

# STORMWATER MANAGEMENT PLAN (SWMP)

## **HEARTLAND DENTAL FALCON**

(LOT 2, MERIDIAN CROSSING FILING NO. 1)  
LOCATED IN SECTION 12, TOWNSHIP 13 SOUTH,  
RANGE 65 WEST OF THE 6TH PRINCIPAL MERIDIAN  
EL PASO COUNTY, STATE OF COLORADO

### **Applicant/Owner:**

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Engineering · Planning · Surveying

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## **I. Stormwater Management Plan (SWMP) General Requirements**

The Federal Clean Water Act and the Colorado Water Quality Control Act require stormwater discharge permits during construction at development sites that disturb one or more acres of land.

### **A. Colorado Department of Public Health and Environment (CDPHE) General Requirements**

1. A stormwater management plan (SWMP) shall be developed for each construction site covered by the Construction Stormwater Permit prior to commencement of construction activities. For public emergency related sites, a plan shall be created no later than days after the commencement of construction activities.
2. The SWMP shall be prepared in accordance with good engineering, hydrologic and pollution control practices. The plan need not be prepared by a registered engineer.
3. The permittee need only submit the SWMP to the CDPHE upon request, it is not required with the application for the Construction Stormwater Permit.
4. The permittee must implement the provisions of the SWMP as written and updated, from commencement of construction activity until final stabilization is complete.
5. A copy of the SWMP must be retained onsite or be onsite when construction activities are occurring at the site unless the permittee specifies another location and obtains approval from the CDPHE.

### **B. Signatory Requirements for Documents Submitted to the CDPHE**

Documents required for submittal to the CDPHE in accordance with the Construction Stormwater Permit, including applications for permit coverage and other documents as requested by the CDPHE, must include signatures by both the owner and the operator, except for instances where the duties of the owner and operator are managed by the owner.

*"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, 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."*

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Brian Schrock, Manager (Applicant)  
WMG Development

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Paul Ellis, Manager (Contractor)  
WIMCO Corp

### **C. Consistency with Other Plans**

The permittee may incorporate, by reference, applicable portions of plans prepared for other purposes at their facility. Plans or portions of plans incorporated by reference must be available along with the SWMP.

### **D. Required SWMP Modifications**

At nearly every site, the implemented control measures will have to be modified to adapt to changing site conditions, or to ensure that potential pollutants are consistently and properly managed. The pollutant sources and management practices at a site must be reviewed on an ongoing basis. When control measures or other site conditions change, the SWMP must be modified to accurately reflect the actual field conditions. Examples include, but are not limited to, removal of control measures, identification of new potential pollutant sources, addition of control measures, modification of control measure installation and implementation criteria or maintenance procedures, and changes in items included in the site map and/or description. The plan should be viewed as a living document that is continuously being reviewed and modified as part of the overall process of assessing and managing stormwater quality issues at the site.

The SWMP must be amended when the following occurs:

- A change in design, construction, operation, or maintenance of the site requiring implementation of new or revised control measures;
- The plan proves ineffective in controlling pollutants in stormwater runoff in compliance with the permit conditions;
- Control measures identified in the SWMP are no longer necessary and are removed; and
- Corrective actions are taken onsite that result in a change to the SWMP.

For SWMP revisions made prior to or following a change(s) onsite, including revisions to sections addressing site conditions and control measures, a notation must be included in the plan that identifies:

- The date of the site change, the control measure removed, or modified,
- The location(s) of those control measures, and
- Any changes to the control measures(s).

The permittee must ensure the site changes are reflected in the SWMP. The permittee is noncompliant with the Construction Stormwater Permit until the plan revisions have been made.



## **II. Stormwater Management Plan Requirements**

### **A. Qualified Stormwater Manager**

An individual knowledgeable in the principles and practices of erosion and sediment control and pollution prevention, and with the skills to assess conditions at construction sites that could impact stormwater quality and to assess the effectiveness of stormwater controls implemented to meet the requirements of this permit.

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Paul Ellis, Construction Manager  
WIMCO Corp

### **B. Spill Prevention and Response Plan**

Whenever significant quantities of fuels, materials, vehicle fluids, or other pollutants are to be used on site, specific procedures for material containment and spill prevention shall be developed and implemented.

#### **Introduction**

The following Spill Prevention and Control Plan shall be implemented during the construction of Heartland Dental Falcon. This plan will be implemented to meet the requirements of El Paso County.

#### **Materials On-Site**

Spill control procedures will be implemented when materials are stockpiled or when chemicals and/or fluids are used in the construction area.

#### **Stockpiles of Dry Materials**

The following spill prevention procedures shall be implemented:

All materials shall be stockpiled in designated areas, with BMPs used to reduce and minimize the runoff of contaminants. BMPs such as silt fence and sediment control logs will be installed according to El Paso County criteria using the details shown in the Erosion Control plans. Loading and unloading operations shall be performed in a manner to limit materials from being spilled. Any spilled materials shall be swept up immediately after the operations are performed.

#### **Vehicle Fueling**

The following spill prevention procedures shall be implemented:

All vehicle fueling will be done off-site as much as possible. All on-site fueling operations will be performed in designated areas. Measures will be taken where necessary to reduce and minimize spills during vehicle fueling operations. These measures may include the placement of a temporary berm around the fueling area, covering the fueling area under a temporary portable

structure, and/or the placement of drip pans under valves and tank openings. Berms will be constructed around all fueling areas. An adequate supply of absorbents will also be stockpiled at each fueling area.

### **Routine Vehicle and Equipment Maintenance**

The following spill prevention procedures shall be implemented:

All vehicle maintenance will be performed off-site when possible. However, there may be occasions where construction equipment and vehicles may break down at the site and on-site repairs are more feasible. On-site vehicle and equipment maintenance, if needed, will be performed in designated areas, where practical, and enclosed by earthen berms. All maintenance areas will maintain an adequate supply of drip pans. These pans will be placed underneath vehicles as needed and absorbents will be used in the event of a minor spill or leak.

### **SPILL RESPONSE**

**NOTE: IN CASE OF FIRE, EVACUATE ALL PERSONNEL FROM THE IMMEDIATE AREA, RENDER FIRST AID TO ANYONE WHO IS INJURED, AND DIAL 911 IMMEDIATELY. TAKE APPROPRIATE STEPS TO PROTECT HUMAN LIFE AND TO CONTROL FIRES FIRST. SPILL CONTROL IS A SECONDARY CONCERN.**

### **Cleanup and Removal Procedures**

Upon detection of any spill, the first action to be taken is to ensure personal safety. All possible ignition sources, including running engines, electrical equipment (including cellular telephones, etc.), or other hazards will be immediately turned off or removed from the area. The extent of the spill and the nature of the spilled material will be evaluated to determine if remedial actions could result in any health hazards, escalation of the spill, or further damage that would intensify the problem. If such conditions exist, a designated employee will oversee the area of the spill and the construction supervisor will be notified immediately.

The source of the spill will be identified, and, if possible, the flow of pollutants stopped if it can be done safely. However, no employee will attend to the source or begin cleanup of the spill until **ALL** emergency priorities (fire, injuries, etc.) have been addressed.

### **Small Spills**

Small spills (usually <5 gallons) consist of minor quantities of gasoline, oil, anti-freeze, or other materials that can be cleaned up by a single employee using readily available materials.

The following procedures shall be used for cleanup of small spills:

1. Ensure personal safety, evaluate the spill, and if possible, stop the flow of pollutants.
2. Contain the spread of the spill using absorbents, portable berms, sandbags, or other available measures.

3. Spread absorbent materials on the area to soak up as much of the liquid as possible and to prevent or minimize infiltration into the soil.
4. Once the liquids have been absorbed, remove all absorbents from the spill and place the materials in a suitable storage container. On paved areas, wipe any remaining liquids from the surface and place the materials in a storage container. Do not spray or wash down the area using water. For open soil areas, excavate any contaminated soil as soon as possible and place the soil in a suitable storage container. All materials will then be transported off-site for disposal.
5. If immediate transfer and storage of the contaminated soil is not practical, excavate and place the contaminated soil on a double thickness sheet of 3-mil or higher polyethylene film. In addition, a small berm should be formed around the outer edges of the soil stockpile, underneath the polyethylene film, to ensure that contaminants are not washed from the site during precipitation events and that materials do not seep through the berm.
6. Record all significant facts and information about the spill, including the following:
  - Type of pollutant
  - Location
  - Apparent source
  - Estimated volume
  - Time of discovery
  - Actions taken to clean up spill
7. Notify the supervisor of the spill and provide the information from Item #6. The supervisor will then contact El Paso County.

### **Medium to Large Spills**

Medium to large spills consist of larger quantities of materials (usually >5 – 25 gallons) that are used on site that cannot be controlled by a single employee. Generally, a number of facility personnel will be needed to control the spill and a response may require the suspension of other facility activities.

The following procedure shall be used for the cleanup of medium to large spills:

1. Ensure personal safety, evaluate the spill, and if possible, stop the flow of pollutants.
2. Immediately dispatch a front-end loader or similar equipment to the spill and construct a berm or berms down gradient of the spill to minimize the spread of potential pollutants. On paved surfaces, portable berms, sandbags, booms, or other measures will be used to control the lateral spread of the pollutants.
3. When the spread of the spill has been laterally contained, contact the supervisor or designated facility employee and provide them information on the location, type, and amount of spilled material, and a briefing on the extent of the spread and measures undertaken to contain the contaminants.
4. Depending on the nature of the spill, mobilize additional resources as needed to contain the contaminants.

5. Cleanup will commence when the lateral spread has been contained and the notification to the supervisor has been made.
6. Freestanding liquid will be bailed or pumped into 55-gallon storage drums, steel tanks, or other suitable storage containers. When all the liquid has been removed from the pavement or soil layer, absorbents will be applied to the surface and transferred to the storage containers when they have soaked up as much of the spill as possible.
7. On paved surfaces, the remaining contaminants will be removed to the extent possible, with rags, sweeping, or similar measures. The area of the spill will not be sprayed or washed down using water. Any contaminant-soaked materials will be placed into the storage containers with the other absorbents.
8. The remaining contaminated soils will be excavated and loaded into a dump truck(s) for disposal off-site at a designated facility. If transport off-site is not immediately available, the remaining soils will be stockpiled on a double thickness sheet of 3-mil or higher polyethylene film. In addition, a small berm will be formed around the outer edges of the soil stockpile, underneath the polyethylene film, to ensure that contaminants are not washed from the site during precipitation and do not seep through the berm.
9. Record all significant facts and information about the spill, including the following:
  - Type of pollutant
  - Location
  - Apparent source
  - Estimated volume
  - Time of discovery
  - Actions taken to clean up spill
10. Provide the supervisor (or designated employee) with the information from Item #9. The supervisor will then contact El Paso County.

## **NOTIFICATION**

Notification to El Paso County and the Colorado Department of Public Health & Environment (CDPHE) is required if there is any release or suspected release of any substance, including oil or other substances that spill into or threaten State Waters. Unless otherwise noted, notifications are to be made by the supervisor and only after emergency responses related to the release have been implemented. This will prevent misinformation and assures that notifications are properly conducted.

The notification requirements are as follows:

1. **Spills into/or Threatens State Waters:** Immediate notification is required for releases that occur beneath the surface of the land or impact or threaten waters of the State or threaten the public health and welfare. Notifications that will be made are:
  - a. For any substance, regardless of quantity, contact CDPHE at 1-877-518-5608.  
State as follows:
    - i. Give your name.

- ii. Give location of spill.
- iii. Describe the nature of the spill, type of products, and estimate size of spill.
- iv. Describe type of action taken thus far, type of assistance or equipment needed.
- b. For any quantity of oil or other fluids, call the National Response Center at 1-800-424-8802. State as follows:
  - i. Give your name.
  - ii. Give location of spill.
  - iii. Describe the nature of the spill, type of product, and estimate size of spill.
  - iv. Describe type of action taken thus far, type of assistance or equipment needed.

2. **Reportable Quantity Spill on Land Surface:** Immediate notification is required of a release upon the land surface of an oil in quantity that exceeds 25 gallons, or of a hazardous substance that equals or exceeds 10 pounds or its reportable quantity under Section 101(14) of the Comprehensive Environmental Response, Compensation Liability Act (CERCLA) of 1980 as amended (40 CFR Part 302) and Section 329 (3) of the Emergency Planning and Community Right to Know Act of 1986 (40 CFR Part 355) whichever is less. This requirement does apply at a minimum to the substances listed in Table A below.

**TABLE A**

Substances Requiring Notification

**SUBSTANCE REPORTABLE QUANTITY**

Motor Oil	25 Gallons
Hydraulic Oil	25 Gallons
Gasoline/Diesel Fuel	25 Gallons

The notification procedures to be followed are:

- a. Give your name.
  - b. Give location of spill.
  - c. Describe nature of the spill, type of product, and estimate size of spill.
  - d. Describe type of action taken thus far, type of assistance or equipment needed.
  - e. Give name of land owner
  - f. Specify department responsible for any facilities that may be impacted.
3. Notification is not required for release of oil upon the land surface of 25 gallons or less that will not constitute a threat to public health and welfare, the environment or a threat of entering the waters of the State.
  4. Notification, as required in paragraphs 1 and 2 above, will be made to the CDPHE using the 24-hour telephone number to report environmental spills. All information known about the release at the time of discovery is to be included, such as the time of occurrence, quantity and type of material, location and any corrective or clean-up actions presently being taken. Table B lists these phone numbers.

## SPILL RESPONSE CONTACTS

**TABLE B**

Emergency Notification Contacts

Name/Agency	Number
Fire Department	911
Police	911
Ambulance	911
Hospital	911
Colorado Springs Police Dept—Stetson Hills Division Non-Emergency 24-Hr	719-444-3140
National Response Center	800-424-8802
CDPHE – Report Environmental Spills (24 hrs/day)	877-518-5608
Colorado Emergency Planning Committee	303-273-1622
El Paso County	719-520-7276

It is the responsibility of the supervisor to contact El Paso County, CDPHE, and the National Response Center.

- **The National Response Center** is to be contacted when a release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR 110, 4- DFR 117, or 40 CFR 302 occurs during a 24-hour period.
- Notification to the **CDPHE** is required if there is any release or suspected release of any material, including oil or hazardous substances that spill into or threaten state waters.

## REPORTS

The CDPHE requires written notification of a spill or discharge of oil or other substance that may cause pollution of the waters of the State of Colorado. A written report must be submitted to the Water Quality Control District (WQCD) within five days after becoming aware of the spill or discharge. The CDPHE requires a written final report within 15 days for all releases of an oil or hazardous substance that require implementation of a contingency plan. The CDPHE may also require additional reports on the status of the clean up until any required remedial action has been completed. Written notification of reports must contain at a minimum:

1. Date, time, and duration of the release.
2. Location of the release.
3. Person or persons causing and responsible for the release.
4. Type and amount of oil or substance released.
5. Cause of the release.
6. Environmental damage caused by the release.
7. Actions taken to respond, contain, and clean up the release.
8. Location and method of ultimate disposal of the oil or other fluids.
9. Actions taken to prevent a reoccurrence of the release.
10. Any known or anticipated acute or chronic health risks associated with the release.
11. When appropriate, advice regarding medical attention necessary for exposed individuals.

### **C. Materials Handling**

Control measures implemented at the site to minimize impacts from handling significant materials that could contribute pollutants to runoff:

1. Concrete Washout Area and Masonry Mixing Station – designated area and appropriately labeled and maintained with a perimeter berm.
2. Stockpile Management – a designated stockpile location surrounded by silt fence.
3. Stabilized Staging Area – clearly designated area on the southeast side of the site, where construction equipment, vehicles, and other materials are stored. No construction materials shall be stored on neighboring streets or properties.

### **D. Potential Sources of Pollution**

Potential pollutant sources for this site include the following:

1. All disturbed and stored soils – to be mitigated by the use of silt fence, temporary or permanent seeding, and erosion control blankets;
2. Vehicle tracking of sediments - to be mitigated by vehicle tracking control measures at the entrances to the site;
3. Management of contaminated soils – not anticipated for this site;
4. Loading and unloading operations – to be mitigated by use of a designated stabilized staging area;
5. Outdoor storage activities (building materials, fertilizers, chemicals, etc.) – to be mitigated by use of designated stabilized staging area;
6. Vehicle and equipment maintenance and fueling – to be mitigated by use of a designated stabilized staging area;
7. Significant dust or particulate generating processes – to be mitigated by road watering as needed;

8. Routine maintenance activities involving fertilizers, pesticides, detergents, fuels, solvents, oils, etc. – to be mitigated by limiting use and proper storage within the stabilized staging area;
9. On-site waste management practices (waste piles, liquid wastes, dumpsters, etc.) – to be mitigated by having a designated location for waste;
10. Concrete truck/equipment washing, including the concrete truck chute and associated fixtures and equipment – to be mitigated by use of a concrete washout area located north of the stabilized staging area;
11. Dedicated asphalt and concrete batch plants are not anticipated to be used for construction of this site. If required, pollutants shall be mitigated by containing within the stabilized staging area;
12. Non-industrial waste sources such as worker trash and portable toilets – to be mitigated by having a designated location for each;
13. Other areas or procedures where potential spills can occur – to be mitigated by having a spill procedure in place and containment provided by silt fencing around the site.

