

Overview of
Section 5

5.0

Section 5 is oriented primarily toward construction field personnel and addresses Steps 8 through 14 in the GESC Permit Process:

Step 8. Select a GESC Manager; review the GESC Field Manual and ensure that the Permittees and their representatives, including field personnel, understand the GESC Permit requirements.

Section 5.1, **The GESC Manager**, discusses the role of the permittee(s)' GESC Manager, who serves as the on-site contact person with County inspectors and is responsible for ongoing compliance with the GESC Permit.

Section 5.2, **Understanding the Requirements of the GESC Plan**, describes the requirements of the Permittee(s) prior to the Preconstruction Meeting, including selecting the GESC Manager, thoroughly reviewing the GESC Field Manual, GESC Plan, GESC Plan Standard Notes and Details, and related plans and permits for the project as well as the benefits of the Permittee(s)' diligence in implementing the GESC Plan throughout construction.

Section Highlight – Implementing the GESC Plan is a Dynamic Process

Implementing the GESC Plan is a dynamic, not static, process. The Permittee(s) are responsible for adapting the original GESC Plan so as to effectively reduce erosion and sedimentation, and comply with any modifications to the Plan as required by Douglas County.

Step 9. Install the Initial BMPs as shown on the accepted GESC Drawings and schedule a Preconstruction Meeting with the County 3 business days in advance of the meeting.

Section 5.3, **Preparation for the Preconstruction Meeting**, summarizes the activities to occur prior to the meeting which include: obtaining a Temporary Construction Access Permit and the installation of Initial BMPs. Other than the installation of the Initial BMPs, no other construction shall start prior to the Preconstruction Meeting.

Section 5.7, **Correct Installation and Maintenance of BMPs**, provides installation and maintenance information for the County Accepted Erosion and Sediment Control BMPs.

Step 10. Attend the on-site Preconstruction Meeting, designate the GESC Manager, confirm an understanding of the GESC Permit requirements, review the Initial BMPs, and make any corrections required.

Section 5.4, **Preconstruction Meeting**, describes who shall attend the Preconstruction Meeting and summarizes the general meeting agenda.

Step 11. Pick up the executed GESC Permit and start construction by first stripping and stockpiling topsoil.

Section 5.5, **The Executed GESC Permit**, provides guidance for picking up the GESC Permit from the County, the duration that the GESC Permit is valid, and procedures for transferring the GESC Permit.

Section 5.6, **Start of Construction**, summarizes the procedures to be completed at the start of construction.

Overview of
Section 5,
continued

Step 12. Ensure that the BMPs are correctly installed, are inspected and maintained in accordance with the required timeframes, and that all of the General Construction Requirements described in the GESC Field Manual are complied with.

Section 5.7, **Correct Installation and Maintenance of BMPs**, provides installation and maintenance information and shows photographs of field installations of each of the County's Standard Erosion and Sediment Control BMPs. Both correct installations and maintenance and practices to avoid are shown.

Section 5.8, **General Construction Practices**, indicates that Permittee(s) working in the County have the responsibility to review, understand, and comply with the general GESC Notes shown on Sheet 1 of the Douglas County GESC Plan Standard Notes and Details, included in Appendix B. This section highlights several of the County's requirements pertaining to general construction practices. Photographs show proper construction practices and practices to avoid.

Step 13. Ensure that the mandatory inspections by the County are scheduled by Permittee(s) and completed and that corrections requested by the County during these or any inspections are made.

Section 5.9, **County GESC Inspection Process**, discusses Inspection related to the County GESC Permitting Program and identifies steps in the construction process that require mandatory inspections and acceptance before work may proceed.

Section 5.10, **Violations and Enforcement**, provides a description of the 3 levels of violations and the associated Stop Work Order.

Section Highlight – Stop Work Order

Permittee(s) committing any Level I Violations listed in Section 5.10.2 will receive a Stop Work Order and have the GESC Permit suspended. A Stop Work Order requires that the Permittee(s) do the following before resuming work on the site:

- ◆ Correct the deficient practices that precipitated the Stop Work Order.
- ◆ Reinstate the GESC Permit and pay the GESC Permit reinstatement fee at the Douglas County Engineering Permits and Inspections Office.
- ◆ Schedule a site inspection with the Erosion Control Inspector through the Engineering Permits Staff.
- ◆ Obtain a new GESC Permit after approval of the corrected work from the Erosion Control Inspector.



Step 14. Ensure that the Interim and Final BMPs are installed at the appropriate times in accordance with the accepted GESC Drawings and GESC Manual.

Section 5.11, **Installation of Interim and Final BMPs**, discusses the general schedule for installing Interim and Final BMPs.

Permit Step 8: Select a GESC Manager; review the GESC Field Manual and ensure that the Permittee(s) and their representatives, including field personnel, understand GESC Permit requirements.
 Section 5.1 and Section 5.2 discuss Step 8.

The GESC Manager

5.1

5.1.1 Responsibilities of the GESC Manager. As the Permittee(s)' focus shifts from applying for the GESC Permit to constructing the project, the first task is to select a GESC Manager. The GESC Manager serves as the Permittee(s)' contact person with the County for all matters pertaining to the GESC Plan and Permit. The GESC Manager may be an employee of the Owner or Contractor, but shall have the authority to act on behalf of the Permittee(s) to ensure that the site remains in compliance with the GESC Permit; however, the Permittee(s) shall remain the legally responsible party. The GESC Manager shall respond to requests made by Douglas County staff and have any deficiencies in the work corrected.

The GESC Manager and Alternate GESC Manager shall be named at the on-site Preconstruction Meeting discussed in Section 5.4.

5.1.2 Alternate GESC Manager. An Alternate GESC Manager who is able to serve in the same capacity as the GESC Manager shall also be selected. The Alternate shall be the contact person if the GESC Manager is not available. The GESC Manager shall inform the Alternate GESC Manager of any absences, fill the Alternate in on the status of the GESC Plan implementation, and ensure that the Alternate GESC Manager assumes the GESC Manager's responsibilities during any absence.

5.1.3 Availability of the GESC Manager. The GESC Manager shall be present at the project site a majority of the time and (along with the Alternate GESC Manager) shall provide the County with a 24-hour emergency contact number. A Stop Work Order shall be issued in the event that the GESC Manager (or Alternate GESC Manager) is not on-site, and cannot be reached during any level of violation (see Section 5.10.2).



5.1.4 Changing the GESC Manager or Alternate. Notification in writing shall be provided to the County if the GESC Manager or Alternate leaves the company or the Permittee(s) intend to change personnel. A field meeting with the Erosion Control Inspector and new GESC Manager or Alternate shall be scheduled within 7 days of the change to discuss site conditions and responsibilities of the GESC Manager.



The GESC Manager shall always be available on-site or by phone for communications with the Erosion Control Inspector.

Understanding the Requirements of the GESC Plan

5.2

5.2.1 Implementing the GESC Plan in the Field. Constructing the project and implementing the GESC Plan in the field is a challenging part of the GESC Permit Process. The GESC Plan will not be effective unless the required measures are properly installed and maintained by the Permittee(s).

5.2.2 Diligence Pays Off. It is to the Permittee(s) advantage to be diligent in controlling erosion from its start and implementing a GESC Plan effectively. This can save both time and money by reducing the need for regrading, repair, clean-up, and rework, and avoids delays associated with Stop Work Orders (see Section 5.10).

As an example, the presence of gully erosion on a construction-site (described in Section 3.1.1) means that inadequate measures have been taken to control the early stages of erosion. Gully erosion is costly to repair. However, Permittee(s) that work to stabilize graded areas quickly through surface roughening, mulching or reseeding, and deal with rill erosion as it develops, will likely prevent gully erosion from occurring. This saves time and money in the long run.

The Permittee(s)' lack of effort in controlling erosion and sediment can increase the cost of construction due to the following additional obligations:

- ◆ *Frequent removal of sediment from basins and from behind silt fences and sediment control devices.*
- ◆ *Clean-up of accumulated sediments from off-site areas.*
- ◆ *Repair of downstream property damage resulting from sediment leaving the site.*
- ◆ *Regrading and refilling rill and gully erosion.*
- ◆ *Replacing lost topsoil.*
- ◆ *Undertaking second and third seeding and mulching operations.*
- ◆ *Work stoppage due to non-compliance and making a trip to the County offices to pay a reinstatement fee or reinspection fee.*

5.2.3 Review of the GESC Field Manual, GESC Plan, and Related Plans and Permits.

Prior to the Preconstruction Meeting, the GESC Manager shall thoroughly review the GESC Field Manual, GESC Plan, Standard Notes and Details, and related plans and permits for the project (see Sections 2.5, 2.6, and 2.7, respectively for a discussion of related plans and permits). A review of the 10 Elements of an Effective GESC Plan in Section 3 would provide valuable insight. It is the GESC Manager's responsibility to understand all of the requirements of the GESC Permit Process as laid out in these documents. In addition, it is the GESC Manager's responsibility to ensure that other field personnel are aware of the GESC requirements.

Douglas County welcomes calls from Permittee(s) during this process to answer any questions that the GESC Manager or other Permittee staff may have regarding the GESC Permit Process.

Understanding the Requirements of the GESC Plan, continued

5.2.4 Documents that Shall Remain On-site. A copy of the GESC Field Manual, GESC Drawings, Standard Notes and Details, and any project permits shall remain on active sites at all times. Once the GESC Permit is obtained, it shall remain on the active site at all times as well.

