

Stormwater Management Plan  
For  
Academy Village Filing No. 3  
El Paso County, CO

December 2017

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#### CERTIFICATION

I hereby affirm that this Stormwater Management Plan for the Academy Village Filing No. 3 project was prepared under my direct supervision in accordance with the provisions of the Colorado Water Quality Control Act and the El Paso County Drainage Criteria Manual Volume II. JR Engineering does not and will not assume liability for the implementation of the methods, requirements and standards set forth in this report.

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Glenn Ellis, P.E.  
For and On Behalf of JR Engineering

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- B. Figure 2-Soil Map
- C. Erosion Control Plans
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## **1.0 SITE DESCRIPTION**

### **1.1. Introduction**

This report represents the Stormwater Management Plan for construction of Academy Village Filing No. 3. It was prepared to meet the regulatory requirements of the El Paso County Drainage Criteria Manual Volume II as well as the Colorado Department of Health, Water Quality Control Division in compliance with the provisions of the Colorado Water Quality Control Act, and the Federal Water Pollution Control Act.

This plan serves as a consolidated document for information on water quality protection for the subject site and areas immediately adjacent. It should also be noted that this plan is a living document that will need to be updated and maintained throughout the construction process. The intent of this plan is to provide the contractor a tool to consolidate records, logs, permits, applications, etc. as well as guidance on water quality protection. The plan incorporates elements that can be found in the contract plans and specifications as well as in the El Paso County Drainage Criteria Manual Volume II.

### **1.2. Current Conditions**

Academy Village Filing No. 3 is located in the southeast quarter of section 1, township 12 south, range 67 west of the 6<sup>th</sup> P.M., County of El Paso, State of Colorado. More specifically, Academy Village Filing No. 3 is approximately 0.709 ac. piece of property that is currently undeveloped and is comprised of relatively flat grasslands.

The site generally slopes from the east to the west with slopes ranging between 1% and 3% to an existing swale. The property is generally covered to 60% or less with native grasses (40% or more appears to be bare soil). The site drains north within the swale towards an existing RCP at the north end of the sites.

### **1.3. Nature and Purpose of Construction**

The future use of the site (0.709 ac.) entails construction of one office building. See Appendix A for a Vicinity Map. The total disturbed area will be 0.56 acres.

### **1.4. Wetlands and Receiving Waters**

The contributing area is composed of two onsite basins. The contributing area has slopes of 1% to 3% with the whole range distributed throughout the entire site. Historically the site conveys runoff, via a swale, to a 24" RCP located at the north end of the site. All proposed storm drainage infrastructure improvements are

tributary to the Black Forest Basin which lies to the south of the site and ultimately conveys the flows to Monument Creek.

According to FEMA there are no major drainageways located within the site. The entire site is located within and adjacent to Zone X, as determined by the Flood Insurance Rate Map (FIRM) Panel Number 08041C0287F, dated March 17, 1997. The FIRM Map is included in Appendix D.

### **1.5. Rainfall Erodibility & Erosion Sediment Control Methods**

Attached at the end of this report is a drawing that describes the proposed site conditions, as well as the locations of the erosion control Best Management Practices (BMPs). The Erosion Control Plan depicts the anticipated drainage patterns after major grading activities and the anticipated locations for BMPs such as silt fence, inlet protection, and staging areas. It has been assumed that the majority of the surrounding areas will remain in their present state during the construction of this project.

The Contractor will be responsible for implementing and maintaining the erosion and sediment control measures described in the document and the accompanying design drawings. The Contractor may designate these tasks to certain subcontractors as he sees fit, but the ultimate responsibility for implementing these controls and their proper function at each phase of the project remains with the Contractor.

Development of the project site will follow standard construction sequencing characteristic of roadway and site construction. Sequencing of development will commence in the following manner:

1. Installation of initial temporary erosion control measures as noted on the plans. Implementation of BMPs shall precede initial construction operations. Sanitary sewer and water system construction is anticipated to commence in Spring 2018. The time schedule may vary depending on plan approvals and weather. The initial BMP's for this project shall include silt fencing as shown on the plans, vehicle tracking control at the staging entrance, a stabilized staging area, a concrete washout area, and installation of inlet protection around existing inlets that are subject to debris or sediment deposition.
2. Site clearing and rough grading will occur within the project limits.
3. Sanitary sewer line and water line construction will then proceed. Existing sanitary sewer and water lines shall be removed per City of Woodland Park standards.
4. On-site storm sewer construction will then proceed. This includes the water quality pond and outlet structure.
5. Building foundation and vertical construction will commence.

6. Fine grading of the parking lot, and roadway will then occur.
7. Installation of concrete and asphalt pavement, along with curb and gutter will occur after fine grading.
8. Installation of the irrigation system will commence, along with the installation of site landscaping.
9. Removal of temporary erosion controls and final site cleanup should not occur until site vegetation is fully restored. Once full site stabilization has been achieved, all temporary BMP's should be removed and final site cleaning performed.

### **1.6. Non-Stormwater Discharge**

Non-stormwater discharges will be eliminated or reduced to the fullest extent feasible. However, there are no non-stormwater source of discharge tributary to the site (i.e. springs). Onsite irrigation for landscaping areas are not known at this time, however; stormwater controls will be utilized to ensure untreated irrigation discharge doesn't leave the site. This plan does not cover construction dewatering. Pumping or draining groundwater that has infiltrated into an excavation requires a general permit for construction dewatering, regardless of the size of the project. Stormwater that mixes with groundwater in an excavation is also subject to the controls in the general permit for Construction Dewatering.

No materials shall be discharged in quantities that will have an adverse effect on the receiving waters. The measures listed below will be implemented to achieve these objectives.

- Proper and lawful disposal of all waste materials.
- Control any spills and leaks that may occur and clean up (mitigate).
- Use of designated areas for equipment repair and cleaning.
- Careful application of irrigation water.

All potential pollutants used during construction other than sediment, will be handled and disposed of in a manner that does not contaminate storm water.

All materials used during construction, which have the potential to impact storm water quality will be stored, managed, used and disposed of in a manner that minimizes the potential for releases to the environment, especially storm water.

## **2.0 STORMWATER MANAGEMENT CONTROLS**

### **2.1. Controls Overview**

During construction, several controls and measures shall be implemented under the direction of the General Contractor to prevent offsite discharge of contaminated storm water. Controls for this project include erosion, sedimentation, stabilization,

and other BMPs. Specifications and engineering drawings for the selected BMPs can be found on the drawing included in the back pocket of this report.

The contractor shall comply with the attached plans and guidelines as a minimum. Field conditions and unforeseen circumstances will dictate modifications to or additions to this Stormwater Management Plan. Where storm water pollution potential exists, appropriate preventative measures (BMPs) must be utilized and documented, whether such measures are identified in this report or not.

## **2.2. Erosion and Sediment Controls**

The objective of erosion control is to limit the amount of erosion occurring on disturbed areas until the site is stabilized. The potential for soil erosion will exist during onsite grading and construction activities. The objective of sediment control is to capture the soil that has been eroded before it leaves the construction site. Despite the use of both erosion and sediment control measures, it is recognized that some sediment could remain in runoff leaving the construction site. This should be minimized to the maximum extent practicable.

The BMPs scheduled for use during the construction of this site can be divided into Structural and Non-Structural Practices. Section 2.2.1 of this report discusses the proposed structural BMPs to be utilized. Section 2.2.2 discusses the non-structural practices.

### **2.2.1. Structural Practices (See drawings for locations)**

Structural BMPs are structural site management practices that will minimize erosion and sediment transport. Such practices may include silt fences, drainage swales, inlet protections, outlet protection, etc. The goal of structural BMPs on this project is to protect areas downstream of the site from turbid water, sediment, oils and other contaminants, which may mobilize during storm water flows. The structural BMPs that may be utilized on the subject site are depicted in the Drainage and Erosion Control Plan and are described in more detail as follows:

#### **Silt Fence:**

- A temporary vertical barrier of filter fabric attached to and supported by posts and entrenched into the ground.
- Utilized to intercept sediment from disturbed areas during construction operations.
- Used to filter shallow sheet flow.
- Typically used along the toe of fills, in transition areas between cut and fills, and adjacent to streams.
- Generally installed prior to or immediately following land-disturbance activity.



- Shall be inspected periodically and after each rain or snowfall event and repaired when necessary. Sediment shall be removed from behind the fence when it accumulates to one-half the exposed fabric height. Sediments removed must be properly disposed.
- Utilized as a temporary feature.

Inlet Protection:

- A barrier across or around a storm drain drop inlet, a curb inlet, or a culvert inlet.
- Utilized to intercept and filter sediment-laden runoff and prevent it from entering storm drainage systems.
- Not to be utilized in place of a sediment-trapping device. Used as a secondary control device.
- Do not use where ponded water might flow onto the roadway.
- Blocking of the inlet should not be watertight.
- Generally installed prior to land-disturbance activity on existing inlets and immediately after the construction of new inlets.
- Shall be inspected periodically and after each rain or snowfall event and repaired when necessary. Accumulated sediment shall be removed and properly disposed.
- Utilized as a temporary feature.

