.

June 2012 Urban Drainage and Flood Control District  
Urban Storm Drainage Criteria Manual Volume 3

TS/PS-5

## EC-2 Temporary and Permanent Seeding (TS/PS)

Table TS/PS-3. Seeding Dates for Annual and Perennial Grasses

Seeding Dates	Annual Grasses (Numbers in table reference species in Table TS/PS-1)		Perennial Grasses	
	Warm	Cool	Warm	Cool
January 1-March 15			✓	✓
March 16-April 30	4	1,2,3	✓	✓
May 1-May 15	4		✓	
May 16-June 30	4,5,6,7			
July 1-July 15	5,6,7			
July 16-August 31				
September 1-September 30		8,9,10,11		
October 1-December 31			✓	✓

### Mulch

Cover seeded areas with mulch or an appropriate rolled erosion control product to promote establishment of vegetation. Anchor mulch by crimping, netting or use of a non-toxic tackifier. See the Mulching BMP Fact Sheet for additional guidance.

### Maintenance and Removal

Monitor and observe seeded areas to identify areas of poor growth or areas that fail to germinate. Reseed and mulch these areas, as needed.

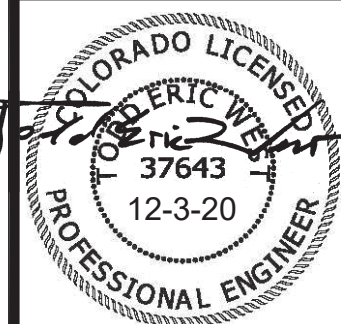
An area that has been permanently seeded should have a good stand of vegetation within one growing season if irrigated and within three growing seasons without irrigation in Colorado. Reseed portions of the site that fail to germinate or remain bare after the first growing season.

Seeded areas may require irrigation, particularly during extended dry periods. Targeted weed control may also be necessary.

Protect seeded areas from construction equipment and vehicle access.

June 2012 Urban Drainage and Flood Control District  
Urban Storm Drainage Criteria Manual Volume 3

TS/PS-6



PREPARED FOR:  
BLACK FOREST, LLC  
12740 BLACK FOREST ROAD  
COLORADO SPRINGS, CO 80908

ESCD Details 1  
CONSTRUCTION DOCUMENTS  
BLACK FOREST OFFICE  
COLORADO SPRINGS, COLORADO

BY: DATE:

REVISIONS:

19015  
12-03-2020  
TEW  
RCE

ESCD Details 1