Permit Step 9: Install the Initial BMPs as shown on the accepted GESC Drawings and schedule a Preconstruction Meeting with the County 3 days in advance of the meeting.
 Section 5.3 discusses Step 9.

Preparation for the Preconstruction Meeting

5.3

5.3.1 Temporary Access Permit. Obtain Temporary Access Permits for all access points to or from a construction site onto a right-of-way as outlined in the *Roadway Manual*, as amended, and comply with the terms of the permits. No ramps of dirt, gravel, asphalt, wood, concrete, or other materials are allowed in the curb section.

5.3.2 Installation of Initial BMPs. The Initial BMPs shown on the GESC Drawings shall be installed prior to the on-site Preconstruction Meeting. The Initial BMPs are shown on the Initial BMPs Drawing for Staged GESC Plans (generally for sites greater than 1.0 acre) and are indicated as “Initial BMPs” when shown on a combined Small Site and Utility GESC Plan.

No formal notification needs to be given to the County to install the Initial BMPs, other than receiving the signed GESC Drawings and the copy of the GESC Field Manual (discussed in Section 4.10.2). However, all of the requirements of the GESC Field Manual and GESC Plan, including the Standard Notes and Details, shall be complied with. See Section 5.7 for a description of proper installation and maintenance of BMPs.

If the Permittee(s) think that modifications to Initial BMPs shown on the GESC Drawings should be made to provide for a more effective plan, the Permittee(s) shall contact the Design Engineer and Public Works Engineering (see contact information in Appendix A) to obtain acceptance of the proposed modifications and initiate a notice of change prior to installing the BMPs.

5.3.3 Construction Shall Not Start. Other than the installation of the Initial BMPs shown on the GESC Plan, no stripping operations, haul road grading, or other construction shall occur.

5.3.4 Scheduling the Preconstruction Meeting. The Permittee(s) shall contact the Public Works Engineering Permits Staff (see contact information in Appendix A) to schedule the on-site Preconstruction Meeting. 3 days notice (business days, not including Saturdays and Sundays) shall be provided to schedule the meeting.



Important! *If the Permittee(s) begin work on the site (other than installing the Initial BMPs) prior to obtaining an approved GESC Permit, the County will issue a Stop Work Order and assess a fee of 3 times the GESC Permit fee.*

Preparation for the Preconstruction Meeting, continued

For instance, if the call to the County takes place before 3:30 pm on a Monday, the Preconstruction Meeting can be scheduled for the next Thursday. If the call to the County takes place before 3:30 pm on a Thursday, the Preconstruction Meeting will be scheduled for the following Tuesday.

Permit Step 10: Attend the on-site Preconstruction Meeting, designate the GESC Manager, confirm an understanding of the GESC Permit requirements, review the Initial BMPs, and make any corrections required. Section 5.4 discusses Step 10.

Preconstruction Meeting

5.4

5.4.1 Attendees at the Preconstruction Meeting. The on-site Preconstruction Meeting is a critical milestone prior to the start of construction. In addition to the Erosion Control Inspector, the following representatives shall attend:

1. **General Contractor.**
2. **GESC Manager and Alternate GESC Manager** (one or both may be the same as the Owner or General Contractor Representative).
3. **Grading Sub-Contractor**, if different than the General Contractor.
4. **Design Engineer** (the Design Engineer's attendance is not mandatory; however, it is strongly recommended that the Design Engineer attend, to avoid possible delays if the County or the Permittee(s) determine that modifications to the GESC Plan are necessary).
5. **Owner or Owner's Representative** attendance is also strongly recommended to avoid possible delays.

5.4.2 General Meeting Agenda. The following agenda items are addressed at the Preconstruction meeting.

1. **Introductions.** Introductions of all attendees, including the GESC Manager and Alternate GESC Manager, will take place.
2. **Contact Information.** Attendees will exchange contact information.
3. **Review of GESC Field Manual.** The Erosion Control Inspector will confirm the Permittee(s)' understanding of the GESC Field Manual.
4. **Field Review of GESC Drawings.** The GESC Drawings for all stages

Important! *If one of the mandatory attendees does not attend the Preconstruction Meeting, or if the GESC Field Manual and accepted GESC Plans are not in the GESC Manager's possession, or the if the installation of the Initial BMPs is not approved by the Erosion Control Inspector, the meeting shall be rescheduled and the applicant will be assessed a \$50.00 reinspection fee. The fee shall be paid at the Douglas County Engineering Permits and Inspection office prior to scheduling another Preconstruction Meeting.*

Preconstruction Meeting, continued



and phases will be reviewed to confirm the attendees' understanding of the GESC Plan and to discuss any modifications to the plan. If modifications to the GESC Plan are thought to be advantageous, input will be sought from the Design Engineer and final acceptance of changes will be as determined by the Review Engineer. Limits of Construction and topsoil stripping limits shall be confirmed.

5. **Inspection of Initial BMPs.** A visual inspection of all of the Initial BMPs that have been installed will take place. The Erosion Control Inspector will confirm if any corrections are required.
6. **Acceptance of Initial BMPs.** If the Initial BMPs are accepted by the Erosion Control Inspector, as is or with minor corrections, the Erosion Control Inspector will inform the Permittee(s), sign the GESC Permit application, and submit the GESC Permit Application to the Engineering Permits Staff for processing. **Construction shall not start until an executed GESC Permit is obtained from the County as described in Section 5.5.**

5.4.3 Corrections to the BMPs. If the Erosion Control Inspector determines that significant modifications or corrections to the BMPs are necessary, the Erosion Control Inspector will inform the Permittees that such corrections shall be made, that a follow-up inspection shall be scheduled with the County, and that acceptance of the corrected BMPs by the Erosion Control Inspector shall take place prior to the signing of the GESC Permit or prior to any additional inspections. Modifications to the GESC Plan will, in most cases, require acceptance of the Design Engineer who signed and stamped the GESC Drawings. A notice of change should be processed through the Design Engineer and the Review Engineer to note changes in the field. The re-inspection requires 1 day notice (by 3:30 pm the weekday prior to the inspection) and shall be scheduled with the Engineering Permits Staff (contact information is listed in Appendix A). It is the GESC Managers responsibility to ensure that minor changes to the GESC Plan that do not require an official Notice of Change Form be reviewed and accepted by the Design Engineer of Record.

Permit Step 11: Pick up the executed GESC Permit and start construction by first stripping and stockpiling topsoil.
Section 5.5 and Section 5.6 discuss Step 11.

The Executed GESC Permit

5.5

5.5.1 Pick Up the Executed GESC Permit. Douglas County will execute the GESC Permit generally within 24 hours of acceptance of the Initial BMPs (either at the Preconstruction Meeting or at a follow-up inspection). Once the Permittee(s) pick up the executed GESC Permit, construction can start.

5.5.2 Duration of GESC Permit. A GESC Permit is valid for 1 year from the date the GESC Permit is granted (the date the GESC Permit is executed). A GESC Permit shall be renewed prior to its expiration. The Permittee(s) shall contact the County and start the renewal process at least 14 days prior to the original GESC Permit's expiration date.

Permittee(s) shall have a valid GESC Permit until the project is transferred to

**The Executed
GESC Permit,
continued****Start of
Construction**

the County's DESC Program for detached single-family residential projects, or until Final Close-out Acceptance (after revegetation is established) for other projects.

5.5.3 Transfer of a GESC Permit. If a project or portion of a project is sold to a new Owner, or if the Contractor that is identified on the GESC Permit is replaced by a different Contractor, the GESC Permit shall be transferred to the new Owner and/or Contractor using a specific transfer procedure. The transfer shall require a new GESC Permit Application, payment of a transfer fee, new Fiscal Security (if new Owner), and an additional Preconstruction Meeting on-site (the Preconstruction Meeting is discussed in Section 5.4). A Stop Work Order per Section 5.10, will be issued for failure to transfer the GESC Permit if the Owner or Contractor changes.

5.6

5.6.1 Topsoil Stripping. With the executed GESC Permit picked up and on-site, construction can start. The first construction operation shall consist of the stripping and stockpiling of topsoil within areas where construction is to occur (actual limits of topsoil stripping shall be confirmed at the Preconstruction Meeting). Topsoil stripping shall not take place outside the accepted Limits of Construction.

Topsoil stripping and replacement is critical to the successful reestablishment of vegetation after a project is constructed. Topsoil shall be stripped to a depth of 6 inches unless otherwise accepted by the Erosion Control Inspector. Woody material in the area to be stripped shall be removed prior to stripping, but grasses shall be left in the topsoil layer to be stripped.

5.6.2 Topsoil Stockpiles. Topsoil stockpiles (as well as stockpiles of excess excavated material that may be generated later) shall have side slopes no steeper than 3 (horizontal) to 1 (vertical) and be placed in the areas indicated on the GESC Drawings.

5.6.3 Topsoil Inspection. The GESC Manager will contact the Engineering Permits Staff (see contact information in Appendix A) to schedule an inspection after the topsoil is stripped and stockpiled. Failure to strip and stockpile topsoil, and obtain an inspection from the Erosion Control Inspector shall result in the issuance of a Stop Work Order (see Section 5.10). The Permittee(s) shall import an adequate quantity of topsoil to the site if inadequate quantities of topsoil have been stockpiled (sufficient to replace at least 6 inches of topsoil in all areas to receive vegetation) to complete the GESC Permit requirements.

