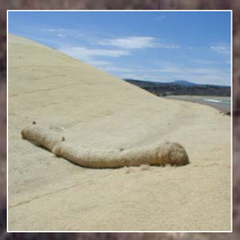
TOWN OF CASTLE ROCK
COLORADO



2015 Grading, Erosion, and Sediment Control (GESC) Manual and Drainage, Erosion and Sediment Control (DESC) Manual

Town of Castle Rock
Department of Utilities
175 Kellogg Ct., Castle Rock, CO 80109
June 2015

Overview of Section 1

1.0

Section 1 addresses the following introductory topics:

Section 1.1, **The GESC and DESC Permits**, introduces the Town of Castle Rock's Grading, Erosion, and Sediment Control (GESC) Permit Program and the Drainage, Erosion and Sediment Control (DESC) Permit Program.

Section 1.2, **Reasons for the Permit**, points out the need to control the high rates of erosion and sedimentation from construction sites in an effort to protect valuable land and water resources.

Section 1.3, **Legislative Mandate**, summarizes how the GESC Permit Program is mandated by legislation, including the Federal Clean Water Act's National Pollutant Discharge Elimination System (NPDES) Stormwater Phase II Regulations and the Colorado Water Quality Control Act.

Section 1.4, **Projects Requiring a GESC Permit**, indicates the types of land-disturbing activities within the Town of Castle Rock that require a GESC Permit.

Section 1.5, **Types of GESC Permits**, identifies the following three types of GESC Permits issued by the Town and describes the projects they apply to:

1. *Low Impact GESC Permit,*
2. *Temporary Batch Plant/GESC Permit, and*
3. *Standard GESC Permit.*

The Temporary Batch Plant and Standard GESC Permit are addressed in **Sections 2 through 6** of the *GESC Manual.* The Low Impact GESC Permit is covered in **Section 7**.

Section 1.6, **Who Obtains a GESC Permit**, states that the Property Owner and Contractor, together referred to as "Applicants" before a GESC Permit is issued and "Permittee(s)" afterwards, are the parties who sign the GESC Permit Application form and are legally responsible for complying with the requirements of the GESC Permit.

Section 1.7, **What Steps are Included in the GESC Permit Process?,** outlines the 20 steps involved in the Temporary Batch Plant and Standard GESC Permit Process.

The Permit Steps. *Each of the 20 steps in the Temporary Batch Plant and Standard GESC Permit Process is highlighted in Section 2 through Section 6 of the GESC Manual. The 10 steps in the Low Impact GESC Permit Process are highlighted in Section 7. Each step is shown in a blue box that looks just like this. A header is provided on each page identifying the step currently being addressed.*

Section 1.8, **Authorization of the *GESC Manual***, states that the *GESC Manual* is authorized by passage and adoption of an ordinance by the Town Council. This section discusses the interpretation and enforcement of the GESC Permit requirements described herein.

Grading, Erosion, and Sediment Control and Drainage, Erosion, and Sediment Control

Rates of erosion increase dramatically during construction.

The GESC and DESC Permits

1.1

The Town of Castle Rock has two permitting programs for erosion and sediment control on public and private construction projects within the limits of the Town. The Drainage, Erosion and Sediment Control (DESC) program covers residential construction on individual lots. The Grading, Erosion and Sediment Control (GESC) program covers all other development and construction projects. This GESC and DESC manual (commonly known as the GESC manual) describes the permitting programs that have been adopted to promote environmentally-sound construction practices in the Town.

Terminology

The Grading, Erosion, and Sediment Control Permit is termed simply the "GESC" Permit for short ("GESC" has a hard "g" and is pronounced like "desk"). The Drainage, Erosion and Sediment Control Permit is termed the "DESC" Permit for short.

Reasons for the GESC and DESC Permits

1.2

The goal of the GESC and DESC Permit Programs is to implement effective erosion and sediment control Best Management Practices (BMPs) as a standard for all land disturbance activities to reduce increases in erosion and sedimentation over pre-development conditions. During the relatively short period of time when undeveloped land is converted to urban uses, a significant amount of sediment can erode from a construction site and be transported to adjacent properties and receiving waters. Erosion caused by construction and downstream sedimentation can damage property and degrade the quality of streams and lakes. Sediment is a transport mechanism for many stormwater pollutants.

Eroded sediment can clog downstream receiving waters.

Sediment can disturb riparian and aquatic habitat and, since eroded sediments often contain significant phosphorus, can lead to unwanted algae growth in lakes and reservoirs.

Nutrients associated with eroding sediments can lead to undesirable algae blooms.

Legislative Mandate

1.3

1.3.1 NPDES Regulations. The development, implementation, and enforcement of the Town of Castle Rock GESC Permit Program is mandated by both the Federal Government and the State of Colorado. The Federal Clean Water Act's National Pollutant Discharge Elimination System (NPDES) Stormwater Regulations require that stormwater discharges from certain types of facilities be authorized under discharge permits (40 C.F.R., 122.26). The goal of the NPDES stormwater permits program is to reduce the amount of pollutants entering streams, lakes, and rivers as a result of stormwater runoff from residential, commercial, and industrial areas.

The original 1990 regulation (**Phase I**) covered municipal (i.e., publicly-owned) storm sewer systems for municipalities over 100,000 population. The regulation was expanded in 1999 to include smaller municipalities, as well as some counties, including the Town of Castle Rock. This expansion of the program is referred to as **Phase II**.

In Colorado, stormwater discharge permits are issued by the Colorado Department of Public Health and Environment, Water Quality Control Division ("Division"). Such permits are part of the Colorado Discharge Permit System, or CDPS, under Regulation No. 61. Regulation No. 61 was promulgated to assist the Division in implementing its stormwater permits program. The Phase II municipal separate storm sewer systems (MS4s) are covered under a general permit for stormwater discharges from MS4s. As per the Division's regulation, the main requirement of this general permit will be for the Town of Castle Rock to develop and implement six stormwater management programs, or minimum control measures. One of these six measures is **construction site storm-water runoff control**.

Regulation No. 61 states that the Town must "develop, implement, and enforce a stormwater management program designed to reduce the discharge of pollutants from lands in the Town to the Maximum Extent Practicable (MEP), to protect water quality, and to satisfy the appropriate water quality requirements of the Colorado Water Quality Control Act (CWQCA) (Colorado Code of Regulations (CCR) 61.8(11)(a)(i))."

Control of construction site erosion in the Town of Castle Rock is mandated by Federal and State law.

Legislative Mandate, continued

In short, the Town must develop a stormwater management program that meets the requirements of the six minimum control measures and protects state waters from pollution, contamination, and/or degradation.

Requirements of the Colorado Water Quality Control Act (CCR 61.8(11)(a)(ii)(D))

The Town of Castle Rock is required to:

"…develop, implement, and enforce a program to reduce pollutants in any stormwater runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of pollutants in stormwater discharges from construction activity disturbing less than one acre must be included in the program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more. The program must be developed and implemented to assure adequate design, implementation, and maintenance of best management practices (BMPs) at construction sites within the MS4 (Town of Castle Rock) to reduce pollutant discharges and protect water quality. The program must include the development and implementation of, at a minimum:

- *An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State or Local law;*
- *Requirements for construction site operators to implement appropriate erosion and sediment control BMPs;*
- *Requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality;*
- *Procedures for site plan review which incorporate consideration of potential water quality impacts;*
- *Procedures for receipt and consideration of information submitted by the public; and*
- *Procedures for site inspection and enforcement of control measures."*

The GESC Permit Program complies with these requirements.

1.3.2 Cherry Creek Reservoir Control Regulation No. 72. In addition to the CDPS program requirements, the Town of Castle Rock is responsible for complying with Cherry Creek Reservoir Control Regulation No. 72, promulgated by the Division pursuant to the CWQCA, Sections 25-8-202(1)(c) and 25-8-205, *et seq*., CRS. This regulation, affecting the eastern part of Castle Rock within the Cherry Creek Watershed, identifies specific requirements for erosion and sediment control BMPs on construction sites, including placing limits on the area of land that can be disturbed at any one time. The intent of the regulation is to protect the water quality of Cherry Creek Reservoir.

1.3.3 Chatfield Reservoir Control Regulation No. 73. The Town of Castle Rock is also responsible for complying with Chatfield Reservoir Control Regulation No. 73, promulgated by the Division pursuant to the CWQCA, Section 25-8-205, *et seq*., CRS. This regulation applies to the Plum Creek Watershed and requires the Town of Castle Rock to implement construction erosion and sediment control BMPs.

Projects Requiring a GESC Permit

1.4

1.4.1 Projects that Require a GESC Permit. The Town of Castle Rock requires that a GESC Permit be obtained prior to the start of the following land-disturbing activities within the Town:

Projects Requiring a Standard GESC Permit

- *New development and redevelopment, including residential projects. (Refer to Section 8 for Residential DESC Permitting)*
- *Installation of utility lines in excess of 1000 linear feet. (outside of the Town Right-of-Way).*
- *Installation of utilities for a new development, prior to the start of overlot clearing or grading.*
- *Any clearing, grubbing, grading or filling operations located within 100 feet of a drainageway.*
- *Fill or excavation of 50 or more cubic yards of material, not related to building of a detached single family residential unit.*
- *Mining projects, even when subject to a State mining permit.*
- *Drilling sites, excluding wells that serve a stand-alone detached single-family residential unit.*
- *Temporary batch plants.*
- *Any project that the Town determines to have a potential impact to the health, safety and welfare of people and/or the environment.*

1.4.2 Projects that Do Not Require a GESC Permit. Some types of projects, listed below, are automatically exempt from the GESC Permit Program.

Projects that Do Not Require a GESC Permit

- *Routine agricultural practices, including tilling, planting, harvesting, or livestock operations. (Activities not considered as routine agricultural practices, and therefore requiring a GESC Permit, include land grading and work in or adjacent to streams and drainage channels.)*
- *Pavement repair, resurfacing, graveling, or re-grading that does not materially change the original vertical or horizontal alignment or original width of public and private roadways and driveways. (Although a GESC Permit is not required, erosion and sediment control BMPs and a Right-of-Way Use and Construction Permit, for public roadways are required.)*
- *Emergency situations that pose an imminent risk to life or property, such as hazardous waste clean-up operations and fire.*
- *Livestock grazing.*
- *Mowing.*
- *Weed control.*
- *Burning.*
- *Irrigation and associated activities (including: operation and maintenance of irrigation facilities; ditch maintenance and pumping; and maintenance, operation and construction of diversions and headgate structures).*
- *Fencing and maintenance of existing fencing.*
- *Routine maintenance activities that are performed to maintain the original line and grade, hydraulic capacity, or original purpose of constructed ditches, constructed channels and constructed ponds.*

Projects Requiring a GESC Permit, continued

Important! ***The projects shown that do not need a GESC Permit are not free from the obligation to control erosion and sediment; BMPs shall still be required in accordance with the information shown in the GESC Manual.***

The projects shown that do not need a GESC Permit are not free from the obligation to control erosion and sediment; BMPs shall still be required in accordance with the information shown in the *GESC Manual*.

1.4.3 Projects Covered Under Other Permits. GESC Permits are required for projects meeting the criteria identified herein even if a Federal or State agency or another jurisdiction has approved the project and issued a permit for the work. Examples include mining projects possessing a State mining permit and projects for which a Nationwide or Individual Section 404 Permit has been obtained from the Corps of Engineers.

The Town of Castle Rock GESC Permits are required even for projects covered under a State or Federal permit.

1.4.4 Permitting for Residential Projects. Three Town divisions have authority over the construction of residential projects. The Utilities Department, through the GESC Permit Program, and the Public Works Department, through the Construction Permit Program, act as the regulatory authorities for the project from the start of grading operations through Initial Close-out Acceptance (discussed in Section 6). When a phase or project is issued Initial Close-out Acceptance by the Town's GESC and Public Works Inspectors, the GESC Permit remains in effect until final close-out acceptance (after vegetation is established) for that phase or project. New disturbances associated with residential lot construction are required to be permitted through the residential Drainage, Erosion and Sediment Control (DESC) Program. The Utilities Department, through the Stormwater Engineering Division, acts as the DESC regulatory authority through the construction of residential properties. The developer, owner or builder follows the guidelines as set forth in Sections 2 and 8 of this manual.

A DESC Plan is required for construction of residential units.

Often, a stand-alone detached single-family residential unit is not required to obtain a GESC Permit and is regulated only by the Town's DESC program. However, the Town, on a case-by-case basis, may require a GESC Permit for these projects if it is determined that the site issues involved merit the engineering oversight that comes with a GESC Permit. If a GESC Permit is required, regulatory authority resides with the Utilities Department.

GESC Permits are issued through the Development Services Department, then are turned over to the Utilities Department for inspection and close-out.

Projects Requiring a GESC Permit, continued

Attached single-family and multi-family residential projects are subject to the regulatory authority of the Utilities GESC Permit Program from the start of grading operations through Final Close-out Acceptance (discussed in Section 6). Refer to Sections 2 and 8 for details regarding the DESC Program.

Types of GESC Permits

1.5

The following three types of GESC Permits are issued by the Town of Castle Rock:

1. *Low Impact GESC Permit,*
2. *Temporary Batch Plant/GESC Permit, and*
3. *Standard GESC Permit.*

Information

Low Impact GESC Permits have a streamlined permitting and inspection process as described in Section 7

1.5.1 Low Impact GESC Permit. Some land-disturbing activities may have a negligible negative impact on adjacent properties and downstream receiving waters. For projects with a disturbed area less than one acre that do not require re-establishment of native vegetation and where insignificant negative impact can be adequately demonstrated to the Town, streamlined submittal requirements apply. If, after reviewing the submitted information, Town staff concur that there is low impact, a Low Impact GESC Permit will be designated for the project.

The permit applications for the Temporary Batch Plant, Standard, and Low Impact/ GESC Permits are provided in ***Appendices J, K, and M****, respectively.*

1.5.2 Temporary Batch Plant/ GESC Permit.

A Temporary Batch Plant requires its own GESC Permit.

Because of their potential impact on land, vegetation, and receiving waters, temporary batch plants require a Temporary Batch Plant/GESC Permit (even if the plant is to be located inside the limits of construction of a GESC-permitted project).

In addition to other submittal documents, the Temporary Batch Plant/ GESC Permit requires a copy of the Lease Agreement between the Property Owner and the Batch Plant Operator.

1.5.3 Standard GESC Permit. A Standard GESC Permit is required for all of the land-disturbing activities identified in Section 1.4.1 other than the activities qualifying for a Low Impact GESC Permit or a Temporary Batch Plant/GESC Permit.

Who Obtains a GESC Permit?

1.6

Typically, GESC Permits are signed by both the Project Owner and the Contractor. Prior to issuance of a GESC Permit, the Owner and the Contractor are referred to as “Applicants”. After the Permit is issued, both are considered “Permittee(s)”.

Who Obtains a GESC Permit?, continued

A Permittee is defined as "any person who is issued a GESC Permit by the Town". The Permittee(s) shall be legally responsible for compliance with the GESC Permit. If an Applicant is a corporation, a manager or officer of the corporation or other authorized person must sign the permit as the Permittee.

Permittee(s) (Owners and Contractors) undertaking land-disturbing activities are responsible for meeting all of the requirements of the Town's GESC Permit Program that are summarized in Section 1.5 and described in detail within the *GESC Manual*. Failure to meet the requirements of the GESC Permit may lead to enforcement action, as described in Section 5.

Important! ***Failure to meet the requirements of a GESC Permit may lead to enforcement action against the Permittee(s).***

What Steps are Included in the GESC Permit Process?

1.7

A flow chart of the Town's Development Review Process is shown on Figures 1-1. The 20 Steps involved in the Town's GESC Permit Process for the Temporary Batch Plant and Standard GESC Permits are shown in Figure 1-2.

Each page of Sections 2 through 7 of the GESC Manual provides a header (appearing at the top right side of the page) identifying the Permit Step currently being addressed. An overview page at the beginning of each section summarizes the GESC Permit Steps covered in the section and relates each subsection to one of the GESC Permit Steps.