## **E. Implementation of Control Measures**

1. Structural Practices for Erosion and Sediment Control:
  - a. Rock Sock – used to trap sediment from stormwater runoff that flows onto roadways as a result of construction activities.
  - b. Silt Fence – a sediment barrier designed to intercept sheet flow runoff from disturbed areas.
  - c. Inlet/Culvert Protection – permeable barriers installed around an inlet/culvert to filter runoff and remove sediment prior to entering a storm drain system. All storm inlet protection devices, for erosion and sediment control measures in construction areas, need to be marked with a tubular reflective marker, which shall meet MUTCD requirements (Manual on Uniform Traffic Control Devices). This will alert the traveling public, along with snow and ice removal operators of the locations of the devices. El Paso County will NOT be responsible for any unmarked storm inlet protection devices that are damaged during snow and ice removal operations. Replacement/repair of these devices will be the responsibility of contractor and/or storm water permit holder
  - d. Check Dams – grade control structure (rock sock) placed in drainage ditch to limit the erosion of stormwater by reducing flow velocity.
2. Non-Structural Practices for Erosion and Sediment Control:
  - a. Temporary and Permanent Seeding – an erosion control method used to stabilize disturbed areas that will be inactive for an extended period or are at final grade and will not be otherwise stabilized.
  - b. Wind Erosion / Dust Control – site watering to keep soil particles from entering the air.
3. Phased Implementation
  - a. Pre-disturbance and Site Access Phase includes the installation of silt fence, inlet/culvert protection, rock socks and vehicle tracking control.



- b. Site Clearing and Grubbing Phase includes the installation of stabilized staging area, concrete washout area, masonry mixing station, stockpile location with perimeter control, temporary seeding if needed, and road watering as needed.
  - c. Utility and Infrastructure Installation Phase includes rock socks as needed, and street sweeping as needed.
  - d. Final Stabilization Phase includes temporary or permanent seeding and removing all temporary control measures when site has reached final stabilization.
- 4. Vehicle Tracking Control will be implemented at site entrance to help remove sediment from vehicles, reducing tracking onto paved surfaces.
  - 5. Street Sweeping – to reduce and remove sediment on roadways.
  - 6. Groundwater and Stormwater Dewatering – not anticipated for this site.

## **F. Site Description**

The Heartland Dental Falcon location sits on 1.09 acres of undeveloped land in Lot 2 of the Meridian Crossing Filing No. 1 Subdivision within the unincorporated Town of Falcon, El Paso County, Colorado. The property includes landscaping and a monument sign along North Meridian Road, private roads on the west and south, including a shared access with McDonald's to the east. There is an existing sidewalk along private drives at the south portion of the site. The interior consists of undeveloped land with existing irrigation and a concrete cross pan access on the southwest line. It is estimated that existing vegetative ground cover is 95%. This was determined from aerial imagery and confirmed with an on-site visual inspection.

Proposed site improvements will include a 4,260 square foot building, parking lot, and landscaping improvements. The site design will maintain historic drainage patterns by directing runoff south via concrete pans and sheet flow across the property. Runoff will flow into the subdivision where water is directed into a regional detention pond pond.

Total Site Area: 1.09 acres

Total Disturbed Area: 0.68 acres

According to the USGS Soil Web Survey the site has a K Factor of 0.10, which means the site has a low potential for erosion. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water.

It is not anticipated that substantial groundwater discharges will be encountered during construction. Any construction dewatering, subterranean or foundation dewatering, uncontaminated vault dewatering, or utility work that generates discharge shall be routed through the existing BMPs, and additional BMPs may be required.

The site discharges to private drives on the west and south sides of the property which direct flows into a subdivision detention pond. The site is located in Drainage Basin Falcon CHWS1400. Released flows are directed under SH 24 where flows are allowed to spread overland.

This site will utilize erosion and sediment control measures (control measures) to minimize the impact on water quality both during and after construction. A subdivision infiltration pond will be utilized after construction to treat the required water quality capture volume produced by the developed site.

### **Construction Scheduling**

#### **Phase I**

- i. Demolition
  - (a) Proposed Start Date 5/22
  - (b) Proposed Completion Date 6/22

#### **Phase II**

- i. Grading and Foundation Operations
  - (a) Proposed Start Date 5/22
  - (b) Proposed Completion Date 6/22
- ii. Utility/Infrastructure Construction
  - (a) Proposed Start Date 5/22
  - (b) Proposed Completion Date 6/22
- iii. Building Construction
  - (a) Proposed Start Date 6/22
  - (b) Proposed Completion Date 11/22
- iv. Landscaping/Site Stabilization
  - (a) Proposed Start Date 10/22
  - (b) Proposed Completion Date 11/22

### **Construction Phasing**

#### **Phase I**

- i. Demo Operations

There are areas of existing concrete and asphalt pavement that will be sawcut and removed to accommodate tie-in of new asphalt pavement, and utility connections.

Proposed BMPs:

- Street Sweeping\*
  - Perimeter Control \*
  - Portable Toilets
  - Rock Socks
  - Vehicle Tracking Control
- \*See below for maintenance schedule

## Phase II

### i. Grading Operations

Clearing and grubbing to remove any existing vegetation will occur first. Topsoil will be stripped and stockpiled on site. Rough grading will then be completed with the drainage swale and offsite swale grading. Final grading will be performed over the majority of the phase of construction, prior to the beginning of grading operations.

Proposed BMPs:

- Vehicle Tracking Control\*
- Rock Socks\*
- Site Stabilization\*
- Spill Prevention/Containment\*
- Street Sweeping\*
- Silt Fence\*
- Perimeter Control\*

\*See below for maintenance schedule

### ii. Utility/Infrastructure Construction

Wet utilities to be constructed on site include sanitary sewer and water service. Parking lot paving will be coordinated with building construction.

Proposed BMPs:

- Vehicle Tracking Control \*
- Site Stabilization \*
- Spill Prevention/Containment \*
- Concrete Washout Containment \*
- Street Sweeping \*
- Perimeter Control \*
- Soil Stockpile
- Rock Socks

\*See below for maintenance schedule

### iii. Building Construction

Proposed building construction to be coordinated with parking lot paving.

Proposed BMPs:

- Vehicle Tracking Control \*
- Site Stabilization \*
- Spill Prevention/Containment \*
- Concrete Washout Containment \*
- Street Sweeping \*
- Perimeter Control \*

- Soil Stockpile
- Rock Socks

\*See below for maintenance schedule

#### iv. Landscaping/Site Stabilization

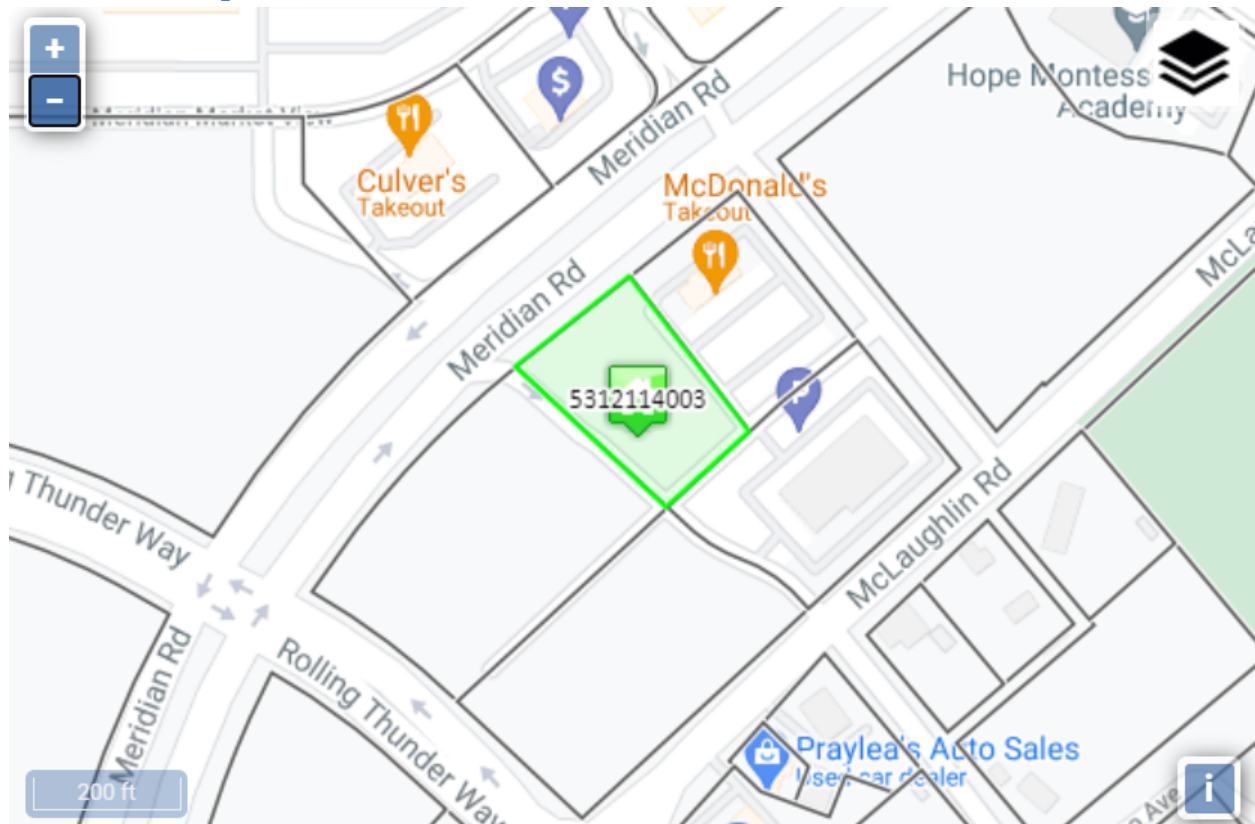
On site landscaping consists of mulch, shrubs, trees, grass, and cobble. Temporary and permanent stabilization will be provided as necessary.

Proposed BMPs:

- Permanent Stabilization \*
- Spill Prevention/Containment \*
- Street Sweeping \*
- Perimeter Control \*
- Rock Socks

\*See below for maintenance schedule

### G. Site Map



## H. Final Stabilization and Long-term Stormwater Management

Final stabilization will include temporary or permanent seeding on all disturbed areas as well as the paved and hardscaped areas per the erosion control and landscaping plans. Final stabilization will be achieved once uniform vegetation of at least 70% has been established. During final stabilization, all temporary control measures will be removed. Long-term stormwater management will include maintenance of the subdivision retention pond. The majority of the site will be captured in the subdivision infiltration pond.

## I. Site Inspection Reports

Inspection and maintenance should be performed on all control measures periodically and after every significant storm event. The minimum inspection schedule of the stormwater management system must be performed and documented at least every 7 days, and within 24 hours of any precipitation or snowmelt event. If more frequent inspections are required to ensure that control measures are properly maintained and operated, the inspection schedule must be modified to meet this need. A Site Inspection Report must be completed for each inspection, this report is included in **Appendix B** of this report.

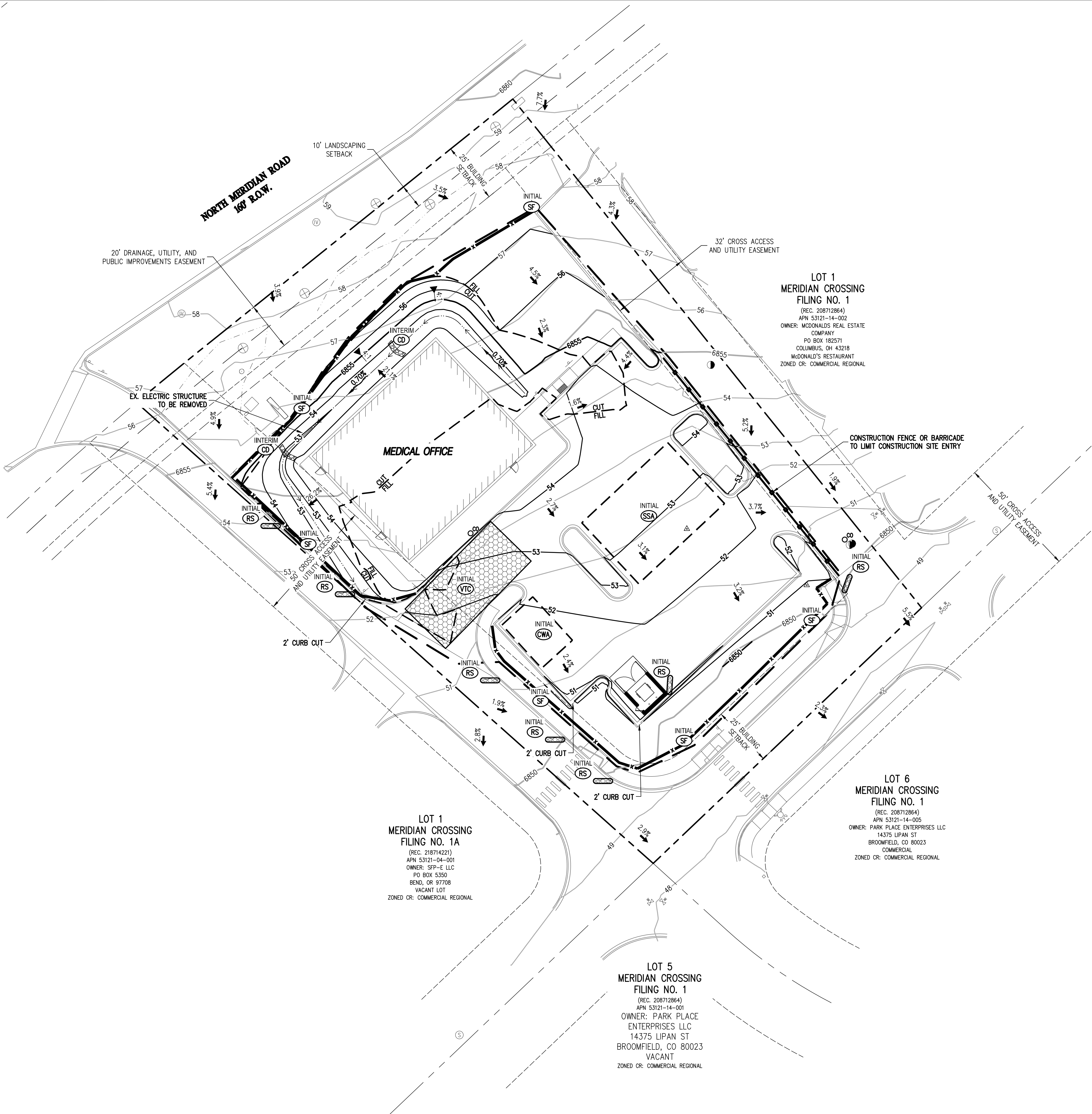
## References

1. *Drainage Criteria Manual*, Volumes 1 and 2, El Paso County, October 2018.
2. *Stormwater Management Plan Preparation Guidance*, Colorado Department of Public Health and Environment, 2021.

## APPENDIX A



N:\co35036CS - WMG Falcon\Drawings\Planning Documents\SDP\35036 EROS PLAN.dwg, 12/17/2021 1:19:58 PM, Luke Steeber



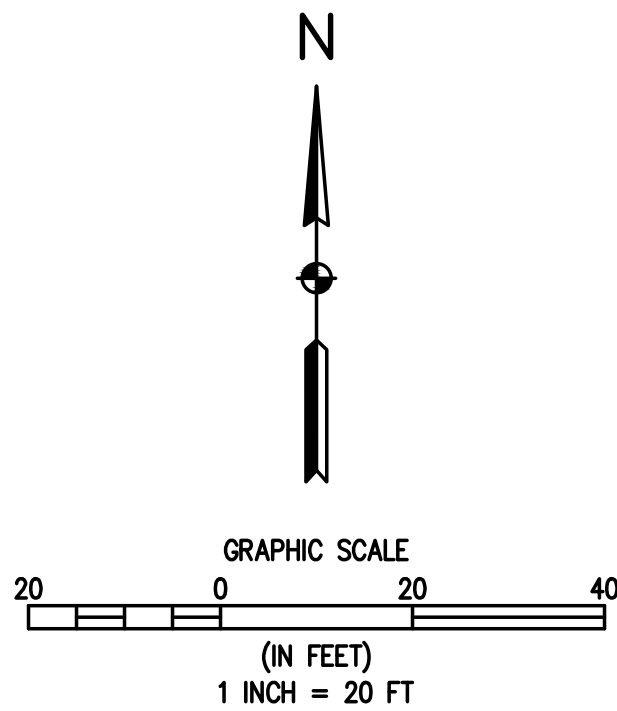
LEGEND

EXISTING LINETYPES	PROPOSED LINETYPES	
81	81	MINOR CONTOUR (1' INTERVAL)
		LOT LINE
		EASEMENT
		EDGE OF ASPHALT
		EDGE OF BUILDING
		LIMITS OF DISTURBANCE
SAN	SAN	SANITARY SEWER MAIN
SS	SS	SANITARY SEWER SERVICE
W	W	WATER LINE
WS	WS	WATER SERVICE
GAS	GAS	GASLINE
E	E	UNDERGROUND ELECTRIC
T	T	UNDERGROUND TELEPHONE

EXISTING SYMBOLS	PROPOSED SYMBOLS	
		FIRE HYDRANT
		WATER VALVE
		SANITARY MANHOLE
		CLEANOUT
		DECIDUOUS TREE
		SIGN
		ADA PARKING STALL
		DEAD TREE
		IRRIGATION VALVE
		VEHICLE TRACKING CONTROL
		STABILIZED STAGING AREA
		CHECK DAM
		ROCK SOCK
		SILT FENCE
		CONCRETE WASHOUT AREA

NOTES

- PER FEMA FIRM PANEL 08041C05616 DATED 12/7/2018, THE PROJECT SITE IS LOCATED IN ZONE X, AN AREA OF MINIMAL FLOOD HAZARD.
- PRIOR TO ELECTRIC UTILITY STRUCTURE REMOVAL ONSITE, CONTRACTOR SHALL COORDINATE WITH MOUNTAIN VIEW ELECTRIC ASSOCIATION.