5.6.4 No Filling in Drainageways. Existing drainageways shall not be filled in beyond the limits of the 100 year floodplain or the existing top of bank of incised channels, whichever is more restrictive, without the acceptance of Douglas County.

Correct Installation and Maintenance of BMPs

5.7

The overall effectiveness of the GESC Plan depends on the correct installation and maintenance of BMPs. With this goal in mind, the County has prepared the GESC Plan Standard Notes and Details, a set of drawings

Permit Step 12: Ensure that the BMPs are correctly installed, are inspected and maintained in accordance with the required timeframes, and that all of the General Construction Requirements described in the GESC Field Manual are complied with.
Section 5.7 and Section 5.8 discuss Step 12.

that identify correct installation and maintenance procedures for all of the County-accepted BMPs. These drawings are provided in Appendix B. They are to be included in all GESC Plans and govern all GESC-Permitted construction work in the County. The Standard Notes and Details allow Design Engineers and Permittee(s) to become familiar with 1 set of BMPs and consistent installation and maintenance requirements. Following are brief descriptions of the standard erosion and sediment control BMPs accepted for use in Douglas County and some of the important installation and maintenance requirements found in the GESC Plan Standard Notes and Details. Example photographs illustrating correctly installed BMPs and practices to avoid are included.



Maintenance procedures are not being followed on this site which may lead to additional costs from reinspection fees, sediment clean up and possible work stoppages.

Correct Installation and Maintenance of BMPs, continued

5.7.1 Check Dam (CD). A Check Dam is a small rock dam, designed to withstand overtopping, that is placed in a drainageway. The purpose of the Check Dam is to trap sediment in the backwater zone upstream of the check and, when used in series, to reduce flow velocities.

Key Installation and Maintenance Requirements:

- Riprap utilized for Check Dams shall have a median stone size of 12".
- Riprap pad shall be trenched into the ground a minimum of 1'-8".
- The ends of the Check Dam shall be a minimum of 1'-6" higher than the center of the Check Dam.
- The recommended inspection frequency for Check Dams are weekly and during and after any storm event and make any repairs or clean out as necessary.
- Sediment accumulated upstream of Check Dams shall be removed when the sediment depth upstream of the Check Dam is within 1/2 of the height of the crest.



DO Properly installed check dam.



DO NOT This check dam was not keyed in adequately to the channel bank, leading to its failure.



DO NOT This disturbed drainageway was not protected by a check dam at the downstream site perimeter, allowing sediment to be conveyed off site.



Correct Installation and Maintenance of BMPs, continued

5.7.2 Compost Blanket (CB) and Compost Filter Berm (CFB).

Compost Blanket consists of a layer of Class 1 Compost spread over prepared, seeded topsoil to protect exposed soil against raindrop and wind erosion and to provide an organic soil amendment to promote the establishment of vegetation. This County-accepted BMP can be considered as an alternative to Erosion Control Blanket or crimp mulch for stabilizing exposed soils, although it cannot be used in drainageways or concentrated flow areas. Compost Filter Berms are used on slopes in conjunction with Compost Blanket to reduce flow length and control rill and gully erosion.

Key Installation and Maintenance Requirements:

- Compost Blanket shall only be utilized in areas where sheet flow conditions prevail and shall be prohibited in areas of possible concentrated flow.
- Compost shall be evenly applied at a depth of 2 inches.
- Compost may be applied utilizing a pneumatic blower or by hand.
- Compost shall be Class 1 Compost as defined by specific physical, chemical and biological parameters, including the following particle distribution:

3" (75 mm)	95% to 100% passing
1" (25mm)	95% to 100% passing
3/4" (19 mm)	85% to 90% passing
3/8" (9.5 mm)	50% to 60% passing
#4 sieve	20% to 35% passing
- Filter Berms shall run parallel to the contour and shall have a minimum height of 1 foot and minimum bottom width of 2 feet.
- Filter Berms shall be constructed utilizing pneumatic blower or hand.
- The recommended inspection frequency for Compost Blanket and Filter Berms are weekly and during and after a storm event.



DO Compost blanket can be used in areas not subject to concentrated flows and shall be applied with a pneumatic blower or by hand.



DON'T Utilizing non-approved application methods of compost blanket can cause additional cost due to re-application and additional clean up costs.

Correct Installation and Maintenance of BMPs, continued

5.7.3 Concrete Washout Area (CWA). A Concrete Washout Area is a shallow excavation with a small perimeter berm to isolate concrete truck washout operations. Durable portable concrete washout basins or tubs may be used with the approval of the Erosion Control Inspector.

Key Installation and Maintenance Requirements:

- Vehicle Tracking Control (Section 5.7.22) is required at the access point to the concrete washout area.
- Signs shall be placed at the construction entrance, at the washout area, and elsewhere as necessary to clearly indicate the location of the Concrete Washout Area to operators of concrete trucks and pump rigs.
- Excavated material shall be utilized in perimeter berm construction.
- The recommended inspection frequency for the Concrete Washout Area are weekly and during and after any storm event. The Concrete Washout Area shall be repaired and enlarged or cleaned out as necessary to maintain capacity for wasted concrete.
- At the end of construction, all concrete shall be removed from the site and disposed of at an approved waste site.



A properly installed concrete washout area with Vehicle Tracking Control.



Extensive wasting of concrete on the construction site requires additional effort to clean up and can impair subsequent revegetation operations.

Correct Installation and Maintenance of BMPs, continued

5.7.4 Construction Fence (CF) and Construction Markers (CM).

Construction Fence consists of orange plastic fencing or other County-accepted material attached to support posts and used to delineate Limits of Construction and to control access to the construction site. If approved by the County, Construction Markers (CM), consisting of orange painted survey lath at 100 foot maximum spacing, may be used to delineate limits of construction.

Key Installation and Maintenance Requirements:

- Steel tee posts shall be utilized for support of Construction Fence.
- Maximum spacing of tee posts is 15 feet.
- Any damaged fence or markers shall be repaired on a daily basis.



DO Use construction fence to restrict access to site and demark limits of disturbance.



DON'T This construction fence is in need of repair. Inspections shall be made daily and downed sections repaired immediately.

Section 5. Field Section

Correct Installation and Maintenance of BMPs, continued

5.7.5 Curb Sock (CS). A Curb Sock consists of a small reinforced rock berm placed in the curb and gutter flowline in order to filter stormwater runoff, and reduce sediment from entering the storm sewer system.

Key Installation and Maintenance Requirements:

- Curb Socks are generally required to be installed as an interim and final sediment control BMP.
- Crushed rock shall be fractured face (all sides) and shall comply with the gradation shown on the GESC Plan Standard Notes and Details (1-1/2" min.).
- Maximum spacing along the street grade is shown in the detail for Curb Sock in the GESC Plan Standard Notes and Details.
- Wire mesh shall be fabricated of 20 gauge wire twisted into a mesh with a maximum opening of 1 inch (commonly termed "Chicken Wire").
- Roll width shall be 48 inches.
- Wire mesh shall be secured using "Hog Rings" or wire ties at 6 inch centers along all joints and at 2 inch centers at the end of the berm.
- Curb Socks shall be constructed in one piece.
- The top of the Curb Sock shall be 1/2" to 1 inch below top of curb.
- Tubular markers shall meet the requirements of Manual on Uniform Traffic Control Devices (MUTCD) as amended.
- Curb Socks shall be placed tightly against the curb face.
- The recommended inspection frequency for Curb Socks are weekly, during and after any storm event and make repairs or clean out as necessary.
- Curb Socks are to remain in place until the upstream disturbed area is stabilized and vegetative cover approved.



DO

These Curb Socks are placed within acceptable distance from each other and do have delineators.



This Curb Sock requires maintenance and replacement and was not installed properly.



These Curb Socks were installed using unapproved material, are placed too close to each other, and do not have delineators.

Correct Installation and Maintenance of BMPs, continued

5.7.6 Dewatering (DW). Dewatering controls consist of a gravel filter provided on the suction end of a pump to reduce the pumping of sediment, a riprap pad at the discharge end of the pump for erosion protection, and a Sediment Basin to provide for settling before the water is discharged into receiving waters.

Key Installation and Maintenance Requirements:

- At a minimum, the Dewatering BMPs shall consist of the following:
 - 1) Pre-filter on the suction end of the pump/hose,
 - 2) Filter BMP prior to final discharge, and
 - 3) Energy dissipating BMP at the discharge end of the hose/pump.
- The type and placement of Dewatering controls shall be coordinated with, and approved by, the Erosion Control Inspector prior to the discharge of any water.
- The GESD Manager shall obtain a Construction Dewatering Permit (Dewatering Permit) from the Colorado Department of Public Health and Environment (CDPHE) prior to any dewatering operations that require a Dewatering Permit.
- The recommended inspection frequency for dewatering systems is hourly and perform any necessary repairs or maintenance.



DO *Sump pumps or suction lines can be contained within perforated 5-gallon buckets and surrounded with gravel to reduce the pumping of mud during dewatering operations.*



DON'T *This suction line is not contained in gravel and is pumping excessive amounts of sediment.*



DON'T *These discharge lines require a riprap pad and a settling trap.*



Correct Installation and Maintenance of BMPs, continued

5.7.7 Diversion Ditch (DD). A Diversion Ditch is a small earth channel used to divert and convey runoff, generally to a Sediment Basin, Check Dam, or Reinforced Rock Berm. Depending on slope, the diversion swale may need to be lined with Erosion Control Blanket, plastic (for temporary installations only), or riprap.