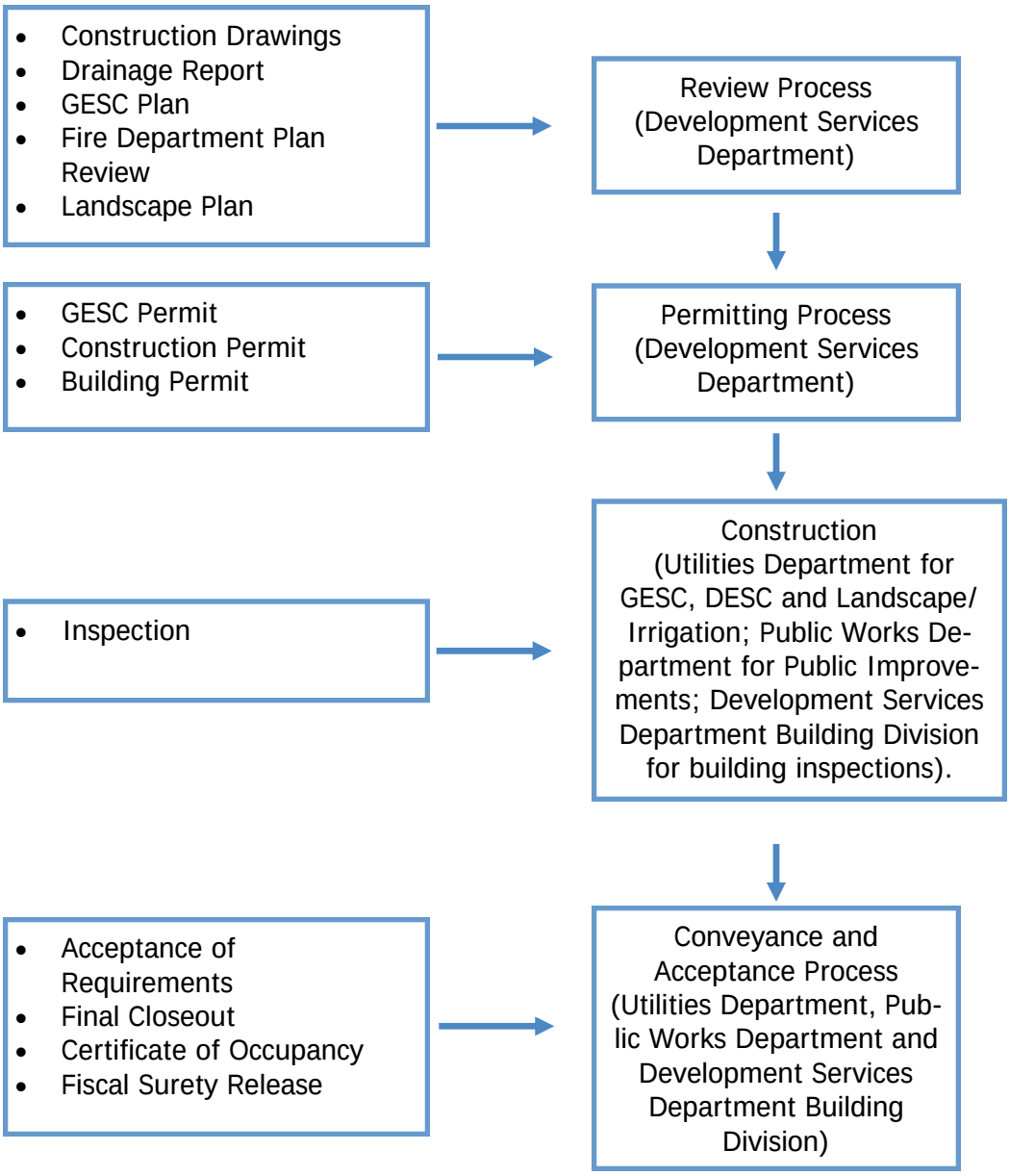
The Ten Steps involved in the Low Impact GESC Permit are outlined in Section 7.

Although the GESC Permit Process is organized into the distinct steps shown in the flowcharts, the process as a whole is intended to be dynamic, responding to individual site conditions to provide effective erosion and sediment control during construction.

Information ***The GESC Permit Process is a dynamic, not static, process. The Permittee(s) are responsible to adapt the original GESC Plan so as to effectively reduce erosion and sediment and comply with any modifications to the GESC Plan required by the Town of Castle Rock.***

Stages of Development Process

Town of Castle Rock
Stages of Development Process
Figure 1-1



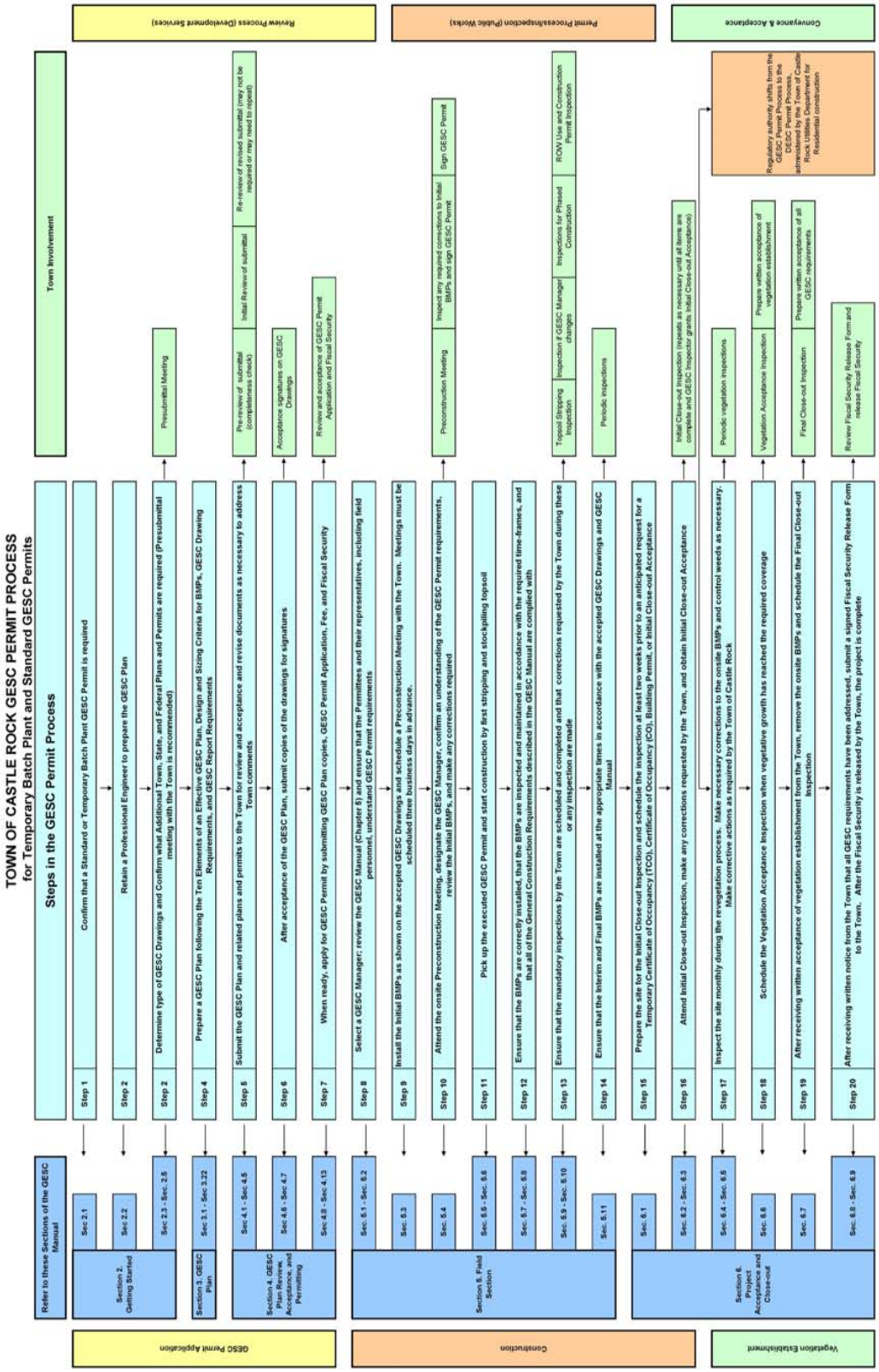


Figure 1.2
TOWN OF CASTLE ROCK GESC PERMIT PROCESS
for Temporary Batch Plant and Standard GESC Permits
Steps in the GESC Permit Process
Town Involvement
Refer to these Sections of the GESC Manual
Step 1
Confirm that a Standard or Temporary Batch Plant GESC Permit is required
Sec 2.1
Step 2
Retain a Professional Engineer to prepare the GESC Plan
Sec 2.2
Section 2. Getting Started
Step 2
Determine type of GESC Drawings and Confirm what Additional Town, State, and Federal Plans and Permits are required (Presubmittal meeting with the Town is recommended)
Presubmittal Meeting
Sec 2.3 - Sec. 2.5
Step 4
Prepare a GESC Plan following the Ten Elements of an Effective GESC Plan, Design and Sizing Criteria for BMPs, GESC Drawing Requirements, and GESC Report Requirements
Sec 3.1 - Sec 3.22
Section 3. GESC Plan
Step 5
Submit the GESC Plan and related plans and permits to the Town for review and acceptance and revise documents as necessary to address Town comments
Pre-review of submittal (completeness check)
Initial Review of submittal
Re-review of revised submittal (may not be required or may need to repeat)
Sec 4.1 - Sec 4.5
Step 6
After acceptance of the GESC Plan, submit copies of the drawings for signatures
Acceptance signatures on GESC Drawings
Sec 4.6 - Sec 4.7
Step 7
When ready, apply for GESC Permit by submitting GESC Plan copies, GESC Permit Application, Fee, and Fiscal Security
Review and acceptance of GESC Permit Application and Fiscal Security
Sec 4.8 - Sec 4.13
Section 4. GESC Plan Review, Acceptance, and Permitting
GESC Permit Application
Review Process (Development Services)
Step 8
Select a GESC Manager; review the GESC Manual (Chapter 5) and ensure that the Permittees and their representatives, including field personnel, understand GESC Permit requirements
Sec 5.1 - Sec. 5.2
Step 9
Install the Initial BMPs as shown on the accepted GESC Drawings and schedule a Preconstruction Meeting with the Town. Meetings must be scheduled three business days in advance.
Sec. 5.3
Step 10
Attend the onsite Preconstruction Meeting, designate the GESC Manager, confirm an understanding of the GESC Permit requirements, review the Initial BMPs, and make any corrections required
Preconstruction Meeting
Inspect any required corrections to Initial BMPs and sign GESC Permit
Sign GESC Permit
Sec. 5.4
Step 11
Pick up the executed GESC Permit and start construction by first stripping and stockpiling topsoil
Sec. 5.5 - Sec. 5.6
Step 12
Ensure that the BMPs are correctly installed, that the BMPs are inspected and maintained in accordance with the required time-frames, and that all of the General Construction Requirements described in the GESC Manual are complied with
Sec. 5.7 - Sec. 5.8
Step 13
Ensure that the mandatory inspections by the Town are scheduled and completed and that corrections requested by the Town during these or any inspection are made
Topsoil Stripping Inspection
Inspection if GESC Manager changes
Inspections for Phased Construction
ROW Use and Construction Permit Inspection
Sec. 5.9 - Sec. 5.10
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
Periodic inspections
Sec. 5.11
Section 5. Field Section
Construction
Permit Process/Inspection (Public Works)
Step 15
Prepare the site for the Initial Close-out Inspection and schedule the inspection at least two weeks prior to an anticipated request for a Temporary Certificate of Occupancy (TCO), Certificate of Occupancy (CO), Building Permit, or Initial Close-out Acceptance
Sec. 6.1
Step 16
Attend Initial Close-out Inspection, make any corrections requested by the Town, and obtain Initial Close-out Acceptance
Initial Close-out Inspection (repeats as necessary until all items are complete and GESC Inspector grants Initial Close-out Acceptance)
Sec. 6.2 - Sec. 6.3
Step 17
Inspect the site monthly during the revegetation process. Make necessary corrections to the onsite BMPs and control weeds as necessary. Make corrective actions as required by the Town of Castle Rock
Periodic vegetation inspections
Sec. 6.4 - Sec. 6.5
Step 18
Schedule the Vegetation Acceptance Inspection when vegetative growth has reached the required coverage
Vegetation Acceptance Inspection
Prepare written acceptance of vegetation establishment
Sec. 6.6
Step 19
After receiving written acceptance of vegetation establishment from the Town, remove the onsite BMPs and schedule the Final Close-out Inspection
Final Close-out Inspection
Prepare written acceptance of all GESC requirements
Sec. 6.7
Section 6. Project Acceptance and Close-out
Vegetation Establishment
Conveyance & Acceptance
Regulatory authority shifts from the GESC Permit Process to the DESC Permit Process. Administration by the Town of Castle Rock Utility Department for Residential construction
Step 20
After receiving written notice from the Town that all GESC requirements have been addressed, submit a signed Fiscal Security Release Form to the Town. After the Fiscal Security is released by the Town, the project is complete
Review Fiscal Security Release Form and release Fiscal Security
Sec. 6.8 - Sec. 6.9
Section 1. Introduction
Town of Castle Rock Grading, Erosion, and Sediment Control Manual
Page 1-10

Authorization of the GESC Manual

1.8

The *GESC* and DESC *Manual* is authorized by the Town of Castle Rock Town Council through **Ordinance #2015– 23** adopting the Town of Castle Rock Grading, Erosion and Sediment Control (GESC) Manual as a primary code and repealing certain provisions of the Town's *Public Works Regulations*.

1.8.1 Jurisdiction. The GESC Permit Program shall apply to all land within the limits of the Town of Castle Rock.

1.8.2 Amendments and Revisions. These policies and criteria may be amended and revised as new technology is developed and experience is gained. The Town Council, following the recommendations of the Town Utilities Director, may consider such amendments and revisions. Minor revisions that do not affect policy may be made without the action of the Town Council.

1.8.3 Enforcement Responsibility. The Town Council, acting through the Development Services, Utilities and Public Works Departments, shall enforce the provisions of the *GESC Manual*.

1.8.4 Review and Acceptance. The Town Development Services Department will manage the review of all GESC Plan submittals for general compliance with these criteria contained herein. An acceptance by the Town does not relieve the Permittee(s) or Design Engineer from responsibility of ensuring that calculations, plans, specifications, construction and as-built drawings are in compliance with the criteria contained herein. Additionally, acceptance by the Town of Castle Rock does not alleviate the Permittee(s) or Design Engineer from complying with all other applicable Federal, State, or Local laws and regulations.

1.8.5 Interpretation. In the interpretation and application of the provisions of this *GESC Manual*, the following shall govern: These provisions shall be regarded as the minimum requirements for the protection of the public health, safety, comfort, convenience, prosperity, and welfare of the residents of the Town. The *GESC Manual* shall therefore, be regarded as remedial and shall be liberally construed to further its underlying purposes.

Whenever a provision in these criteria and any other provision of the Town of Castle Rock Municipal Code or any provision in any law,

The GESC Permit Program is designed to fulfill a legislative mandate and significantly reduce construction erosion.

Authorization of the GESC Manual, continued

ordinance, resolution, rule or regulation of any kind, contain any restrictions covering any of the same subject matter, **whichever are more restrictive or impose higher standards shall govern.** In the event that there is a discrepancy in the interpretation of the *GESC Manual*, the Town Utilities Director shall have the final determination of the intent of the *GESC Manual.* Should a person disagree with a final determination by the Director, a written appeal may be submitted to the Town. If the Utilities Commission denies the appeal, the applicant can appeal to Town Council for a final ruling.

The GESC Manual shall be considered minimum requirements and the Town of Castle Rock reserves the right to apply more stringent criteria. Additionally, the Town reserves the right to change, modify, or alter these requirements at any time.

The *GESC Manual* shall not abrogate or annul any permits or accepted drainage reports and construction plans issued before the effective date of the *GESC Manual* or any easement or covenant.

1.8.6 Relationship to Other Standards. If special districts impose more stringent criteria, differences are not considered conflicts. When differences arise, the more stringent requirements shall apply. If the Federal or State government imposes stricter criteria, standards or requirements, these shall be incorporated into the Town's requirements after due process and public hearing(s) needed to modify Town regulations, standards, and ordinances.

Overview of Section 2

2.0

Section 2 addresses Steps 1 through 3 in the GESC Permit Process:

Step 1. Confirm that a Temporary Batch Plant or Standard GESC Permit is required.

Section 2.1, ***Projects that Require a Temporary Batch Plant or Standard GESC Permit****, identifies the kinds of projects that require either a Temporary Batch Plant/GESC Permit or Standard GESC Permit.*

Step 2. Retain a Professional Engineer to prepare a GESC Plan.