Outlet Protection:

- A structurally lined apron (generally with riprap, grouted rip rap, or concrete) placed at the outlet of pipes or paved channel sections.
- Used as an energy dissipation device to prevent scour and erosion at the outlet by reducing the velocity and energy of concentrated flow.
- Shall be installed immediately following the construction of the upstream conveyance element.
- Inspection shall be performed after high flows for scour and dislodged stones. Repairs shall be made immediately.
- Utilized as a permanent feature.

Grading Techniques:

- Soil surface roughening, terracing and rounding at tops of cuts, transitions and roadway ditches to facilitate plant establishment and minimize erosion.
- Utilized to temporarily stabilize disturbed areas and protect from wind and water erosion immediately after grading activities have ceased.
- Used as a temporary practice during construction.
- Inspection and maintenance must be provided periodically and after each rain or snowfall event that causes runoff to ensure roughened state is maintained.
- Rills developed should be filled and the area re-graded immediately.

Erosion control measures are the responsibility of the General Contractor to inspect and maintain. Any existing erosion control devices that are removed in order to complete the construction of the utilities shall be replaced immediately following the construction that required its removal unless directed otherwise by the construction plans.

### **2.2.2. Non-Structural Practices (See drawings for locations)**

Non-Structural BMPs are both interim and permanent stabilization practices. Such practices may include temporary seeding, permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, tree protection, preservation of mature vegetation, etc. The non-structural BMPs that may be utilized on the subject site are described in more detail as follows:

#### **Temporary and Permanent Seeding:**

- Soil preparation, seeding, mulch tackifier and/or mulching shall be required for all disturbed areas that are not hardscaped, paved or stabilized.
- Exposed soils, which are not part of the active grading and/or construction activity, shall be stabilized.
- Seeded areas shall be inspected frequently. If the seeded areas fail to establish, provide adequate ground coverage. If seeded areas are disturbed, the area should be re-seeded.
- Permanent landscaping and vegetative cover is depicted on the Landscaping plans.

#### **Mulching:**

- Application of plant residues to the soil surface. Typical mulching material includes certified weed free hay or straw, certified under the Colorado Department of Agriculture Weed Free Forage Certification Program as regulated by the Weed Free Forage Act, Title 35, Article 27.5, CRS and wood cellulose fiber.
- Utilized in combination with mulch tackifier for temporary erosion control (i.e., incomplete slopes, detour slopes, stockpiles).
- Utilized in combination with mulch tackifier for temporary erosion control on slopes when seeding is not allowed due to seasonal constraints.
- Used to cover permanent or temporary seed areas. Hydromulch shall not be done in the presence of free surface water.

- Inspect frequently and reapply mulching in areas where the mulching has been loosened or removed. Mulch tackifier must be applied with additional applications of mulching.

Mulch Tackifier:

- An organic soluble powder adhesive used as a water slurry to adhere native hay, straw, hydromulch, or seed to a surface and together.
- Used to cover disturbances as temporary cover for wind erosion.
- Mulch movement indicates poor application and procedure mixture.
- Proper application will bond mulch material together and to soil.
- Inspect by touching mulch surface to determine if adhesion has occurred.

Maintain Existing Vegetation:

- Existing vegetation should be preserved where possible to prevent the migration of sediment.
- Should be inspected regularly.
- Establish and maintain buffers.
- Areas beginning to show signs of erosion or soil transport may require additional emergency BMPs.

**2.2.3. Other Controls (See drawings for location)**

Vehicle Tracking Control / Construction Entrance:

- A temporary stabilized layer of aggregate underlined with geotextile or gravel located where traffic enters or exits the construction site.
- The structure shall be constructed prior to any construction activity and maintained daily.
- Stone shall be added and repairs performed as conditions require.
- When mud is present and not easily removed by a tracking pad, tire washing should be implemented as needed. Tire washing operations should occur near the construction exit on a stabilized stone pad. Implementation of a tire washing area should include provisions for collecting wash water and directing it to an onsite pond.

Tracking of Sediment onto Roads and Streets:

- Public and private roadways shall be kept clear of accumulated sediment. Bulk clearing of accumulated sediment shall not include flushing the area with water. Sediment will be shoveled and or swept from the street and disposed of in a manner that prevents contamination of storm water or surface water runoff.

### **2.3. SWMP Administrator**

Implementation and management of the environmental aspects of this project under this SWMP Plan are the responsibilities of the General Contractor. The General Contractor shall ensure the all contractors providing services on the project have access to a copy of the SWMP Plan and appropriate training regarding storm water pollution prevention. The General Contractor, Building Contractor, Utility Installations Contractor, Grading Contractor and all other contractors and subcontractors shall be familiar with the SWMP Plan and their responsibilities on the plan.

### **2.4. Materials Management**

#### **2.4.1. Potential Pollution Sources**

It is anticipated that this construction project will not utilize any abnormal or atypical hazardous materials. The construction site will operate much like other typical construction projects. The following materials or substances are expected to be present onsite during construction:

Concrete/Additives/Wastes	Cleaning solvents
Detergents	Petroleum based products
Paints/Solvents	Pesticides
Acids	Fertilizers
Solid and construction wastes	Sanitary wastes
Soil stabilization additives	

Activities on the site that may have an impact on stormwater include the following:

- Equipment and/or vehicle washing
- Fertilizers, chemicals, or other material storage
- Vehicle maintenance or fueling
- Waste incineration, treatment, storage or disposal
- Off-site vehicle tracking
- Loading/unloading areas
- Concrete truck washout

As construction progresses, specific areas shall be designated for vehicle maintenance and refueling, material and waste storage, construction equipment staging, and bathroom facilities. Management measures and procedures for these facilities are discussed later in the plan.

#### **2.4.2. Pollution Prevention Measures**

Pollution prevention measures shall be utilized to prevent construction materials with the potential of polluting stormwater, such as those listed above, from coming in contact with runoff. Measures include good housekeeping and proper disposal of construction and demolition debris, equipment fuel, lubricants, paints and solvents, asphalt, concrete, topsoil and other materials, as well as controls which prevent sediments from being tracked off-site by construction vehicles, and proper control of any non-stormwater flows on-site.

As previously stated, Best Management Practices (BMPs) are schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce pollution of public waters. BMPs also control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. With regard to construction, these may include structural controls and nonstructural practices that are designed to prevent pollutants from entering water or direct the flow of water away from potential sources of pollution.

For construction sites, there are three main types of BMPs, those that prevent erosion and sediment transport, others that prevent pollutants from construction materials from mixing with stormwater, and those that trap pollutants before they can be discharged. BMPs for most common construction materials and wastes with the greatest potential for adversely affecting stormwater quality are as follows:

**BMPs for Disturbed and Stored Soils:**

- Seeding and mulching should be completed for the site
- Soil preparation, seeding, mulch tackifier and/or mulching shall be required for all disturbed areas that are not surfaced.
- Exposed soils, which are not part of the active grading and/or construction activity, shall be stabilized.
- Seeded areas shall be inspected frequently. If the seeded areas fail to establish, provide adequate ground coverage. If seeded areas are disturbed, the area should be re-seeded.
- Permanent landscaping and vegetative cover is depicted on the Landscaping plans.

**BMPs for Vehicle Tracking of Sediment:**

- Use vehicle tracking pads at the entrances of construction
- Public and private roadways shall be kept clear of accumulated sediment. Bulk clearing of accumulated sediment shall not include flushing the area with water. Sediment will be shoveled and or swept from the street and disposed of in a manner that prevents contamination of storm water or surface water runoff.

- A temporary stabilized layer of aggregate underlined with geotextile or gravel located where traffic enters or exits the construction site.
- The structure shall be constructed prior to any construction activity and maintained daily.
- Stone shall be added and repairs performed as conditions require.
- When mud is present and not easily removed by a tracking pad, tire washing should be implemented as needed. Tire washing operations should occur near the construction exit on a stabilized stone pad. Implementation of a tire washing area should include provisions for collecting wash water and directing it to an onsite pond

BMPs for Management of Contaminated Soils:

- Have equipment to contain and clean up spills of hazardous materials in the vicinity of where these materials are to be stored or used.
- Contain and clean up spills immediately after they occur. Contact State or Local solid waste regulatory agency concerning information and procedures necessary to treat or dispose of contaminated soils.
- Keep materials in a dry covered area and elevated from the ground.

BMPs for Loading and Unloading Operations:

- Select a loading and unloading area for the site

BMPs for Outdoor Storage Activities:

- Select an outdoor storage area for the site
- When possible store equipment and material in covered areas

BMPs for Equipment Maintenance and Fueling:

- Fueling operations shall occur in a designated area.
- Have equipment to contain and clean up petroleum spills in fuel storage areas or on board maintenance and fueling vehicles.
- Where possible, store petroleum products and fuel vehicles in covered areas and construct dikes to contain spills.
- Contain and clean up spills immediately.
- Use preventive maintenance for onsite equipment such as checking for and fixing gas and oil leaks in construction vehicles on a regular basis.
- Follow proper procedure for the handling and application of asphaltic substances.
- Oversee all filling operations.
- Fueling equipment and area shall be fenced and valving locked to prevent vandalism.