Key Installation and Maintenance Requirements:

- In locations where construction traffic must cross a Diversion Ditch, the Permittee(s) shall install a temporary culvert with a minimum diameter of 12 inches.
- The recommended inspection frequency for all Diversion Ditches is weekly and during and after any storm event and make any repairs or clean out as necessary.



DO This diversion ditch provides protection for an adjacent drainageway.



DO NOT Lack of a diversion ditch at the top of this slope to divert upstream runoff has led to severe rill and gully erosion.

Correct Installation and Maintenance of BMPs, continued

5.7.8 Erosion Control Blanket (ECB). Erosion Control Blanket is a fibrous blanket of straw, jute, excelsior, or coconut material trenched in and staked down over prepared, seeded soil. The blanket reduces both wind and water erosion.

Key Installation and Maintenance Requirements:

- All Erosion Control Blankets and netting shall be made of 100% natural and biodegradable material; no plastic or other synthetic material, even if photodegradable, shall be allowed.
- In areas where Erosion Control Blanket is shown on the plans, the Permittee(s) shall place topsoil and perform final grading, surface preparation, and seeding below the blanket in accordance with the requirements of Detail 17 of the GESC Plan Standard Notes and Details, Seeding and Mulching. Subgrade shall be smooth and moist prior to blanket installation and the blanket shall be in full contact with the subgrade; no gaps or voids shall exist under the blanket.
- Perimeter anchor trench shall be used at the outside perimeter of all blanket areas.
- Joint anchor trench shall be used to join rolls of blankets together (longitudinally and transversely) unless it is a slope where concentrated flows are not present. In that case, the trenches will only be needed along the perimeter for all blankets except 100% straw, which may use an overlapping joint.
- The recommended inspection frequency for Erosion Control Blankets is weekly and during and after any storm event and make repairs as necessary.



DO Ample erosion control blanket is used on this hill slope.



DON'T The edges of this erosion control blanket are not trenched in, allowing the blanket to become displaced. Blanket shall be 100% natural and biodegradable.

Correct Installation and Maintenance of BMPs, continued

5.7.9 Inlet Protection (IP). Inlet Protection consists of a small reinforced rock berm and cinder block frame placed in front of (but not blocking) a curb inlet or around an area inlet to reduce sediment in runoff entering the storm sewer system.

Key Installation and Maintenance Requirements:

- Interim configuration of Inlet Protection in streets (before paving) shall be installed within 48 hours of pouring inlet. Inlet Protection (after paving) shall be installed within 48 hours after paving is placed.
- Inlet Protection at area inlets shall be installed within 48 hours of pouring inlet.
- Crushed rock shall be fractured face (all sides) and shall comply with gradation shown on the GESC Plan Standard Notes and Details (1-1/2" min.). Recycled concrete meeting this gradation may be used.
- Wire mesh shall be fabricated of 20 gauge wire twisted into a mesh with a maximum opening of 1 inch (commonly termed "Chicken Wire"). Roll width shall be 48 inches.
- Wire mesh shall be secured using "Hog Rings" or wire ties at 6 inch centers along all joints and at 2 inch centers on ends of berm.
- Reinforced Rock Berm shall be constructed in 1 piece or shall be constructed using joint detail of Detail 10 of the GESC Plan Standard Notes and Details.
- The top of Reinforced Rock Berm shall be 1/2 to 1 inch below top of curb.
- Tubular markers shall meet requirements of *Manual on Uniform Traffic Control Devices (MUTCD)*, as amended.
- Reinforced Rock Berm shall be placed tightly against curb face.
- The recommended inspection frequency for Inlet Protection is weekly and during and after any storm event and make repairs or clean out as necessary. More frequent inspections and repairs shall be required during winter conditions due to freeze/thaw problems.
- Inlet Protection is to remain in place until the upstream disturbed area is stabilized and grass cover approved, unless the County approves earlier removal of Inlet Protection in streets.



DO Properly installed inlet protection for curb-inlets in a sump condition.



DON'T Tubular markers were not placed in front of this inlet protection installation, making it more susceptible to damage from snowplows and other vehicles. This installation is in need of immediate repair.



Section 5. Field Section

Step 12. Ensure that BMPs are Correctly Installed and Maintained and that General Construction Requirements are Complied With



DO Properly installed inlet protection for continuous-grade curb-inlets.

Temporary Inlet Protection
This interim configuration of blocks protects a street inlet prior to paving.



DO



DO NOT

This inlet protection is overdue for sediment removal.



DO

Properly installed area inlet protection.



DO NOT

No gaps shall exist between sections of reinforced rock berm.



DO NOT

Blocking the inlet opening or use of alternate materials for inlet protection is prohibited.

DO NOT



**Correct Installation
and Maintenance
of BMPs,
continued**

5.7.10 Reinforced Check Dam (RCD). A Reinforced Check Dam is a rock dam contained within a twisted wire gabion, designed to withstand overtopping, that is placed in a major drainageway (upstream watershed area in excess of 100 to 130 acres). Like a Check Dam, the purpose of the Reinforced Check Dam is to trap sediment in the backwater zone upstream of the check. The reinforcement increases the ability of the rock dam to withstand the larger overtopping flows of major drainageways.

Key Installation and Maintenance Requirements:

- The Check Dam shall be trenched into the ground a minimum of 1'-6".
- Erosion Control Blanket shall be placed in the Reinforced Check Dam trench extending a minimum of 1'-6" on both the upstream and downstream sides of the Reinforced Check Dam.
- Gabions shall have galvanized twisted wire netting with a maximum opening dimension of 4 ½" and a minimum wire thickness of 0.10". Wire mesh shall be secured using "Hog Rings" at 4" spacing or other approved means shall be used at all gabion seams and to secure the gabion to the adjacent gabion.
- Riprap utilized for Check Dams shall have a D₅₀ median stone size of 12".
- The recommended inspection frequency for Check Dams is weekly and during and after any storm event and make repairs or clean out as necessary.
- Sediment accumulated upstream of Check Dams shall be removed when the sediment depth upstream of Check Dam is within ½ of the height of the crest.



DO

Reinforced check dams are required in major drainageways to resist breaching from overtopping flows.

Correct Installation and Maintenance of BMPs, continued

5.7.11 Reinforced Rock Berm (RRB). A Reinforced Rock Berm consists of a linear mass of gravel enclosed in wire mesh to form a porous filter, able to withstand overtopping. The berm is heavy and stable and promotes sediment deposition on its upstream side.

Key Installation and Maintenance Requirements:

- Crushed rock shall be fractured face (all sides) and shall comply with gradation shown on the GESC Plan Standard Notes and Details. Recycled concrete meeting these gradations may be used.
- Wire mesh shall be fabricated of 20 gauge wire twisted into a mesh with a maximum opening of 1 inch (commonly termed "Chicken Wire"). Roll width shall be 48 inches.
- Wire mesh shall be secured using "Hog Rings" or wire ties at 6 inch centers along all joints and at 2 inch centers on ends of berm.
- For concentrated flow areas the ends of the Reinforced Rock Berm shall be 12 inches higher than the center of the berm.
- The recommended inspection frequency for Reinforced Rock Berm is weekly and during and after any storm event and make repairs of clean out as necessary.
- Sediment accumulated upstream of Reinforced Rock Berm shall be removed when the sediment depth upstream of filter is within 5 inches of the crest.



DO *A reinforced rock berm may be used downgradient of disturbed areas in lieu of silt fence.*



DO *Reinforced rock berms are especially useful over bedrock outcroppings or pavement where silt fence and sediment control logs cannot be installed.*

Correct Installation and Maintenance of BMPs, continued

5.7.12 RRB for Culvert Protection (RRC). A Reinforced Rock Berm for Culvert Protection consists of a Reinforced Rock Berm placed in front of a culvert to reduce sediment in runoff approaching the culvert.

Key Installation and Maintenance Requirements:

- Crushed rock shall be fractured face (all sides) and shall comply with gradation shown on the GESC Plan Standard Notes and Details. Recycled concrete meeting this gradation may be used.
- Wire mesh shall be fabricated of 20 gauge wire twisted into a mesh with a maximum opening of 1 inch (commonly termed "Chicken Wire"). Roll width shall be 48 inches.
- Wire mesh shall be secured using "Hog Rings" or wire ties at 6-inch centers along all joints and at 2 inch centers on ends of berm.
- For concentrated flow areas the ends of the Reinforced Rock Berm shall be 12 inch higher than the center of the berm.
- The recommended inspection frequency for Reinforced Rock Berm is weekly and during and after any storm event and make repairs of clean out as necessary.
- Sediment accumulated upstream of Reinforced Rock Berm shall be removed when the sediment depth upstream of filter is within 5 inches of the crest.



DO *A properly installed reinforced rock berm for culvert protection.*



DON'T *Although some sediment trapping would occur with this alternate arrangement, the standard detail shall be utilized.*



DON'T *Without a reinforced rock berm for culvert protection, culverts fill with sediment.*

Correct Installation and Maintenance of BMPs, continued

5.7.13 Sediment Basin (SB). A Sediment Basin is an impoundment that captures sediment-laden runoff and releases it slowly, providing prolonged settling times to capture coarse and fine-grained soil particles.