Section 2.2, ***Who Prepares GESC Plans?*** *confirms that the State Board of Registration has stipulated that a GESC Plan must be prepared under the responsible charge of a licensed Professional Engineer. This section emphasizes the value of continued training in the field of construction site erosion and sediment control.*

Step 3. Determine type of GESC Drawings and identify what additional Town, State, and Federal plans and permits are required for the project (Pre-submittal Meeting with the Town is recommended).

Section 2.3, ***Pre-submittal Meeting****, points out that an efficient way to clarify GESC Permit requirements is to schedule a Pre-submittal Meeting with Town staff at the outset of the process. A Pre-submittal Meeting, although optional, gives Town staff an opportunity to understand the Applicant's plans for the site and to offer guidance in developing a GESC Plan.*

Section 2.4, ***Types of GESC Drawings****, discusses four types of GESC Drawings and their submittal formats. Depending on the size and nature of a construction project, either a Temporary Batch Plant, Small Site and Utility, Staged, or Staged and Phased is required.*

Section 2.5, ***Other Town Plans and Permits****, describes the related plans and permits that may need to be submitted along with the development of a GESC Plan, including the following:*

- *Construction plans for the project.*
- *Drainage Plans.*
- *Drainage, Erosion and Sediment Control (DESC) Plan (for residential construction projects). (Refer to Section 8 for Residential DESC Permitting)*
- *Landscape/Irrigation Plans.*
- *Construction Permit.*
- *Floodplain Development Permit.*

Section 2.6 discusses ***State Permitting****, such as the following:*

- *Stormwater Management Plan.*
- *Dewatering Permit.*
- *Air Quality Permitting.*

Section 2.7 discusses ***Federal Permitting****, including:*

- *Federal Emergency Management Agency map revisions.*
- *Department of Army Corps of Engineers Section 404 Permit.*
- *Threatened and Endangered Species approvals.*
- *NEPA*

Permit Step 1: Confirm that a Temporary Batch Plant or Standard GESC Permit is Required.
Section 2.1 provides background information related to Step 1.

Projects that Require a Temporary Batch Plant or Standard GESC Permit

Information

If a Low Impact GESC Permit is required, see Section 7 for applicable Permit Steps and information.

2.1

The first step in the process is to examine the information in Section 1.4 and 1.5 to confirm that a Temporary Batch Plant or Standard GESC Permit is required for the project. These GESC Permits apply to most land disturbing activities in the Town other than small (less than 1 acre) projects with negligible negative impact (requiring a Low Impact GESC Permit) and most agricultural or emergency activities (exempt activities).

The Town of Castle Rock can be contacted to clarify GESC Permit requirements and to help interpret which GESC Permit, if any, applies to a particular project. Contact information is provided in Appendix A.

Important!

If a GESC Permit is not required, the process described herein is not applicable; however, BMPs shall still be required in accordance with the information shown in Sections 3 and 5.

Permit Step 2: Retain a Professional Engineer to Prepare a GESC Plan.
Section 2.2 discusses Step 2.

Who Prepares GESC Plans?

2.2

Laying out erosion and sediment controls on a site may involve engineering design issues such as embankment stability and spillway sizing (for sediment basins), pipe strength calculations (for temporary stream crossings), and peak discharge estimates and hydraulic computations (for determination of flood elevations and velocities and for sizing conveyance facilities).

Because of these issues, Colorado State Statutes require that GESC Plans be prepared by or under the responsible charge of, and signed and stamped by, a Professional Engineer (PE) registered in the State of Colorado (see Colorado State Engineering Law 12-25-101, General Provisions). For the purpose of this manual the Professional Engineer is referred to as the Design Engineer. Non-PEs with experience in erosion and sediment control may assist in the development of a GESC Plan, but they must conduct their work under the supervision of the Design Engineer.

GESC Plans are to be prepared under the responsible charge of a Professional Engineer.

It is the responsibility of the Design Engineer to use professional judgment in the development of the GESC plans. If the Design Engineer determines that any GESC requirements, as applied to their specific project, pose a safety hazard, it is the Design

Who Prepares GESC Plans? continued

Engineer's responsibility to notify the Town of Castle Rock of these issues, as well as to recommend an approach to alleviate the concerns.

The Design Engineer is responsible for preparing the GESC Plan in accordance with the requirements of this *GESC Manual* and is one of the key personnel who should attend the on-site Preconstruction Meeting at the start of the construction phase.

Information

The Town of Castle Rock highly recommends that the Design Engineer attend the Presubmittal meeting to reduce delays in the start of construction.

Step 3. Determine type of GESC Plan and identify what additional Town, State, and Federal plans and permits are required for the project (Pre-Submittal Meeting with the Town is recommended).

Sections 2.3 through 2.5 address Step 3.

Presubmittal Meeting

2.3

Prior to preparing GESC Plans and other submittal documents for a proposed construction project, a Pre-Submittal Meeting with Town staff is recommended. The purpose of the meeting is to confirm the type of GESC Plan appropriate for a specific development site. The meeting will help to clarify the GESC Permit Program and confirm what related plans and permits may be required. Also, initial discussions can take place regarding the general configuration of controls that may be appropriate for the site.

A Pre-Submittal Meeting with Town staff is recommended to clarify GESC Permit requirements.

It is anticipated that the Owner and/or the Design Engineer of the GESC Plan would attend the Pre-Submittal Meeting. The Owner or Owner's representative shall bring the following information to the meeting:

Information Needed at Pre-Submittal Meeting

- *Name, type, and location of development.*
- *Brief description of site topography and drainage features.*
- *Size of development site and anticipated disturbed area, in acres.*
- *Anticipated type of GESC permit.*
- *Anticipated plans and permits to accompany GESC Plan.*

Types of GESC Drawings

2.4

Depending on the degree of disturbance and the amount of area to be disturbed, one of four types of GESC Drawing is applicable. Each type of GESC Drawing has unique formatting requirements, as described in detail in Section 3. Table 2-1 summarizes permit types, site areas, and GESC Drawing requirements.

Table 2-1. Types of GESC Plans

Type of GESC Permit	*Type of GESC Drawing*	*Site Size Criteria*	*Drawing Format*
Temporary Batch Plant/ GESC Permit	*Temporary Batch Plant*	*No size criteria*	*Projects shall be organized into an Initial (Site Plan) and Final (Reclamation) Plan.*
Standard GESC Permit	*Small Site/ Utility*	*Less than 1 acre*	*Initial, Interim, and Final Stage BMPs may be shown on a single sheet.*
	Staged	*1 acre to 40 acres*	*Projects shall be organized into an Initial, Interim, and Final Stage; Initial, Interim, and Final BMPs shall be shown on separate sheets.*
	Staged and Phased	*Greater than 40 acres*	*Projects shall be divided into separate construction phases each disturbing less than 40 acres (70 acres for soil mitigation operations), with each phase showing Initial, Interim, and Final BMPs on separate sheets.*

A brief description of each type of GESC Drawing follows.

2.4.1 Temporary Batch Plant/GESC Drawing. Temporary Batch Plant/ GESC Drawings shall be organized into two stages. Initial BMPs shall be shown on a Batch Plant Site Drawing and Final BMPs shall be shown on a Reclamation Plan. Additional detail on Drawing requirements is provided in Section 3.16.

2.4.2 Small Site and Utility GESC Drawing. For disturbed areas of new developments less than one acre and utility construction over 1000 linear feet, (outside of Town Right-of-Way) erosion and sediment controls for the Initial, Interim, and Final stages of construction may be shown on a single drawing (as opposed to three separate drawings).

2.4.3 Staged GESC Drawing. For disturbed areas greater than one acre, separate GESC Drawings are required for the Initial, Interim and Final stages of a project. This is to clarify, both to the Design Engineer and field personnel, what erosion and sediment controls are appropriate at the outset of construction, as well as maximum during construction drainage areas, during site development, and at the end of construction prior to final establishment of vegetation.

Types of GESC Drawings, continued

2.4.4 Staged and Phased GESC Drawing. For sites where the total disturbed area will exceed 40 acres, grading operations shall not take place all at one time. Instead, the site shall be divided into separate grading phases each disturbing 40 acres or less. If over-excavation, stockpiling, and replacement of soils is necessary for mitigating expansive soils or addressing similar issues, each phase may disturb up to a maximum of 70 acres. During construction, each grading phase shall be approved by the GESC Inspector and drill seeded and crimp mulched prior to starting the subsequent phase. Additional information on drawing requirements for these stages is provided in Section 3.

Large areas of disturbance create huge potential for erosion and sedimentation; limiting the area of disturbance substantially reduces the problem.

If a GESC Plan can not adequately be shown on one plan sheet (see scale requirements in Section 3), multiple sheets shall be used. However, at least one overall plan sheet shall be provided as an index to subsequent sheets.

Other Town Plans and Permits

2.5

GESC Plans shall be submitted along with the following related Town plans and permit applications. These related plans and permits do not reflect all requirements for development in the Town of Castle Rock, but rather describe plans and permits that shall be considered when proceeding through the GESC Permit Process.

2.5.1 Complete Submittal Package. The GESC Plan shall be submitted concurrently with or prior to, the construction plans for a proposed construction project, when applicable. The entire submittal package may include a Final Planned Development Site Plan (FPDSP); Site Plan; Utility Study; Final Plat, construction plans, drainage report, traffic study, pavement design report, geotechnical report, landscape/ irrigation plans, payment of applicable review and inspection fees, or other documents as determined by the Development Services Department.

2.5.2 Construction Permit. Projects that include use of or construction in the Town right-of-way must obtain a Construction Permit. All storm drainage improvements require a Construction Permit. Overexcavation due to soil mitigation for pavement design requires an active GESC Permit as well as a Construction Permit. Special requirements will be associated with work in the right-of-way to reduce impacts to vehicular traffic. Information on construction permitting is found in the Town of Castle Rock Development Procedures Manual, as amended.

2.5.3 Temporary Construction Access Permitting. All access points to or from a construction site require review and approval from the Town, and are permitted as part of the GESC Permit. No ramps of dirt, gravel, asphalt, wood, or other materials are allowed in the curb section.

2.5.4 Drainage Plans. The GESC Plan shall be consistent with the Phase III Drainage Plans for the development, prepared in accordance with the Town's Storm Drainage Design and Technical Criteria Manual, as amended. This requirement does not apply to Temporary Batch Plant GESC Plans, Low Impact GESC Plans or Temporary Stockpiles. At a minimum, the Phase II Drainage Plan shall be submitted, reviewed, and accepted by the Town before a GESC Permit is issued.

Information

At a minimum, the Phase II Drainage Plan shall be submitted, reviewed, and accepted by the Town before a GESC Permit is issued.

Permanent erosion control measures shall be addressed in the Drainage Plans per the requirements found in the *Drainage Regulations*. Permanent water quality or detention basins shall incorporate sediment basins during construction and shall be constructed and maintained as soon as possible once site disturbance occurs. GESC Plan BMPs shall be provided for permanent drainage features and shall be staged and removed at the appropriate time relative to drainage facility construction and final site stabilization.

Other Town Plans and Permits, continued

2.5.5 DESC Plan. A Drainage, Erosion and Sediment Control (DESC) Plan must be submitted to the Town of Castle Rock for all residential construction. (See Section 8).

2.5.6 Floodplain Development Permit. Projects that include work within designated 100-year floodplain limits of drainageways in the Town require a Floodplain Development Permit. This permit shall be obtained from the Town Floodplain Administrator prior to issuance of the GESC Permit. The objective of this permit is to ensure that the proposed project activities are in compliance with approved floodplain management standards. If the floodplain is altered as a result of the project, a flood insurance map change approval may be needed from the Federal Emergency Management Agency (FEMA), as discussed in Section 2.7.1.

Streams and drainage channels comprise valuable resources and are not to be disturbed unless accepted in advance by the Town of Castle Rock.

Drainageways comprise valuable resources and shall not be disturbed unless accepted in advance by the Town of Castle Rock. Erosion and sediment controls addressing work in and around drainageways are described in Section 3 along with illustrations in the example GESC Plans. Any acceptance obtained from the Town of Castle Rock does not release an Applicant from the need to comply with the requirements of Sections 7 and 9 of the Endangered Species Act of 1973, 16 U.S.C. 1531 *et seq.*, as amended, or with any other applicable Federal, State or Local laws or regulations.

State Permitting

2.6

The State of Colorado requires permits for construction-related activities, which are in addition to permitting requirements of the Town of Castle Rock. The Applicants or the Design Engineer shall contact the State of Colorado, Water Quality Control Division (WQCD) for specific State permitting information for their specific projects. Contact information for the WQCD is provided in Appendix A.

State Permitting, continued

Information on some of the State permits that may be applicable include the following (this is not to be considered an exhaustive list; therefore, applicants are advised to contact the State).

2.6.1 Stormwater Management Plan. In compliance with the NPDES Stormwater Permit Program, the State requires that Stormwater Management Plans (SWMPs) be prepared for construction projects exceeding one (1) acre of disturbance.

2.6.2 Construction Dewatering Permits. The State issues a permit for Discharges Associated with Construction Activities to manage dewatering discharges from construction projects. The permit establishes water quality standards and BMPs for dewatering discharges.

2.6.3 Air Quality Plans. As described in the Urban Drainage and Flood Control District's *Urban Storm Drainage Criteria Manual -Volume 3*, (*Volume 3*), as amended, the surface stabilization measures identified for control of precipitation-induced erosion generally inhibit soils from becoming windborne. However, measures and requirements to control airborne emissions shall be addressed in the GESC Plan. In addition, applicable State regulations pertaining to air quality shall be addressed.

Control of airborne emissions is to be addressed in the GESC Plan and may be subject to additional State regulations.

The Air Pollution Control Division of the Colorado Department of Public Health and Environment (CDPHE) has passed air quality regulations consistent with Federal legislation. Regulation No. 3 requires submittal of an Air Pollutant Emission Notice (APEN) for sources of fugitive dust from construction sites, as well as other sources. Regulation No. 1 defines particulate emission control regulations for haul roads and roadways. Additional controls, such as road watering, may be necessary to fully comply with these regulations at a construction site. The CDPHE should be contacted about APENs and other air quality requirements.

Federal Permitting

2.7

Applicants are also responsible for complying with all applicable Federal permitting. This may include, but is not limited to the FEMA map revision process, the Department of the Army Corps of Engineers Section 404 Permit and US Fish and Wildlife Service, Endangered Species Action Section 10 and/or Section 7 Permits.

Information on some of the Federal programs and permits that may be applicable include the following (this is not to be considered an exhaustive list; therefore, applicants are advised to confirm the Federal requirements that may apply).

Federal Permitting, continued

2.7.1 FEMA Map Revisions. As mentioned in Section 2.5.6, projects that impact the regulatory floodplain may need to obtain a Conditional Letter of Map Revision (CLOMR) and/or Letter of Map Revision (LOMR) from FEMA. In this case, proper documentation needs to be submitted to FEMA through the Town's Floodplain Administrator for review and approval.

Contact Information for FEMA is provided in Appendix A.

2.7.2 Section 404 Permitting. Excavation activity associated with a dredge and fill project in "Waters of the United States" (including streams, open water lakes, ponds, wetlands, etc.) may require a Section 404 Permit. The level of permitting is dependent on the extent of disturbance along the water body of interest. It should be reviewed with the U.S. Army Corps of Engineers as to whether a Nationwide Permit or an Individual Permit is required. Individual Permits will require more detailed information about the project and preparation of exhibits specific to the project site.

Contact Information for the U.S. Army Corps of Engineers is provided in Appendix A.

2.7.3 U.S. Fish and Wildlife Service Threatened and Endangered Species Clearance. The U.S. Fish and Wildlife Service has established guidelines for surveys to determine the presence or absence of threatened and endangered species within a project's limits. The most prominent of these species in this area are the Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*). Clearance of this species from a project site is dependant on spatial, regional requirements determined by the U.S. Fish and Wildlife Service.

Contact Information for the U.S. Fish and Wildlife Service is provided in Appendix A.

A Preble's Meadow Jumping Mouse.

Overview of Section 3

3.0

Section 3 is oriented toward the Design Engineer of the GESC Plan and addresses Step 4 in the GESC Permit Process:

Step 4. Prepare a GESC Plan following the Ten Elements of an Effective GESC Plan, Design and Sizing Criteria for BMPs, GESC Drawing Requirements, and GESC Report Requirements.