BMPs for Significant Particulate Generating:

- Use silt fence and inlet protection to protect the areas downstream of the site
- Maintain and clean out any sediment that builds up around the inlet protection and silt fence

BMPs for On-Site Waste Management:

- Select a designated waste collection area onsite.
- Provide an adequate number of containers with lids or covers that can be placed over the containers prior to rainfall.
- When possible, locate containers in a covered area.
- Arrange for waste collection before containers overflow.
- If a container does spill, provide cleanup immediately.
- Plan for additional containers and more frequent pickups during the demolition phase of construction.
- Make sure that construction waste is collected, removed, and disposed of only at authorized disposal areas.
- Check with local solid waste management agency for specific guidance.
- Trash, debris and spoils shall be properly contained at the END of EACH day.

BMPs for residual Concrete disposal:

- Emptying or wash out of excess concrete may be allowed on site. Excess concrete and wash water should be disposed of in a manner that prevents contact between these materials and stormwater discharges from the site.
- Residual concrete shall be discharged in specifically designated dike areas, which have been prepared to prevent contact between the concrete and/or washout and stormwater discharged from the site and/or ground water.
- The hardened residue from the dike areas shall be disposed of in the same manner as other non-hazardous construction waste materials or may be broke up and utilized as deemed appropriate by the contractor.
- The use of the washout area shall be temporary (less than one year).
- Washing of trucks and masonry equipment is to be performed only at a designated concrete washout. No burying of wastes.

BMPs for Sanitary/Septic Wastes:

- Sanitary or septic wastes that are generated onsite should be treated or disposed of in accordance with State or local requirements.
- If self-contained, temporary facilities are utilized, the domestic waste haulers should be contracted to regularly remove the sanitary and septic wastes and to maintain the facilities in good working order.
- Any facilities to be connected to a sanitary sewer system should be properly hooked to the sanitary sewer system to prevent illicit discharges.
- Untreated, raw sewage should never be discharged or buried onsite.

- Contact local government and State regulatory agencies to ensure the compliance with State or local requirements.
- If sewage is being discharged to the sanitary sewer, the local treatment works authority should be contacted.

BMPs for pesticides:

- Store pesticides in a dry covered area and elevate above the ground.
- Provide curbs or dikes to contain possible spills.
- Have measures on site to contain and clean up spills.
- Strictly follow recommended application rates and recommended application methods.
- Only a Certified Applicator shall use pesticides.

BMPs for Fertilizers/Detergents:

- Limit the application of fertilizers to the minimum area and minimum recommended amounts.
- Reduce exposure of nutrients to storm water runoff by working the fertilizer deep into the soil.
- Apply fertilizer more frequently, but at lower application rates.
- Hydro seeding, where lime and fertilizers are applied to the ground surface in one application should be limited, where possible.
- Limit the use of detergents onsite: wash water containing detergents should not be discharged to the storm system.
- Implement good erosion and sediment control to help reduce the amount of fertilizers that can leave the site as well as sediments.
- Fertilizers and detergents shall be stored in dry and covered area and elevated above the ground.
- Berming shall be provided around the storage area to avoid contact with stormwater runoff.

BMPs for Hazardous Wastes Disposal:

- Check with local waste management authorities to determine what the requirements are for disposing of hazardous materials.
- Use the entire product before disposing of the container.
- Do not remove the original product label from the container. It contains important information.
- Do not mix products together unless specifically recommended by the manufacturer.
- The correct disposal of these products varies with the product utilized. Follow the manufacturers recommended method, which is often found on the label.



## **2.5. Spill Management**

Construction site supervisors should create and adopt a spill control plan that includes measures and procedures to stop the source of the spill, contain the spill, clean up, and disposal of contaminated materials. Key personnel shall be identified and trained to be responsible for spill prevention and control. The following measures would be appropriate for a spill prevention and response plan:

- Store and handle materials to prevent spills.
  - Tightly seal containers.
  - Make sure all containers are clearly labeled.
  - Stack containers neatly and securely
  - Where possible, store containers on pallets in a covered area.
- Reduce stormwater contact if there is a spill.
  - Have cleanup procedures clearly posted.
  - Have cleanup materials readily available.
  - Contain any liquid.
  - Stop the source of the spill.
  - Cover spill with absorbent material.
- Dispose of contaminated materials according to manufacturer's instructions or according to State or local requirements.
- Identify personnel responsible for responding to a spill of toxic or hazardous materials.
  - Provide personnel spill response training.
  - Post names of spill response personnel.
- Keep the spill area well ventilated.

Additionally, records of spills, leaks, or overflows that result in the discharge of pollutants must be documented and maintained. Information such as the time and date, weather conditions, response procedure taken, response personnel involved, reasons for the spill, etc., shall be recorded for all occurrences in the SWMP Plan and on the map.

Spill Categories are as follows:

### **Minor Spills**

- Any event that involves 5 gallons or more and or involves the following:
- Less than the reportable quantity
- Stays within the permitted area
- Does not threaten any stormwater conveyances

### **Significant Spills**

- Reportable Quantity (SARA title III List of Lists, available from EPA for reportable quantity)
- Any amount leaving the permitted area
- And/or threatens any water conveyances.

#### Hazardous Spills

- Any substance requiring a MSDS response.
- Procedure shall include but limited to:
  - Secure the area
  - Provide first aid
  - Notify emergency response personnel

Some spills may need to be reported to the Division of Water Quality and the County of El Paso immediately. Specifically significant spills that are, a release of any chemical, oil, petroleum product, sewage, etc., which may enter waters of the State of Colorado (which include surface water, ground water and dry gullies or storm sewers leading to surface water), any spill that exceeds the reportable quantity, and any amount that leaves the permitted area must be reported. The Division's toll-free 24-hour environmental emergency spill reporting line is 1-877-518-5608. Written documentation to both the CDPHE (Division) and the County of El Paso of significant spills should be provided within 5 days.

### **3.0 Dry Land Vegetation**

#### **3.1. Soil and Surface Conditions**

The Academy Village Filing No. 3 site consists of Course Sandy Loams, which the USDA-NSCS classifies as Type B soils. See Appendix B for the NRCS soil map.

#### **3.2. Seed Mixes**

A standard County of El Paso seed mix should be used for the site. If a standard mix is not used than a request to the County must be submitted of the preferred seed mix with the application rates.

#### **3.3. Mulches**

Typical mulching material includes certified weed free hay or straw, certified under the Colorado Department of Agriculture Weed Free Forage Certification Program as regulated by the Weed Free Forage Act, Title 35, Article 27.5, CRS and wood cellulose fiber. Mulch should be utilized in combination with mulch tackifier for temporary erosion control (i.e., incomplete slopes, detour slopes, stockpiles) when seeding is not allowed due to seasonal constraints. Mulch is also used to cover permanent or temporary seed areas. The mulch should be inspected frequently and reapplied in areas where the mulch has been loosened or removed. Mulch tackifier must be applied with additional applications of mulching.

### **4.0 Detailed Sequence of Construction Activities**

**Sequence of Land Disturbing Activity Chart**

	<i>Mobilization</i>	<i>Demolition</i>	<i>Grading</i>	<i>Utilities Installation</i>	<i>Flat work Installation</i>	<i>Vertical Installation</i>	<i>Landscape</i>	<i>Demobilization</i>
Best Management Practices (BMPs)								
Structural "Installation"								
Silt Fence Barriers*								
Vehicle Tracking Pad*								
Inlet Filter Bags*	Any prior inlets that could use protecting							
Rock Bags*	Any prior inlets that could use protecting							
Rip Rap								
Collecting Asphalt / Concrete Saw Cutting Waste								
*All BMPs to be Removed once Construction is Complete.								
Vegetative								
Temporary Seeding Planting		Any time the site will sit dormant longer than 30 Days.						
Mulching/Sealant		Any time the site will sit dormant longer than 30 Days.						
Permanent Seeding Planting								
Sod Installation								
Rolled Products : Netting/Blankets/Mats		Any time the site will sit dormant longer than 30 Days.						