Key Installation and Maintenance Requirements:

- Schedule 40 pipe or greater shall be used for outlet pipe and riser.
- A Check Dam shall be provided within the basin conforming to Detail 1 of the GESC Plan Standard Notes and Details.
- A gravel pack of 1 to 2 inch rock around the pipe outlet shall be provided.
- The recommended inspection frequency for Sediment Basin is weekly and during and after any storm event and make repairs or clean out as necessary.
- Sediment accumulated within the Sediment Basin shall be removed when the sediment depth is 1 foot deep.

A Sediment Basin shall be incorporated into any permanent detention or water quality basins:

- A Right-of-Way Use and Construction Permit shall be obtained prior to installing the permanent outlet works.
- At least 1/2 of the Sediment Basin design volume shall be constructed below the lowest orifice of the permanent outlet works. A temporary gravel pack shall be placed in front of the permanent orifices.
- The Sediment Basin volume shall be kept active and in a maintained condition until vegetation in upstream watershed is fully established and accepted.



DO Properly installed outlet pipe and gravel pack.



DON'T The sediment basin above is improperly installed due to:

- Lack of an armored spillway.
- Pipe perforations set above the spillway crest elevation.

Correct Installation and Maintenance of BMPs, continued

5.7.14 Sediment Control Log (SCL). A Sediment Control Log consists of a cylindrical bundle of excelsior, straw, compost, or coconut material designed to form a semi-porous filter, able to withstand overtopping. The log shall be staked into the ground to promote sediment deposition on its upstream side and reduce flow velocities.

Key Installation and Maintenance Requirements:

- The Sediment Control Log shall be trenched into the ground a minimum of 2 inches.
- The recommended inspection frequency for Sediment Control Logs is daily and during and after any storm event and make repairs or clean out as necessary.



Sediment control logs shall not be installed in roadside ditches or other concentrated flow areas.



Sediment control logs may be used instead of silt fence on steep slopes.



Sediment control logs shall be placed along a contour.

Correct Installation and Maintenance of BMPs, continued

5.7.15 Sediment Trap (ST). A Sediment Trap consists of a riprap berm with a small upstream basin that acts to trap coarse sediment particles. It can be used for upstream disturbed areas less than 1.0 acre. Disturbed areas greater than 1.0 acre require a Sediment Basin.

Key Installation and Maintenance Requirements:

- The top of the earthen berm shall be a minimum of 6 inches higher than the top of the riprap outlet structure.
- The ends of the riprap outlet structure shall be a minimum of 6 inches higher than the center of the outlet structure.
- The recommended inspection frequency for the Sediment Trap is weekly and during and after any storm event and make repairs or clean out as necessary.



DO *A properly installed sediment trap.*

Correct Installation and Maintenance of BMPs, continued

5.7.16 Seeding and Mulching (SM). Seeding and Mulching consists of drill seeding disturbed areas with the approved Douglas County seed mix and crimping in straw mulch to provide immediate protection against raindrop and wind erosion and, as the grass cover becomes established, to provide long-term stabilization of exposed soils.

Key Installation and Maintenance Requirements:

- All areas to be Seeded and Mulched shall have native topsoil spread to a depth of at least 6 inches (loose depth). All disturbed areas shall be loosened to a depth of 6 inches prior to spreading topsoil.
- Soil shall be thoroughly loosened (tilled) to a depth of at least 6 inches prior to seeding. The top 6 inches of the seed bed shall be free of rocks greater than 4 inches and soil clods greater than 2 inches. Seeding over any compacted areas that haven't been loosened to a depth of at least 6 inches shall be rejected. Seed shall be applied using a mechanical drill to a depth of not less than ¼ inch and not more than ¾ inch. Row spacing shall be no more than 6 inches. Material used for mulch shall consist of long-stemmed straw. At least 50% of the straw, by weight, shall be 10 inches or more in length. Mulch shall be applied and mechanically anchored to a depth of at least 2 inches. Mulch shall be applied at a rate of 4,000 pounds of straw per acre.
- Copies of seed tickets shall be provided to the Erosion Control Inspector upon request.
- The recommended inspection frequency for seeded and mulched areas for required coverage is monthly for a period of 2 years following initial seeding. Repairs and re-seeding and mulching shall be undertaken after the first growing season for any areas failing to meet the required coverage.
- See Section 6.4.2 of the *GESC Manual* for a definition of required vegetation coverage.



DO *A drill seeder shall be used to plant seed in Douglas County. With the County's approval, seed may be hand broadcast, at twice the drilled rate, raked and crimp mulched in small areas where it is not possible to drill seed.*



DO *A mechanical crimper shall be used to anchor long-stemmed straw mulch.*

Correct Installation and Maintenance of BMPs, continued

5.7.16 Seeding and Mulching (SM) continued.



The area on the left was hydraulic seeded at the same time as the area on the right (across the street) was drilled. Due to poor performances like this example, Hydraulic seeding/mulching is not allowed as a seeding method.



Hydraulic seeding/mulching is not allowed.



This mulch was not crimped into soil and is susceptible to displacement, leaving seed bed unprotected.

Correct Installation and Maintenance of BMPs, continued

5.7.17 Silt Fence (SF). Silt Fence is a temporary sediment barrier constructed of woven fabric stretched across supporting posts. The bottom edge of the fabric is placed in an anchor trench that is backfilled with compacted soil.

Key Installation and Maintenance Requirements:

- The bottom portion of the Silt Fence shall be trenched in and compacted so that the Silt Fence resists being pulled out by hand. Silt Fence installation machines that use trenching or slicing may be utilized to install Silt Fence.
- Use of road graders, backhoes and similar equipment for installation of Silt Fence is prohibited.
- The recommended inspection frequency for Silt Fence is daily and during and after any storm event and make repairs or clean out as necessary.
- Sediment accumulated upstream of Silt Fence shall be removed when the upstream sediment reaches a depth of 6 inches.



Source: Storm Water Control

DO Properly installed silt fence cannot easily be pulled out of the ground.



DO Silt fence is to be securely tied into adjacent BMPs such as the sediment control log shown here, or reinforced rock berms or sediment basin embankments.



DO NOT The lower edge of this silt fence is not anchored in a backfilled trench.



Correct Installation and Maintenance of BMPs, continued

5.7.18 Stabilized Staging Area (SSA). A Stabilized Staging Area consists of stripping topsoil and spreading a layer of 1-1/2 inch rock, recycled concrete or CDOT Class 6 road base in the area to be used for a trailer, parking, storage, unloading and loading. A Stabilized Staging Area reduces the likelihood that the vehicles most frequently entering a site are going to come in contact with mud.

Key Installation and Maintenance Requirements:

- Stabilized Staging Area shall be large enough to fully contain parking, storage, and unloading and loading operations.
- Stabilized Staging Area shall consist of a minimum thickness of 3 inches of granular material (gravel or recycled concrete).
- Stabilized Staging Area shall be inspected weekly and during and after any storm event and repaired (by adding more granular material) or enlarged as necessary.



DO Properly installed stabilized staging area.



DON'T Parking, staging, and storage are spread out all over this site, increasing disturbance and erosion.

Correct Installation and Maintenance of BMPs, continued

5.7.19 Surface Roughening (SR). Surface Roughening consists of creating a series of grooves or furrows on the contour in all disturbed, graded areas to trap rainfall and reduce the formation of rill and gully erosion.

Key Installation and Maintenance Requirements:

- Disturbed surfaces shall be roughened using ripping or tilling equipment on the contour or tracking up and down a slope using equipment treads.
- The recommended inspection frequency for Surface Roughening is weekly and during and after any storm event and make repairs (re-roughen soil or repair rill erosion) as necessary.



DO Properly executed surfacing roughening.



DO NOT Surface roughening on this slope may have prevented this rill erosion.

Correct Installation and Maintenance of BMPs, continued

5.7.20 Temporary Slope Drain (TSD). A Temporary Slope Drain is a small culvert or plastic rundown to convey runoff down a slope or channel bank to reduce the occurrence of rill and gully erosion.

Key Installation and Maintenance Requirements:

- A riprap pad shall be placed at the outfall of the slope drain.
- The recommended inspection frequency for Slope Drains is weekly and during and after any storm event and make repairs as necessary.



DO Properly installed temporary slope drain pipe alternative.



DO This plastic lined temporary slope drain allows runoff to be conveyed down a slope without causing rill and gully erosion.

Correct Installation and Maintenance of BMPs, continued

5.7.21 Temporary Stream Crossing (TSC). A Temporary Stream Crossing consists of a riprap layer (for a ford crossing) or culverts covered with riprap (for a culvert crossing) to allow construction equipment to cross a stream. In either case, excavation of the existing channel banks is not allowed and, in general, disturbance is to be kept to a minimum.

Key Installation and Maintenance Requirements:

- Permittee(s) shall confirm that all related stream permitting is obtained prior to installing Temporary Stream Crossings and that all work will be in compliance with such permitting (see Sections 2.5.6 and 2.7.2).
- The recommended inspection frequency for Stream Crossings is weekly and during and after any storm event and make repairs or clean out upstream sediment as necessary.
- Sediment accumulated upstream of Stream Crossings shall be removed when the sediment depth upstream of crossing is within 6 inches of the crest (ford crossing) or greater than an average depth of 12 inches (culvert crossing).