**BASELINE**  
Engineering • Planning • Surveying

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DESIGNED BY	LDS
DRAWN BY	JDD
CHECKED BY	MRB

DATE	
PREPARED BY	

REVISION	DESCRIPTION

EL PASO COUNTY  
LOT 2, MERIDIAN CROSSING FILING 1  
7225 N. MERIDIAN ROAD  
STORMWATER MANAGEMENT PLAN

WMG FALCON  
FALCON, COLORADO

PREPARED UNDER THE DIRECT SUPERVISION OF

**PRELIMINARY  
NOT FOR  
CONSTRUCTION**

FOR AND ON BEHALF OF BASELINE CORPORATION	
INITIAL SUBMITTAL	8/25/2021
DRAWING SIZE	24" X 36"
SURVEY FIRM	SURVEY DATE
BEC	4/08/2021
JOB NO.	C035036
DRAWING NAME	35036 EROS PLAN.dwg
SHEET	1 OF 1

PCD FILE NO. PPR-21-045



## Check Dam

### What it is

Check dams are small, temporary or permanent dams constructed across a drainage ditch, swale or channel to reduce the velocity of concentrated flows and to trap sediment eroded from upstream. Check dams can be constructed out of rocks, gravel-filled sandbags or straw bales.



### When and Where to use it

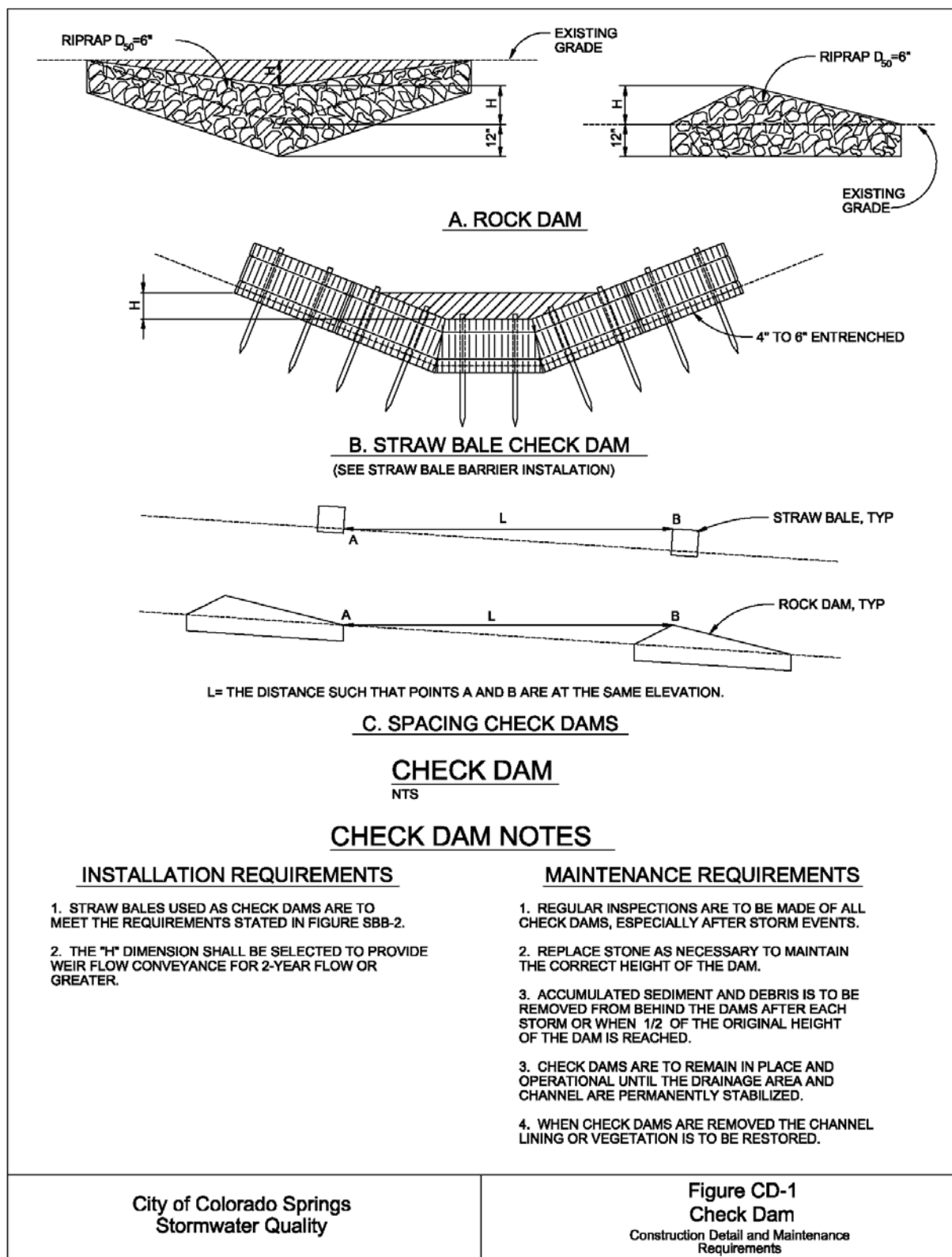
- In open channels that receive flow from drainage between 1 and 10 acres.
- In steeply sloped swales.
- In swales that need protection during the establishment of grasses or prior to installation of a non-erodible lining.

### When and Where NOT to use it

- In live streams.
- In channels that receive flow from drainage areas greater than 10 acres.
- In channels that will be overtopped by flow once the dams are constructed.

### Construction Detail and Maintenance Requirements

Figure CD-1 provides a construction detail and maintenance requirements for a check dam.



## Erosion Control Blankets

### What it is

Erosion control blankets are geotextiles or filter fabrics that are used to stabilize soils, steep slopes and drainage channels.



### **TYPES OF EROSION CONTROL BLANKETS**

- WOVEN OR BONDED SYNETHETIC MATERIALS SUCH AS POLYPROPELENE, POLYESTER, POLYETHEYLENE, NYLON, POLYVINYL CHLORIDE, GLASS AND VARIOUS MIXTURES OF THESE.
- MULCH MATTING MADE FROM JUTE OR OTHER WOOD FIBER THAT HAS BEEN FORMED INTO SHEETS.
- NETTING MADE FROM JUTE OR OTHER WOOD FIBER, PLASTIC, PAPER, OR COTTON USED TO HOLD MULCH AND MATTING TO THE GROUND.
- BLANKETS OF WOVEN STRAW MULCH WITH A SYNTHETIC LAYER OR NET.

### **When and Where to use it**

- In temporary and permanent swales.
- To protect recently seeded slopes.
- In drainageway channels.

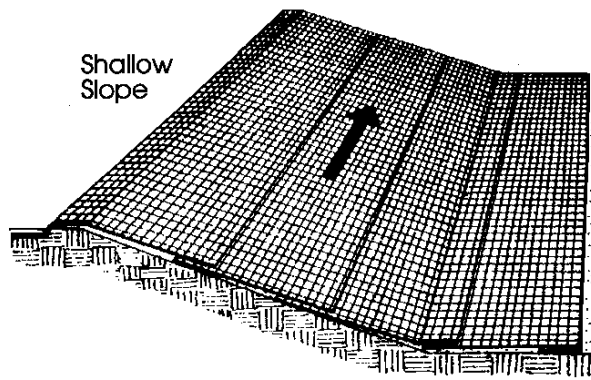
### **When and Where NOT to use it**

- In swales with slopes greater than 5 percent or with stormwater velocities > 8 feet per second.

### **Installation and Maintenance Requirements**

Installation requirements are provided in Figures ECB-1 and ECB-2.

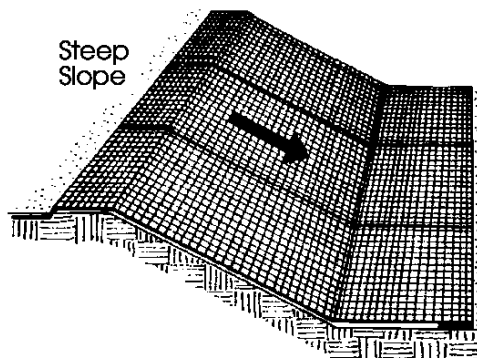
Maintenance requirements include regular inspections to determine if fabric is damaged or has come loose, and appropriate repairs or replacement of damaged materials.



Shallow  
Slope

On shallow slopes, strips of netting may be applied across the slope.

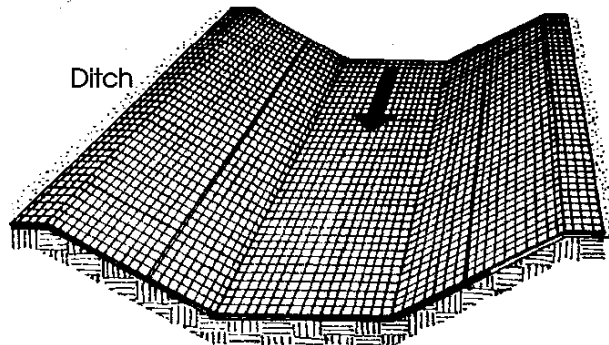
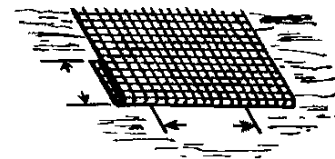
Where there is a berm at the top of the slope, bring the netting over the berm and anchor it behind the berm.



Steep  
Slope

On steep slopes, apply strips of netting parallel to the direction of flow and anchor securely.

Bring netting down to a level area before terminating the installation. Turn the end under 6" and staple at 12" intervals.



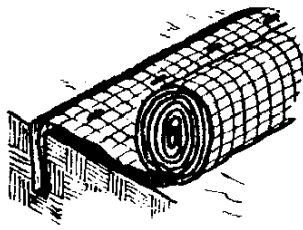
Ditch

In ditches, apply netting parallel to the direction of flow. Use check slots every 15 feet. Do not join strips in the center of the ditch.

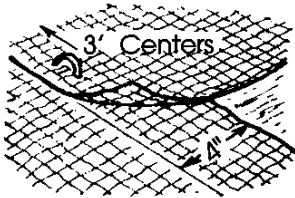
From: Virginia Soil and Water Conservation Commission, 1985

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Storm Water Quality

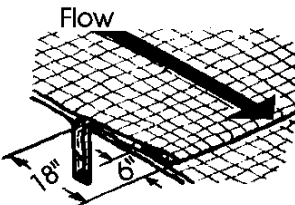
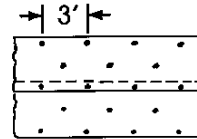
Figure ECB-1  
Erosion Control Blanket  
Application Examples



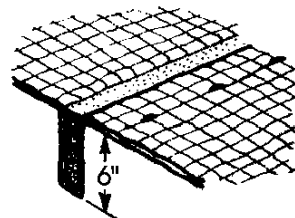
**Anchor Slot:** Bury the up-channel end of the net in a 6" deep trench. Tamp the soil firmly. Staple at 12" intervals across the net.



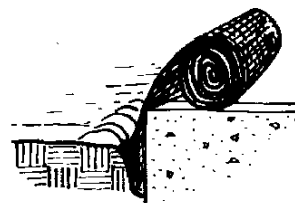
**Overlap:** Overlap edges of the strips at least 4". Staple every 3 feet down the center of the strip.



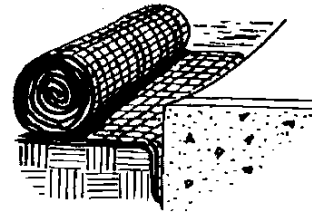
**Joining Strips:** Insert the new roll of net in a trench, as with the Anchor Slot. Overlap the up-channel end of the previous roll 18" and turn the end under 6". Staple the end of the previous roll just below the anchor slot and at the end at 12" intervals.



**Check Slots:** On erodible soils or steep slopes, check slots should be made every 15 feet. Insert a fold of the net into a 6" trench and tamp firmly. Staple at 12" intervals across the net. Lay the net smoothly on the surface of the soil - do not stretch the net, and do not allow wrinkles.



**Anchoring Ends At Structures:** Place the end of the net in a 6" slot on the up-channel side of the structure. Fill the trench and tamp firmly. Roll the net up the channel. Place staples at 12" intervals along the anchor end of the net.



From: Virginia Soil and Water Conservation Commission, 1985

City of Colorado Springs  
Storm Water Quality

Figure ECB-2  
Erosion Control Blanket  
Installation Requirements

DEN/MI/153722.CS CB/Fig/ECB-2/9-99



### What it is

Inlet protection is a sediment control barrier formed around a storm drain inlet. A number of alternative inlet protection designs are available, including:

- Silt Fence Inlet Protection.
- Straw Bale Barrier Inlet Protection.
- Block and Gravel Bag Inlet Protection.
- Curb Socks Inlet Protection.



### When and Where to use it



Application of inlet protection differs by design.

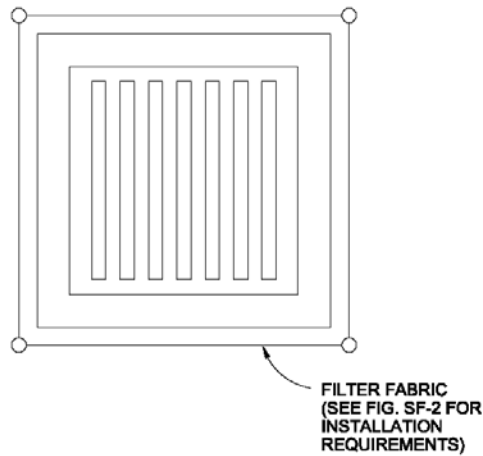
- Filter fabric and straw bale inlet protection are used for area inlets (not located within streets).
- Block and gravel bag curb inlet protection is used for street inlets in sumps.
- Curb sock protection is used for street inlets in sumps or on continuous grade.

### When and Where NOT to use it

- Filter fabric and straw bale inlet protection cannot be used for drain inlets that are paved because these designs require excavation and/or staking of materials.
- Block and gravel bag inlet protection is not recommended for continuous grade inlets due to concerns about damage from bypassed flow.

### **Construction Detail and Maintenance Requirements**

Figures IP-1 through IP-4 provide a construction detail and maintenance requirements for each inlet protection design alternative.



## **FILTER FABRIC INLET PROTECTION**

NTS

### **FILTER FABRIC INLET PROTECTION NOTES**

#### **INSTALLATION REQUIREMENTS**

1. INLET PROTECTION SHALL BE INSTALLED IMMEDIATELY AFTER CONSTRUCTION OF INLET.
2. SEE SILT FENCE FIGURE SF-2 FOR INSTALLATION REQUIREMENTS.
3. POSTS ARE TO BE PLACED AT EACH CORNER OF THE INLET AND AROUND THE EDGES AT A MAXIMUM SPACING OF 3 FEET.

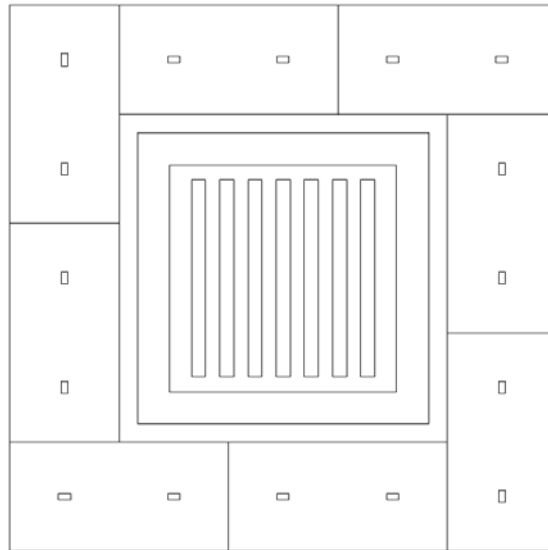
#### **MAINTENANCE REQUIREMENTS**

1. CONTRACTOR SHALL INSPECT INLET PROTECTION IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS NO RAINFALL.
2. DAMAGED, COLLAPSED, UNENTRENCHED OR INEFFECTIVE INLET PROTECTION SHALL BE PROMPTLY REPAIRED OR REPLACED.
3. SEDIMENT SHALL BE REMOVED FROM BEHIND FILTER FABRIC WHEN IT ACCUMULATES TO HALF THE EXPOSED GEOTEXTILE HEIGHT.
4. FILTER FABRIC PROTECTION SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED IN THE DRAINAGE AREA AS APPROVED BY THE CITY.