*Section 3.1, **Principles of Erosion and Sedimentation**, recommends addressing erosion near its start and employing sediment control BMPs to reduce downstream damages.*

*Section 3.2, **BMPs to Address Erosion and Sediment**, identifies a number of standard BMPs accepted for use in the Town of Castle Rock to control erosion and sediment on construction sites.*

> ***Section Highlight – Standard BMP Drawings***
> *A set of GESC Plan Standard Notes and Details, included in Appendix B, has been prepared to establish a consistent approach to BMP implementation in the Town. These shall be attached to each GESC Drawing set.*

*Section 3.3, **Ten Elements of an Effective GESC Plan**, presents a systematic approach to select BMPs for a GESC Plan. The Ten Elements are described in Sections 3.4 through 3.13.*

> ***Section Highlight – Ten Elements of an Effective GESC Plan***
> *These ten elements provide Design Engineers with a step-by-step approach for selecting BMPs to include on a GESC Plan.*

Section 3.14, Intentionally left blank

*Section 3.15, **Special Requirements for Utility Construction**, describes erosion and sediment control requirements for utility construction.*

*Section 3.16, **Special Requirements for Temporary Batch Plants**, describes erosion and sediment control BMPs to use for Temporary Batch Plants.*

*Section 3.17, **Design and Sizing Criteria for BMPs**, identifies the design parameters to be specified for each BMP on the GESC Plan and provides criteria for sizing BMPs.*

*Sections 3.18, 3.19, and 3.20, **Standard GESC Drawing Requirements**, **Report Requirements**, **and Submittal Requirements for Related Plans**, list detailed information to include on the various GESC documents. A checklist of requirements is included in Appendix G.*

> ***Section Highlight – Example GESC Drawings***
> *Several example sets of GESC Drawings have been prepared to illustrate the selection and depiction of erosion and sediment control BMPs.*

*Section 3.21, **BMP Cost Issues**, Cost issues associated with the installation and maintenance of BMPs are discussed.*

*Section 3.22, **Variances**, provides guidance for requesting variances to the criteria presented in the GESC Manual.*

Permit Step 4: Prepare a GESC Plan following the Ten Elements of an Effective GESC Plan, Design and Sizing Criteria for BMPs, GESC Drawing Requirements, and GESC Report Requirements.
Sections 3.1 through 3.21 discuss Step 4.

Principles of Erosion and Sedimentation

3.1

The reduction of erosion and the capture of sediment are necessary to reduce the loss of soil on a construction site and minimize off-site impacts. In order to understand how BMPs can be used to control construction site erosion, it is helpful to gain an understanding of erosion and sedimentation processes. The following information was based on principles discussed in *Urban Drainage and Flood Control Distrct Volume 3.*

Once vegetation is removed, erosion proceeds unchecked.

3.1.1 Erosion. Soil erosion is the process by which the land surface is worn away by the action of wind, water, ice and gravity. Erosion is a natural process and has occurred since the earth was formed. The shape of the land was created, in large part, by erosional processes. The problem comes when the natural rate of erosion is greatly increased by construction activities that disturb the land. Construction disturbs the natural soil and vegetation and increases erosion because bare, loose soil is easily moved by wind and water.

Water-caused erosion starts small, when rain hits the ground, and grows progressively greater as the runoff moves downhill. Erosion follows a definite progression, as follows:

1. ***Raindrop*** *erosion leads to* ***sheet*** *erosion.*
2. ***Sheet*** *erosion leads to* ***rill*** *erosion.*
3. ***Rill*** *erosion leads to* ***gully*** *erosion.*
4. ***Gully*** *erosion leads to* ***channel*** *erosion.*

Raindrop Erosion. Raindrops detach soil particles and splash them into the air. These detached particles are then vulnerable to stormwater runoff or snowmelt.

Raindrop erosion.

Sheet erosion.

Sheet Erosion. Shallow surface flows move as a uniform sheet for a short distance, transporting soil dislodged from raindrop erosion, exposing weaknesses in the soil structure, and starting to concentrate in tiny surface irregularities, forming rivulets.

Principles of Erosion and Sedimentation, continued

Rill erosion.

Rill Erosion. As the flow changes from a shallow sheet to a concentrated flow, the velocity and turbulence of the flow increases. The energy of the concentrated flow is able to detach and transport soil particles. This action begins to cut into the soil mantle and form tiny channels. Rills are small, but well-defined channels that are only a few inches deep.

Gully erosion.

Gully Erosion. Gullies occur as the flows in rills come together into larger and larger channels. Whereas rill erosion can be eliminated or repaired fairly easily, gully erosion requires major work to regrade and stabilize.

Channel erosion.

Channel Erosion. As runoff in rills and gullies continues to move downstream, it enters channels that are also susceptible to erosion through bank cutting and degradation. Channels continually adjust and change, degrading and widening, in response to increased runoff from urbanization.

Controlling erosion at its early stages is the most effective way to manage construction site erosion and sedimentation. Therefore, an effective GESC Plan will focus on the following:

- Controlling erosion potential by limiting the area and duration of disturbance.
- Requiring timely restabilization of disturbed areas.
- Providing an adequate drainage network throughout the site in all stages of construction to ensure that stormwater runoff has a defined place to go.
- Designing all drainage conveyances, from small swales to larger drainage channels, to be noneroding and stable.

Vegetation plays an extremely important role in controlling erosion. Roots bind particles together and the leaves or blades of grass reduce raindrop impact forces on the soil. Grass, leaves, plant litter and other ground cover trap rain, which allows infiltration and reduces runoff velocity. Vegetation reduces wind velocity at the ground surface, and provides a rougher surface, which will trap particles moving along the ground. Once vegetation is removed, erosion proceeds unchecked.

Sheet, rill, and gully erosion develop quickly in the absence of vegetation.

Principles of Erosion and Sedimentation, continued

3.1.2 Sedimentation. Once soil particles are picked up and moved by wind or water, they eventually come to rest, often in undesirable locations. This is the process of *sedimentation*. During a rainstorm, runoff normally builds up rapidly to a peak and then diminishes. Because the amount of sediment a watercourse can carry is dependent upon the velocity and volume of runoff, sediment is deposited as runoff decreases. The deposited sediments may be resuspended when future runoff events occur. In this way, sediments are moved progressively downstream in the waterway system.

The burden of cleaning up deposited sediments can be substantial.

Sediment that accumulates in water quality ponds needs to be cleaned-out periodically, requiring significant effort and cost.

Sedimentation can cause property damage and increase drainage maintenance costs, impair habitat and water quality in downstream receiving waters, and accelerate eutrophication and loss of storage in lakes and reservoirs.

Even with a focus on reducing erosion at its start, no plan will be 100-percent effective; therefore, GESC Plans must also identify a number of measures designed to capture eroded sediments prior to their conveyance off site.

Sedimentation can impair aquatic habitat in downstream receiving waters.

BMPs to Address Erosion and Sediment

3.2

The *GESC Manual* describes a number of Standard BMPs acceptable to the Town of Castle Rock for use in reducing erosion and sediment from construction activities. These BMPs are shown in Table 3-1.

Table 3-1. Erosion and Sediment Control BMPs

No.	BMP	ID	Type of Control	Initial Stage	Interim Stage	Final Stage
1	Check Dam	CD	Sediment			
2	Compost Blanket	CB	Erosion			
3	Compost Filter Berm	CF	Erosion			
4	Concrete Washout Area	CWA	Construction			
5	Construction Fence	CF	Construction			
6	Construction Markers	CM	Construction			
7	Dewatering	DW	Sediment			
8	Diversion Ditch/Berm	DD	Erosion			
9	Erosion Control Blanket	ECB	Erosion			
10	Inlet Protection	IP	Sediment			
11	Reinforced Check Dam	RCD	Sediment			
12	Reinforced Rock Berm	RRB	Sediment			
13	RRB for Culvert Protection	RRC	Sediment			
14	Sediment Basin	SB	Sediment			
15	Sediment Control Log	SCL	Sediment			
16	Sediment Trap	ST	Sediment			
17	Seeding and Mulching	SM	Erosion			
18	Silt Fence	SF	Sediment			
19	Stabilized Staging Area	SSA	Erosion			
20	Surface Roughening	SR	Erosion			
21	Temporary Slope Drain	TSD	Erosion			
22	Temporary Stream Cross-ing	TSC	Erosion			
23	Terracing	TER	Erosion			
24	Vehicle Tracking Control	VTC	Sediment			
25	VTC with Wheel Wash	WW	Sediment			

BMPs to Address Erosion and Sediment, continued

Seeding and mulching (SM) *reduces erosion and is considered an erosion control.*

A ***sediment control log (SCL)*** *captures eroded sediments and is considered a sediment control BMP.*

All BMPs shall be indicated in the GESC Plans as being part of the Initial Stage, Interim Stage or Final Stage of construction.

3.2.1 Standard Detail Number and Identifier. The number indicated in the first column of Table 3-1 corresponds to the number of the standard construction detail shown in the Town of Castle Rock's standard drawings, entitled GESC Plan Standard Notes and Details, included in Appendix B. To take less space on the drawing, BMPs are called out on a GESC Drawing using the two or three letter identifier and symbol shown in the BMP Legend.

3.2.2 Type of Control. Three general types of BMPs are shown:

- Construction control. These BMPs are related to construction access and staging.
- Erosion control. These BMPs are used to limit the amount and extent of erosion.
- Sediment control. Sediment control BMPs are designed to capture eroded sediments prior to their conveyance off site.

3.2.3 Phase of Construction. The BMPs listed apply to one or more of the following construction phases. All BMPs shall be indicated in the GESC Drawings as being part of the Initial Stage, Interim Stage or Final Stage of construction. This is to help clarify when each BMP is to be installed.

- Initial Stage. These BMPs shall be installed at the outset of construction, prior to the initial Preconstruction Meeting and any other land-disturbing activities. Initial controls are to be placed on existing grades, but shall be based in part on proposed grading operations.
- Interim Stage. These BMPs shall be based on proposed grades and drainage features and are installed after initial site grading. For some BMPs such as Inlet Protection, interim controls are installed after the construction of site infrastructure.
- Final Stage. BMPs shown in the Final Stage GESC Drawing shall be installed as one of the last steps in the construction process, such as final seeding and mulching.

3.2.4 GESC Drawings are to Use the Standard BMPs. When preparing GESC Drawings, the Design Engineer shall use the standard BMPs shown in Table 3-1. These BMPs have shown to be effective under actual construction site conditions within the Town of Castle Rock and therefore are accepted for use by the Town. A complete set of details for these accepted BMPs (the Town of Castle Rock GESC Plan Standard Notes and Details - see Appendix B), has been prepared to illustrate the BMPs shown in Table 3-1. All GESC Plans shall also include a scale and north arrow.

The Town of Castle Rock GESC Plan Standard Notes and Details provide Permittee(s) with comprehensive installation and maintenance information for all of the BMPs accepted for use in the Town.

BMPs to Address Erosion and Sediment, continued

The GESC Drawings submitted to the Town for final signatures and subsequently provided to the Contractor as construction drawings shall include a set of the GESC Plan Standard Notes and Details. **Other details shall not be used.** The complete set of BMP details is discussed further in Section 3.2.6.

If the Town approves additional BMPs in the future (see Section 3.2.5), documentation of the additional BMPs will be made available on the Town's website (www.*CRgov.com*) or at the Development Services Department for inclusion in Section 11. Section 11 is intended to contain all of the revisions and additions to the *GESC Manual* that may be prepared prior to a complete updating and reprinting of the *GESC Manual*.

3.2.5 Use of Alternative or Innovative BMPs. The Town recognizes that there will be new advances in the development of erosion and sediment control BMPs that may prove effective, or even out-perform controls currently accepted. The Town of Castle Rock may allow, under strictly-controlled circumstances, the installation of erosion and sediment control BMPs other than the standard BMPs shown in Table 3-1. These shall be considered pilot programs.

A pilot program will be considered upon demonstration by the Design Engineer of adequate evidence that shows the proposed control measure will effectively control erosion and sediment. Complete plans and details for the proper installation and maintenance of the proposed BMP shall also be submitted. The pilot program, if allowed, shall be undertaken for no more than 12 months. If the Town finds the BMP to be effective at the end of the testing period, a revision to the *GESC Manual* may be considered (revisions will be made available on the Town's website (www.*CRgov.com*) or at the Development Services Department to all holders of the *GESC Manual* for inclusion in Section 11).

The use of alternative or innovative erosion or sediment control BMPs other than those already accepted for use by the Town of Castle Rock (shown in Table 3-1) may be allowed under the terms of the Pilot Program described in this section.

The Town reserves the right to reject any BMP proposed for the pilot program, either during the review period or during the field trial, if the pilot BMP does not perform with sufficient effectiveness. In the case of an unsuccessful field trial, one or more of the Town of Castle Rock standard BMPs listed in Table 3-1 shall replace the failed pilot BMP at the Owner's expense.

3.2.6 GESC Plan Standard Notes and Details. As discussed in Section 3.2.4, the Town of Castle Rock GESC Plan Standard Notes and Details, has been prepared to depict the BMPs shown in Table 3-1. Construction details and notes provide direction to the Permittee(s) regarding installation and maintenance requirements for each BMP. The Town of Castle Rock Standard Notes and Details shall be submitted with **all** GESC Drawings. A reduced copy of these standard drawings is included in Appendix B.

BMPs to Address Erosion and Sediment, continued

The GESC Plan Standard Notes and Details comprise minimum measures to be adhered to on a construction site. The Permittee(s) and Design Engineer may select more conservative approaches than indicated herein and exceed minimum criteria.

The Town of Castle Rock GESC Plan Standard Notes and Details serve several purposes:

- ***Increased consistency****. Consistent details and notes for a standard set of BMPs will increase the likelihood that BMPs will function effectively and will be installed and maintained correctly.*
- ***Time savings****. The set of standard drawings will save Design Engineers the effort associated with developing and drawing their own notes and details. Less time will be needed to review plans and inspect the BMPs, and as field personnel gain experience constructing the standard BMPs, it is anticipated that installation and maintenance will become more efficient.*
- ***Definition of sizing variables****. The standard details identify the critical variables that the Design Engineer must specify on the GESC Plan to locate and size the BMPs. This will reduce the likelihood that information needed on the plans will be missing or unclear, or that BMPs are improperly sized.*

3.2.7 Selecting BMPs for the GESC Drawings. Section 3.3 introduces a ten-step approach for developing a GESC Plan. Guidance is provided for selecting standard BMPs for specific portions of a construction site. It is important to consider effectiveness and maintenance requirements when selecting BMPs. Some BMPs, such as silt fence, are relatively inexpensive to install the first time, but may be tougher to maintain or not as effective as other BMPs. It is also important to follow the manufacturers specifications for a specific BMP.

The goal of GESC Plan Standard Notes and Details is to avoid the prevalence of improper BMP installations and insufficient maintenance.

Ten Elements of an Effective GESC Plan

3.3

This section describes a systematic approach to control erosion and sediment on a construction site. Ten Elements of an effective GESC Plan are summarized; the Town of Castle Rock requires that each of these elements be addressed in a GESC Plan.

Ten Elements of an Effective GESC Plan:

1. *Preserve and Stabilize Drainageways.*
2. *Avoid the Clearing and Grading of Sensitive Areas.*
3. *Balance Earthwork On Site.*
4. *Limit the Size of Grading Phases to Reduce Soil Exposure.*
5. *Stabilize Exposed Soils in a Timely Manner.*
6. *Implement Effective Perimeter Controls.*
7. *Use Sediment Basins for Areas Exceeding 1.0 Acre.*
8. *Protect Steep Slopes.*
9. *Protect Inlets, Storm Sewers, and Culverts.*
10. *Provide Access and General Construction Controls.*

These Ten Elements are based in part on work published by the Center for Watershed Protection, a nonprofit group specializing in stormwater quality research and education. The Ten Elements are designed to reduce the amount and duration of erosion and trap most sediments that do erode prior to leaving the site.

A set of example GESC Drawings (shown in Appendix C) have been prepared in accordance with the Ten Elements to illustrate the concepts discussed herein and depict the information that shall be shown on GESC Drawings. Figure 3-1 relates the Ten Elements to the example GESC Drawings.

Information

The example GESC Drawings shown in Appendix C are provided as a guide but, since each site is different, are not to be considered all -inclusive.