DO Properly installed temporary stream crossing.



DON'T This temporary stream crossing is constructed of soil and is not acceptable.

Correct Installation and Maintenance of BMPs, continued

5.7.22 Terracing (TER). Terracing consists of creating one or more flat benches in high, steep cut or fill slopes to interrupt runoff and reduce the formation of rill and gully erosion.

Key Installation and Maintenance Requirements:

- The recommended inspection frequency for Terracing is weekly and during and after any storm event and make repairs (repair rill erosion, re-roughen soil, or re-seed and mulch) as necessary.



This terraced bench interrupts slope drainage and reduces rill and gully erosion.

Correct Installation and Maintenance of BMPs, continued

5.7.23 Vehicle Tracking Control (VTC). Vehicle Tracking Control consists of a 3 to 6 inch crushed rock pad 12 inches thick at all entrance/exit points for a site that is intended to help strip mud from tires prior to vehicles leaving the construction site. A Temporary Construction Access Permit is required and access to the site may only be taken at a permitted access point (see Section 2.5.3).

Key Installation and Maintenance Requirements:

- Vehicle Tracking Control pads shall be installed at every access point to or from the site.
- Vehicle Tracking Control pads shall consist of hard, dense, durable stone, angular in shape and resistant to weathering. Rounded stone or boulders will not be acceptable. The stones shall be 3 to 6 inches in size and have a specific gravity of at least 2.6. A stop sign installed in accordance with the *MUTCD*, as amended, shall be installed for exiting traffic from the vehicle tracking control pad.
- The recommended inspection frequency for the Vehicle Tracking Control is daily and during and after any storm event.



DO Properly installed vehicle tracking control.



DON'T Use of low density rock such as Rhyolite is not permitted since it does not stay in place and can get tracked onto paved streets.



DON'T No vehicle tracking control means mud on streets and an immediate Stop Work Order.



DON'T Curb ramps of earth, concrete or lumber are not permitted in the curb section.



Correct Installation and Maintenance of BMPs, continued

5.7.24 Vehicle Tracking Control with Wheel Wash (WW). Wheel Wash consists of a gravel and riprap pad at the main entrance/exit point for the site with an adjacent Washwater/Sediment Trap. If Douglas County requires a contractor to implement this BMP, each wheel of all vehicles coming in contact with dirt or mud shall be cleaned using a high-pressure washer prior to the vehicle leaving the site.

Key Installation and Maintenance Requirements:

- Specific requirements will be specified by the County in cases where Vehicle Tracking Control with Wheel Wash is required.



DO *A high-pressure washer effectively cleans mud from wheels.*

General Construction Practices

5.8

Sheet 1 of the GESC Plan Standard Notes and Details (see Appendix B) contains a series of standard notes governing construction practices in the County. Permittee(s) working in the County have the responsibility to review, understand, and comply with these notes. Several of the County's requirements pertaining to general construction practices are highlighted in the following paragraphs.

5.8.1 Complying with Limits of Construction.

No work, storage of equipment, stockpiling, or parking of vehicles shall be allowed outside of the approved limits of construction. The source



Lack of construction fence to define limits of construction can lead to unnecessary disturbance in drainageways.



Construction fence helps a GESC Manager restrict operations to the defined limits of construction.

of construction water shall also be within the Limits of Construction. Violating the Limits of Construction is considered a Level I Violation

subject to a Stop Work Order. The Permittee(s) shall obtain written approval for use of any adjacent property for stockpiling, etc. from the legal owner and Douglas County and shall provide erosion and sediment control BMPs for the adjacent area.

5.8.2 Street Cleaning. Streets shall be kept clean throughout the life of a project. In the event of accidental tracking of mud on streets, the mud shall be cleaned immediately using a vacuum-type street sweeper, a brush-type street sweeper with dust control, or manually using shovels and brooms.

If a large quantity of mud needs to be cleaned up, initial removal may take place using a small road grader or loader, but care shall be exercised to avoid damage to the roadway. Any damage shall be repaired at the Permittee(s) expense. Streets shall not be washed with water under any circumstance.



Failure to keep streets clean, or washing mud off streets with water, shall result in issuance of a Stop Work Order.



A vacuum or brush-type street sweeper is recommended to clean up any tracking of mud.



General Construction Practices, continued

5.8.3 Dust Control. The GESC Manager shall be responsible for dust control on the site. Disturbed areas not yet ready to be seeded, landscaped, paved, or otherwise stabilized shall be watered, sprayed with a tackifier, mulched (without seed) or ripped as necessary to preclude visible dust emissions.



5.8.4 Stockpiles. Stockpile areas for stripped topsoil, excess excavated material, and other materials shall be located within the Limits of Construction and at least 100 feet from the banks of a drainageway. Stockpile areas shall be sized to fully contain the material based on maximum allowable stockpile side slopes of 3 (horizontal) to 1 (vertical). Soils that will be stockpiled shall be seeded and mulched within 14 days of stockpile construction.

Haul roads and other disturbed areas shall be kept watered or otherwise stabilized to preclude visible dust emissions; otherwise a Stop Work Order shall be issued.



As stated in Section 5.6, topsoil shall be stripped from all disturbed areas of a site, stockpiled, and inspected by the County prior to other construction work on the site. Failure to strip and stockpile topsoil will result in the issuance of a Stop Work Order.

5.8.5 Import and Export of Soil. Section 3.6 discusses the importance of balancing earthwork on-site. If earthwork is not balanced on-site, a variance, accepted by Public Works Engineering, is required. Any import of soil to a site or export of soil from a site without a County variance will result in the issuance of a Stop Work Order. This does not apply to the import of aggregates, concrete, or asphalt used for development.



Excavation and fill shall take place under controlled conditions in accordance with recommendations of a licensed Geotechnical Engineer.

5.8.6 Placement of Fill. Unless otherwise specified and approved, all embankment material placed on an approved project in the County shall be essentially free of debris, organic matter, frozen material, and particles greater than 6 inches in diameter.

Subgrade areas to receive embankment material shall be prepared by removing vegetation and any organic material, stripping topsoil, scarifying the subgrade to a depth of at least 6 inches and wetting or drying as necessary to meet moisture requirements. All material that is placed outside of the Right-of-

**General
Construction
Practices,
continued**

Way shall be placed in accordance with recommendations from a Geotechnical Engineer.

Unless County acceptance has been granted, fill shall not be placed in streams and drainage channels.

Imported fill material that contains concrete, asphalt, or other non-earthen material may be considered for use when the Colorado Department of Public Health and Environment has issued a recommendation for approval for a certificate of designation and Douglas County has approved a Use by Special Review per Section 21 of the Douglas County Zoning Resolution.

Fill material that contains concrete, asphalt, or other non-earthen material that is generated on-site may be considered for disposal on-site provided that the Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division, has issued a positive determination, based upon review of an Engineering Design and Operations Report prepared and submitted by the owner.

Recycled fill material that contains concrete, asphalt, or other non-earthen material may be considered for use as fill material provided that the Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division, has issued a positive determination, based upon review of an Engineering Design and Operations Report prepared and submitted by the owner.

5.8.7 Temporary Stream Diversions. When constructing a drop structure, culvert crossing, or other feature within a stream channel, it may be necessary to divert baseflows and storm runoff around the construction operation. It is essential that any diversions be undertaken in a manner that minimizes disturbance to the stream channel and reduces erosion in the diversion system itself. Care shall be taken to avoid areas of desirable channel vegetation that otherwise could be left undisturbed. Any berms constructed across the channel to direct water into a pumped or piped diversion shall be protected against overtopping damage. Open ditches shall be lined or otherwise protected against erosion.

All plans for temporary stream diversions shall be submitted to the County for review and acceptance before any diversion work is undertaken. Plans shall be in accordance with the *Drainage Manual* and *Volume 3*, as amended.

5.8.8 Utility Construction. As Douglas County grows so does the demand for installation of new underground utility lines and upgrade and maintenance of existing utility lines. Within street rights-of-way, utility work is in close proximity to storm sewer systems. Although the work is generally short lived, construction provides ample opportunity for contamination of stormwater runoff. Additionally, installation of new utility lines in open space areas may cross or run parallel to drainageways, again providing opportunities for contamination of stormwater runoff.

The following requirements are designed to reduce the contamination of stormwater runoff from the installation and maintenance of underground activities.

**General
Construction
Practices,
continued**

Utility line installation shall comply with the following:

- All utility work within a Douglas County right-of-way shall be required to obtain a Douglas County Right-of-Way Use and Construction Permit in accordance with the *Roadway Manual*.
- Provide adequate erosion and sediment controls (see Section 3.15).
- No more than 1,000 feet of trench are to be open at any one time.
- Where consistent with safety and space considerations, excavated material is to be placed on the uphill side of trenches.
- At **NO** time shall excavated material be placed on the street, sidewalk or in a drain line.
- Trench Dewatering devices must discharge in a manner that will not affect streams, wetlands, drainage systems, or off-site property. Discharge from the trench shall be free of any sediment. A rock riprap pad shall be placed at the discharge end of the hose to prevent any additional erosion (see Standard Details in Appendix B).
- Storm sewer inlet protection shall be provided whenever soil erosion from the excavated area has the potential of entering the storm drainage system (see Standard Details in Appendix B).
- All disturbed areas shall be drill seeded and crimp mulched within 14 days after utility installation or maintenance is completed (see GESC Plan Standard Notes and Details in Appendix B).
- All other applicable criteria as outline in the *GESC Manual*.