## 5.0 Inspection and Maintenance

### 5.1. Inspection and Maintenance Overview

A site inspection of all erosion control facilities shall be conducted at least once every two weeks and immediately following any significant precipitation or snowmelt event that could cause surface erosion and every 30 days for inactive construction projects. The inspection must determine if there is evidence of, or the potential for, pollutants entering the drainage system, and BMPs should be reviewed to determine if they still meet the design and operational criteria in the SWMP Plan and that they continue to adequately control pollutants at the site. The construction site perimeter, disturbed areas, discharge points and areas used for

material storage that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the storm drainage system. Erosion and sediment control measures identified in this SWPM Plan and on the construction plans shall be observed to ensure that they are operating correctly. Any other structural BMPs that may require maintenance, such as secondary containment around fuel tanks or the conditions of spill response kits shall also be inspected. Stormwater items to be inspected include the following:

- Condition & failures of structural & non-structural BMPs
- Perimeter and outfall structure
- Evidence of spills, upsets & discharges
- Maintaining accurate SWMP Plan documentation
- Material Handling and storage
- Good Housekeeping
- Site Stabilization
- Meet authorities during inspections
- Update permit disturbed acreage
- Equipment and vehicle storage area
- Maintenance records of equipment, systems & operations

The project site and the adjacent streets impacted by the construction shall be kept neat, clean and free of debris. The control measures and facilities need to be maintained in good working order. Any items that are not functioning properly or are inadequate should be promptly repaired or upgraded. The site shall be inspected by responsible personnel who are familiar with the site. Inspection and monitoring will follow the procedures outlined below:

Minimum Monitoring (Inspection) Requirements:

- Inspections of the construction site shall be conducted by the contractor (or agent) every two weeks and after significant storm events.
- The qualified site superintendent familiar with this SWMP Plan /BMP shall perform the inspections.
- The contractor shall certify the site is in compliance with the SWMP Plan /BMP and the permit by:
  - Ensuring that areas contributing significant storm water discharges related to the construction activities have been identified.
  - Evaluating preventive measures required by the SWMP Plan /BMP to insure they are adequate and has been properly implemented.
  - Points of discharge from the site will be inspected to check for signs of pollutant discharge.
  - Certifying the grade elevations and capacity of permanent sedimentation facilities.

- Determining if additional control measures will need to be implemented.
- Updating this SWMP Plan if new measures are implemented or existing controls are deleted.

Based on the results of the inspection, the description of potential pollutant sources, and the pollution prevention and control measures that are identified within this plan shall be revised and modified as appropriate and as soon as practicable after such inspection. Typically corrective action shall commence immediately when a deficiency is observed.

In addition to the inspections performed at least every 7 days, several daily inspections will be required. Each day when any type of construction activity has taken place onsite, qualified personnel provided by the General Contractor shall:

- Inspect all onsite areas where petroleum products are stored, used or handled for spills and leaks from vehicles and equipment.
- Inspect all onsite locations where vehicle enter or exit the site for evidence of offsite sediment tracking.

## **5.2. Final stabilization and long term stormwater management**

Permanent stabilization will be achieved by establishing a vegetative cover on all disturbed areas. The vegetative cover will be as specified on the Landscape Plan. Final stabilization shall be considered complete when all paving and landscaping are completed and the vegetative cover has been established with a density of at least 70 percent of pre-disturbance levels (including shrubs and trees).

In general spring and fall encouraged whenever possible. Temporary and permanent seeding shall be completed within 14 days after grading has ceased and left to idle for more than 30 days. Care should be taken to complete seeding activities prior to November 1st for disturbed land intending to remain inactive for the winter months.

Roughening and scarifying disturbed areas is allowed as a temporary stabilization with the following conditions:

- During winter activity
- Intended to seeded in the spring fall seasons
- Intended to be active within 2-3 months of inactivity (with Stormwater approval)

Management of storm water after completion of construction will be accomplished by utilizing the practices listed below:

- Upon completion of construction, the site shall be inspected to ensure that all equipment, waste materials, and debris have been removed.
- The site will be inspected to make certain that all graded surfaces have been landscaped or seeded with an appropriate ground cover.
- Upon acceptance of final stabilization measures, all temporary BMP's shall be removed and proper function of inlets, drainage ways, or other storm water conveyance elements shall be restored.
- The storm sewer systems and the detention pond will be returned to full capacity and the outlet structures will be checked to assure they are unclogged and in working order.

The General Contractor shall be responsible for maintaining the storm water controls in good working order including removal measures until the Inactivation Notice is filed with the State. The state requires the Inactivation Notice be filed within 3 months of the proposed end of construction. Alternatively, permit responsibilities may be transferred or reassigned by submitting a Notice of Transfer and Acceptance of Terms or a Reassignment of Coverage if control of a portion of the site changes parties.

## **6.0 CONCLUSION**

This Stormwater Management Plan has been prepared in accordance with the criteria and methods described in the "State of Colorado General Permit Application and Stormwater Management Plan Guidance for Stormwater Discharges Associated with Construction Activity." The drainage system has been designed to comply with the regulatory requirements of the El Paso County Drainage Criteria Manual Volume II. All temporary and permanent erosion and sediment control BMPs shall be inspected, maintained and repaired by the General Contractor as needed to ensure continued performance of their intended function.

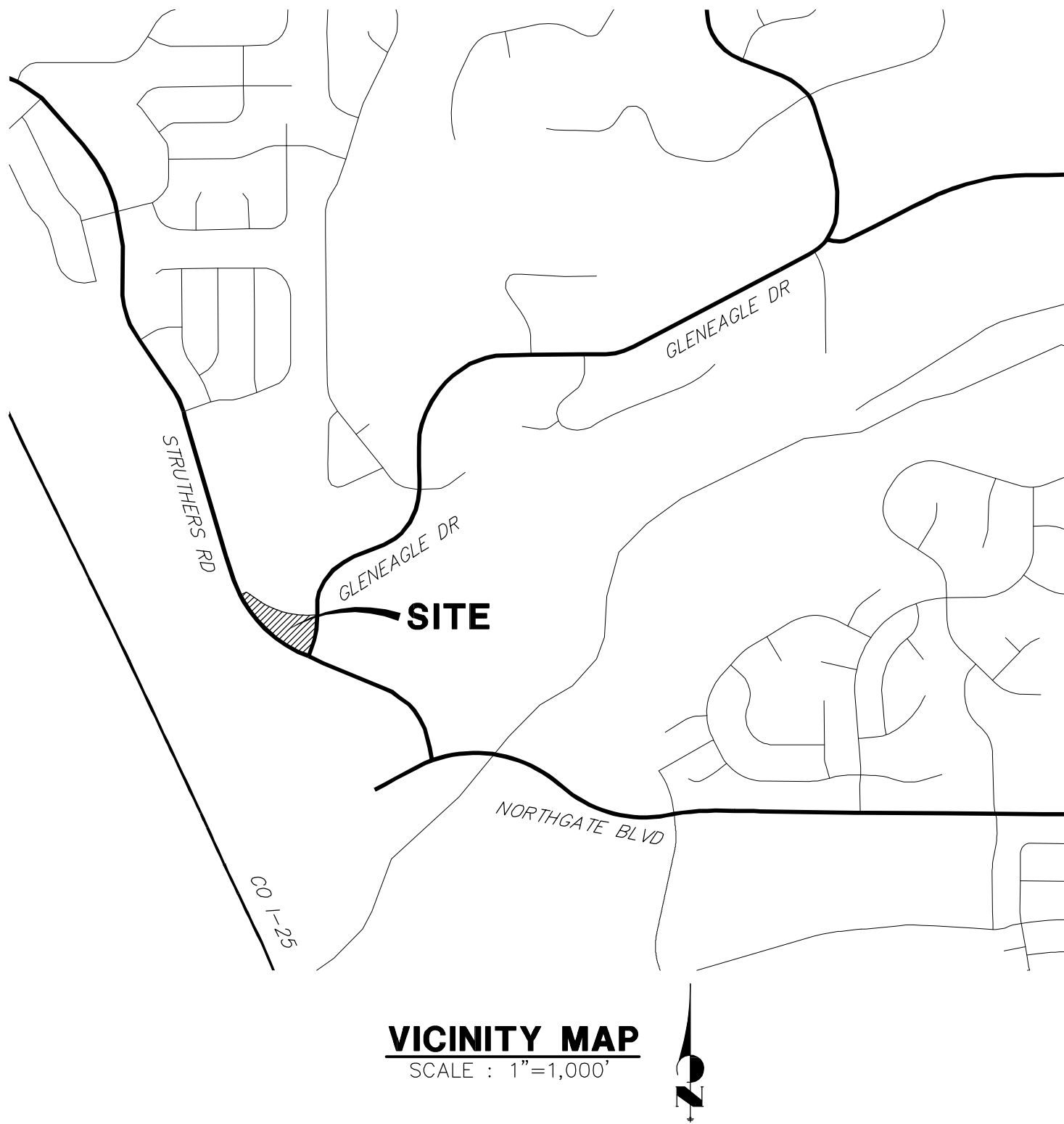
The General Contractor shall remove all temporary erosion and sediment control BMPs after stabilization is achieved or after temporary BMPs are no longer needed. Trapped sediment will be removed by the General Contractor or stabilized onsite. Disturbed soil areas resulting from removal of BMPs or the General Contractor will need to be permanently stabilized with vegetation as soon as possible.