The following information has been included in the GESC Manual to assist the Design Engineer in developing an effective GESC Plan:

- *Sections 3.4 through 3.13 describe the Ten Elements of an Effective GESC Plan that shall be addressed when preparing a GESC Plan.*
- *Section 3.17 addresses design and sizing information for each of the Town's Standard BMPs and describes the dimensions and parameters that shall be specified on the GESC Drawings.*
- *Sections 3.18 and 3.19 describe information that shall be provided in the GESC Drawings and Report.*
- *Appendix B contains a copy of the Town of Castle Rock GESC Plan Standard Notes and Details that shall be attached to all construction drawings.*
- *Appendix C provides example GESC Drawings for each type of GESC Plan.*
- *Appendix D provides a detailed checklist that shall be followed when developing a GESC Plan.*

Figure 3-1. Ten Elements of an Effective GESC Plan

Element 1. Preserve and Stabilize Drainageways

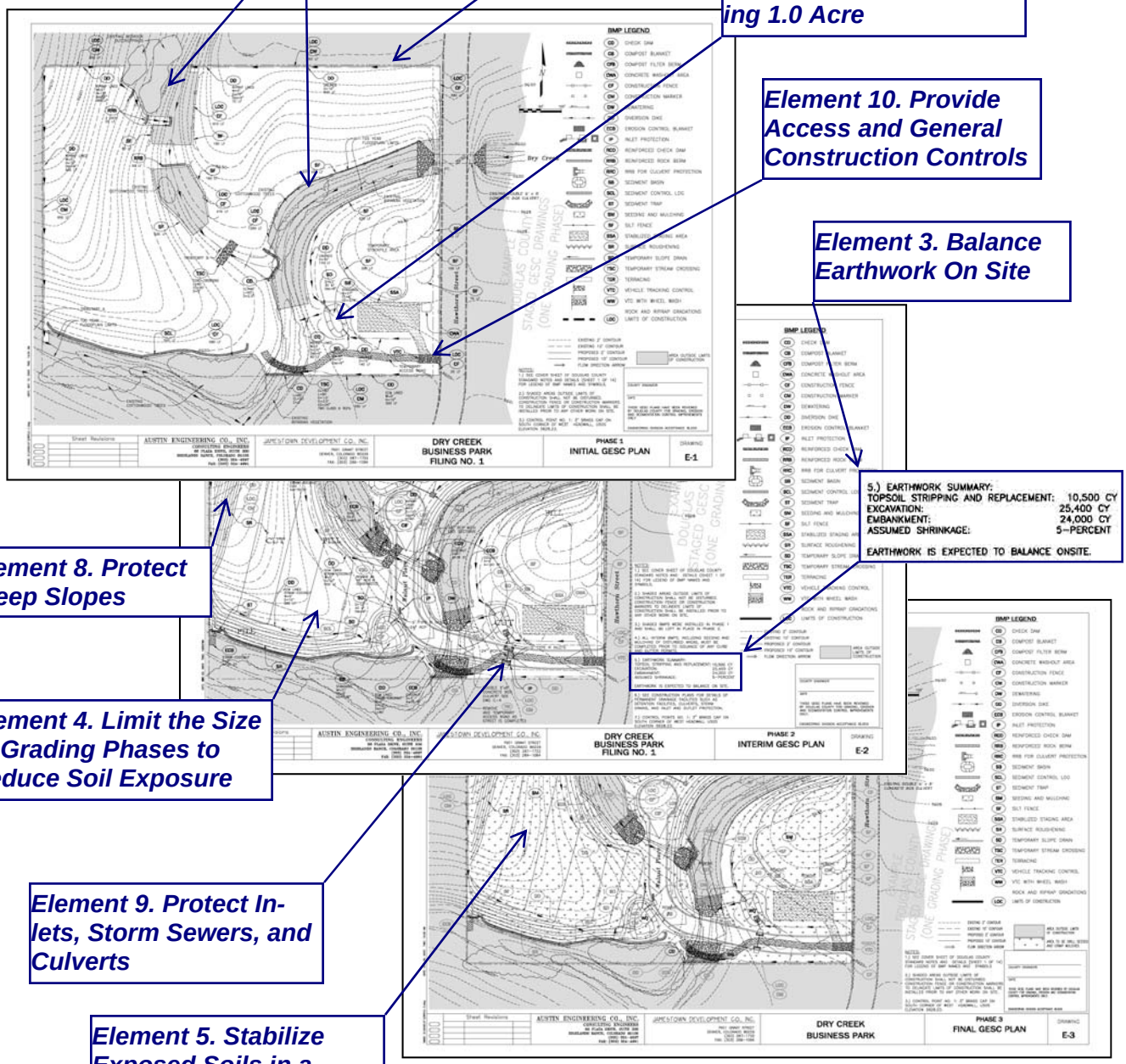
Element 6. Implement Effective Perimeter Controls

Element 2. Avoid the Clearing and Grading of Sensitive Areas

Element 7. Use Sediment Basins for Areas Exceeding 1.0 Acre

Element 10. Provide Access and General Construction Controls

Element 3. Balance Earthwork On Site



Element 8. Protect Steep Slopes

Element 4. Limit the Size of Grading Phases to Reduce Soil Exposure

Element 9. Protect Inlets, Storm Sewers, and Culverts

Element 5. Stabilize Exposed Soils in a Timely Manner

See Appendix C for 11" by 17" sets of example GESC Drawings

Element 1. Preserve and Stabilize Drainageways

3.4

Work in drainageways requires special care and attention. Drainageway corridors comprise an important natural resource with habitat, open space, and aesthetic value. Since drainageways also function to convey stormwater runoff, they are susceptible to damage from the erosive forces of water, especially if they are disturbed. It is critical that construction activities be designed to reduce any adverse impacts to drainageways and that Town, State, and Federal permitting processes be complied with (see Sections 2.5, 2.6, and 2.7).

Existing drainageway corridors offer valuable habitat, vegetation, and aesthetics, and shall not be filled in, regraded, or realigned without the approval of the Town.

3.4.1 Drainageways Shall Not be Filled, Regraded, or Realigned. Existing drainageways shall not be filled within the limits of the 100-year floodplain or the existing top of banks of incised channels, whichever is more restrictive, without the approval of the Town. If riparian vegetation, desirable habitat, or other stream resources exist beyond the limits of the 100-year floodplain, consideration shall be given to avoiding impacts to those areas as well. Existing drainageways shall not be regraded or realigned without the approval of the Town. Physical barriers, such as fencing, shall be required to limit access into stream corridors. Perimeter sediment controls, discussed in Section 3.9.2, shall be implemented to protect drainageways.

Important! ***Existing Drainageways shall not be filled within the limits of the 100-year floodplain or the existing top of banks of incised channels, whichever is more restrictive, without the approval of the Town. Existing drainageways shall not be regraded or realigned without the approval of the Town.***

Element 1. Preserve and Stabilize Drainageways, continued

All existing drainageways on the site shall be delineated on GESC Drawings to the limit of their 100-year floodplains (based on future development peak discharges). Limits of construction shall be clearly shown on GESC Drawings to indicate the exact limits of grading adjacent to a drainageway and to delineate the limits of the undisturbed riparian corridor.

3.4.2 Ample Freeboard Above the 100-year Floodplain Shall be Provided. Floodplain elevations can rise over time due to the following:

Grade control structures, increased roughness from wetland vegetation, and aggradations can raise floodplain elevations. Therefore, ample freeboard shall be provided at the outset of development.

- Increased baseflows and runoff from development can promote increased growth of wetland and riparian vegetation, making drainageways hydraulically rough and leading to higher flow depths.
- Stream stabilization work can raise the bed of the drainageway at the crests of drop structures and flatten the channel slope, leading to higher flow depths.
- Upstream bank erosion or watershed erosion, flatter slopes, or increased channel vegetation can lead to sediment deposition and channel aggradation, raising the streambed and floodplain elevations.

All of these conditions are generally healthy and positive, since they slow flow velocities, improve stream stability, and enhance water quality through sediment trapping. For these conditions to occur over time without jeopardizing properties during floods, ample freeboard must be provided at the outset of development. Freeboard over the future development 100-year water surface elevation must be provided as outlined in the *Town's Drainage Regulations,* as amended.

Freeboard over the future development 100-year water surface elevation must be provided as outlined in the Town's Drainage Regulations, as amended.

3.4.3 Existing Drainageways Shall be Stabilized. It may be impossible, or undesirable, to avoid all construction in an existing drainageway. Most natural channels cannot be left alone in their predevelopment condition, however, the natural channel shall be preserved to the maximum extent possible. Increased runoff from development can shift the natural balance of a stream over time, tending toward degradation and bank erosion as the stream tries to flatten its grade.

Element 1. Preserve and Stabilize Drainageways, continued

Drop structures and other grade control features are usually necessary to reduce the channel slope to future equilibrium conditions and to control flow velocity. Bank or toe protection may also be necessary to reinforce weak, unstable channel banks. Grade control structures and other channel stabilization improvements shall be designed according to the criteria shown in the *Drainage Regulations,* as amended. **Under no circumstances shall broken up concrete or asphalt be used for bank stabilization.**

Stream stabilization improvements shall limit disturbance and retain a natural character.

3.4.4 Disturbance to Existing Drainageways Shall be Minimized and Quickly Restored. In addition to the construction of grade control and bank stabilization improvements, there may be other unavoidable instances where construction must occur in existing drainageways. Examples include bridges and culverts for road crossings, utility crossings, storm sewer outfalls, and temporary stream crossings for construction access. However, it is critical that construction disturbance within drainageways be minimized and quickly restored.

When construction within a drainageway is unavoidable, the Design Engineer shall delineate construction limits that restrict activities to the smallest area possible. **Construction Fence (CF)** or **Construction Markers (CM)** shall be indicated on the GESC Drawing within the drainageway corridor to indicate the allowable limits of disturbance. In the same manner, construction fence or construction markers shall be shown throughout the site to identify all limits of construction (along all perimeters of the site, along all stream corridors to be preserved, and around any other preservation zones). Coordinates or other information shall be provided to establish the location of the fence.

Construction Fence (CF) *consists of orange plastic fencing material, or other Town approved material, attached to support posts and used to limit access to the construction site.*

Element 1. Preserve and Stabilize Drainageways, continued

If disturbance to a drainageway is significant, such that excessive amounts of sediment may be transported downstream, a **Check Dam (CD)**, reinforced or nonreinforced, shall be installed immediately downstream of the disturbed area in the drainageway. If several areas of disturbance are located in close proximity, one check dam at the downstream end of the construction may be appropriate (in general, BMPs shall be configured to control erosion and trap sediment outside of the limits of drainageways to enable check dams to be used infrequently). Sizing criteria for check dams is provided in Section 3.17.1.

*A **Check Dam (CD)** is a small rock dam, designed to withstand overtopping, that is placed in a stream or drainageway. The purpose of the check dam is to trap water-borne sediment in the backwater zone upstream of the check.*

Crossing drainageways with construction equipment requires a **Temporary Stream Crossing (TSC)**. Temporary stream crossings shall be limited to one per 2000 lineal feet of drainageway unless otherwise approved by the Town.

*A **Temporary Stream Crossing (TSC)** consists of rock layer placed temporarily in a stream to allow construction equipment to cross. A stream crossing may include culverts or provide a low-water crossing, or ford.*

As soon as possible after construction of facilities in drainageways, or after removal of a temporary stream crossing, all disturbed areas within streams and drainage channels shall be topsoiled, seeded and mulched, and, unless otherwise approved, protected with **Erosion Control Blanket (ECB)**. Additional plantings, such as willows or other riparian species, shall be considered to enhance channel stability, habitat, and aesthetics. Erosion control blanket shall be required for the disturbed channel bed and banks and all slopes steeper than 4:1. The Design Engineer shall indicate approximate limits of erosion control blanket on the GESC Drawing. These limits shall extend to the top of the banks. Additional design information for erosion control blanket is provided in Section 3.17.7.

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

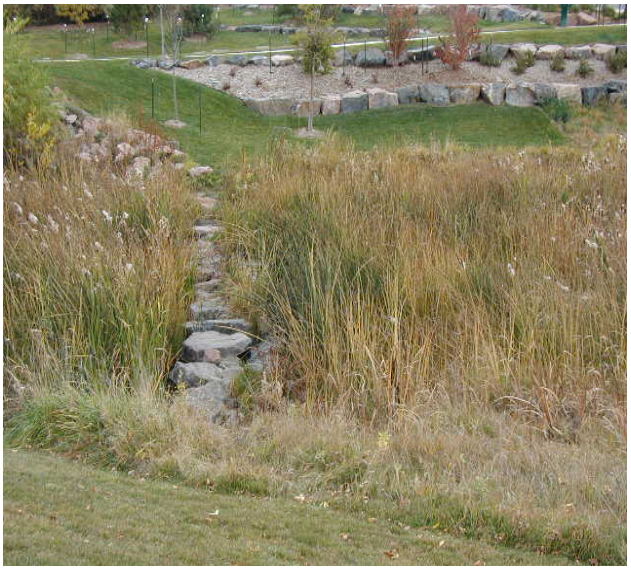
Important!

What about straw bales?

Straw bales are not an accepted sediment control BMP for GESC Permitted projects in the Town; the track record for effective long-term performance of straw bales in the Town has not been strong.

Element 1. Preserve and Stabilize Drainageways, continued

3.4.5 Any New Drainageway Shall be Designed and Stabilized. Even after existing drainageways are identified and preserved, new development projects usually require an additional network of small drainageways, swales and storm sewer facilities. During grading operations, prior to the construction of storm sewer facilities, additional temporary ditches or dikes may be necessary to control site stormwater runoff.



Permanent drainageways and swales shall be designed and stabilized in accordance with the Drainage Manual, as amended.

Upgradient properties will generate runoff that may need to be intercepted and conveyed through the site in drainageways that don't necessarily correspond to existing stream channels. Off-site flows shall be conveyed through the site in stable drainageways and discharged to stable outlet points. Off-site flow impacts the layout of perimeter drainage facilities and starts to set the location and size of the on site drainage network.

Permanent drainage facilities, including roadside ditches, shall be designed and stabilized according to the Town of Castle Rock *Drainage Regulations,* as amended.

Temporary diversion ditches may be necessary at upslope and downslope perimeters, at the top of steep slopes, and downstream of slope drains. Diversion ditches shall be sized and stabilized according to the criteria shown herein for a **Diversion Ditch (DD)**. Sections 3.9.2 and 3.11.2 provide specific guidance for locating diversion ditches.

*A **Diversion Ditch (DD)** is a small earth channel used to divert and convey runoff. Depending on slope, the diversion swale may need to be lined with erosion control matting, plastic (for temporary installations only), or riprap.*

Element 2. Avoid the Clearing and Grading of Sensitive Areas

3.5
In addition to drainageways, other sensitive resources may exist on a site. These could include:

Disturbance to sensitive resource areas shall be avoided or minimized.

- Protected habitat for threatened or endangered species
- Wetlands
- Nesting bird habitat
- Riparian corridors
- Forested areas
- Mature cottonwood stands
- Bedrock outcroppings
- Steep slopes
- Potential stormwater infiltration areas
- Historic, cultural, or archeological resources
- Areas of unique or pristine vegetation, habitat, or landform

A resource inventory should be conducted for the site and include any sensitive areas such as those listed above. The location, aerial extent, and type of resource, including stream floodplains as discussed in Section 3.4, shall be shown on the Initial GESC Drawing.

Disturbance to sensitive resource areas shall be avoided or minimized. Destroying or disturbing wetlands, nesting bird habitat, and protected habitat for threatened or endangered species is sharply restricted; these restrictions shall be addressed through the appropriate Federal or State agency permitting process.

A Design Engineer can go farther than preserving critical resource areas; other open space areas can be left undisturbed and exempt from clearing and grading operations. The technique of mapping out areas of the site that can be left undisturbed, termed “fingerprinting”, can reduce grading costs and contribute to the ultimate value of the development. The GESC Drawings shall clearly show limits of construction and shall call out **Construction Fence (CF)** or other approved means to protect resources that are to be preserved.

Element 3. Balance Earthwork On Site

3.6
A common design task for almost all construction projects is the development of a proposed grading plan. Proposed contours shall be shown to provide for new roadways, building sites, and drainage features on the Interim and Final GESC Drawings. To reduce impacts on Town roadways, development projects are encouraged to balance earthwork quantities on site.

Element 3. Balance Earthwork On Site, continued

In the event that it is impractical to balance earthwork quantities, an Authorization for Haul Route application shall be included with the review submittal for the import or export of material The submittal shall include the following, at a minimum:

- Amount of material to be imported or exported
- Location of disposal site if export or source site if import
- GESC Permit numbers for disposal or source sites
- Detailed haul route plan and traffic control plan for haul route
- Type and number of trucks required to complete import or export

GESC Drawings shall be prepared for the import or export site in accordance with the *GESC Manual,* and applicable permits, fees and fiscal surety shall be required.