5.8.9 Construction Site Chemical Control. Many potential pollutants other than sediment are associated with construction site activities. These pollutants include pesticides (insecticides, fungicides, herbicides, and rodenticides); fertilizers used for vegetative stabilization; petrochemicals (oils, gasoline, and asphalt degreasers); construction chemicals such as concrete products, sealers, and paints; wash water associated with these products; paper; wood; garbage; and sanitary wastes.¹ The Permittee(s) shall comply with the following construction site management practices for proper chemical control:

1. Washington State Department of Ecology, 1991.
This section was adapted from the United States Environmental Protection Agency's, *Polluted Runoff Nonpoint Source Pollution*, 2003

Potential Pollutants on a Construction Site:

Pesticides. Insecticides, rodenticides, and herbicides are used on construction sites to provide safe and healthy conditions, reduce maintenance and fire hazards, and curb weeds and woody plants. Rodenticides are also used to control rodents attracted to construction sites. Common insecticides employed include synthetic, relatively water insoluble chlorinated hydrocarbons, organophosphates, carbamates, and pyrethrins.

Petroleum Products. Petroleum products used during construction activities include fuels and lubricants for vehicles, for power tools, and for general equipment maintenance. Specific petroleum pollutants include gasoline, diesel oil, kerosene, lubricating oils, and grease. Asphalt paving also can be particularly harmful since it releases various oils for a considerable time period after application. Asphalt overloads might be dumped and covered without inspection. However, many of these pollutants adhere to soil particles and other surfaces and can therefore be more easily controlled.

Nutrients. Fertilizers are used on construction sites when revegetating graded or disturbed areas. Fertilizers contain nitrogen and phosphorus, which in large doses can adversely affect surface waters, causing eutrophication.

Solid Wastes. Solid wastes on construction sites are generated from trees and shrubs removed during land clearing and structure installation. Other wastes include wood and paper from packaging and building materials, scrap metals, sanitary wastes, rubber, plastic and glass, and masonry and asphalt products. Food containers, cigarette packages, leftover food, and aluminum foil also contribute solid wastes to the construction site.

Construction Chemicals. Chemical pollutants, such as paints, acids for cleaning masonry surfaces, cleaning solvents. Asphalt products, soil additives used for stabilization, and concrete-curing compounds, may also be used on construction sites and carried in runoff.

**General
Construction
Practices,
continued****5.8.10 Properly Store, Handle, Apply, and Dispose of Pesticides.**

Pesticide storage areas on construction sites should be protected from the elements. Warning signs should be placed in areas recently sprayed or treated. Persons mixing and applying these chemicals should wear suitable protective clothing, in accordance with the law.

Other practices include setting aside a properly labeled, locked storage area, tightly closing lids, storing in a cool, dry place, checking containers periodically for leaks or deterioration, maintaining a list of products in storage, using plastic sheeting to line the storage area, and notifying neighboring property owners prior to spraying.

General Construction Practices, continued



5.8.11 Properly Store, Handle, Use, and Dispose of Petroleum Products.

When storing petroleum products, follow these guidelines:

- Line the storage area for fuel storage with a double layer of plastic sheeting or similar material;
- Create an impervious berm around the perimeter with a capacity of 110% of the capacity of the largest container;
- Clearly label all products;
- Keep tanks off the ground; and
- Keep lids securely fastened.

Oil and oily wastes such as crankcase oil, cans, rags, and paper dropped into oils and lubricants should be disposed of in proper receptacles or recycled.

Fueling and vehicle maintenance operations shall take place in the Stabilized Staging Areas (SSA) unless an emergency maintenance is needed.



Equipment maintenance shall take place in the stabilized staging area unless an emergency maintenance is needed; fluids shall be captured and contained. Fluid Spills not properly contained or cleaned up shall result in a Stop Work Order.

5.8.12 Sanitary Facilities. Sanitary facilities shall be provided and maintained for construction workers. These facilities shall be staked down to assist in preventing vandalism and being blown over. Trailer facilities are also acceptable. Sanitary facilities shall be located in the Stabilized Staging Area (SSA) away from drainageways. Sanitary facilities shall never be placed near storm sewer inlets.



Sanitary facilities shall be located in the stabilized staging area away from drainageways and storm sewer inlets and staked down.

5.8.13 Other Construction Site Pollutants.

The County requires that proper management of other construction site pollutants occur. Store, cover, and isolate construction materials, including topsoil and chemicals, to prevent runoff of pollutants and contamination of ground water.

Develop and implement a spill prevention and control plan. Agencies, contractors, and other commercial entities that store, handle, or transport fuel, oil, or hazardous materials should develop a spill response plan.

General Construction Practices, continued



Post spill response procedure information in a conspicuous place(s) and have persons trained in spill handling on-site and/or on-call at all times. Materials for cleaning up spills should be kept on-site and made easily available. Spills should be cleaned up immediately and the contaminated material properly disposed. Spill control plan components should include:

- Identify and stop the source of the spill.
- Contain any liquid.
- Cover the spill with absorbent material such as kitty litter or sawdust, but do not use straw. Dispose of the used absorbent properly.

Washing of equipment and machinery shall not be allowed on-site.

Adequate disposal facilities shall be utilized and maintained for solid waste (e.g. trash dumpsters), including excess asphalt, concrete, wood, rebar and other construction wastes produced during construction.

5.8.14 Spills Response. All chemical or hazardous material spills which may enter waters of the State of Colorado, which include but are not limited to, surface water, ground water and dry gullies or storm sewer leading to surface water, shall be immediately reported to the CDPHE per CRS 25-8-601, and Douglas County. Releases of petroleum products and certain hazardous substances listed under the Federal Clean Water Act (40 CFR Part 116) must be reported to the National Response Center as well as the CDPHE. Contact information for CDHPE, Douglas County and the National Response Center can be found in Appendix A. Spills that pose an immediate risk to human life shall be reported to 911. Failure to report and properly clean up any spill shall result in issuance of a Stop Work Order.

Permit Step 13: Ensure that the mandatory inspections by the County are scheduled and completed and that corrections requested by the County during these or any inspections are made.
 Section 5.9 and Section 5.10 discuss Step 13.

County GESC Inspection Process

The Owner's signature on the GESC Permit application form constitutes written authorization for Douglas County and its agents to enter the project site and conduct regular inspections to ensure compliance with County regulations.

5.9

5.9.1 County GESC Inspections. During the construction phase, erosion and sediment controls will be inspected regularly by the Erosion Control Inspector. Erosion Control Inspectors will consider the overall effectiveness of the controls for reducing erosion and trapping sediment on the site and will check for proper installation and maintenance of the controls. Erosion Control Inspectors will coordinate with the GESC Manager, whose responsibility it is to ensure that the site remains in compliance with all GESC requirements.

Besides observations by Erosion Control Inspectors, selected inspections will be provided by Public Works Engineering staff, including inspections of the initial traffic control and temporary access plan and any permanent drainage facilities.

5.9.2 Mandatory County Inspections. The Permittee(s) shall call the Engineering Permits Staff (contact information is shown in Appendix A) to schedule the following mandatory inspections:

County GESC Inspection Process, continued

1. Preconstruction Meeting/Inspection of Initial BMPs.
2. Any time during construction when a new GESC Manager or Alternate GESC Manager is chosen.
3. Prior to issuance of a Right-of-Way Use and Construction Permit for construction of curb, gutter, and/or sidewalk or paving roadways.
4. Prior to any waterline flushing.
5. Initial Close-out Inspection prior to CO or TCO is issued for commercial, industrial, rental residential and multifamily projects, at end of construction if no CO or TCO is requested.

The Erosion Control Inspectors regulate grading, erosion and sediment control requirements for detached single-family projects from the commencement of the overlot grading operations through the Final Close-out Acceptance of the subdivision improvements.

6. Two years after final inspection, or when grass has reached required vegetative cover in accordance with Section 6, prior to removal of on-site BMPs.
7. Final Close-out Inspection (after vegetation has been accepted and sediment controls have been removed).
8. For Staged and Phased GESC Plans where more than 40 acres needs to be disturbed (70 acres for soil mitigation) and where work occurs in multiple grading phases, the following inspection process is required:

Mandatory Inspections for Staged and Phased Projects:

1. A phased project starts in the same manner as any other GESC permitted project, with the installation of the Initial BMPs as shown on the Initial GESC Drawing. The difference is that only the Initial BMPs for Phase I need to be installed and inspected in order to obtain the GESC Permit.
2. Once the Permittee(s) have obtained the GESC Permit, topsoil stripping/stockpiling and grading may begin on Phase I only. Failure to restrict grading operations to the limits of Phase I shall result in issuance of a Stop Work Order (see Section 5.10.3).
3. When the Permittee(s) are nearing the end of grading on Phase I, the Interim BMPs for Phase I shall be installed per the Interim GESC Drawing; in addition, the Initial BMPs shall be installed on Phase II as shown on the Initial GESC Drawing.
4. A **mandatory inspection** shall be scheduled, in accordance with this section, to inspect the Initial and Interim BMPs on Phase I as well as the Initial BMPs for Phase II. If the Erosion Control Inspector finds the BMPs to be installed and maintained in accordance with the approved GESC Plan and GESC Manual, the Erosion Control Inspector will sign the GESC Phasing Acceptance Sheet.
5. Once the Erosion Control Inspector has signed the GESC Phasing Acceptance Sheet, topsoil stripping/ stockpiling and grading may commence on Phase II.
6. All disturbed areas on Phase I shall be Drill Seeded and Crimp Mulched or otherwise stabilized in accordance with the accepted GESC Plan within 14 calendar days from the Erosion Control Inspectors sign-off for commencement of the next phase. Failure to complete the required seeding and mulching within the allotted time shall result in issuance of a Stop Work Order for the entire project. **NO TIME EXTENTIONS SHALL BE GRANTED.**
7. This process shall be repeated for each additional phase until all earthwork is complete.