## **7.0 REFERENCES**

1. Urban Storm Drainage Criteria Manual (Volumes 1, 2, and 3), Urban Drainage and Flood Control District, (Rev. April 2008)
2. Storm Drainage Criteria Manual Volume II, El Paso County, Colorado, Updated November, 2002.
3. "Hydrologic Group Rating for El Paso County Area, Colorado", USDA-Natural Resources Conservation Service, National Cooperative Soil Survey. Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>.

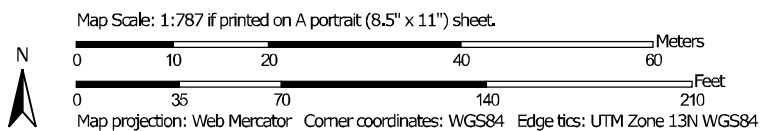
## APPENDIX A



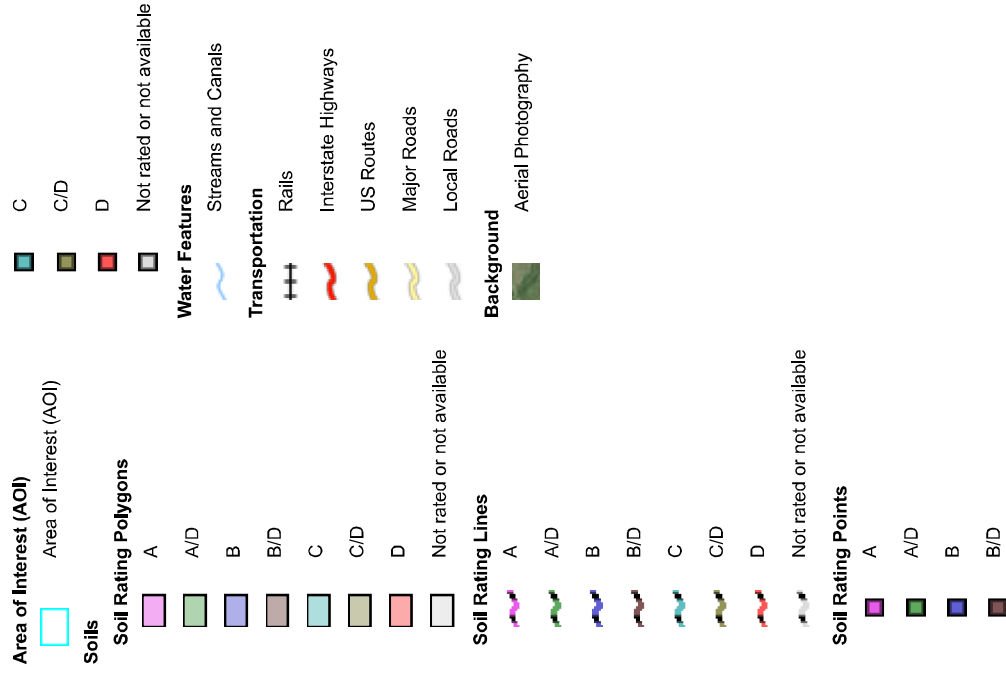


## APPENDIX B

# Hydrologic Soil Group—El Paso County Area, Colorado



## MAP LEGEND



## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL:  
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado  
Survey Area Data: Version 14, Sep 23, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 15, 2011—Sep 22, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — El Paso County Area, Colorado (CO625)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
71	Pring coarse sandy loam, 3 to 8 percent slopes	B	1.1	100.0%
<b>Totals for Area of Interest</b>			<b>1.1</b>	<b>100.0%</b>

## Description

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

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

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

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

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

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

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

## Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

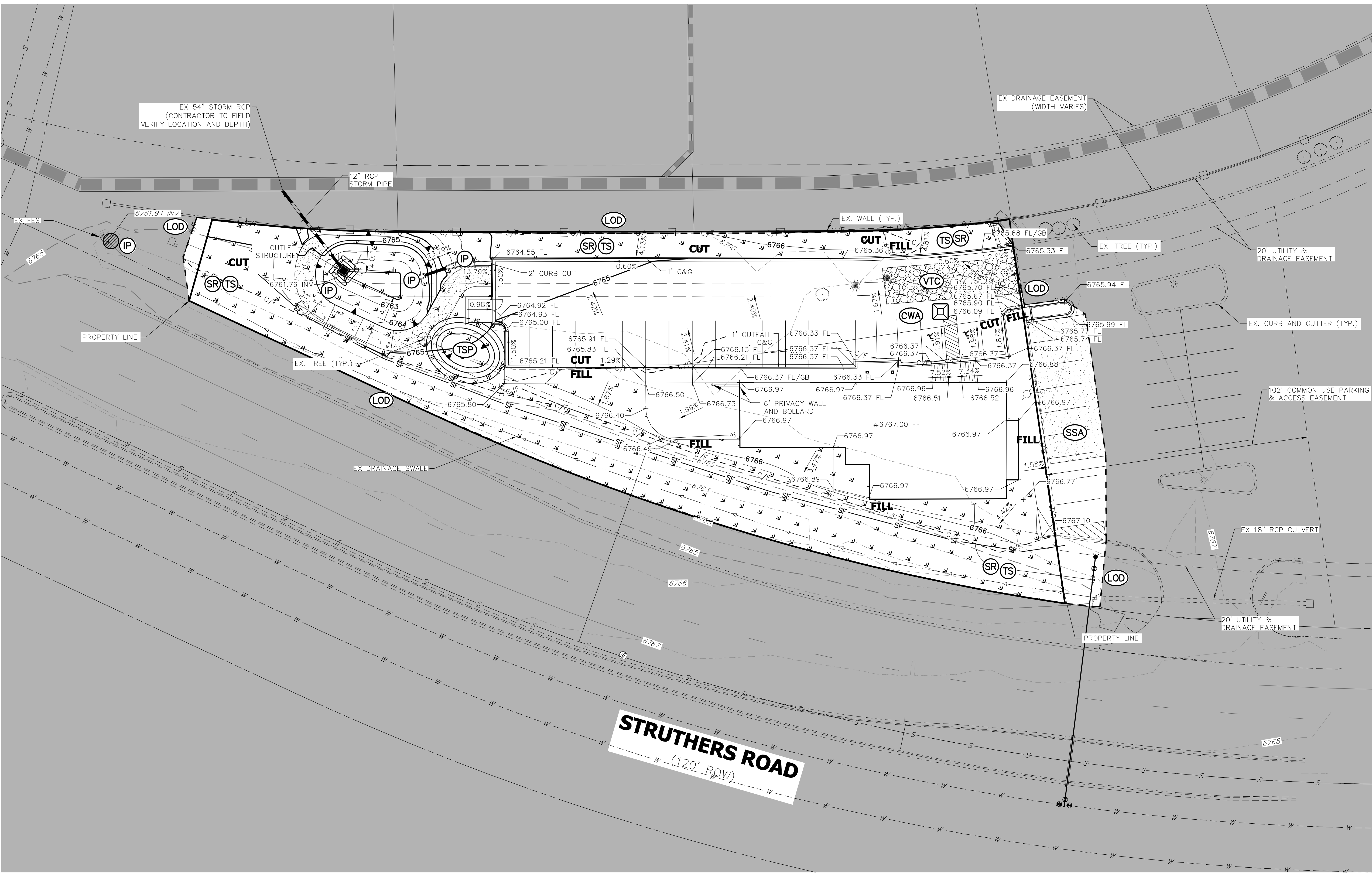
*Tie-break Rule: Higher*

## APPENDIX C









GESC PLAN LEGEND

- SURFACE ROUGHENING/  
TEMPORARY SEEDING (SR/PS)
- SILT FENCE (SF)
- VEHICLE TRACKING CONTROL (VTC)
- STABILIZED STAGING AREA (SSA)
- CONCRETE WASHOUT AREA (CWA)
- INLET PROTECTION (IP)
- TEMPORARY STOCKPILE (TSP)
- FLOW DIRECTION
- NON-IRRIGATED  
DROUGHT TOLERANT  
NATIVE GRASSES
- SF
- IP
- TSP

LEGEND

- EXISTING CONTOURS (6100)
- PROPOSED INDEX CONTOURS (6100)
- PROPOSED INTERMEDIATE CONTOURS
- PROPOSED STORM SEWER
- PROPOSED INLET
- FINISHED GRADE ELEVATION (XX.XX)
- LOW POINT ELEVATION (XX.XX LP)
- HIGH POINT ELEVATION (XX.XX HP)
- RIGHT OF WAY ELEVATION (XX.XX ROW)
- GRADE BREAK ELEVATION (XX.XX GB)
- FLOW LINE ELEVATION (XX.XX FL)
- PROPOSED RIDGELINE
- LIMITS OF DISTURBANCE
- EROSION CONTROL BLANKET
- CUT-FILL LIMITS (C/F)