Element 4. Limit the Size of Grading Phases to Reduce Soil Exposure

3.7

For sites where the total disturbed area will exceed 40 acres, grading operations shall not take place all at one time. Instead, the site shall be divided into separate grading phases each disturbing 40 acres or less. If overexcavation, stockpiling, and replacement of soils is necessary for

Design Requirements for Phased Grading

1. *Determine if the site exceeds "threshold" size of 40 acres (70 acres for soil mitigation operations).*
2. *Clearly identify sequence of construction of each phase and entire project on drawings. Phasing sequence for the GESC Plan shall match the phasing from the Development Agreements (DA), the Subdivision Improvements Agreement (SIA), the Public Improvement Agreement (PIA), and/or the Public Improvement Plans, which serve as the guides by which individual portions of the subdivision will be initially accepted and released from conveyance and building permit restrictions. Careful consideration should be given when developing the DA, SIA, PIA, and Public Improvement Plans, since the developer will have to adhere to the Plan through construction. Phasing of the subdivision improvements and lots shall be such that the streets and lots to be accepted are accessible from a street that has already been accepted by the Town of Castle Rock. Additional information on Initial Close-out Acceptance is provided in Section 6.2.*
3. *Balance earthwork within each phase, if possible (if not possible, area of grading plus stockpiles and/or borrow areas must not exceed 40 acres (70 acres for soil mitigation operations) per grading phase.*
4. *Carefully locate temporary stockpiles and staging areas in each phase to prevent additional soil disturbance.*
5. *Accommodate water/sewer and other utility construction within each phase.*
6. *Incorporate road segments, temporary turn-arounds, and emergency access within each phase.*
7. *Segregate temporary construction access in each phase from access for permanent residents.*
8. *Show both the temporary and permanent stormwater management facilities in each phase.*
9. *Develop Initial, Interim and Final GESC Drawings for each phase.*
10. *Ensure that the GESC Plan for later upstream phases address potential impacts to already completed downstream phases of the construction site.*

Element 4. Limit the Size of Grading Phases to Reduce Soil Exposure, continued

Information

Phased GESC Plans shall be configured to be consistent with DA, SIA, and PIA phasing, including Public Improvement Plan.

mitigating expansive soils or addressing similar issues, each phase may disturb up to a maximum of 70 acres, as approved by the Town. Drill seeding and crimp mulching shall be completed within seven days of the GESC Inspector's acceptance of the phase or a Stop Work Order shall be issued (see Section 5.10.3). If site conditions prevent installation, Permittee(s) shall notify GESC inspector in writing of the other BMP(s) to be employed as listed in 3.8 below until conditions allow for seeding and crimping.

Phased grading operations shall be configured to match the phasing of the Development Agreement (DA) or Subdivision Improvements Agreement (SIA) for detached single-family residential projects. This includes ensuring that the GESC Drawing phases are consistent with Public Improvement Plans. The Design Engineer must also consider how to balance earthwork in each phase to end up with the final overall grading phases desired.

Element 5. Stabilize Exposed Soils in a Timely Manner

Important!

Topsoil Preservation.

Topsoil stripping, stockpiling, and re-spreading in areas to be vegetated shall be a mandatory practice called for in all GESC Plans. Adequate "footprints" for topsoil stockpiles shall be shown within the limits of construction, assuming stockpile slopes are no steeper than 3 to 1.

3.8

All areas disturbed by construction shall be stabilized as soon as possible to reduce the duration of soil exposure and the potential amount of erosion. Unless otherwise approved, the Town requires that disturbed areas be drill seeded and crimp mulched, or permanently landscaped, within 30 days from the start of land disturbance activities or within seven days of the substantial completion of grading and topsoiling operations, whichever duration is shorter. Topsoil stripping, stockpiling, and re-spreading in areas to be vegetated shall be a mandatory practice called for in all GESC Drawings. Adequate "footprints" for topsoil stockpiles shall be shown assuming stockpile slopes are no steeper than 3 to 1.

Erosion control blanket protecting a slope.

The BMPs applicable to stabilizing exposed soils consist of **Surface Roughening (SR), Seeding and Mulching (SM), Erosion Control Blanket (ECB),** and **Compost Blanket (CB)**. Descriptions and photographs for surface roughening, seeding and mulching, and compost blanket are shown below; erosion control blanket was shown in Section 3.4.4. Design for erosion control blanket is provided in Section 3.17.7.

Surface Roughening (SR) *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.*

Surface roughening shall be shown for all disturbed areas and drill seeding and crimp mulching shall be shown for all areas that shall not be paved, sodded, landscaped or otherwise stabilized in an approved manner.

Element 5. Stabilize Exposed Soils in a Timely Manner, continued

Seeding and Mulching (SM) *consists of drill seeding disturbed areas with grasses 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.*

Compost blanket has performed favorably in field trials in areas around the Town. This Town-accepted BMP can be considered as an alternative to erosion control blanket and crimp mulch for stabilizing exposed soils (see Section 3.17.2).

Compost Blanket (CB) *consists of a layer of Class I Compost spread over prepared, seeded topsoil in non-concentrated flow areas to protect exposed soil against raindrop and wind erosion and to provide an organic soil amendment to promote the establishment of vegetation.*

Element 6. Implement Effective Perimeter Controls

3.9

3.9.1 Upslope Perimeters. If the upstream off-site area is developed, runoff will most likely enter the site at one or more discrete outfalls; drainage facilities shall be sized and stabilized to convey off-site runoff through the site (see Section 3.4 for design guidance for streams and drainage channels). The Design Engineer should consider the need for a **Construction Fence (CF)** to discourage public entry to the site during construction (see Section 3.4.4 for a description and photograph of construction fence).

If the upstream off-site area is currently undeveloped, runoff may enter the site in a defined natural channel or via sheet flow (or both). Runoff in existing channels shall be conveyed through the site in a stabilized stream or drainage channel (see Section 3.4). Runoff entering the site via sheet flow shall be captured in a **Diversion Ditch (DD)** and directed to a stream or drainage channel (see Section 3.4.5 for a description and photograph of a diversion ditch). Diversion ditches that have mild slopes may be unlined, whereas steeper ditches and rundowns must be lined with erosion control blanket (for moderate slopes), plastic (temporary short-term installations only), or riprap. Design Engineer must evaluate impacts to water rights.

A **Temporary Slope Drain (TSD)** shall be used to convey runoff down a channel bank or slope to the bottom of a drainageway. When diversion ditches intersect a slope or channel bank, a temporary slope drain, consisting of pipe, plastic, or riprap, shall be required to convey diverted water from the diversion ditch down the slope or channel bank.

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

Element 6. Implement Effective Perimeter Controls, continued

3.9.2 Downslope Perimeters. Downslope perimeter BMPs apply to the downslope perimeters of construction disturbance (generally the downhill site perimeters), perimeters along drainageways, and downslope perimeters adjacent to other areas to be left undisturbed. Sediment controls shall be located as close to the source of erosion as possible, on the downslope side of any disturbed area.

If the upstream disturbed drainage area exceeds 1.0 acre, a **Diversion Ditch (DD)** shall be required to convey runoff to the required sediment basin (see Section 3.10 for sediment basin criteria).

If the upstream disturbed drainage area is less than 1.0 acre, one of the following BMPs shall be shown along the perimeter:

Reinforced Rock Berm (RRB)

*A **Reinforced Rock Berm (RRB)** 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.*

Sediment Control Log (SCL)

*A **Sediment Control Log (SCL)** consists of a cylindrical bundle of wood, coconut, compost, excelsior, or straw fiber designed to form a semi-porous filter, able to withstand overtopping. The log can be staked into the ground and promotes sediment deposition on its upstream side.*

Silt Fence (SF)

***Silt Fence (SF)** 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.*

Photo provided by Storm Water Control.

Diversion Ditch (DD). A diversion ditch is described in Section 3.4.5.

*A **Diversion Ditch (DD)** is a small earth channel used to divert and convey runoff. Depending on slope, the diversion ditch may need to be lined with erosion control matting, plastic (for temporary installations only), or riprap.*

Element 6. Implement Effective Perimeter Controls, continued

Of these four BMPs, a reinforced rock berm, sediment control log, and silt fence function best when installed level, on a contour. However, these BMPs may slope up to 5 percent from horizontal in accordance with the design information provided in Section 3.17.14. In the Town's experience, silt fence is the least durable and has the highest maintenance cost of the four alternatives; therefore, consideration should be given to all of the alternatives before simply specifying silt fence. Additional information on maintenance costs is provided in Section 3.21.

Construction Fence (CF) is also recommended along the downslope perimeters if the adjacent area is developed or consists of a public use area. Construction fence is necessary to discourage vehicle access over the top of a diversion ditch, reinforced rock berm, or sediment control log. See Section 3.13 for construction site access controls.

In drainageways with an upstream watershed area of 20 acres or more that exit the site, and where disturbance is such that excessive amounts of sediment may move downstream, a **Check Dam (CD)** is recommended at the downgradient perimeter (**Reinforced Check Dam (RCD)** for areas exceeding 130 acres). In disturbed drainageways having an upstream watershed area of less than 20 acres that exit the site, a **Reinforced Rock Berm (RRB)** is recommended at the downgradient perimeter. However, if possible, BMPs are to be configured to control erosion and sediment outside the limits of drainageways so that instream BMPs are used infrequently, and only as a last resort.

Element 7. Use Sediment Basins for Areas Exceeding 1.0 Acre

3.10

Runoff from all disturbed drainage areas exceeding 1.0 acre shall be treated in a **Sediment Basin (SB)**. Runoff from disturbed areas less than 1.0 acre may be treated in a sediment basin, a **Sediment Trap (ST)**, or one of the downslope perimeter BMPs described in Section 3.9.2. Design guidance for sediment basins is provided in Section 3.17.10.

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

*A **Sediment Trap (ST)** consists of a riprap berm with a small upstream basin that acts to trap coarse sediment particles.*

Element 7. Use Sediment Basins for Areas Exceeding 1.0 Acre, continued

Any permanent detention or water quality facility shall incorporate a sediment basin with at least half of the sediment basin required storage volume provided below the lowest outlet of a permanent detention facility or water quality basin. Including sediment basins in these facilities makes sense for several reasons:

- The need for a temporary outlet and spillway are eliminated.
- Detention and water quality basins are generally located at a low point in the drainage system, enabling site runoff to be conveyed to the sediment basin.
- The sediment basin ends up being "out of the way" of other construction and doesn't have to be relocated.

A stable drainage path shall be designed and shown downstream of the outlet and spillway of a sediment basin. If the sediment basin is located within a permanent detention facility or water quality basin, the drainageway downstream is likely to be a permanent feature and shall be shown in a separate design detail. Temporary drainage paths shall consist of a **Diversion Ditch (DD)** or, if appropriate, a riprap apron or other stable feature that is detailed by the Design Engineer.

Permanent detention facilities shall be constructed as early in the development process as possible. If site planning has identified easements for permanent detention facilities, the Design Engineer shall locate sediment basins in these locations even if permanent detention facilities are not planned until later in the development.

Element 8. Protect Steep Slopes

3.11

Steep slopes may either be comprised of steep existing slopes that are to be preserved, or cut or fill slopes created during the grading process. In either case, the measures in this section shall be taken to protect these slopes against erosion. For the purposes of definition, a slope is considered steep if it is steeper than 4 (horizontal) to 1 (vertical).

Erosion Control Blanket (ECB) *shall be used on slopes greater than 4:1.*

3.11.1 Proposed Slopes Shall be No Steeper than 3 to 1. Slopes steeper than 3 to 1 are difficult to vegetate and maintain. Long term rill and gully erosion are likely on such slopes. Approved permanent stabilization shall be required to control grades on all sites that cannot be graded at a 3 to 1 slope. Retaining walls may be necessary to control grades on a site where other approved means of stabilization cannot be achieved. All instances where means of stabilization other than retaining walls are proposed must be submitted to the Town of Castle Rock Stormwater Division for approval. Slopes equal to or steeper than 4 to 1 shall be protected with **Erosion Control Blanket (ECB).**

Element 8. Protect Steep Slopes, continued

3.11.2 Runoff Shall be Diverted Away from Steep Slopes. A permanent or temporary **Diversion Ditch (DD)** shall be depicted above all steep slopes on the site that may receive concentrated or sheet flows. Where steep cut slopes are planned near the site perimeters, a minimum of 6 feet between the property line and the top of the cut slope shall be reserved for the diversion ditch, unless otherwise accepted by the Town.

3.11.3 Terracing Shall be Incorporated into the Grading of Steep Slopes. To break up the flow of incidental runoff down slopes and reduce the development of rill and gully erosion, grading of new steep slopes shall incorporate **Terracing (TER).** Design criteria are provided in Section 3.17.19.

Terracing (TER) *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.*

Element 9. Protect Inlets, Storm Sewer Outfalls, and Culverts

3.12

The entrances to storm sewer inlets shall be protected using one of the following approved BMPs to reduce the inflow of sediment. Likewise, storm sewer outfalls and culvert outlets shall be protected against scour and erosion.

All storm sewer inlets on a site shall be provided with **Inlet Protection (IP)**. The GESC Drawing shall specify whether area, sump, or continuous grade inlet protection is to be used in a particular location. The half Y-shaped continuous grade inlet protection is intended to trap sediment upstream of an inlet on a continuous grade street without causing any bypass of flow around the inlet. Sump and area inlet

Inlet Protection (IP) *consists of a reinforced rock berm placed in front of (but not blocking) a curb-opening inlet or around an area inlet to reduce sediment in runoff approaching the inlet.*

protection is also designed to maintain inlet capacity after runoff flows over the wire-enclosed rock. The only inlet protection that blocks an inlet opening is temporary inlet protection, discussed in Section 5, which is only used to keep soil out of an inlet prior to paving operations.

Element 9. Protect Inlets, Storm Sewer Outfalls, and Culverts, continued

All culvert inlets on a site shall be provided with a **Reinforced Rock Berm (RRB).**

*A **Reinforced Rock Berm (RRB)** can be placed in front of a culvert to reduce sediment in the run-off approaching the culvert.*

Storm sewer outfalls and culvert outlets shall be permanently protected against erosion with a riprap apron or other approved means in accordance with the *Drainage Regulation,* as amended. Riprap shall be installed at the same time as construction of the storm sewer outfall or culvert. In addition, **Erosion Control Blanket (ECB)** shall be provided in the area disturbed by the construction of the storm sewer outfall or culvert.

Element 10. Provide Access and General Construction Controls

3.13

3.13.1 Limits of Construction (LOC). Limits of construction shall be shown on GESC Drawings and shall include all utility tie-ins. The Design Engineer shall be careful to delineate limits of construction that provide adequate room for the necessary work, including vehicular and temporary storage of equipment and materials, while at the same time limiting the disturbed area to the minimum necessary. Unless otherwise accepted by the Town for utility work, all stock-piles of excavated materials shall be placed on the uphill side of the trench within the limits of construction.

It is especially important to show limits of construction and erosion and sediment control BMPs for utility work outside the site.

3.13.2 Construction Fence (CF). Construction fence or **Construction Markers (CM)** shall be shown throughout the site to delineate all limits of construction (along all perimeters of the site, along all stream corridors to be preserved, and around any other preservation zones). Construction fence installation notes as found in Appendix B require that construction fence or other means defining all limits of construction shall be installed as the very first step in the construction phase, prior to any other work or disturbance on the site. This is critical to avoiding unwanted disturbance beyond the limits of construction.

3.13.3 Vehicle Tracking Control (VTC). Vehicle tracking control shall be provided at all entrance/exit points at the site. The number of access points shall be minimized. A location shall be selected that accounts for the safety of the traveling public and avoids disturbance of trees, desirable vegetation, and low, wet areas. Steep grades (greater than eight percent) shall be avoided.

***Vehicle Tracking Control (VTC)** consists of a pad of 3" to 6" rock at all entrance/exit points for a site that is intended to help strip mud from tires prior to vehicles leaving the construction site.*

Element 10. Provide Access and General Construction Controls, continued

3.13.4 Stabilized Staging Area (SSA). A stabilized staging area shall be provided near the main access point and connected to the vehicle tracking control.

*A **Stabilized Staging Area (SSA)** consists of stripping topsoil and spreading a layer of granular material 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.*

3.13.5 Concrete Washout Area (CWA). A concrete washout area shall be indicated in a location near all concrete work areas.