All inspections shall be coordinated through the Public Works Engineering Permits Staff. All inspection requests need to be called into the Engineering Permits Staff by 3:30 pm the day before the inspection (3 business days prior to the inspection for the Preconstruction Meeting).

Violations and Enforcement

5.10

5.10.1 Penalties and Enforcement. Failure to comply with any term, condition, limit, deadline or other provision of the *GESC Manual* or failure to obtain a GESC Permit, constitutes a violation of the Douglas County Stormwater Ordinance Regarding Grading, Erosion and Sediment Control, Drainage, Erosion and Sediment Control, Operation and Maintenance of Stormwater Management Facilities, and Illicit Discharge Detection and Elimination, as amended (Ordinance) and/or Section 31 of the Douglas County Zoning Resolution, as amended and may constitute a violation of the Federal Clean Water Act and the Colorado Water Quality Control Act, Section 25-8-101, *et seq.*, CRS (“Act”).

Pursuant to Section 25-8-608, CRS, any person who violates the Act or any permit issued under the Act shall be subject to a civil penalty of not more than \$10,000 per day for each day during which such violation occurs. Pursuant to Section 25-8-609, CRS, any person who recklessly, knowingly, intentionally, or with criminal negligence discharges any pollutant into any state waters commits criminal pollution if such discharge is made in violation of any permit issued under the Act. If the violation is committed with

Important!

Violations to the Clean Water Act shall be subject to civil penalties of up to \$25,000 per day.

Violations and Enforcement, continued

negligence or recklessness, the maximum fine shall be \$12,500 per day. If the violation is committed knowingly or intentionally, the maximum fine shall be \$25,000 per day.

In addition to any other legal or equitable remedies that the County may have for GESC Permit violations, the County may cease issuances of all Building Permit approvals and other permissions until such violation is corrected and the Permittee(s) takes additional steps to ensure compliance with the GESC Permit, by the Erosion Control Inspector.

5.10.2 Levels of Violations. Douglas County classifies violations in 1 of 3 categories, depending on the severity of the violation. Enforcement action varies for each category. Level I Violations have the most severe impact on people and the environment and Level III Violations have the least severe impact.

Level I Violations are viewed by Douglas County to pose an immediate serious risk to the health, safety, or welfare of people and/or the environment. Level I Violations result in an immediate issuance of a Stop Work Order. Example Level I Violations include the following:

- *Clearing, grubbing or grading without a Douglas County GESC Permit.*
- *Failure to schedule a Preconstruction Meeting.*
- *Failure to be able to contact the GESC Manager or Alternate GESC Manager during any level of violation.*
- *Failure to restrict operations to approved limits of construction.*
- *Failure to clean up tracking of material onto roadways and adjacent paved areas.*
- *Exporting material to or importing material from a non-permitted site.*
- *Exporting/importing soil material without a variance.*
- *Failure to follow approved phasing plan.*
- *Failure to correct Level II violations per the directives of the Erosion Control Inspector.*

Level II Violations are viewed by Douglas County to pose a moderate immediate risk to the health, safety, or welfare of people and/or the environment; however, if not immediately corrected, will pose a serious risk. Remediation for Level II Violations shall commence immediately after the Permittee(s) are notified of the violation(s). Generally Douglas County will reinspect for compliance within 24 hours of notification of Level II Violations. Example Level II Violations include the following:

- *Tracking of material onto roadways and adjacent paved areas.*
- *Failure to make required plan revisions.*
- *Failure to perform BMP maintenance as directed by the Douglas County Erosion Control Inspector.*

Violations and Enforcement, continued

Level III Violations are viewed by Douglas County to pose a low immediate risk to the health, safety, or welfare of people and/or the environment, however, if not corrected quickly, will pose a more serious risk. Level III Violations shall be corrected immediately after the Permittee(s) are notified of the violation(s). Generally Douglas County will reinspect for compliance within 48 hours of notification of Level III Violations. Example Level III Violations include the following:

- **Failure to provide routine maintenance for erosion and sediment controls.**
- **Installation of non-Douglas County-accepted erosion and sediment control BMPs.**
- **Failure to provide temporary inlet protection within 48 hours or pouring of inlet.**
- **Failure to provide inlet protection within 48 hours of placement of asphalt or concrete pavement.**
- **Staging of equipment outside of Stabilized Staging Area.**
- **Failure to have accepted GESC Permit, accepted GESC Drawings and GESC Field Manual on-site.**

5.10.3 Stop Work Orders. The Public Works Engineering Director, or his/her designated representative, is authorized to order work to be stopped on any project that disturbs the land and which is not in compliance with the requirements of the GESC Permit. **When a Stop Work Order is issued, the GESC Permit for that project is suspended.** In addition, the State of Colorado Department of Public Health and Environment may be notified.

If a project is issued a Stop Work Order, all work on-site shall be stopped. Safety-related items (e.g., backfilling of holes and trenches) as well as corrective actions may be completed; however, the Permittee(s) shall inform the Erosion Control Inspector of such activities.

The Permittee(s) shall do the following to reinstate a GESC Permit and resume work on the site:

1. Correct the deficient practices that precipitated the Stop Work Order.
2. Pay the Permit reinstatement fee at the Public Works Engineering Permits and Inspections Office. (Note: Low Impact GESC Permits are not subject to the reinstatement fee).
3. Call the Engineering Permits Staff to schedule a site inspection.

A posted Stop Work Order shall not be removed from the site, except by the County. A Douglas County

**Violations and Enforcement, continued****Important!**

If a Permittee works without a GESC Permit, a fee of 3 times the permit fee will be assessed as a reinstatement fee. This fee shall apply each time the project is found to be working without or prior to issuance of a GESC Permit. The County will enforce the GESC Permit, GESC Manual, GESC Plan and Stop Work Order through any available means.

Inspector is the only authorized agent to remove a posted Stop Work Order.

5.10.4 Stormwater Ordinance Civil Enforcement Action. Douglas County may pursue a Civil Enforcement action for violations of the *GESC Manual* through the Ordinance, as amended.

5.10.5 Section 31 Zoning Civil Enforcement. Douglas County may pursue a Civil Enforcement action for violations of the *GESC Manual* through the Douglas County Zoning Resolution, as amended.

5.10.6 Remedies Not Exclusive. The remedies listed in this Section are not exclusive of any other remedies available under any applicable Federal, State or local law, and it is within the discretion of Douglas County to seek cumulative remedies. This shall include but not be limited to, remedies available to the Douglas County Sheriff's Office, the Colorado Department of Public Health and Environment and the U.S. Environmental Protection Agency.

5.10.7 Re-inspection Fees. To offset the cost of additional inspections on non-compliant sites, Douglas County requires that re-inspection fees be paid in person at Douglas County offices prior to receiving subsequent inspections and approval of work. Re-inspection fees shall be charged for all projects that are deficient due to the following:

- *Permittee(s) fail to properly install all Initial BMPs prior to the scheduled Preconstruction Meeting.*
- *The required attendees fail to attend the scheduled Preconstruction Meeting.*
- *Permittees) fail to have the GESC Field Manual and GESC Drawings on-site during the Preconstruction Meeting.*
- *Permittee(s) receive a Stop Work Order (fee consists of a reinstatement fee in this case).*
- *Permittee(s) fail to obtain vegetation acceptance from the County prior to requesting a final release of Fiscal Security.*
- *Permittee(s) remove any BMPs prior to receiving authorization by Douglas County.*
- *Erosion Control Inspector finds violations of GESC Permit requirements during routine inspections.*
- *Failure to cancel any inspection before 3:30 pm the day prior to the inspection in the event that a site is not ready for an inspection and an inspection had already been scheduled.*



This site was issued a reinspection fee when the GESC Manager scheduled an inspection prior to reaching the required vegetative cover as well as not maintaining the required sediment controls.

Permit Step 14: Ensure that the Interim and Final BMPs are installed at the appropriate times in accordance with the accepted GESC Drawings and GESC Manual.

Section 5.11 discusses Step 14.

Installation of Interim and Final BMPs

5.11

It is the responsibility of the GESC Manager to ensure that Interim and Final BMPs are installed at the earliest opportunity that grading or construction of new facilities allows. Some BMPs have specific time requirements for installation that are identified on the GESC Plan Standard Notes and Details; these time requirements shall be adhered to (for example, temporary and area Inlet Protection shall be installed within 48 hours of the pouring of an inlet).

For BMPs where a specific time frame is not given, the controls shall be installed as soon as construction of the infrastructure is substantially complete or when grading activities have produced grades close to the final grade. In any case, it is up to the discretion of the Erosion Control Inspector to make the final determination of Interim and Final BMP installation time frames.