City of Colorado Springs  
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Figure IP-1  
Filter Fabric Inlet Protection  
Construction Detail and Maintenance  
Requirements





STRAW BALE  
(SEE FIG. SBB-2  
FOR INSTALLATION  
REQUIREMENTS)

## STRAW BALE INLET PROTECTION

NTS

### STRAW BALE INLET PROTECTION NOTES

#### INSTALLATION REQUIREMENTS

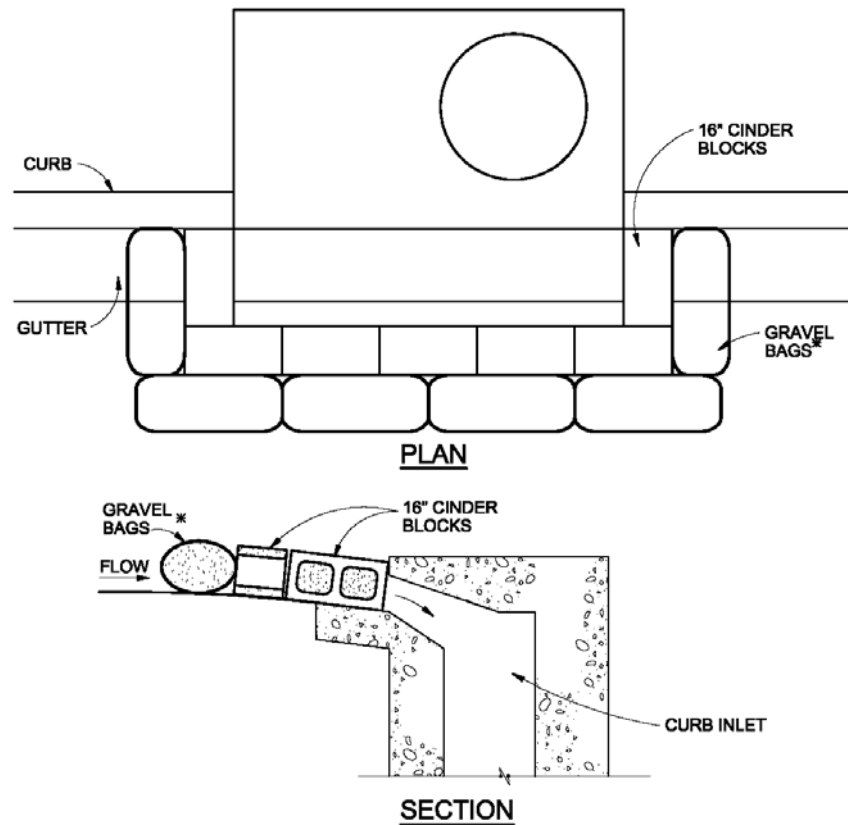
1. INLET PROTECTION SHALL BE INSTALLED IMMEDIATELY AFTER CONSTRUCTION OF INLET.
2. BALES ARE TO BE PLACED IN A SINGLE ROW AROUND THE INLET WITH THE END OF THE BALES TIGHTLY ABUTTING ONE ANOTHER.
3. SEE STRAW BALE BARRIER FIGURE SBB-2 FOR INSTALLATION REQUIREMENTS.

#### MAINTENANCE REQUIREMENTS

1. CONTRACTOR SHALL INSPECT STRAW BALE INLET PROTECTION IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS NO RAINFALL.
2. DAMAGED OR INEFFECTIVE INLET PROTECTION SHALL PROMPTLY BE REPAIRED, REPLACING BALES IF NECESSARY, AND UNENTRENCHED BALES NEED TO BE REPAIRED WITH COMPACTED BACKFILL MATERIAL.
3. SEDIMENT SHALL BE REMOVED FROM BEHIND STRAW BALES WHEN IT ACCUMULATES TO APPROXIMATELY 1/3 THE HEIGHT OF THE BARRIER.
4. INLET PROTECTION SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED WITHIN THE DRAINAGE AREA AS APPROVED BY THE CITY.

City of Colorado Springs  
Stormwater Quality

Figure IP-2  
Straw Bale Inlet Protection  
Construction Detail and Maintenance  
Requirements



## **BLOCK AND GRAVEL BAG\*CURB INLET PROTECTION**

NTS

### **BLOCK AND GRAVEL BAG\*CURB INLET PROTECTION NOTES**

#### **INSTALLATION REQUIREMENTS**

1. INLET PROTECTION SHALL BE INSTALLED IMMEDIATELY AFTER CONSTRUCTION OF INLET.
2. CONCRETE BLOCKS ARE TO BE LAID AROUND THE INLET IN A SINGLE ROW ON THEIR SIDES, ABUTTING ONE ANOTHER WITH THE OPEN ENDS OF THE BLOCK FACING OUTWARD.
3. GRAVEL BAGS ARE TO BE PLACED AROUND THE CONCRETE BLOCKS CLOSELY ABUTTING ONE ANOTHER SO THERE ARE NO GAPS.
4. GRAVEL BAGS ARE TO CONTAIN WASHED SAND OR GRAVEL APPROXIMATELY 3/4 INCH IN DIAMETER.
5. BAGS ARE TO BE MADE OF 1/4" INCH WIRE MESH (USED WITH GRAVEL ONLY) OR GEOTEXTILE.

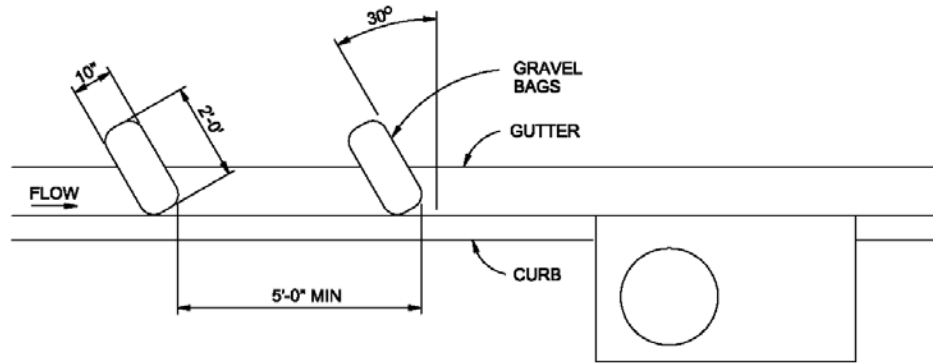
\* AN ALTERNATE 3/4" TO 1" GRAVEL FILTER OVER A WIRE SCREEN MAY BE USED IN PLACE OF GRAVEL BAGS. THE WIRE MESH SHALL EXTEND ABOVE THE TOP OF THE CONCRETE BLOCKS AND THE GRAVEL PLACED OVER THE WIRE SCREEN TO THE TOP OF THE CONCRETE BLOCKS.

#### **MAINTENANCE REQUIREMENTS**

1. CONTRACTOR SHALL INSPECT INLET PROTECTION IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS NO RAINFALL.
2. DAMAGED OR INEFFECTIVE INLET PROTECTION SHALL PROMPTLY BE REPAIRED OR REPLACED.
3. SEDIMENT SHALL BE REMOVED WHEN SEDIMENT HAS ACCUMULATED TO APPROXIMATELY 1/2 THE DESIGN DEPTH OF THE TRAP.
4. INLET PROTECTION SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED WITHIN THE DRAINAGE AREA AS APPROVED BY THE CITY.

City of Colorado Springs  
Stormwater Quality

Figure IP-3  
Block & Gravel Bag Curb Inlet Protection  
Construction Detail and Maintenance  
Requirements



## **CURB SOCK INLET PROTECTION**

NTS

### **CURB SOCK INLET PROTECTION NOTES**

#### **INSTALLATION REQUIREMENTS**

1. INLET PROTECTION SHALL BE INSTALLED IMMEDIATELY AFTER CONSTRUCTION OF INLET.
2. SOCK IS TO BE MADE OF 1/4 INCH WIRE MESH (USED WITH GRAVEL ONLY) OR GEOTEXTILE.
3. WASHED SAND OR GRAVEL 3/4 INCH TO 4 INCHES IN DIAMETER IS PLACED INSIDE THE SOCK.
4. PLACEMENT OF THE SOCK IS TO BE 30 DEGREES FROM PERPENDICULAR IN THE OPPOSITE DIRECTION OF FLOW.
5. SOCKS ARE TO BE FLUSH WITH THE CURB AND SPACED AT A MINIMUM 5 FEET APART.
6. AT LEAST 2 CURB SOCKS IN SERIES IS REQUIRED.

#### **MAINTENANCE REQUIREMENTS**

1. CONTRACTOR SHALL INSPECT INLET PROTECTION IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL AND WEEKLY DURING PERIODS NO RAINFALL.
2. DAMAGED OR INEFFECTIVE INLET PROTECTION SHALL PROMPTLY BE REPAIRED OR REPLACED.
3. SEDIMENT SHALL BE REMOVED FROM BEHIND THE SOCK WHEN GUTTER WIDTH IS FILLED.
4. INLET PROTECTION SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED WITHIN THE DRAINAGE AREA AS APPROVED BY THE CITY.

City of Colorado Springs  
Stormwater Quality

Figure IP-4  
Curb Sock Inlet Protection  
Construction Detail and Maintenance  
Requirements

Mulching

What it is



Mulching is used to temporarily stabilize soils by securely applying materials such as grass, hay, woodchips or wood fibers to the soil's surface. Mulching protects the soil from raindrop impact and reduces the velocity of overland runoff. Mulch also aids in the growth of temporary seeding by holding seeds and topsoil in place, retaining moisture, and insulating against extreme temperatures.

#### **When and Where to use it**

- All disturbed areas and stockpiles shall be mulched within 21 days after final grade is reached.
- 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.
- Mulching is always to be used when applying temporary or permanent seeding.
- Mulching is often used when temporary seeding cannot be used due to the season or climate.

#### **When and Where NOT to use it**

- In areas that will involve paving, building, or utility construction within 21 days after final grade is reached.

#### **Application Techniques and Maintenance Requirements**

Figure MU-1 provides application techniques and maintenance requirements for mulching.

## MULCHING NOTES

### INSTALLATION REQUIREMENTS

1. ALL DISTURBED AREAS MUST BE MULCHED WITHIN 21 DAYS AFTER FINAL GRADE AND SEEDED AREAS ARE TO BE MULCHED WITHIN 24 HOURS AFTER SEEDING.
2. MATERIAL USED FOR MULCH CAN BE CERTIFIED CLEAN, WEED- AND SEED-FREE LONG STEMMED FIELD OR MARSH HAY, OR STRAW OF OATS, BARLEY, WHEAT, RYE, OR TRITICALE CERTIFIED BY THE COLORADO DEPARTMENT OF AGRICULTURE WEED FREE FORAGE CERTIFICATION PROGRAM.
3. HYDRAULIC MULCHING MATERIAL SHALL CONSIST OF VIRGIN WOOD FIBER MANUFACTURED FROM CLEAN WHOLE WOOD CHIPS. WOOD CHIPS CANNOT CONTAIN ANY GROWTH OR GERMINATION INHIBITORS OR BE PRODUCED FROM RECYCLED MATERIAL. GRAVEL CAN ALSO BE USED.
4. MULCH IS TO BE APPLIED EVENLY AT A RATE OF 2 TONS PER ACRE.
5. MULCH IS TO BE ANCHORED EITHER BY CRIMPING (TUCKING MULCH FIBERS 4 INCHES INTO THE SOIL), USING NETTING (USED ON SMALL AREAS WITH STEEP SLOPES), OR WITH A TACKIFIER.
6. HYDRAULIC MULCHING AND TACKIFIERS ARE NOT TO BE USED IN THE PRESENCE OF FREE SURFACE WATER.

### MAINTENANCE REQUIREMENTS

1. REGULAR INSPECTIONS ARE TO BE MADE OF ALL MULCHED AREAS.
2. MULCH IS TO BE REPLACED IMMEDIATELY IN THOSE AREAS IT HAS BEEN REMOVED, AND IF NECESSARY THE AREA SHOULD BE RESEEDDED.

City of Colorado Springs  
Stormwater Quality

Figure MU-1  
Mulching  
Construction Detail and Maintenance  
Requirements



### **What it is**

A temporary sediment basin detains sediment-laden runoff long enough to allow much of the sediment to settle out. Sediment basins are constructed by excavation and/or by placing an earthen embankment across a low area or drainage swale. Basins can be designed to maintain a permanent pool or to drain completely dry through a controlled outlet structure.

### **When and Where to use it**

- Required in disturbed areas draining more than one acre.
- Where there is sufficient space and appropriate topography.
- In areas that allow access for maintenance and sediment removal.
- Positioned so that it captures sediment from the entire upstream disturbed area.
- Where a permanent detention basin is planned for the site.

### **When and Where NOT to use it**

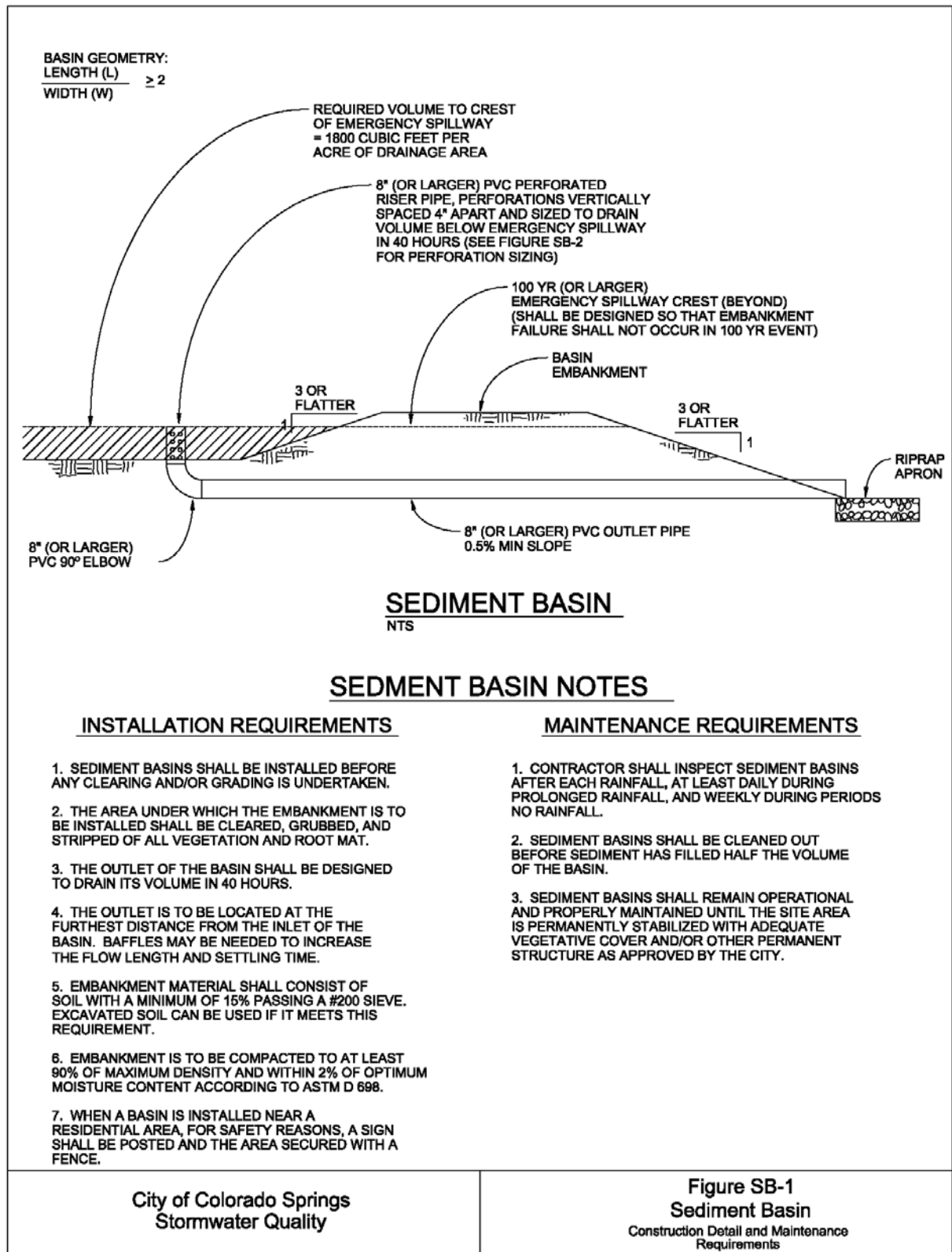
- Sediment basins are not to be installed in active streams.



This low area will provide for some removal of sediment; however, it lacks a designed outlet structure.