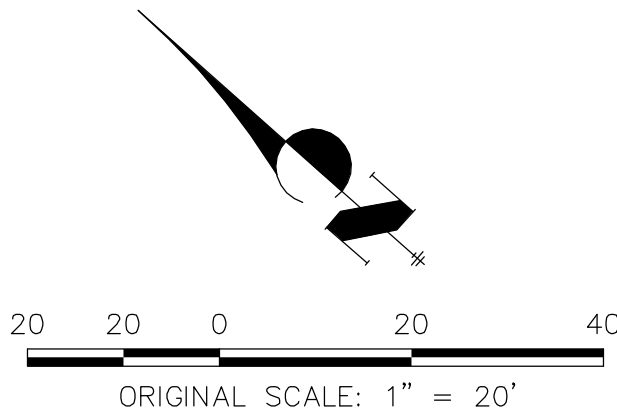
GESC PLAN NOTES

- SEE COVER SHEET FOR EL PASO COUNTY GRADING AND EROSION CONTROL NOTES.
- THE PLAN SHALL NOT SUBSTANTIALLY CHANGE THE DEPTH OF COVER, OR ACCESS TO UTILITY FACILITIES. ADDITIONALLY, THE PLAN SHALL NOT INCREASE OR DIVERT WATER TOWARDS UTILITY FACILITIES. ANY CHANGES TO UTILITY FACILITIES TO ACCOMMODATE THE PLAN, MUST BE DISCUSSED AND AGREED TO BY THE AFFECTED UTILITY PRIOR TO IMPLEMENTING THE PLAN. THE RESULTING COST TO RELOCATE OR PROTECT UTILITIES, OR PROVIDE INTERIM ACCESS IS AT THE EXPENSE OF THE PLAN APPLICANT.

LAND DISTURBANCE		
	VOLUME (CY)	AREA (AC)
CUT	315	0.34
FILL	222	0.22
NET	93 (CUT)	N/A




Know what's below.  
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UNTIL SUCH TIME AS  
THESE DRAWINGS ARE  
APPROVED BY THE  
APPROPRIATE REVIEWING  
AGENCIES, OR ENGINEERING  
APPROVES THEIR USE FOR  
DESIGNATED BY WRITTEN  
AUTHORIZATION.

PREPARED FOR  
**RON COVINGTON HOMES**  
13725 STRUTHERS ROAD, SUITE 200  
COLORADO SPRINGS, CO 80920  
RON COVINGTON  
719-491-1220  
RCOVINGTON@COVINGTONHOME.COM

**J.R. ENGINEERING**  
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Fort Collins: 970-497-9888 • www.jrengineering.com

H-SCALE	V-SCALE	DATE	DESIGNED BY	DRAWN BY	CHECKED BY	No.	REVISION	BY	DATE
1"=20'	N/A	8/25/17	AUH	AUH					

ACADEMY VILLAGE FILING NO. 3

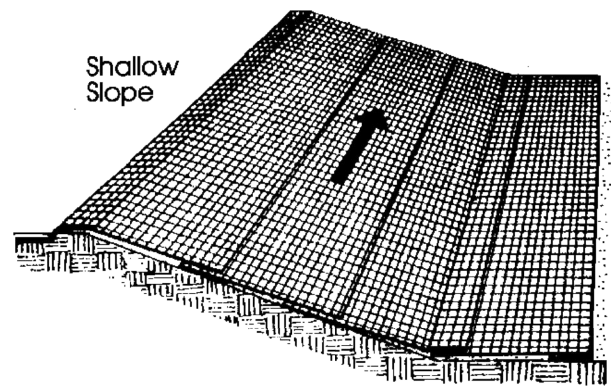
GRADING & EROSION  
CONTROL PLAN

SHEET 2 OF 4

JOB NO. 25123.00

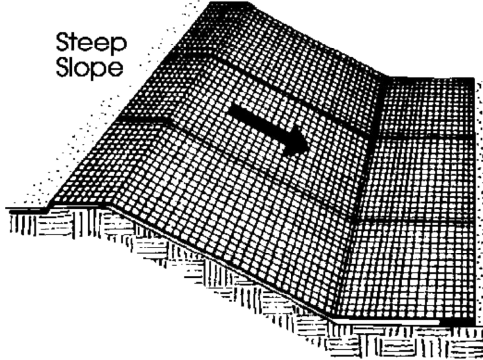


From: Virgin Soil and Water Conservation Commission, 1995



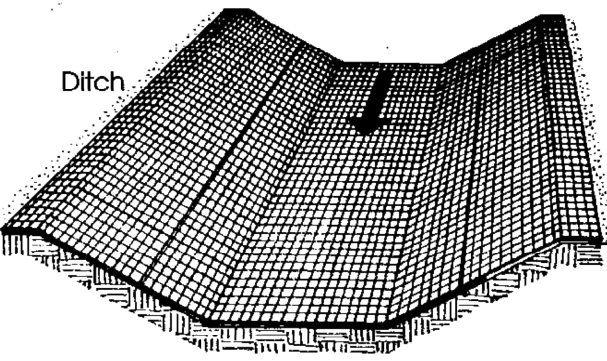
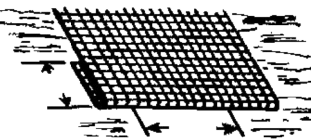
On shallow slopes, strips of netting may be applied across the slope.

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



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.



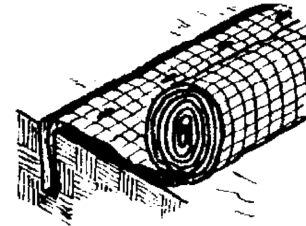
In ditches, apply netting parallel to the direction of flow. Use check slots every 15 feet. Do not join strips in the center of the ditch.

City of Colorado Springs  
Storm Water Quality

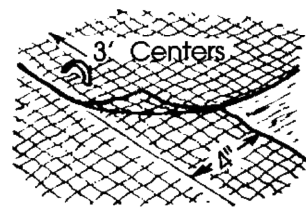
Figure ECB-1  
Erosion Control Blanket  
Application Examples

06/NA153722 CS CB/FigECB-1/9-99

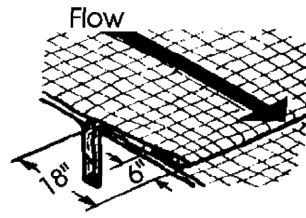
3-22



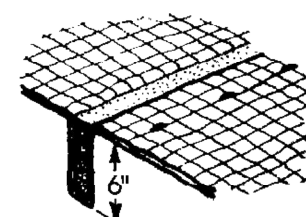
Anchor Slot: Bury the up-channel end of the net in a 6" deep trench. Tamp the soil firmly. Staple at 12" intervals across the net.



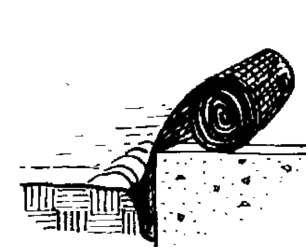
Overlap: Overlap edges of the strips at least 4". Staple every 3 feet down the center of the strip.



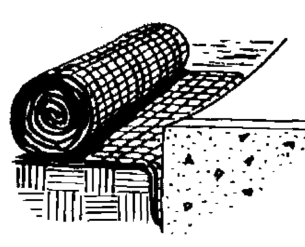
Joining Strips: Insert the new roll of net in a trench, as with the Anchor Slot. Overlap the up-channel end of the previous roll 18" and turn the end under 6". Staple the end of the previous roll just below the anchor slot and at the end at 12" intervals.



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.



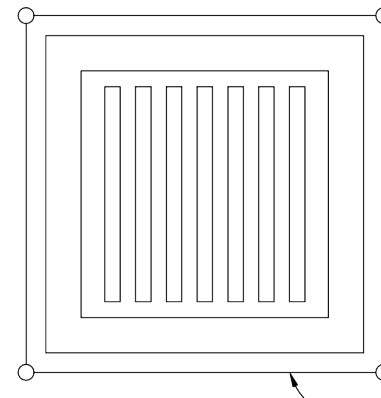
Anchoring Ends At Structures: Place the end of the net in a 6" slot on the up-channel side of the structure. Fill the trench and tamp firmly. Roll the net up the channel. Place staples at 12" intervals along the anchor end of the net.



From: Virgin Soil and Water Conservation Commission, 1995

06/NA153722 CS CB/FigECB-2/9-99

3-23



FILTER FABRIC INLET PROTECTION  
NTS

City of Colorado Springs  
Stormwater Quality

Figure IP-1  
Filter Fabric Inlet Protection  
Construction Detail and Maintenance  
Requirements

3-25

#### 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 OF NO RAINFALL.
2. DAMAGED, COLLAPSED, UNTRENCHED 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.

#### 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. SUANGRASS	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 UDPCD 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 SEEDDED 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 LOOSENED.
4. SEEDDED 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 BIRDWEED, 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 SEEDDED 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 SEEDDED AREAS TO ENSURE GROWTH.
2. AREAS WHERE GROWTH IS NOT OCCURRING QUICKLY OR THE MULCH HAS BEEN REMOVED SHALL BE RE-SEEDDED AS SOON AS POSSIBLE AND RE-MULCHED IF NEEDED.
3. SEEDDED 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

3-47

#### MULCHING NOTES

##### INSTALLATION REQUIREMENTS

1. ALL DISTURBED AREAS MUST BE MULCHED WITHIN 21 DAYS AFTER FINAL GRADE AND SEEDING 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 FIBER D OR MARRA 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.