*A **Concrete Washout Area (CWA)** is a shallow excavation with a small perimeter berm to isolate concrete truck washout operations. The washout area shall be combined with a vehicle tracking control pad to control tracking of mud.*

3.13.6 Stockpile Areas. All stockpile areas shall be shown on the GESC Drawing. As discussed in Section 3.8, topsoil stripping, stockpiling, and re-spreading in areas to be vegetated shall be a mandatory practice called for in all GESC Drawings. Adequate "footprints" for topsoil stockpiles, stockpiles of excess excavated material, and stockpiles for imported materials shall be shown assuming stockpile slopes are no steeper than 3 to 1. Stockpiles shall not be shown outside the limits of construction.

3.13.7 Temporary Access Roads. All temporary access roads shall be shown on the GESC Drawing.

3.14 Intentionally Left Blank

Special Requirements for Utility Construction

3.15

As the Town of Castle Rock grows, so does the demand for installation of new underground utility lines, and upgrade and maintenance of existing lines. Many times this work is located in streets, where storm sewer inlets can be impacted, or along or across drainageways. Although the work is generally short lived, the close proximity to storm drainage systems provides an ample opportunity for contamination of stormwater runoff. A GESC Plan for underground utility work should configure BMPs to

Special Requirements for Utility Construction, continued

reduce the contamination of stormwater runoff from construction erosion and sediment.

At a minimum, all utility line construction shall comply with the following:

- Obtain GESC Permit prior to the start of construction.
- All utility work within a Town of Castle Rock right-of-way shall be required to obtain a Town of Castle Rock Construction Permit in accordance with the *Public Works Regulations,* as amended, and may require a landscape/irrigation permit.
- Provide adequate erosion and sediment controls.
- No more than 300 linear feet of trench shall 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 in the curb, gutter, sidewalk, or in the street within 6-feet of the flowline.
- Limits of construction shall be large enough for a work area, temporary storage of excavated material and imported material, and equipment access to the project.
- Downslope perimeter controls shall be installed per Section 3.9.2.
- 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 hose to prevent any additional erosion. The **Dewatering (DW)** detail shall be complied with at the suction and discharge ends of the pumping facilities.
- **Inlet Protection (IP)** shall be provided whenever soil erosion from the excavated area has the potential of entering a storm sewer system.
- All disturbed areas shall be drill seeded and crimp mulched within seven days after utility work is completed. For larger projects, seeding and mulching shall be done in phases rather than at the end of construction, per Section 3.8.
- Comply with all other applicable criteria as outlined in the *GESC Manual*.

Special Requirements for Temporary Batch Plants

3.16

As stated in Section 1.5.2, because of the potential impact of Temporary Batch Plants on land, vegetation, and receiving waters, batch plants require their own GESC Permit (even if the plant is to be located inside the limits of construction of a GESC-permitted project).

GESC Permits for temporary batch plants are valid for one year from the date issued. The site shall be reclaimed per the associated reclamation plan prior to the end of the one-year permit cycle. A Temporary Batch Plant/GESC Permit renewal application may be considered for a Tempo-

Special Requirements for Temporary Batch Plants, continued

rary Batch Plant/GESC Permit extension. The request for renewal shall be made no later than 30 days prior to the expiration of the Temporary Batch Plant/GESC Permit. All extensions are contingent on the applicant reapplying for the Temporary Batch Plant/GESC Permit and completion of a satisfactory site inspection to ensure that the site is in compliance with the Temporary Batch Plant GESC Plan. The license agreement from the property owner shall be resubmitted with the request for a time extension.

Temporary Batch Plants have specific GESC Plan requirements to reduce impacts to the environment.

Temporary Batch Plant GESC Drawings have specific BMP requirements as shown below. Additional information on Drawing and Report requirements is provided in Sections 3.20.1. Other Temporary Batch Plant submittal requirements are described in Section 4.

Design and Sizing Criteria for BMPs

3.17

All of the design parameters outlined on the Town of Castle Rock accepted details shall be specified for each BMP selected, as indicated on the Town of Castle Rock GESC Plan Standard Notes and Details drawings in Appendix B and discussed in detail in Section 5.7. The parameters may include specific dimensions, such as lengths and widths, or type if more than one configuration of a BMP exists. Design guidance is provided in the following paragraphs for each of the Town of Castle Rock-accepted BMPs.

3.17.1 Check Dam (CD) and **Reinforced Check Dam (RCD)**. Design parameters to be specified on the plan-view GESC drawings include the following items shown on the construction detail:

- Type of check dam (check dam or reinforced check dam)
- Length (L) dimension
- Crest length (CL) dimension
- Depth (D) dimension

The type of check dam is based on the drainage area upstream of the check dam. A **Reinforced Check Dam (RCD)** shall be used for drainage areas greater than 130 acres. A nonreinforced **Check Dam (CD)** may be used for drainage areas less than 130 acres. A **Reinforced Rock Berm (RRB)** may be used as a check dam for drainage areas less than 20 acres.

Design and Sizing Criteria for BMPs, continued

Dimensions are to be specified to ensure that the dam fits the existing drainageway cross section shape and provides adequate overtopping capacity. The depth (D) dimension shall provide a minimum weir capacity equal to a 2-year return period event for development conditions expected during the operation of the check dam.

3.17.2 Compost Blanket (CB) and **Compost Filter Berm (CFB)**. Design parameters to be specified on the plan-view GESC Drawings include the following items :

- Location and aerial extend of compost blanket and any compost filter berms
- Area (A) in square yards of compost blanket
- Length (L) in linear feet of any compost filter berm
- Compost material composition

Compost blanket and filter berms shall not be used in drainageways, swales, or any area of concentrated flow, but may be used as an alternative for erosion control blanket on slopes outside of drainageways, or as an alternative to crimp mulching.

3.17.3 Concrete Washout Area (CWA). One or more locations for a concrete washout area, near all areas of concrete work, shall be specified on the plan-view GESC Drawings. The use of vehicle tracking control in conjunction with a concrete washout area is mandatory.

3.17.4 Construction Fence (CF) and **Construction Markers (CM)**. Design parameters to be specified on the plan-view GESC Drawings include the following items :

- Location of construction fence or line of markers
- Length (L) in lineal feet of construction fence or line of markers
- Coordinates or other location information

Construction fence or construction markers shall be shown throughout the site to identify the limits of construction. Construction fence shall be required along all drainageways and sensitive resources, as listed in Section 3.5. Construction fence is also required adjacent to schools, parks, and other locations where pedestrian traffic may be a concern. Either construction fence or markers should be considered for the remainder of the site.

3.17.5 Dewatering (DW). Design parameters to be specified on the plan-view GESC Drawings include the following items:

- The location of all proposed dewatering operations
- The location of the sediment basin where discharges are to be directed.

Design and Sizing Criteria for BMPs, continued

The size of the dewatering pump shall be determined by the Contractor to provide sufficient capacity for the proposed pumping rates.

Unless otherwise approved, the discharge from dewatering operations is to be directed into a sediment basin that has been constructed on the site.

As mentioned in Section 2.6.2, a State Permit for Discharges Associated with Construction Activities is generally required for dewatering operations.

3.17.6 Diversion Ditch (DD). Design parameters to be specified on the plan-view GESC Drawings include the following items:

- Lining of diversion ditch (earth, ECB, riprap, or plastic)
- Length of each type of ditch
- Depth (D) and width (W) dimensions
- In addition, if the ditch lining is ECB or riprap, the type of erosion control blanket and size of riprap (D_{50}) needs to be specified

Lining type is based on slope of the ditch, as shown on the GESC Drawing Standard Notes and Details provided in Appendix B.
Dimensions shall be specified to ensure that the ditch adequately conveys runoff from a 2-year return period event for development conditions expected during the operation of the ditch. Ditches or drainageways conveying a 2-year flow rate exceeding 10 cfs shall require an independent design by a Professional Engineer (P.E.).

3.17.7 Erosion Control Blanket (ECB). Design parameters to be specified on the plan-view GESC Drawings include the following items shown on the construction detail:

- Type of blanket (straw, straw-coconut, coconut, or excelsior).
- Area (A) in square yards for each type of blanket.
- Dimensions or location information.

Type of blanket shall be based on the shear stress associated with the design flow, as discussed below. Dimensions shall be specified to ensure that the blanket provides protection to the top of the disturbed channel.

All erosion control blankets shall have double sided netting. All erosion control blankets and netting should be made of 100% natural and biodegradable material and shall have a minimum product life of 2-years for channel applications and 12 month product life for slope applications.

Erosion control blanket shall be specified based on the judgment of the Design Engineer, but at a minimum, blanket in drainageways shall be

Information

All erosion control blankets shall have double sided netting. All erosion control blankets and netting should be made of 100% natural and biodegradable material and shall have a minimum product life of 2-years.

Design and Sizing Criteria for BMPs, continued

sized for the shear stress from a 2-year return period event for development conditions expected during the operation of the matting. Table 3-2 provides the maximum shear stress and velocity, based on unvegetated channel conditions, for allowable types of erosion control blankets.

A double-net straw or excelsior blanket shall be used for all slopes steeper than 4:1, outside of drainageways. Concave slope areas that may concentrate sheet flows as well as all other drainage channels (up to the top of the banks) shall require a double-net 70% straw / 30% coconut, double-net 100% coconut, or double-net 100% excelsior blanket based on the shear stress and velocity of the new or disturbed channel. The shear stresses and velocities shown in Table 3-2 shall be considered the maximum allowable values. Channels where velocities and stresses exceed those shown in Table 3-2 shall be designed in accordance with the *Drainage Regulations*, as amended.

The GESC Drawing shall indicate erosion control blanket in disturbed areas of a drainageway adjacent to permanent erosion protection at storm sewer outfalls. Permanent erosion protection shall be designed according to the *Drainage Regulations*, as amended, and shown on the construction drawings for the project.

Table 3-2 Erosion Control Blanket Type

TYPE	*COCONUT CONTENT*	*STRAW CONTENT*	*MIN. WEIGHT (lbs/sy)*	*MANNING'S N VALUE (varies with depth as shown)*	*ALLOWABLE MAX. SHEAR STRESS (lbs/sf)*	*ALLOWABLE MAX. VELOCITY (fps)*
STRAW	*0%*	*100%*	*0.5*	*0.018 for D>=2.0' 0.050 for D<=0.5'*	*Not allowed in drainageways or diversion ditches*	
STRAW-COCONUT	*30% MIN.*	*70% MAX.*	*0.5*	*0.018 for D>=2.0' 0.050 for D<=0.5'*	*1.75*	*5.0*
COCONUT	*100%*	*0%*	*0.5*	*0.018 for D>=2.0' 0.050 for D<=0.5'*	*2.25*	*5.0*
EXCELSIOR	*NA*	*NA*	*0.7*	*0.028 for D>=2.0' 0.066 for D<=0.5'*	*2.00*	*5.0*

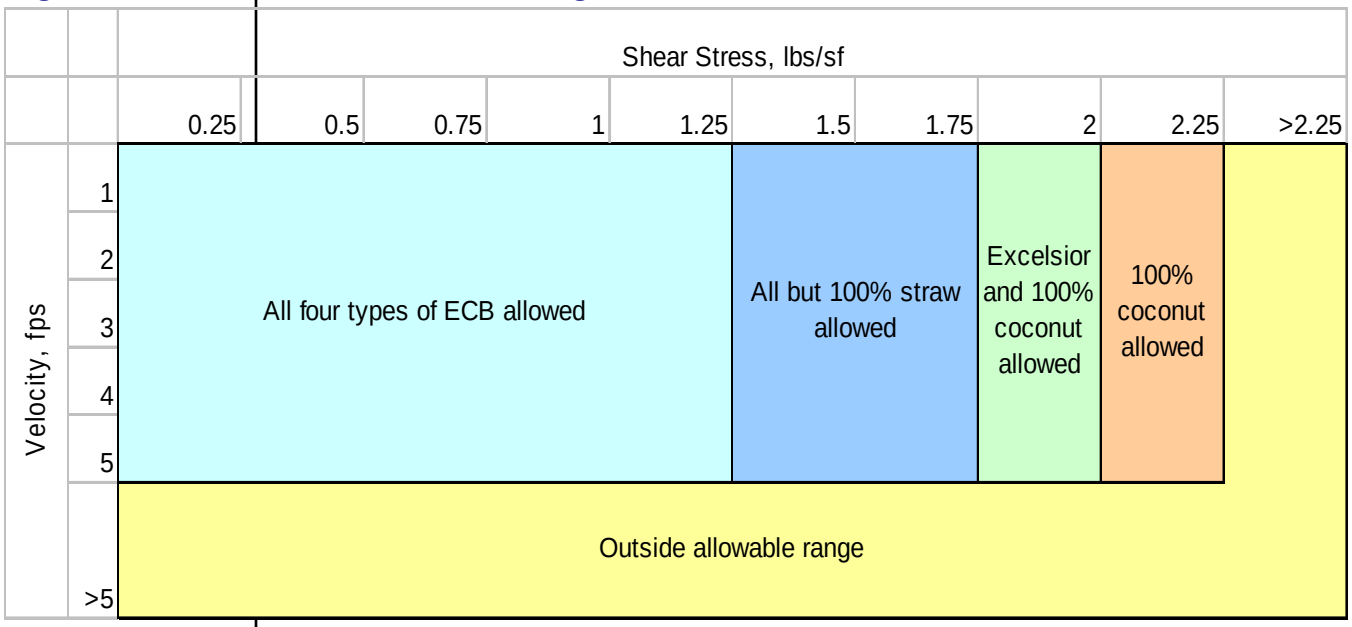
Shear stress and velocity in ditches and drainageways may be calculated based on the following formulas:

- Shear stress (lbs/sf) = 62.4 ∗ D ∗ S, where
- D (ft) = maximum flow depth for the design (2-yr) storm event, and S (ft/ft) = drainageway slope.
- Velocity (ft/sec) = Q/A, where Q (cfs) = design (2-yr) flow

Design and Sizing Criteria for BMPs, continued

For depths between 0.5 and 2.0 feet, the solution will be iterative, continuing until the depth corresponding to the Manning's N value is within 0.25-feet of the calculated depth. The maximum drainageway shear stress and velocity calculated using the above equations shall be less than the values indicated in Table 3-2 for the type of blanket specified. Figure, 3-2 shows the information in Table 3-2 in a graphical format. This criterion is for temporary ditches and permanent channels designed to be grass-lined. For permanent channels, the types of erosion control blanket shown shall be considered to comprise temporary erosion control only until vegetation can be established.

Figure 3-2. Erosion Control Blanket Design Criteria



The erosion control blanket shown herein shall be fabricated from 100 percent natural, biodegradable materials. Erosion control blanket, as discussed in this section, is to be provided for temporary stabilization of permanent drainageways or roadside ditches that have been designed to be stable with grass or vegetative lining, consistent with criteria presented in the *Drainage Regulations*, as amended. The blanket is to provide erosion protection until the vegetation is established, and it is therefore an important component of an effective GESC Drawing.

Under no circumstance does the use of temporary erosion control blanket relieve the Design Engineer of the requirement to satisfy channel design criteria in the *Drainage Regulations*. Permanent channel and roadside ditch stabilization measures must be addressed in the Phase III Drainage Report for the project and be specified and detailed on the project construction drawings.

Design and Sizing Criteria for BMPs, continued

3.17.8 Inlet Protection (IP). Inlet protection shall be shown on the plan-view GESC Drawings at all street and area inlets. The GESC Drawing shall indicated the type of inlet protection, either sump or continuous-grade for curb-opening inlets, or area inlet protection.

Providing temporary inlet protection in accordance with the GESC Drawing Standard Notes and Details, as well as determining the length of the reinforced rock berm to fit the inlet is the responsibility of the Permittee(s).

3.17.9 Reinforced Rock Berm (RRB). Design parameters to be specified on the plan-view GESC Drawings include the following items:

- Length (L) dimensions
- Depth (D) dimensions

If used in a diversion ditch or small drainageway, dimensions are to be specified to ensure that the berm fits the drainageway cross section shape and provides adequate overtopping capacity. The depth (D) dimension shall provide a minimum weir capacity equal to a 2-year return period event for development conditions expected during the operation of the reinforced rock berm.

When used as a downhill perimeter control, the design criteria described for **Silt Fence (SF)** in Section 3.17.14 shall apply, except that the reinforced rock berm may be used as a check dam across swales and small drainageways (up to 20 acres of upstream drainage area).