## Construction Detail and Maintenance Requirements

Figure SB-1 provides a construction detail and maintenance requirements for a sediment basin.



Required Area per Row (in<sup>2</sup>)

		Depth at Outlet (ft)							
		1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5
Design Volume (acre-ft)	2	15.04	7.71	5.10	3.76	2.95	2.41	2.02	1.73
	1	7.52	3.86	2.55	1.88	1.48	1.21	1.01	0.87
	0.6	4.51	2.31	1.53	1.13	0.89	0.72	0.61	0.52
	0.4	3.01	1.54	1.02	0.75	0.59	0.48	0.40	0.35
	0.2	1.50	0.77	0.51	0.38	0.30	0.24	0.20	0.17
	0.1	0.75	0.39	0.26	0.19	0.15	0.12	0.10	0.09
	0.06	0.45	0.23	0.15	0.11	0.09	0.07	0.06	0.05
	0.04	0.30	0.15	0.10	0.08	0.06	0.05	0.04	0.03
	0.02	0.15	0.08	0.05	0.04	0.03	0.02	0.02	0.02
	0.01	0.08	0.04	0.03	0.02	0.01	0.01	0.01	0.01

TABLE SB-1

Circular Perforation Sizing

Hole Diameter (in)	Hole Diameter (in)	Area per Row (in <sup>2</sup> )		
		n = 1	n = 2	n = 3
1/4	0.250	0.05	0.10	0.15
5/16	0.313	0.08	0.15	0.23
3/8	0.375	0.11	0.22	0.33
7/16	0.438	0.15	0.30	0.45
1/2	0.500	0.20	0.39	0.59
9/16	0.563	0.25	0.50	0.75
5/8	0.625	0.31	0.61	0.92
11/16	0.688	0.37	0.74	1.11
3/4	0.750	0.44	0.88	1.33
7/8	0.875	0.60	1.20	1.80
1	1.000	0.79	1.57	2.36
1 1/8	1.125	0.99	1.99	2.98
1 1/4	1.250	1.23	2.45	3.68
1 3/8	1.375	1.48	2.97	4.45
1 1/2	1.500	1.77	3.53	5.30
1 5/8	1.625	2.07	4.15	6.22
1 3/4	1.750	2.41	4.81	7.22
1 7/8	1.875	2.76	5.52	8.28
2	2.000	3.14	6.28	9.42
n = Number of columns of perforations				
Minimum steel plate thickness		1/4"	5/16"	3/8"

TABLE SB-2

City of Colorado Springs  
Stormwater Quality

Figure SB-2  
Outlet Sizing  
Application Techniques and Maintenance  
Requirements

Silt Fence





### What it is

A silt fence is a temporary sediment barrier constructed of filter fabric stretched across supporting posts. The bottom edge of the fabric is entrenched and covered with backfill.

### When and Where to use it

- On the down gradient perimeters of a construction site.
- On a contour to control overland sheet flow.
- At the top or toe of a steep slope.
- As a form of inlet protection (see inlet protection factsheet).

Figure SF-1 depicts five cases where the use of silt fence is appropriate.

### When and Where NOT to use it

- In areas of concentrated flows such as in ditches, swales or channels that drain areas greater than 1.0 acre.
- At the top of a slope or at high points which do not receive any drainage flows.



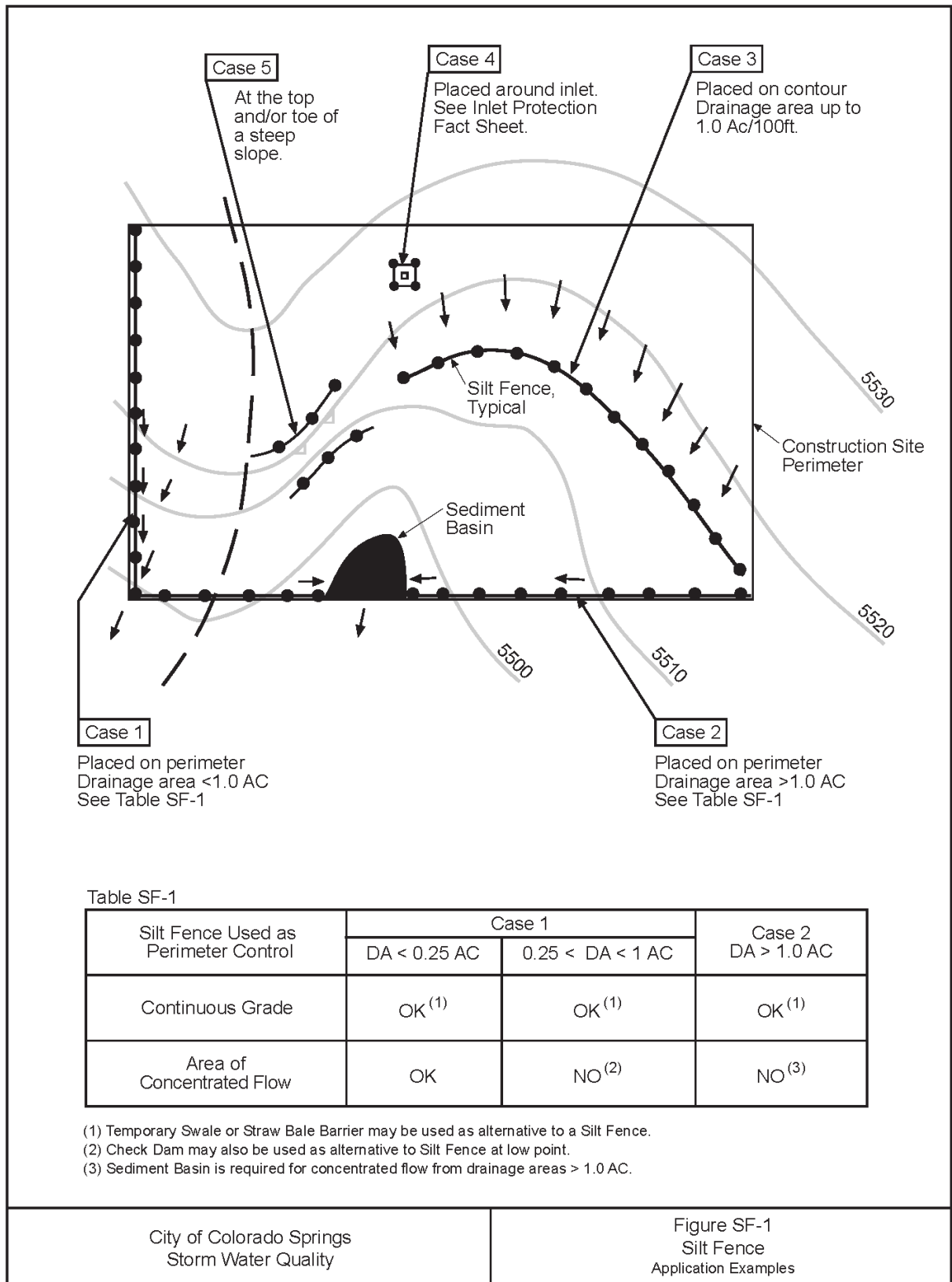
This photo reveals a silt fence that has become unentrenched because it was not securely installed.

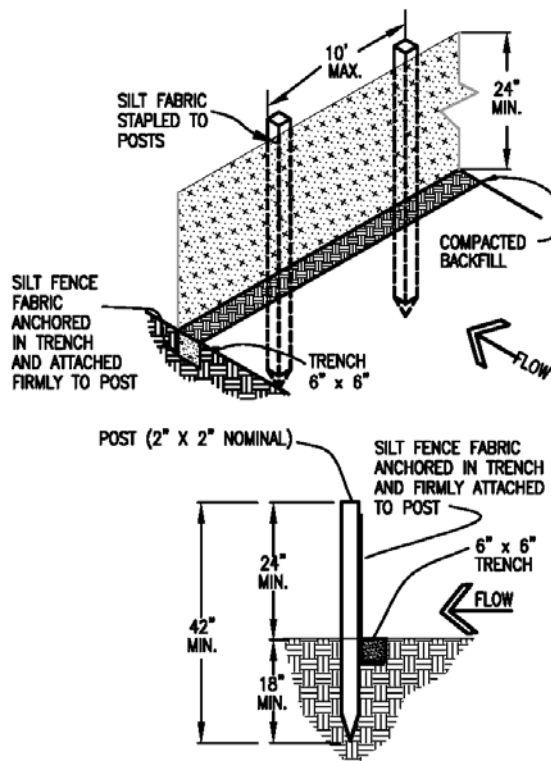


This photo illustrates what will happen to a silt fence if it is installed in an area of concentrated flow.

### Construction Detail and Maintenance Requirements

Figure SF-2 provides a construction detail and maintenance requirements for a silt fence.





SILT FENCE

## SILT FENCE NOTES

### INSTALLATION REQUIREMENTS

1. SILT FENCES SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
2. WHEN JOINTS ARE NECESSARY, SILT FENCE GEOTEXTILE SHALL BE SPICED TOGETHER ONLY AT SUPPORT POST AND SECURELY SEALED.
3. METAL POSTS SHALL BE "STUDDED TEE" OR "U" TYPE WITH MINIMUM WEIGHT OF 1.33 POUNDS PER LINEAR FOOT. WOOD POSTS SHALL HAVE A MINIMUM DIAMETER OR CROSS SECTION DIMENSION OF 2 INCHES.
4. THE FILTER MATERIAL SHALL BE FASTENED SECURELY TO METAL OR WOOD POSTS USING WIRE TIES, OR TO WOOD POSTS WITH 3/4" LONG #9 HEAVY-DUTY STAPLES. THE SILT FENCE GEOTEXTILE SHALL NOT BE STAPLED TO EXISTING TREES.
5. WHILE NOT REQUIRED, WIRE MESH FENCE MAY BE USED TO SUPPORT THE GEOTEXTILE. WIRE FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY-DUTY WIRE STAPLES AT LEAST 3/4" LONG, TIE WIRES OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 6" AND SHALL NOT EXTEND MORE THAN 3' ABOVE THE ORIGINAL GROUND SURFACE.

6. ALONG THE TOE OF FILLS, INSTALL THE SILT FENCE ALONG A LEVEL CONTOUR AND PROVIDE AN AREA BEHIND THE FENCE FOR RUNOFF TO POND AND SEDIMENT TO SETTLE. A MINIMUM DISTANCE OF 5 FEET FROM THE TOE OF THE FILL IS RECOMMENDED.

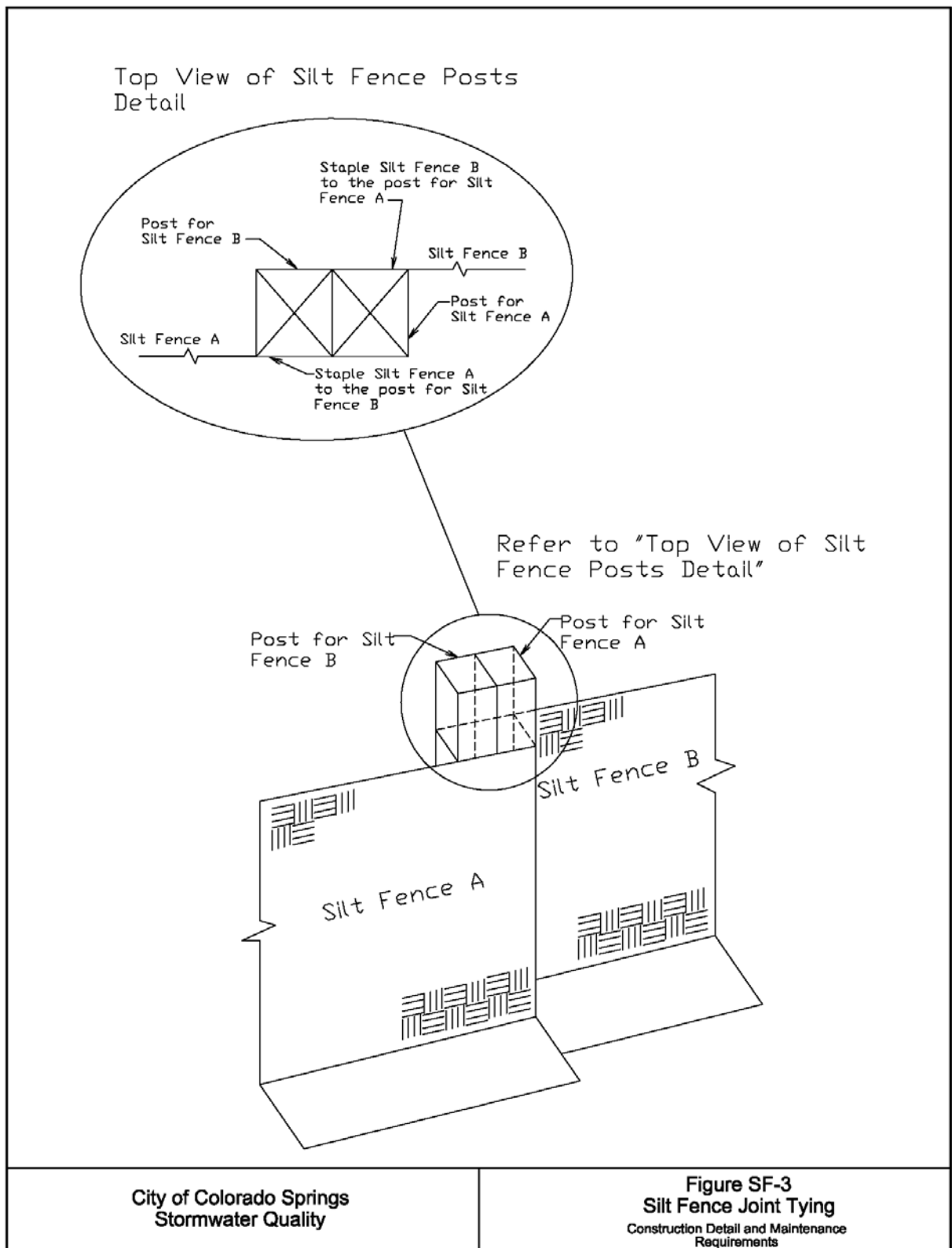
7. THE HEIGHT OF THE SILT FENCE FROM THE GROUND SURFACE SHALL BE MINIMUM OF 24 INCHES AND SHALL NOT EXCEED 36 INCHES; HIGHER FENCES MAY INPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE OF THE STRUCTURE.

### MAINTENANCE REQUIREMENTS

1. CONTRACTOR SHALL INSPECT SILT FENCES IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS OF NO RAINFALL. DAMAGED, COLLAPSED, UNENTRENCHED OR INEFFECTIVE SILT FENCES SHALL BE PROMPTLY REPAIRED OR REPLACED.
2. SEDIMENT SHALL BE REMOVED FROM BEHIND SILT FENCE WHEN IT ACCUMULATES TO HALF THE EXPOSED GEOTEXTILE HEIGHT.
3. SILT FENCES SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED AS APPROVED BY THE CITY.

City of Colorado Springs  
Stormwater Quality

Figure SF-2  
Silt Fence  
Construction Detail and Maintenance  
Requirements



## Slope Drain

### What it is

Slope drains are either flexible or rigid pipes that convey concentrated runoff from the top of a slope to a stable discharge point at the bottom of the slope. Slope drains can be either temporary or permanent depending on the method of installation and material used.

**When and Where to use it**

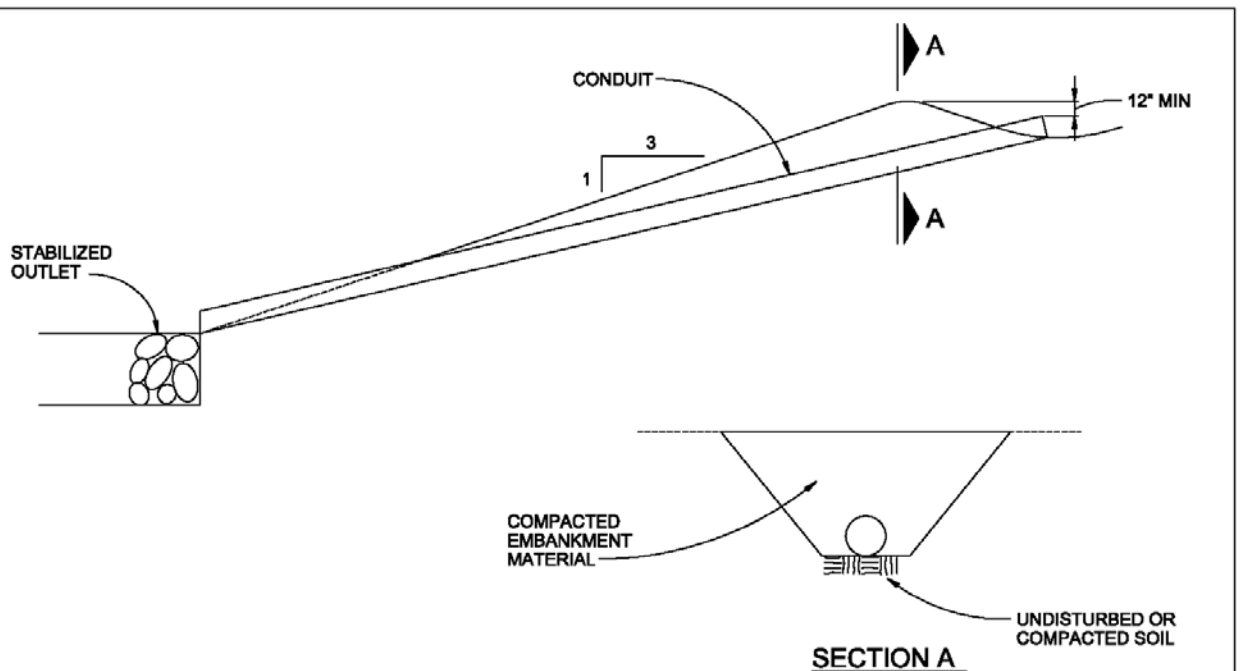
- At the top of cut-and-fill slopes to convey stormwater down the slope.
- Before a slope has been stabilized or before permanent drainage structures are ready for use.
- In combination with other BMPs that have been used to concentrate flows, including temporary swales.