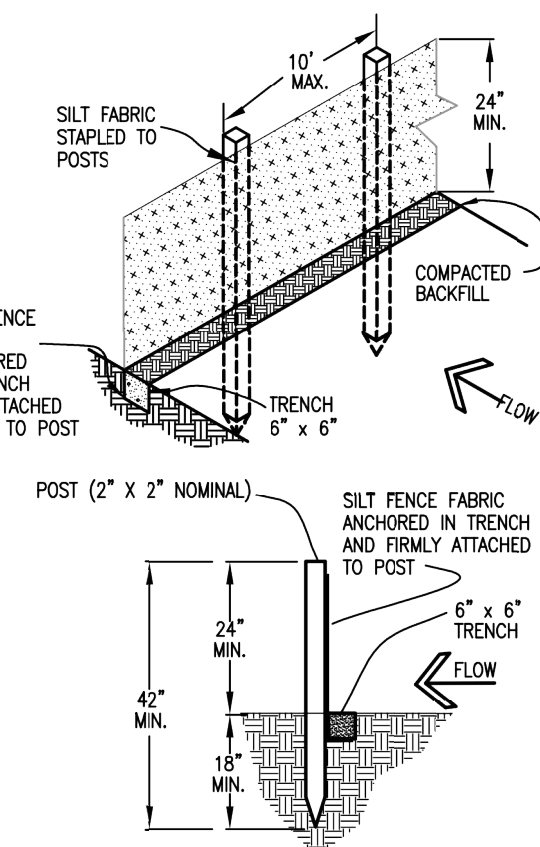
##### MAINTENANCE REQUIREMENTS

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 RE-SEEDDED.

City of Colorado Springs  
Stormwater Quality

Figure MU-1  
Mulching  
Construction Detail and Maintenance  
Requirements

3-30



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 SPPLICED 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 IMPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE OF THE STRUCTURE.

##### MAINTENANCE REQUIREMENTS

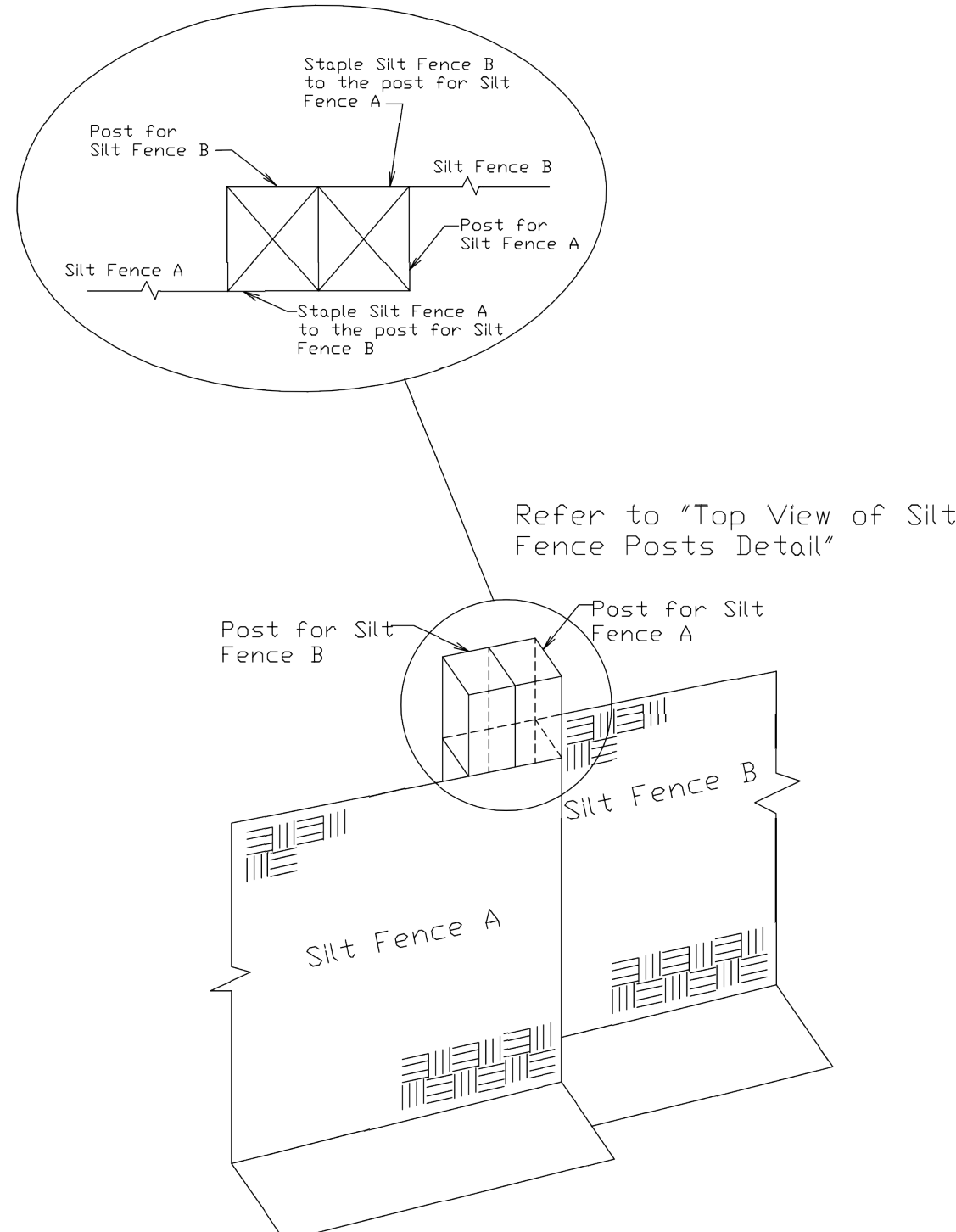
1. CONTRACTOR SHALL INSPECT SILT FENCES IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS OF NO RAINFALL. DAMAGED, COLLAPSED, UNTRENCHED OR INEFFECTIVE SILT FENCES SHALL BE PROMPTLY REPAIRED OR REPLACED.
2. SEDIMENT SHALL BE REMOVED FROM BEHIND SILT 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

3-36

#### Top View of Silt Fence Posts Detail



City of Colorado Springs  
Stormwater Quality

Figure SF-3  
Silt Fence Joint Tying  
Construction Detail and Maintenance  
Requirements

3-37

#### 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.

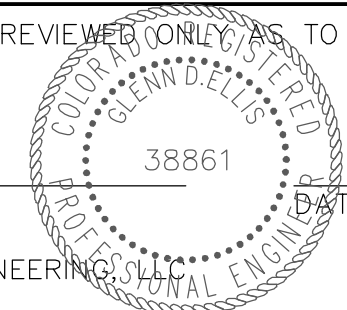
STORMWATER QUALITY BMP MANUAL

3-45

#### ENGINEER'S STATEMENT

STANDARD DETAILS SHOWN WERE REVIEWED ONLY AS TO THEIR APPLICATION ON THIS PROJECT

GLENN ELLIS, P.E.  
COLORADO P.E. 38861  
FOR AND ON BEHALF OF JR ENGINEERING, LLC



DATE

BY

REVISION

NO.

RAB

RAB

DATE

DESIGNED BY

DRAWN BY

CHECKED BY

DATE

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UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, OR ENGINEERING APPROVES THEIR USE. THESE DRAWINGS ARE DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR  
**RON COVINGTON HOMES**  
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A Western Company



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Fort Collins 970-491-9888 • www.jrengineering.com