**When and Where NOT to use it**

Slope drains should not be used for drainage areas larger than 5 acres.

**Construction Detail and Maintenance Requirements**

Figure SD-1 provides a construction detail and maintenance requirements for a slope drain.



## SLOPE DRAIN

NTS

### SLOPE DRAIN NOTES

#### INSTALLATION REQUIREMENTS

1. THE SLOPE DRAIN IS TO BE DESIGNED TO CONVEY THE PEAK RUNOFF FOR THE 2-YEAR STORM.
2. PIPE MATERIAL MAY INCLUDE CORRUGATED METAL, OR RIGID OR FLEXIBLE PLASTIC.
3. EMBANKMENT MATERIAL SHALL CONSIST OF SOIL WITH A MINIMUM OF 15% PASSING A #200 SIEVE. EXCAVATED SOIL CAN BE USED IF IT MEETS THIS REQUIREMENT.
4. EMBANKMENT IS TO BE COMPACTED TO AT LEAST 90% OF MAXIMUM DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT ACCORDING TO ASTM D 698.
5. SLOPE DRAIN SECTIONS ARE TO BE SECURELY FASTENED TOGETHER AND HAVE WATERTIGHT FITTINGS.
6. THE OUTLET IS TO BE STABILIZED AND, UNLESS THE DRAIN DISCHARGES DIRECTLY TO A SEDIMENT BASIN, A TEMPORARY SURFACE IS TO BE PROVIDED TO CONVEY FLOWS DOWN STREAM.
7. IMMEDIATELY STABILIZE ALL AREAS DISTURBED BY INSTALLATION OR REMOVAL OF THE PIPE SLOPE DRAIN.

#### MAINTENANCE REQUIREMENTS

1. INLET AND OUTLET POINTS ARE TO BE CHECKED REGULARLY, AND AFTER HEAVY STORMS FOR CLOGGING AND OVERCHARGING. ANY BREAKS IN THE PIPE ARE TO BE PROMPTLY REPAIRED, AND CLOGS REMOVED AS NEEDED.
2. WATER IS NOT TO BYPASS OR UNDERCUT THE INLET OR PIPE. IF THESE PROBLEMS DO EXIST, THE HEADWALL NEEDS TO BE REINFORCED WITH COMPACT EARTH OR SANDBAGS.
3. THE OUTLET POINT IS TO BE FREE OF EROSION, AND, IF NECESSARY, ADDITIONAL OUTLET PROTECTION SHOULD BE INSTALLED.
4. CONSTRUCTION TRAFFIC IS NOT TO CROSS THE SLOPE DRAIN AND MATERIALS ARE NOT TO BE PLACED ON IT.
5. THE SLOPE DRAIN IS TO REMAIN IN PLACE UNTIL THE SLOPE HAS BEEN COMPLETELY STABILIZED OR UP TO 30 DAYS AFTER PERMANENT SLOPE STABILIZATION.

City of Colorado Springs  
Stormwater Quality

Figure SD-1  
Slope Drain  
Construction Detail and Maintenance  
Requirements



### **What it is**

A straw bale barrier is a temporary sediment barrier consisting of a row of entrenched and anchored straw bales used to retain sediment from runoff in small drainage areas of disturbed soil.

### **When and Where to use it**

- At the base of a slope.
- On the down gradient perimeters of a construction site.
- On a contour to control overland sheet flow.
- As a form of check dam (see check dam factsheet).
- As a form of inlet protection (see inlet protection factsheet).

Figure SBB-1 depicts six cases where the use of Straw Bale Barriers is appropriate.

### **When and Where NOT to use it**

- In areas of concentrated flows such as in ditches, swales, or channels that drain areas greater than 1.0 acre (unless used as a form of check dam).
- At the top of a slope or at high points which do not receive any drainage flows.



This straw bale barrier was not installed properly because runoff is able to flow around the barrier.

### **Construction Detail and Maintenance Requirements**

Figure SBB-2 provides a construction detail and maintenance requirements for a straw bale barrier.



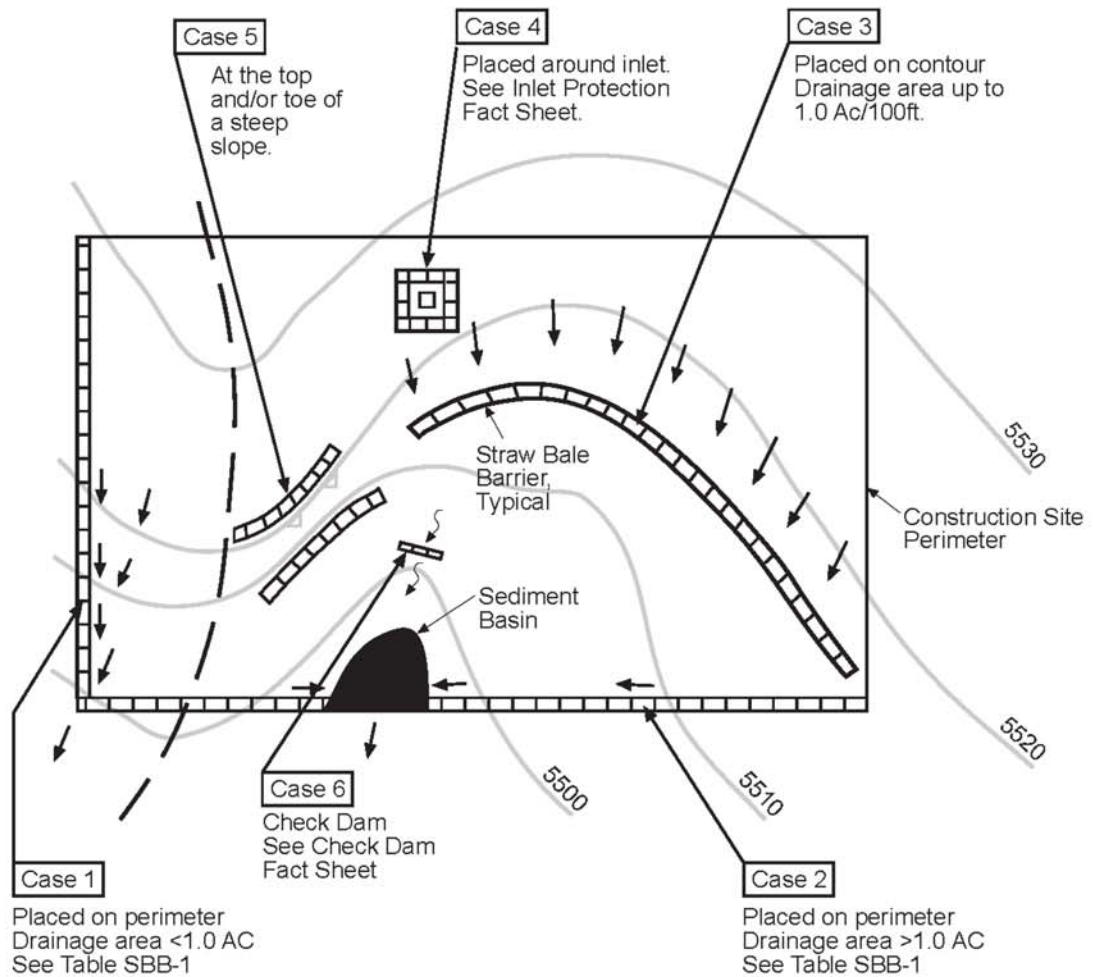


Table SBB-1

Straw Bale Barrier Used as Perimeter Control	Case 1 DA < 1.0 AC	Case 2 DA > 1.0 AC
Continuous Grade	OK <sup>(1)</sup>	OK <sup>(1)</sup>
Area of Concentrated Flow	OK <sup>(2)</sup>	NO <sup>(3)</sup>

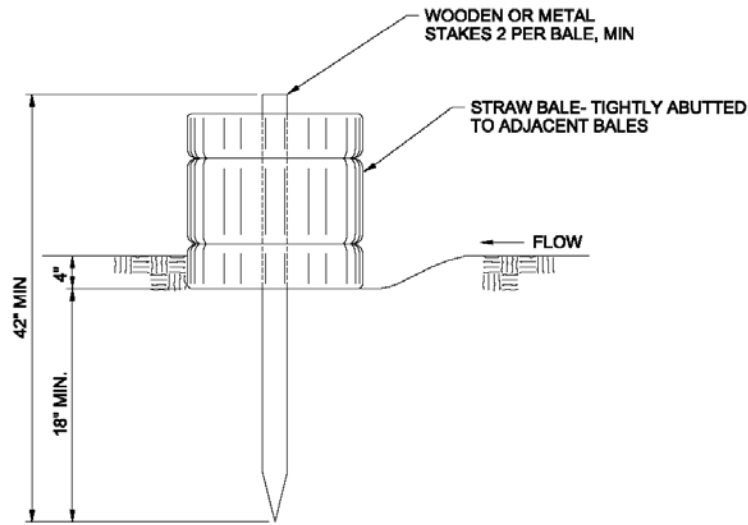
(1) Temporary Swale or Silt Fence may be used as alternative to a Straw Bale Barrier.

(2) Straw Bale Check Dam may be used at low points.

(3) Sediment Basin is required for concentrated flow from drainage areas > 1.0 AC.

City of Colorado Springs  
Storm Water Quality

Figure SBB-1  
Straw Bale Barrier  
Application Examples



## STRAW BALE BARRIER

NTS

### STRAW BALE BARRIER NOTES

#### INSTALLATION REQUIREMENTS

1. STRAW BALE BARRIERS SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
2. BALES SHALL CONSIST OF APPROXIMATELY 5 CUBIC FEET OF CERTIFIED WEED FREE HAY OR STRAW AND WEIGH NOT LESS THAN 35 POUNDS.
3. BALES ARE TO BE PLACED IN A SINGLE ROW WITH THE END OF THE BALES TIGHTLY ABUTTING ONE ANOTHER.
4. EACH BALE IS TO BE SECURELY ANCHORED WITH AT LEAST TWO STAKES AND THE FIRST STAKE IS TO BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE TO FORCE THE BALES TOGETHER.
5. STAKES ARE TO BE A MINIMUM OF 42 INCHES LONG. METAL STAKES SHALL BE STANDARD "T" OR "U" TYPE WITH MINIMUM WEIGHT OF 1.33 POUNDS PER LINEAR FOOT. WOOD STAKES SHALL HAVE A MINIMUM DIAMETER OR CROSS SECTION DIMENSION OF 2 INCHES.
6. BALES ARE TO BE BOUND WITH EITHER WIRE OR STRING AND ORIENTED SUCH THAT THE BINDINGS ARE AROUND THE SIDES AND NOT ALONG THE TOPS AND BOTTOMS OF THE BALE.
7. GAPS BETWEEN BALES ARE TO BE CHINKED (FILLED BY WEDGING) WITH STRAW OR THE SAME MATERIAL OF THE BALE.
8. END BALES ARE TO EXTEND UPSLOPE SO THE TRAPPED RUNOFF CANNOT FLOW AROUND THE ENDS OF THE BARRIER.

#### MAINTENANCE REQUIREMENTS

1. CONTRACTOR SHALL INSPECT STRAW BALE BARRIERS IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS NO RAINFALL.
2. DAMAGED OR INEFFECTIVE BARRIERS SHALL PROMPTLY BE REPAIRED, REPLACING BALES IF NECESSARY, AND UNENTRENCHED BALES NEED TO BE REPAIRED WITH COMPACTED BACKFILL MATERIAL.
3. SEDIMENT SHALL BE REMOVED FROM BEHIND STRAW BALE BARRIERS WHEN IT ACCUMULATES TO APPROXIMATELY 1/2 THE HEIGHT OF THE BARRIER.
4. STRAW BALE BARRIERS SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED AS APPROVED BY THE CITY.

City of Colorado Springs  
Stormwater Quality

Figure SBB-2  
Straw Bale Barrier  
Construction Detail and Maintenance  
Requirements

Street Wash Water Associated with Construction Activities

The CDPS Municipal Stormwater Discharge Permit for the City of Colorado Springs calls for the development and implementation of best management practices to minimize the impacts from street wash water associated with construction activities. The proposed best management

practices (BMPs) are listed below. The permit allows these discharges into State Waters without obtaining a permit providing BMPs are maintained.

### **Activity**

During construction, it is not uncommon for dirt to accumulate on roadways in the construction site and adjacent to the site. This occurs when BMPs have not been implemented on the site or from the vehicles tracking materials around the site. If the sediment is not removed from the roadways, it will be washed into the storm sewer or other drainage facilities during the next storm event. Therefore, it is necessary to clean the roadways within or adjacent to a construction site on a regular basis. There are several methods for doing this, which include sweeping the streets, scraping the streets and using water to wash down the street. The practice of washing with water, while not encouraged, may be necessary in some cases.

### **Areas of Concern**

The concern with construction street sweeping is that the water will carry sediment into the storm sewer and then into State Waters. The sediment can have a negative impact on the aquatic life in the stream.

While the water used to clean the street may be potable in some cases, it is believed that the act of spraying the water would dissipate the chlorine.

### **BMPs**

1. Prior to washing the street with water, efforts will first be made to scrape and sweep the dirt off the roadways. Scraped or swept material will not be deposited in the storm sewer or other drainage facility.
2. Inlet protection or other BMPs will be in place prior to the washing of the streets. Materials collected by the BMP will be removed and will not be disposed of in a manner that would result in it entering the storm sewer or other drainage system.
3. Where practical, high-pressure wash systems will be used on the hard to remove spots. Washing the entire area with a fire hose will be avoided wherever possible. Water will only be used as needed.

## **Surface Roughening**

### **What it is**

Surface roughening is a temporary erosion control practice where the soil surface is roughened by the creation of grooves, depressions, or steps that run parallel to the contour of the land.

### **When and Where to use it**

- Surface roughening is appropriate for all slopes and should be performed immediately after rough grades have been established in an area.
- Surface roughening can also be used to help establish vegetative cover by reducing runoff velocity and giving seed an opportunity to take hold and grow.
- Surface roughening can be used in combination with other erosion control measures such as mulching and seeding.

#### **When and Where NOT to use it**

- Slopes that are not smooth-graded and are left sufficiently rough after final grading do not need further roughening to control erosion.
- Surface roughening alone is not sufficient to stabilize a slope for long periods of times, further stabilization measures should be implemented within two weeks of grading.
- Extremely sandy or rocky soils are not well suited for surface roughening.

#### **Application Techniques and Maintenance Requirements**

Figure SR-1 provides application techniques and maintenance requirements for surface roughening.

#### Surface Roughening Notes

##### APPLICATION TECHNIQUES

1. STAIR STEP GRADING - USED ON SLOPES WITH GRADIENTS BETWEEN 3:1 AND 2:1 AND FOR SOIL CONTAINING A LARGE AMOUNT OF SMALL ROCKS. STAIRS ARE TO BE WIDE ENOUGH TO WORK WITH STANDARD EARTH MOVING EQUIPMENT.
2. GROOVE CUTTING - USED ON SLOPES WITH GRADIENTS BETWEEN 3:1 AND 2:1. GROOVES ARE TO BE AT LEAST 3 INCHES DEEP AND NO MORE THAN 15 INCHES APART.
3. TRACKING - USED ON SOILS WITH HIGHER SAND CONTENT DUE TO COMPACTION BY HEAVY MACHINERY.

##### MAINTENANCE REQUIREMENTS

1. REGULAR INSPECTIONS ARE TO BE MADE OF ALL SURFACE ROUGHENED AREAS.
2. SURFACE ROUGHENING IS TO BE REPEATED AS OFTEN AS NECESSARY.
3. VEHICLES OR EQUIPMENT IS NOT TO BE DRIVEN OVER AREAS THAT HAVE BEEN ROUGHENED.
4. AS SURFACE ROUGHENING IS ONLY A TEMPORARY CONTROL, ADDITIONAL TREATMENTS MAY BE NECESSARY TO MAINTAIN THE SOIL SURFACE IN A ROUGHENED CONDITION.

#### Temporary Seeding

## What it is



Temporary seeding is the use of quickly germinating vegetative cover on disturbed areas to stabilize soils and control erosion.

## When and Where to use it

- On any disturbed areas that are to remain in an interim state for more than 60 days, but less than one year.

## When and Where NOT to use it

- Temporary seeding shall not be used in areas that receive construction traffic; granular material shall be used to stabilize high traffic areas (see Vehicle Tracking Fact Sheet).
- Temporary seeding is not to be used on disturbed areas left in an interim state for more than 1 year. Permanent seeding is then required.

## Application Techniques and Maintenance Requirements

Figure TS-1 provides application techniques and maintenance requirements for temporary seeding.

### RECOMMENDED ANNUAL GRASSES

SPECIES (COMMON NAME)	GROWTH SEASON	SEEDING DATE	POUNDS OF PURE LIVE SEED (PLS) (PLS/ACRE)	PLANTING DEPTH (INCHES)
1. OATS	COOL	MARCH 16 - APRIL 30	35-50	1-2
2. SPRING WHEAT	COOL	MARCH 16 - APRIL 30	25-35	1-2
3. SPRING BARLEY	COOL	MARCH 16 - APRIL 30	25-35	1-2
4. ANNUAL RYEGRASS	COOL	MARCH 16 - JUNE 30	10-15	1/2
5. MILLET	WARM	MAY 16 - JULY 15	3-15	1/2-3/4
6. SUDANGRASS	WARM	MAY 16 - JULY 15	5-10	1/2-3/4
7. SORGHUM	WARM	MAY 16 - JULY 15	5-10	1/2-3/4
8. WINTER WHEAT	COOL	SEPTEMBER 1 - 30	20-35	1-2
9. WINTER BARLEY	COOL	SEPTEMBER 1 - 30	20-35	1-2
10. WINTER RYE	COOL	SEPTEMBER 1 - 30	20-35	1-2
11. TRITICALE	COOL	SEPTEMBER 1 - 30	25-40	1-2

THIS TABLE WAS TAKEN FROM UDFCD FOR RECOMMENDED ANNUAL GRASSES FOR THE DENVER METROPOLITAN AREA. THIS TABLE MAY BE USED UNLESS A SITE-SPECIFIC SEED MIX IS REQUESTED AND APPROVED.

TABLE TS-1

### TEMPORARY SEEDING NOTES

#### INSTALLATION REQUIREMENTS

1. DISTURBED AREAS ARE TO BE SEEDED WITHIN 21 DAYS AFTER CONSTRUCTION ACTIVITY OR GRADING ENDS IF SEASON ALLOWS.
2. IF NECESSARY, SOIL IS TO BE CONDITIONED FOR PLANT GROWTH BY APPLYING TOPSOIL, FERTILIZER, OR LIME.
3. SOIL IS TO BE TILLED IMMEDIATELY PRIOR TO APPLYING SEEDS. COMPACT SOILS ESPECIALLY NEED TO BE LOOSENEED.
4. SEEDBED DEPTH IS TO BE 4 INCHES FOR SLOPES FLATTER THAN 2:1, AND 1 INCH FOR SLOPES STEEPER THAN 2:1.
5. ANNUAL GRASSES LISTED IN TABLE TS-1 ARE TO BE USED FOR TEMPORARY SEEDING. SEED MIXES ARE NOT TO CONTAIN ANY NOXIOUS WEED SEEDS INCLUDING RUSSIAN OR CANADIAN THISTLE, KNAWEED, PURPLE LOOSESTRIPE, EUROPEAN BINDWEED, JOHNSON GRASS, AND LEAFY SPURGE.
6. TABLE TS-1 ALSO PROVIDES REQUIREMENTS FOR SEEDING RATES, SEEDING DATES, AND PLANTING DEPTHS FOR THE APPROVED TYPES OF ANNUAL GRASSES.
7. SEEDING IS TO BE APPLIED USING MECHANICAL TYPE DRILLS EXCEPT WHERE SLOPES ARE STEEP OR ACCESS IS LIMITED THEN HYDRAULIC SEEDING MAY BE USED.
8. ALL SEEDED AREAS ARE TO BE MULCHED (SEE FACTSHEET ON MULCHING).
9. IF HYDRAULIC SEEDING IS USED THEN HYDRAULIC MULCHING SHALL BE DONE SEPARATELY TO AVOID SEEDS BECOMING ENCAPSULATED IN THE MULCH.

#### MAINTENANCE REQUIREMENTS

1. REGULAR INSPECTIONS ARE TO BE MADE OF ALL SEEDED AREAS TO ENSURE GROWTH.
2. AREAS WHERE GROWTH IS NOT OCCURRING QUICKLY OR THE MULCH HAS BEEN REMOVED SHALL BE RE-SEEDED AS SOON AS POSSIBLE AND RE-MULCHED IF NEEDED.
3. SEEDED AREAS ARE NOT TO BE DRIVEN OVER WITH CONSTRUCTION EQUIPMENT OR VEHICLES.

City of Colorado Springs  
Stormwater Quality

Figure TS-1  
Temporary Seeding  
Construction Detail and Maintenance  
Requirements

Temporary Swale



### **What it is**

A temporary swale is an earth channel used to convey runoff. A temporary swale can be excavated or formed upslope from an earthen berm, and may be lined or unlined.

### **When and Where to use it**

- At the top of a slope to divert upland runoff away from the slope face.
- At the bottom of a slope to convey sediment-laden runoff to a sediment-trapping device such as a sediment basin.
- Along the perimeter of the construction site to keep runoff from leaving the site.

Figure TSW-1 illustrates cases where temporary swales are most effective.

### **When and Where NOT to use it**

- Where longitudinal slope exceeds 10 percent (lining is required where longitudinal slope exceeds 2 percent).
- In areas where concentrated flow will overtop the swale transversely.

### **Construction Detail and Maintenance Requirements**

Figure TSW-2 provides a construction detail and maintenance requirements for a temporary swale. Figure TSW-3 provides a construction detail and maintenance requirements for swale linings.

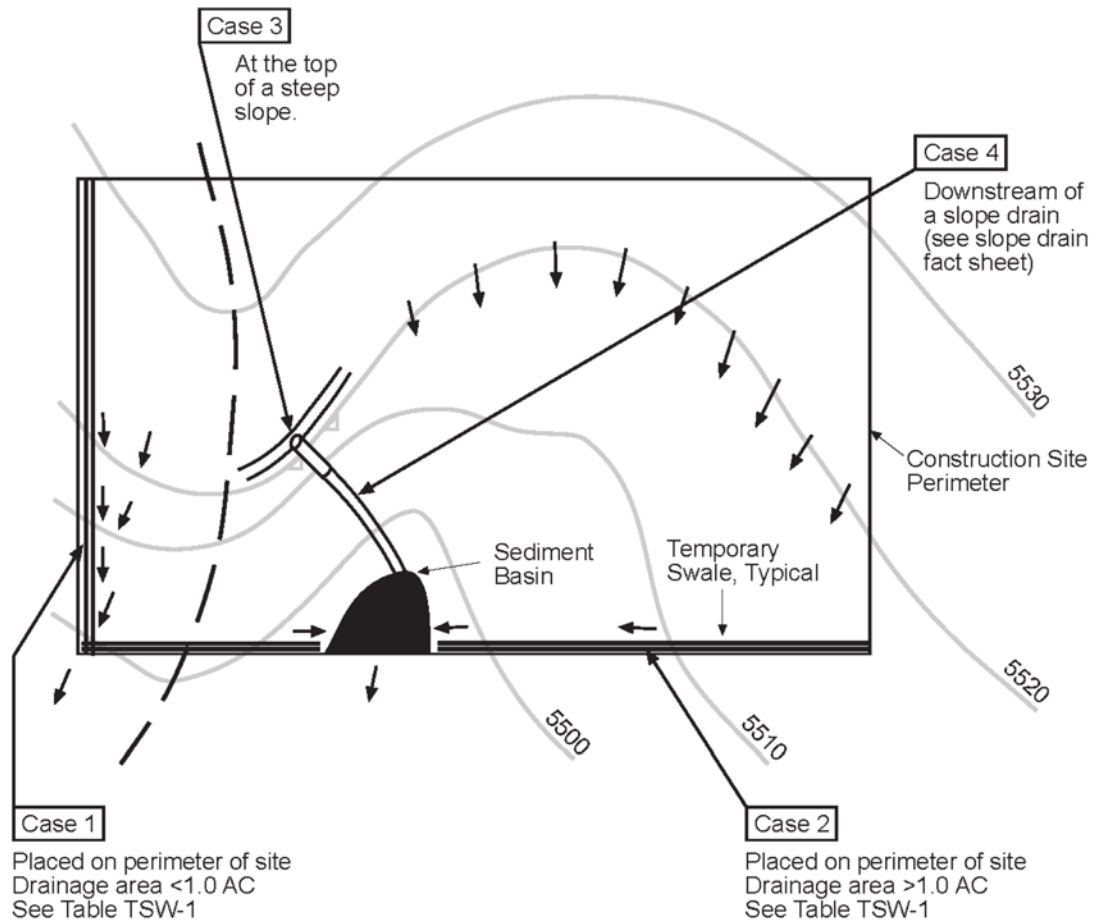


Table TSW-1

Temporary Swale Used as Perimeter Control	Case 1 DA < 1.0 AC	Case 2 DA > 1.0 AC
Continuous Grade	OK <sup>(1)</sup>	OK <sup>(1)</sup>
Area of Concentrated Flow	NO <sup>(3)</sup>	NO <sup>(2)</sup>

(1) Silt Fence or Straw Bale Barrier may be used as alternative to a Temporary Swale.

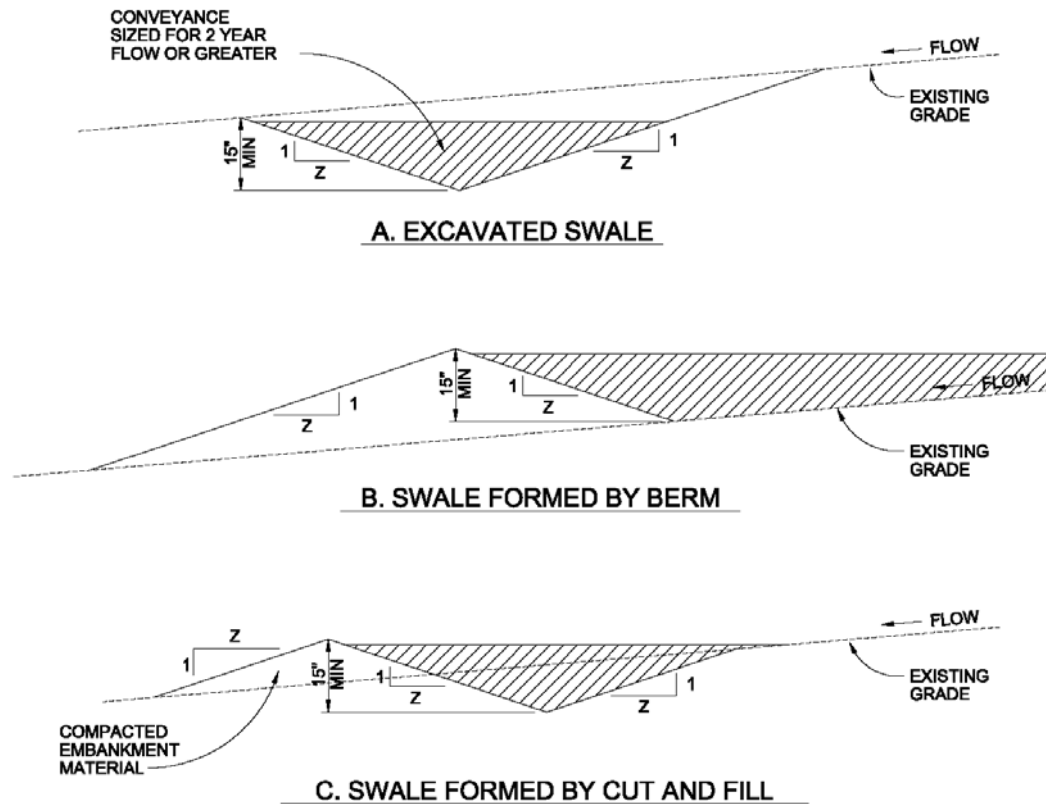
(2) With Temporary Swales Sediment Basin is required for concentrated flow from drainage areas > 1.0 AC.

(3) Check Dam is required at concentrated flow for drainage areas > 1.0 acres.

City of Colorado Springs  
Storm Water Quality

Figure TSW-1  
Temporary Swale  
Application Examples





## TEMPORARY SWALE

NTS

### TEMPORARY SWALE NOTES

#### INSTALLATION REQUIREMENTS

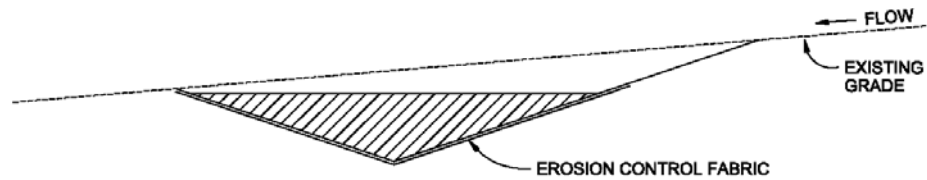
1. TEMPORARY SWALES SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
2. THE AREA UNDER WHICH THE EMBANKMENT IS TO BE INSTALLED SHALL BE CLEARED, GRUBBED, AND STRIPPED OF ALL VEGETATION AND ROOT MAT.
3. EMBANKMENT MATERIAL SHALL CONSIST OF SOIL WITH A MINIMUM OF 15% PASSING A #200 SIEVE. EXCAVATED SOIL CAN BE USED IF IT MEETS THIS REQUIREMENT.
4. EMBANKMENT IS TO BE COMPACTED TO AT LEAST 90% OF MAXIMUM DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT ACCORDING TO ASTM D 698.
5. SWALES WITH SLOPE > 2% SHALL BE LINED, SEE FIGURE TSW-3.
6. SWALES ARE TO DRAIN INTO A SEDIMENT BASIN OR OTHER STABILIZED OUTLET.
7. Z SHALL BE 3 OR GREATER.

#### MAINTENANCE REQUIREMENTS

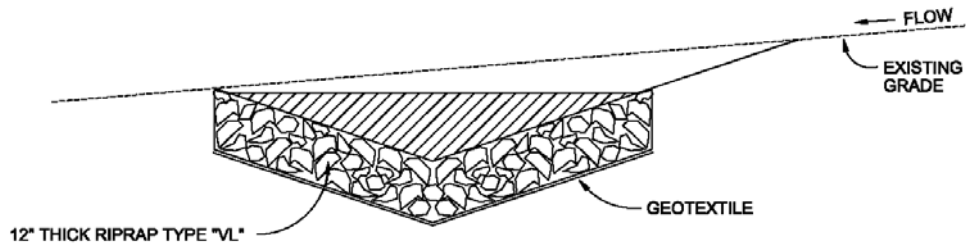
1. CONTRACTOR SHALL INSPECT SWALES AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS OF NO RAINFALL.
2. SWALES SHALL BE ROUTINELY CLEARED OF ANY DEBRIS OR ACCUMULATION OF SEDIMENT.
3. ERODED SLOPES OR DAMAGED LININGS SHALL IMMEDIATELY BE REPAIRED.
4. TEMPORARY SWALES SHALL REMAIN OPERATIONAL AND PROPERLY MAINTAINED UNTIL THE SITE AREA IS PERMANENTLY STABILIZED WITH ADEQUATE VEGETATIVE COVER AND/OR OTHER PERMANENT STRUCTURE AS APPROVED BY THE CITY.

City of Colorado Springs  
Stormwater Quality

Figure TSW-2  
Temporary Swale  
Construction Detail and Maintenance  
Requirements



**A. EROSION CONTROL FABRIC**  
 $2\% < \text{SLOPE} < 5\%$  AND VELOCITY  $\leq 8$  FPS



**B. RIPRAP**  
 SLOPE  $> 5\%$  OR VELOCITY  $> 8$  FPS

## **SWALE LINING**

NTS

### **SWALE LINING NOTES**

#### **INSTALLATION REQUIREMENTS**

1. REFER TO THE EROSION CONTROL BLANKETS FACTSHEET FOR PROPER INSTALLATION OF EROSION CONTROL FABRIC LINING.
2. SWALES WITH EASILY ERODIBLE SOILS AND SLOPES LESS THAN 2%, SHALL BE LINED WITH EROSION CONTROL FABRIC.
3. VELOCITIES FOR EROSION CONTROL FABRICS SHALL NOT EXCEED 8 FPS. SWALES WITH VELOCITIES GREATER THAN 8 FPS SHALL BE LINED WITH RIP RAP.