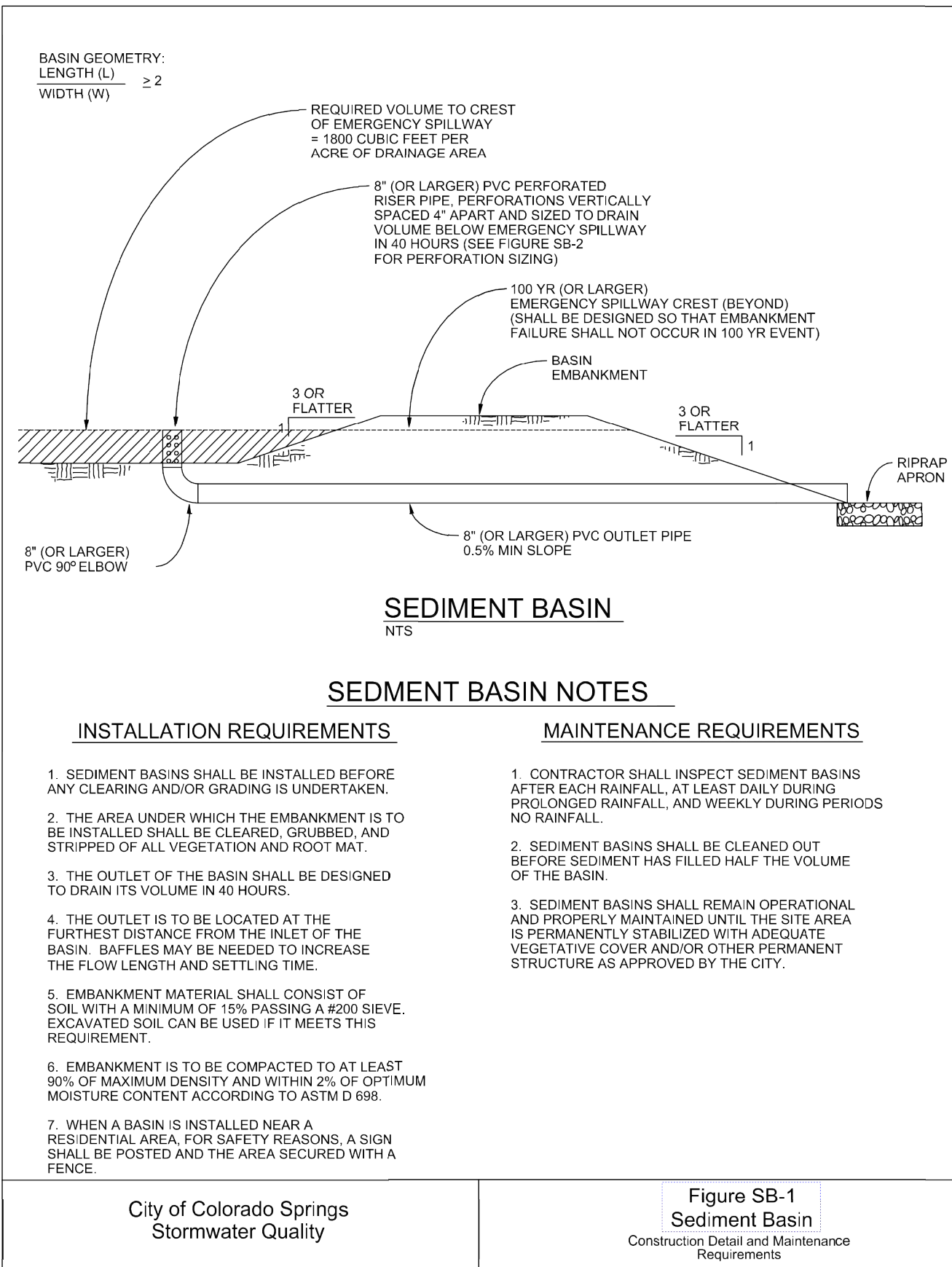
ACADEMY VILLAGE FILING NO. 3

GRADING AND EROSION  
CONTROL DETAILS

SHEET 3 OF 4

JOB NO. 25123.00





3-32

Required Area per Row ( $\text{in}^2$ )

Design Volume (acre-ft)	Depth at Outlet (ft)									
	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5		
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 ( $\text{in}^2$ )		
		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

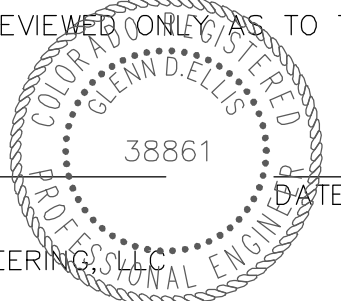
Figure SB-2  
Outlet Sizing  
Application Techniques and Maintenance  
Requirements

3-33

ENGINEER'S STATEMENT

STANDARD DETAILS SHOWN WERE REVIEWED ONLY AS TO THEIR APPLICATION ON THIS PROJECT

GLENN ELLIS, P.E.  
COLORADO P.E. 38861  
FOR AND ON BEHALF OF JR ENGINEERING



ACADEMY VILLAGE FILING NO. 3

GRADING AND EROSION  
CONTROL DETAILS

SHEET 3 OF 4

JOB NO. 25123.00

H-SCALE	N/A	N/A	No.	REVISION	BY	DATE
V-SCALE	N/A	N/A	RAB	RAB		
DESIGNED BY	DATE	01/02/18				
DRAWN BY	NQJ	NQJ				
CHECKED BY	NQJ					

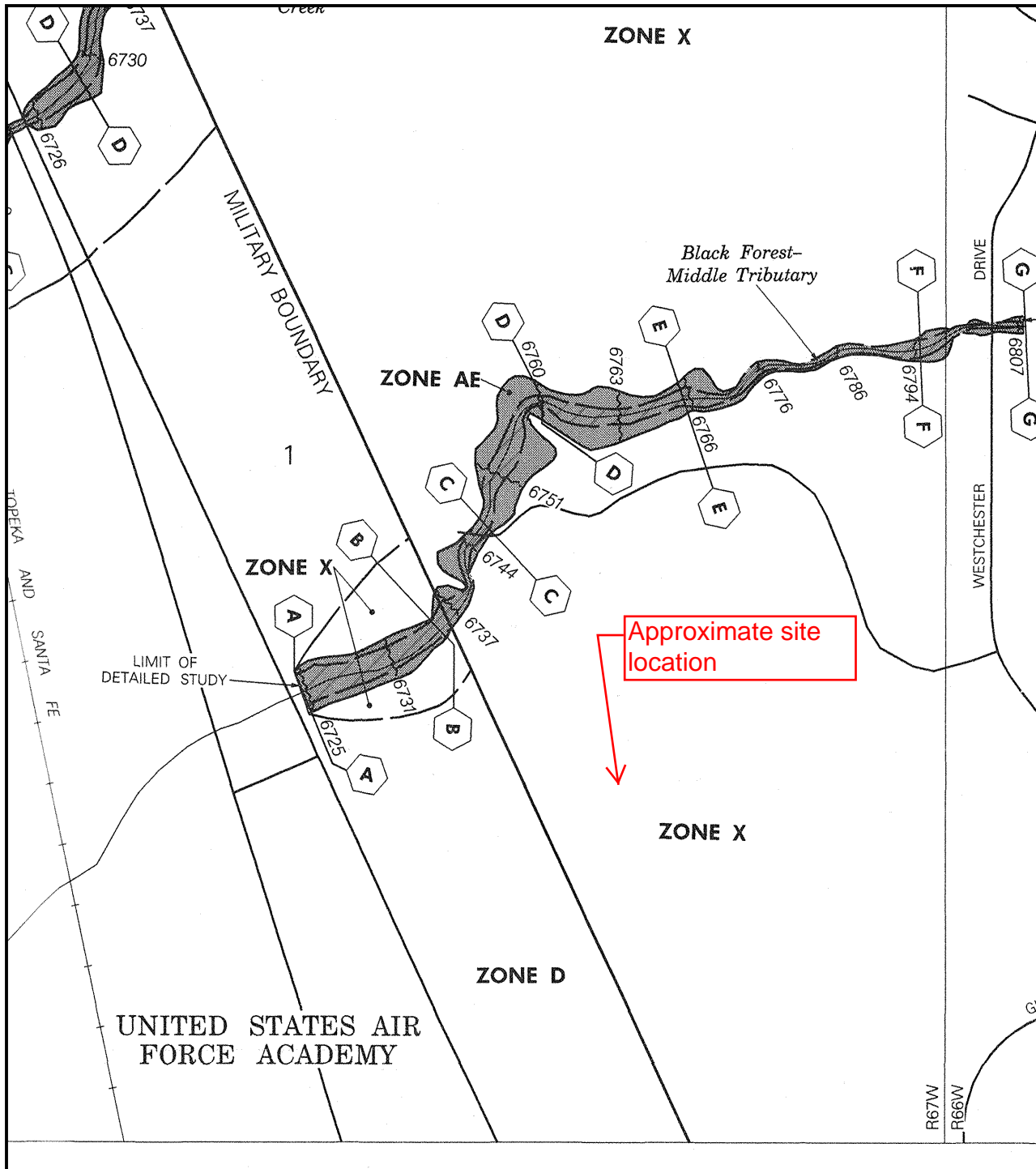
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DESIGNATED BY WRITTEN  
AUTHORIZATION.

## APPENDIX D



APPROXIMATE SCALE IN FEET  
500 0 500

# NATIONAL FLOOD INSURANCE PROGRAM

## **FIRM** FLOOD INSURANCE RATE MAP

EL PASO COUNTY,  
COLORADO AND  
INCORPORATED AREAS

PANEL 287 OF 1300

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:  
COMMUNITY

NUMBER PANEL SUFFIX

COLORADO SPRINGS, CITY OF	080060	0287	F
EL PASO COUNTY	080059	0287	F
UNINCORPORATED AREAS	060064	0287	F
MONUMENT, TOWN OF			

MAP NUMBER  
08041C0287 F

EFFECTIVE DATE:  
MARCH 17, 1997



Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)