#### **MAINTENANCE REQUIREMENTS**

1. CONTRACTOR SHALL INSPECT SWALE LININGS AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL AND WEEKLY DURING PERIODS OF NO RAINFALL.
2. DAMAGED LININGS SHALL IMMEDIATELY BE REPAIRED.
3. REFER TO THE EROSION CONTROL BLANKETS FACTSHEET FOR PROPER MAINTENANCE.
4. DISPLACED RIPRAP OR COARSE AGGREGATE IS TO BE REPLACED AS SOON AS POSSIBLE.
5. SWALE LININGS ARE TO REMAIN IN PLACE AND BE PROPERLY MAINTAINED UNTIL THE TEMPORARY SWALE IS REMOVED.

City of Colorado Springs  
 Stormwater Quality

Figure TSW-3  
 Swale Linings  
 Construction Detail and Maintenance

Vehicle Tracking

What it is



Vehicle tracking refers to the stabilization of construction entrances, roads, parking areas, and staging areas to prevent the tracking of sediment from the construction site.

#### **When and Where to use it**

- All points where vehicles exit the construction site onto a public road.
- Construction entrance/exit should be located at permanent access locations if at all possible.
- Construction roads and parking areas.
- Loading and unloading areas.
- Storage and staging areas.
- Where trailers are parked.
- Any construction area that receives high vehicular traffic.

#### **When and Where NOT to use it**

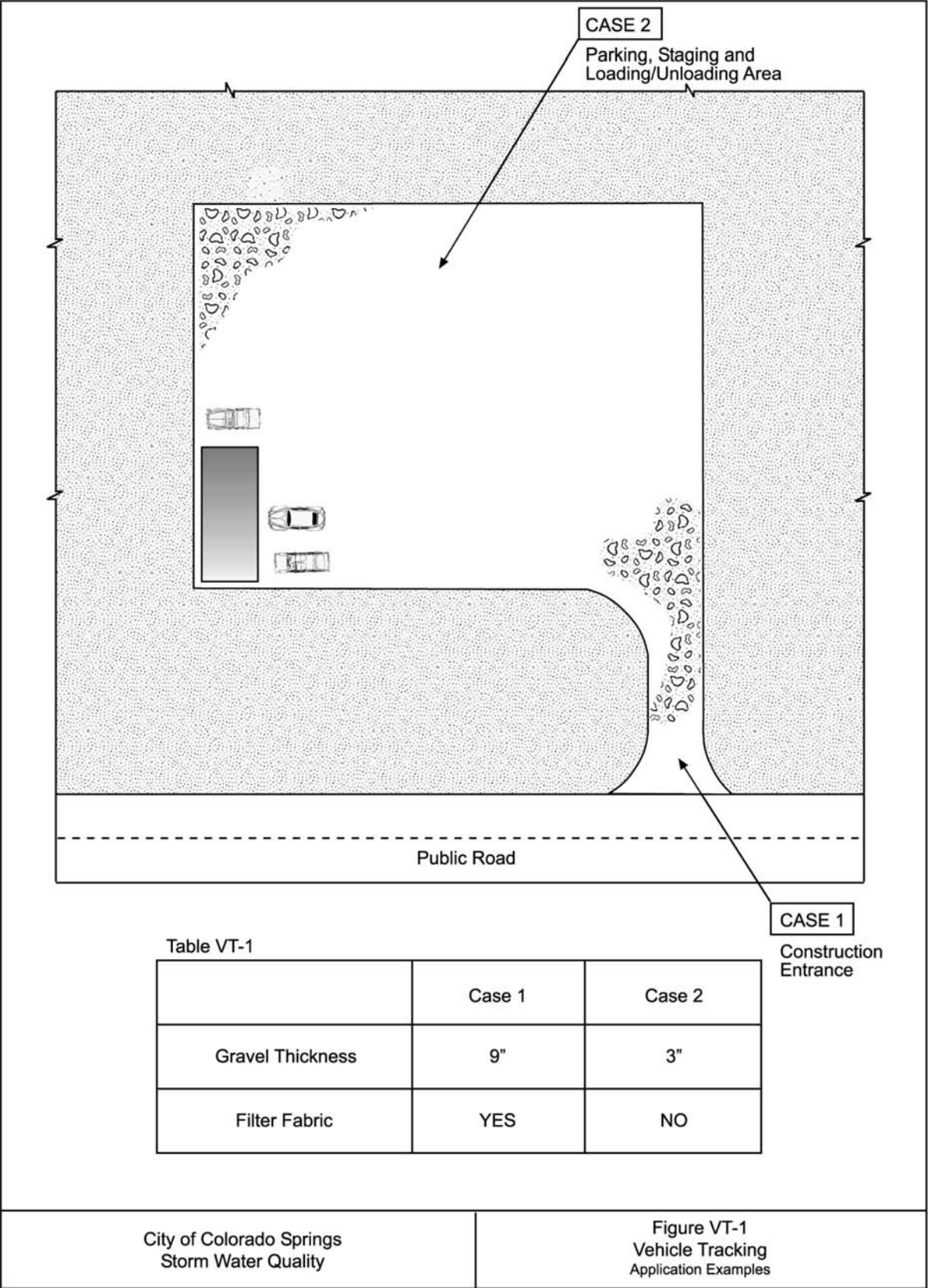
- The vehicle tracking area should not be located in areas that are wet or where soils erode easily.

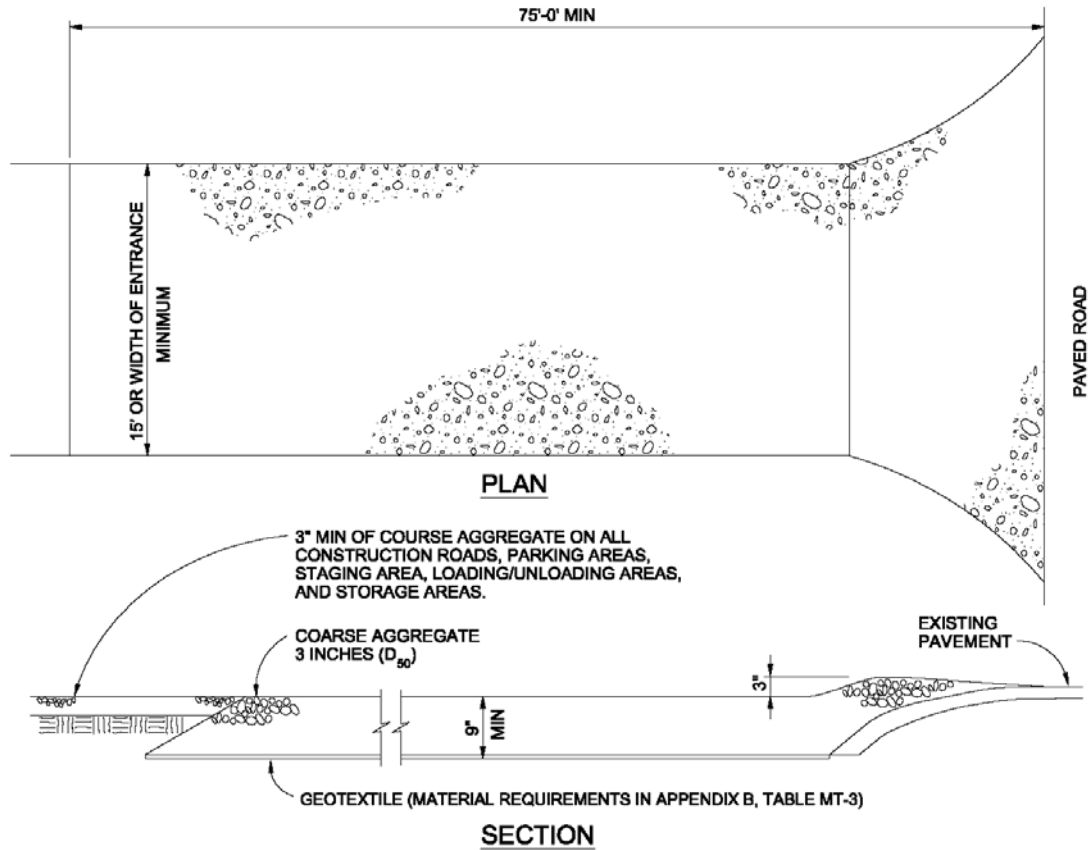


This picture shows an unstabilized entrance where dirt is being tracked onto a public road.

#### **Construction Details and Maintenance Requirements**

Figure VT-1 and VT-2 provide construction details and maintenance requirements for vehicle tracking.





## VEHICLE TRACKING

NTS

### VEHICLE TRACKING NOTES

#### INSTALLATION REQUIREMENTS

1. ALL ENTRANCES TO THE CONSTRUCTION SITE ARE TO BE STABILIZED PRIOR TO CONSTRUCTION BEGINNING.
2. CONSTRUCTION ENTRANCES ARE TO BE BUILT WITH AN APRON TO ALLOW FOR TURNING TRAFFIC, BUT SHOULD NOT BE BUILT OVER EXISTING PAVEMENT EXCEPT FOR A SLIGHT OVERLAP.
3. AREAS TO BE STABILIZED ARE TO BE PROPERLY GRADED AND COMPACTED PRIOR TO LAYING DOWN GEOTEXTILE AND STONE.
4. CONSTRUCTION ROADS, PARKING AREAS, LOADING/UNLOADING ZONES, STORAGE AREAS, AND STAGING AREAS ARE TO BE STABILIZED.
5. CONSTRUCTION ROADS ARE TO BE BUILT TO CONFORM TO SITE GRADES, BUT SHOULD NOT HAVE SIDE SLOPES OR ROAD GRADES THAT ARE EXCESSIVELY STEEP.

#### MAINTENANCE REQUIREMENTS

1. REGULAR INSPECTIONS ARE TO BE MADE OF ALL STABILIZED AREAS, ESPECIALLY AFTER STORM EVENTS.
2. STONES ARE TO BE REAPPLIED PERIODICALLY AND WHEN REPAIR IS NECESSARY.
3. SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED DAILY BY SHOVELING OR SWEEPING. SEDIMENT IS NOT TO BE WASHED DOWN STORM SEWER DRAINS.
4. STORM SEWER INLET PROTECTION IS TO BE IN PLACE, INSPECTED, AND CLEANED IF NECESSARY.
5. OTHER ASSOCIATED SEDIMENT CONTROL MEASURES ARE TO BE INSPECTED TO ENSURE GOOD WORKING CONDITION.

City of Colorado Springs  
Stormwater Quality

Figure VT-2  
Vehicle Tracking

Application Examples

## **APPENDIX B**

# CONSTRUCTION STORMWATER SITE INSPECTION REPORT

Facility Name		Permittee					
Date of Inspection		Weather Conditions					
Permit Certification #		Disturbed Acreage					
Phase of Construction		Inspector Title					
Inspector Name							
Is the above inspector a qualified stormwater manager? (permittee is responsible for ensuring that the inspector is a qualified stormwater manager)			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">YES</td> <td style="width: 50%; text-align: center;">NO</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>	YES	NO	<input type="checkbox"/>	<input type="checkbox"/>
YES	NO						
<input type="checkbox"/>	<input type="checkbox"/>						

INSPECTION FREQUENCY					
Check the box that describes the minimum inspection frequency utilized when conducting each inspection					
At least one inspection every 7 calendar days	<input type="checkbox"/>				
At least one inspection every 14 calendar days, with post-storm event inspections conducted within 24 hours after the end of any precipitation or snowmelt event that causes surface erosions	<input type="checkbox"/>				
<ul style="list-style-type: none"> <li>This is this a post-storm event inspection. Event Date: _____</li> </ul>	<input type="checkbox"/>				
Reduced inspection frequency - Include site conditions that warrant reduced inspection frequency	<input type="checkbox"/>				
<ul style="list-style-type: none"> <li>Post-storm inspections at temporarily idle sites</li> </ul>	<input type="checkbox"/>				
<ul style="list-style-type: none"> <li>Inspections at completed sites/area</li> </ul>	<input type="checkbox"/>				
<ul style="list-style-type: none"> <li>Winter conditions exclusion</li> </ul>	<input type="checkbox"/>				
Have there been any deviations from the minimum inspection schedule? If yes, describe below.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">YES</td> <td style="width: 50%; text-align: center;">NO</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>	YES	NO	<input type="checkbox"/>	<input type="checkbox"/>
YES	NO				
<input type="checkbox"/>	<input type="checkbox"/>				

INSPECTION REQUIREMENTS*
i. Visually verify all implemented control measures are in effective operational condition and are working as designed in the specifications
ii. Determine if there are new potential sources of pollutants
iii. Assess the adequacy of control measures at the site to identify areas requiring new or modified control measures to minimize pollutant discharges
iv. Identify all areas of non-compliance with the permit requirements, and if necessary, implement corrective action
*Use the attached <b>Control Measures Requiring Routine Maintenance</b> and <b>Inadequate Control Measures Requiring Corrective Action</b> forms to document results of this assessment that trigger either maintenance or corrective actions

AREAS TO BE INSPECTED			
Is there evidence of, or the potential for, pollutants leaving the construction site boundaries, entering the stormwater drainage system or discharging to state waters at the following locations?			
	NO	YES	If "YES" describe discharge or potential for discharge below. Document related maintenance, inadequate control measures and corrective actions <b>Inadequate Control Measures Requiring Corrective Action</b> form
Construction site perimeter	<input type="checkbox"/>	<input type="checkbox"/>	
All disturbed areas	<input type="checkbox"/>	<input type="checkbox"/>	
Designated haul routes	<input type="checkbox"/>	<input type="checkbox"/>	
Material and waste storage areas exposed to precipitation	<input type="checkbox"/>	<input type="checkbox"/>	
Locations where stormwater has the potential to discharge offsite	<input type="checkbox"/>	<input type="checkbox"/>	
Locations where vehicles exit the site	<input type="checkbox"/>	<input type="checkbox"/>	
Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	

### CONTROL MEASURES REQUIRING ROUTINE MAINTENANCE

Definition: Any control measure that is still operating in accordance with its design and the requirements of the permit, but requires maintenance to prevent a breach of the control measure. These items are not subject to the corrective action requirements as specified in Part I.B.1.c of the permit.

Are there control measures requiring maintenance?	NO	YES	
	<input type="checkbox"/>	<input type="checkbox"/>	If "YES" document below

[illegible]



## INADEQUATE CONTROL MEASURES REQUIRING CORRECTIVE ACTION

Definition: Any control measure that is not designed or implemented in accordance with the requirements of the permit and/or any control measure that is not implemented to operate in accordance with its design. This includes control measures that have not been implemented for pollutant sources. If it is infeasible to install or repair the control measure immediately after discovering the deficiency the reason must be documented and a schedule included to return the control measure to effective operating condition as possible.

Are there inadequate control measures requiring corrective action?	NO	YES	
	<input type="checkbox"/>	<input type="checkbox"/>	If "YES" document below

Are there additional control measures needed that were not in place at the time of inspection?	NO	YES	
	<input type="checkbox"/>	<input type="checkbox"/>	If "YES" document below

[illegible]

## REPORTING REQUIREMENTS

The permittee shall report the following circumstances orally within twenty-four (24) hours from the time the permittee becomes aware of the circumstances, and shall mail to the division a written report containing the information requested within five (5) working days after becoming aware of the following circumstances. The division may waive the written report required if the oral report has been received within 24 hours.

<b>All Noncompliance Requiring 24-Hour Notification per Part II.L.6 of the Permit</b>			
<b>a. Endangerment to Health or the Environment</b> Circumstances leading to any noncompliance which may endanger health or the environment regardless of the cause of the incident (See Part II.L.6.a of the Permit) <i>This category would primarily result from the discharge of pollutants in violation of the permit</i>			
<b>b. Numeric Effluent Limit Violations</b> <ul style="list-style-type: none"><li>○ Circumstances leading to any unanticipated bypass which exceeds any effluent limitations (See Part II.L.6.b of the Permit)</li><li>○ Circumstances leading to any upset which causes an exceedance of any effluent limitation (See Part II.L.6.c of the Permit)</li><li>○ Daily maximum violations (See Part II.L.6.d of the Permit)</li></ul> <i>Numeric effluent limits are very uncommon in certifications under the COR400000 general permit. This category of noncompliance only applies if numeric effluent limits are included in a permit certification.</i>			

Has there been an incident of noncompliance requiring 24-hour notification?	NO	YES	
	<input type="checkbox"/>	<input type="checkbox"/>	If "YES" document below

Date and Time of Incident	Location	Description of Noncompliance	Description of Corrective Action	Date and Time of 24 Hour Oral Notification	Date of 5 Day Written Notification *

\*Attach copy of 5 day written notification to report. Indicate if written notification was waived, including the name of the division personnel who granted waiver.

After adequate corrective action(s) and maintenance have been taken, or where a report does not identify any incidents requiring corrective action or maintenance, the individual(s) designated as the Qualified Stormwater Manager, shall sign and certify the below statement:

“I verify that, to the best of my knowledge and belief, all corrective action and maintenance items identified during the inspection are complete, and the site is currently in compliance with the permit.”

\_\_\_\_\_  
Name of Qualified Stormwater Manager

\_\_\_\_\_  
Title of Qualified Stormwater Manager

\_\_\_\_\_  
Signature of Qualified Stormwater Manager

\_\_\_\_\_  
Date

Notes/Comments