3.17.10 Sediment Basin (SB). Design parameters shall be specified on the plan-view GESC drawings and include the following items:

- Location
- Crest length (CL) dimension, bottom area (A), height of orifices (H), number of columns of orifices (N), and hole diameter (HD)

The sediment basin design shown on the GESC Drawing Standard notes and Details provided in Appendix B shall be used for any disturbed drainage area greater than 1.0 acre. The standard sediment basin is appropriate for use for disturbed drainage areas up to 15 acres. For drainage areas greater than 15 acres, a *Volume 3* design must be prepared and shown in the construction drawings.

Sizing information for the sediment basin design (based on providing a minimum initial storage volume equal to 1800 cubic feet per upstream acre, shall be determined from Table 3-3 (on the following page). As shown on the standard detail sheets, the standard sediment basin

Design and Sizing Criteria for BMPs, continued

features a pipe outlet drilled with a single column of orifice holes. The hole diameter shown in Table 3-3 will drain the upper 1.5 feet of the sediment basin in about 40 hours.

A Construction Permit and inspections are necessary prior to the construction of the outlet works, if the outlet is to be part of a permanent detention basin or water quality facility.

Table 3-3. Sizing Information for Standard Sediment Basin

Upstream Drainage Area (rounded to nearest acre), (ac)	*Basin Bottom Width (W), (ft)*	*Spillway Crest Length (CL), (ft)*	*Hole Diameter (HD), (in)*
1	*16*	*2.0*	*7/16*
2	*22*	*4.0*	*5/8*
3	*27*	*6.0*	*3/4*
4	*31*	*8.0*	*7/8*
5	*35*	*10.0*	*1.0*
6	*38*	*12.0*	*1 1/8*
7	*41*	*14.0*	*1 1/4*
8	*44*	*16.0*	*1 1/4*
9	*47*	*18.0*	*1 3/8*
10	*49*	*20.0*	*1 3/8*
11	*52*	*22.0*	*1 1/2*
12	*54*	*24.0*	*1 1/2*
13	*56*	*26.0*	*1 5/8*
14	*59*	*28.0*	*1 5/8*
15	*61*	*30.0*	*1 3/4*

Permanent detention and water quality facilities shall have temporary sediment basins incorporated within them. Outlet facilities for extended detention basins that provide a drain time of 40-hours may be used as the sediment basin outlet as long as at least half of the sediment basin volume is provided below the lowest orifice of the permanent outlet works. Permittee is responsible for the removal and accumulated sediment prior to the completion of the permanent detention or water quality basin.

3.17.11 Sediment Control Log (SCL). Design parameters to be specified on the plan-view GESC Drawings shall include the following items:

- Location of the sediment control log
- Length (L) of the sediment control log

When used as a downslope perimeter control, the design criteria described for **Silt Fence (SF)** in Section 3.17.14 shall apply.

Design and Sizing Criteria for BMPs, continued

3.17.12 Sediment Trap (ST). Design parameters to be specified on the plan-view GESC Drawings include the following items:

- Location
- Length (L) and width (W) dimensions

Sediment trap may be used for upstream disturbed areas less than 1.0 acre. Sediment trap dimensions shall be specified to provide a storage volume equal to 1800 cubic feet per upstream acre.

3.17.13 Seeding and Mulching (SM). Design parameters to be specified on the plan-view GESC Drawings include the following items:

- Type of seed mix (Permanent, Temporary, or Low Growth)
- Area (A) in acres to be seeded and mulched

Unless otherwise approved by the Town, the standard seed mix shall be specified. It is recommended that the Design Engineer be familiar with Contractor requirements for seeding and mulching, documented in the Town of Castle Rock GESC Drawing Standard Notes and Details (see Appendix B). Some of the main requirements include the following:

- Existing topsoil shall be stripped to a depth of six inches (unless otherwise approved) from areas to be disturbed. The stripped topsoil shall be stockpiled during grading operations, then replaced to a depth of at least six inches in all areas to be seeded. If quantities of on-site topsoil are inadequate to provide a replaced depth of six inches, the Permittee(s) will have to import topsoil or condition the soil as approved by the Town of Castle Rock. All disturbed areas are to be ripped prior to placing topsoil. Topsoil shall be thoroughly loosened prior to seeding to a depth of at least six inches.
- All seeding shall be accomplished using a drill seeder at a depth of seeding not less than 1/4-inch and not more than 3/4-inch and at the rates specified in the GESC Drawing Standard Notes and Details. In small areas that are impossible to drill seed, the Permittee(s), with the Town's prior approval, may hand broadcast seed at twice the drilled rate, lightly rake to cover the seed, and crimp mulch.
- Straw mulch shall be applied at 2 tons per acre and mechanically crimped into the soil. Revegetation is considered complete when the site is adequately covered with the variety and species found in the Town of Castle Rock (same as Douglas County) approved mix. There shall be no bare areas larger than 4 square feet (2 feet by 2 feet or equivalent). The site shall be free of eroded areas and shall be free from infestation of noxious weeds in accordance with Section 6.5. Seeded and mulched areas shall be inspected monthly. Repairs and reseeding and mulching shall be undertaken after the first growing season for any areas failing to meet required coverage as stated above.

Design and Sizing Criteria for BMPs, continued

Important!

What about Hydraulic Seeding / Hydraulic Mulching?

Hydraulic seeding/ hydraulic mulching, the practice of applying grass seed to the surface of the soil along with a slurry of water and cellulose mulch, has had a poor record of performance in the Town of Castle Rock and surrounding areas. As a result, hydraulic seeding and mulching shall not be allowed on GESC permitted projects.

The GESC Permit shall be active until revegetation has reached completion and Final Close-out Acceptance is granted *(Refer to Section 8 for Residential DESC Permitting).* Seeding and mulching operations must be undertaken when a GESC Permit expires and no renewal is granted.

3.17.14 Silt Fence (SF). Design parameters to be specified on the plan-view GESC drawings include the following items:

- Location of silt fence
- Length (L) in linear feet of silt fence

Silt fence works most effectively when placed relatively level, on the contour, to capture and filter approaching sheet flow. It is not suited for concentrated flow or for large upstream drainage areas. The following criteria shall apply to the use of silt fence:

1. Silt fence shall not be used across swales or drainageways.
2. Silt fence shall be located on the contour. Silt fence may be shown running up or down slight slopes (up to 5-percent), but shall not be placed in a location where the fence slope exceeds five percent unless conditions of Table 3-4 are met.
3. The average upslope length of the area draining to an individual section of silt fence shall not exceed 100 disturbed feet and the total area draining to a section of silt fence shall not exceed 10,000 square feet of disturbed area.
4. Silt fence located transverse to a slope shall be staggered based on the information in Table 3-4. The end of a downslope section of silt fence shall extend a minimum of 15 feet into the drainage “shadow” of the adjacent upslope section to ensure capture of all approaching sheet flow.

Design and Sizing Criteria for BMPs, continued

5. In all cases, the ends of individual sections of silt fence shall be placed upslope at least one foot higher vertically than the low point in the fence.

Items 1 through 5 above also apply to **Sediment Control Log (SCL)** and notes 2 through 5 apply to **Reinforced Rock Berm (RRB)** when these are used as downslope perimeter controls. As long as a site perimeter slopes less than five percent and has no low points where concentrated flow occurs, silt fence (or sediment control log or reinforced rock berm) may be placed directly along the perimeter. In this case, the fence will occupy a narrow strip of ground (less than one foot) and the limits of construction can extend relatively close to the perimeter.

If the perimeter slopes more than five percent, silt fence (or sediment control log or reinforced rock berm) must be staggered according to the information in Table 3-4, with individual sections oriented generally on the contour (or on less than a five percent slope) and "overlapping" by at least 15 feet. In this case, the sections of silt fence will occupy a relatively wide strip of ground (perhaps 20 to 50 feet); therefore, either the silt fence needs to be placed downslope of the perimeter (requiring the approval of the Town of Castle Rock and, if it affects adjacent property, the owner of the adjacent property) or the limits of construction cannot extend very close to the perimeter. For this reason, it may be advantageous for the Design Engineer to use a lined **Diversion Ditch (DD)** along downslope perimeters steeper than five percent (a diversion ditch may be a good option for perimeters flatter than five percent as well).

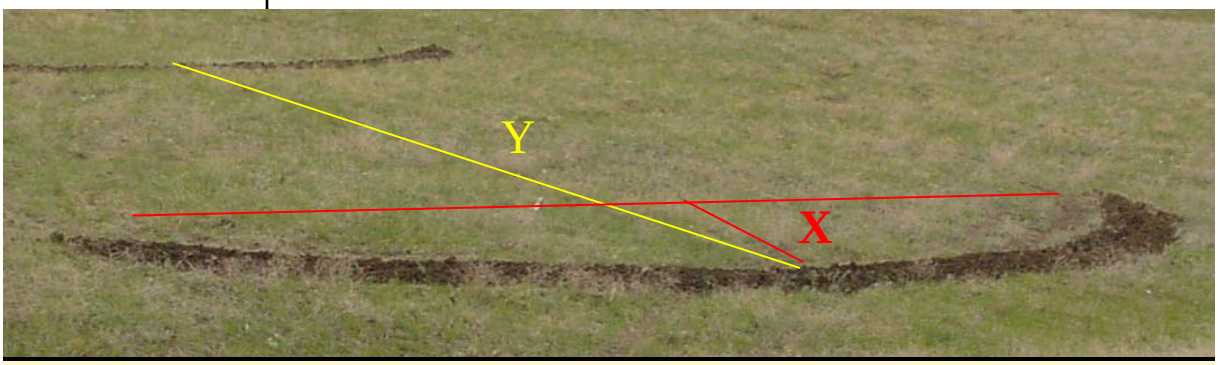


Table 3-4. Silt Fence on Slope

Slope Percentage	*Slope Ratio*	*Minimum elevation difference from low point in fence to ends of fence, X (feet)*	*Maximum space between rows, Y (feet)*
5-10%	*20:1 - 10:1*	*1*	*50*
10-20%	*10:1 - 5:1*	*1*	*25*
20% - 33%	*5:1 - 3:1*	*1*	*15*

Silt fencing located at the toe of a slope shall be placed a minimum of five feet offset from the toe to allow for maintenance activities. In locations where silt fencing is required on a slope, it shall be designed and

Design and Sizing Criteria for BMPs, continued

installed per Table 3-4. The slope percentage or slope ratio dictates the spacing of adjacent rows of silt fence.

If construction takes place in the winter, silt fence should be placed far enough off the roadway to avoid damage from snow-plowing operations.

Silt fence should be located far enough off streets to avoid damage from snow-plowing operations.

3.17.15 Temporary Slope Drain (TSD). Design parameters to be specified on the plan-view GESC Drawings include the following items:

- Type of slope drain (pipe, riprap lined, or plastic lined)
- Location and length (L) in linear feet
- "D" dimension and "D50" size

Dimensions are to be specified to ensure that the slope drain provides capacity equal to a 2-year return period event for development conditions expected during the operation of the slope drain.

3.17.16 Stabilized Staging Area (SSA). Design parameters to be specified on the plan-view GESC Drawings include the following:

- Location of staging area
- Approximate area (A) in square yards of the staging area

Gravel, road base, or recycled concrete may be used for the stabilized staging area.

3.17.17 Surface Roughening (SR). Since surface roughening is to be performed in all disturbed, graded areas on a site, the location of surface roughening does not need to be indicated. However, as a reminder, the surface roughening **(SR)** symbol is to be shown on the GESC Drawing.

3.17.18 Stream Crossing (SC). Design parameters to be specified on the plan-view GESC Drawings include the following items shown on the construction detail:

- Location of stream crossing
- Type of stream crossing (ford or culvert)
- For ford crossing, length (L), crest length (CL), and depth (D) dimensions
- For culvert crossing, length (L), height (Y), overtopping depth (H), diameter (D) and number of culverts

Design and Sizing Criteria for BMPs, continued

The type of stream crossing is based on the presence of baseflow and the shape of the channel. If there is any baseflow present, or the channel is relatively deep and narrow, a culvert crossing shall be used. Ford-type stream crossings shall not be used where bank cuts are necessary. Dimensions are to be specified to ensure that the crossing fits the existing drainageway cross section shape and provides adequate overtopping capacity. The flow depth (D or H) dimension shall provide a minimum weir capacity equal to a 2-year return period event for development conditions expected during the operation of the stream crossing.

For temporary culvert crossings, the Design Engineer shall specify pipe class, minimum cover, etc. to ensure that the culverts will bear the loads associated with the type of vehicles that may use the crossing. The structural capacity of the crossing shall be the responsibility of the Design Engineer.

3.17.19 Terracing (TER). Design parameters to be specified on the plan-view GESC Drawings include the following items:

- Location and length of terracing
- Width (W) and height (H) dimensions

Terracing shall be used on all permanent slopes between 3 to 1 and 4 to 1 that are greater than 15 feet in height. Benches shall be at least 8 feet wide and shall occur at a vertical spacing of not more than 15 feet on all permanent slopes.

3.17.20 Vehicle Tracking Control (VTC). Design parameters to be specified on the plan-view GESC Drawings include the following:

- Location of all vehicle tracking controls.

A location shall be selected that avoids disturbance of trees, desirable vegetation, and low, wet areas. Slopes greater than 8% shall be avoided. All access points to and from a construction site must be shown on the GESC Plans, and are reviewed and approved as part of the GESC Permit. No ramps of dirt, gravel, asphalt, wood, or other materials are allowed in the curb section. A stop sign is required for all exiting traffic from the site.

3.17.21 Vehicle Tracking Control with Wheel Wash (WW). Vehicle tracking control with wheel wash does not need to be specified. It shall be used only if specifically required by the GESC Inspector, typically, only if vehicle tracking onto public streets becomes a major problem.

Standard GESC Plan Drawing Requirements

3.18

The following GESC Drawing requirements shall be adhered to when preparing a Standard GESC Drawing. Specific requirements vary based on

Standard GESC Plan Drawing Requirements, continued

the three types of Standard GESC Drawings described in Section 2. Drawing requirements for a Staged GESC Permit (separate drawings for the Initial, Interim, and Final Stages) are discussed in the following paragraphs. Requirements for Small Site and Utility GESC Drawings and Staged and Phased GESC Drawings are shown in Sections 3.18.8 and 3.18.9, respectively. Submittal requirements for the Temporary Batch Plant GESC Drawings, Early Grading GESC Drawings, and Temporary Stockpile GESC Drawings are described in Section 3.20.

Appendix G summarizes the drawing requirements in a checklist format. This checklist must be filled out, signed, stamped by the Design Engineer, and submitted with the GESC Drawing to ensure that each of the requirements is addressed.

All GESC Drawings, which are also required for off-site borrow or disposal areas, shall be prepared on 22” by 34” or 24” by 36” sheets at a scale of 1-inch to 20-feet up to 1-inch to 200-feet, as appropriate, to clearly show sufficient detail for review. An example set of GESC Drawings for Staged/Phased permits is provided in Appendix C.

As discussed in Section 2.2, GESC Drawings shall be signed and stamped by the Design Engineer. Only the drawing sets submitted for final acceptance need to be signed and stamped (See Section 4.6).

3.18.1 GESC Drawing Cover Sheet. A separate cover sheet is required for all GESC Plans. It shall include the following:

1. Project name.
2. Project address (if applicable).
3. Owner address.
4. Design firm’s name and address.
5. Plan sheet index.
6. Design Engineer’s Signature Block.
7. The following note:

> THE ***GRADING, EROSION AND SEDIMENT CONTROL PLAN*** INCLUDED HEREIN IS ON FILE AT THE TOWN OF CASTLE ROCK AND APPEARS TO FULFILL APPLICABLE TOWN OF CASTLE ROCK GRADING, EROSION AND SEDIMENT CONTROL CRITERIA, AS AMENDED. ADDITIONAL GRADING, EROSION AND SEDIMENT CONTROL MEASURES MAY BE REQUIRED OF THE PERMITTEE(S) DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED GESC PLAN DOES NOT FUNCTION AS INTENDED. THE REQUIREMENTS OF THIS GESC PLAN SHALL RUN WITH THE LAND AND BE THE OBLIGATION OF THE PERMITTEE(S) UNTIL SUCH TIME AS THE GESC

Standard GESC Plan Drawing Requirements, continued

PLAN IS PROPERLY COMPLETED, MODIFIED OR VOID-ED.

8. GESC Drawing Design Engineer's signature block with name, date, and Professional Engineer registration number. Signature block shall include the following note:

   THE ***GRADING, EROSION AND SEDIMENT CONTROL PLAN*** INCLUDED HEREIN HAS BEEN PREPARED UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH THE REQUIREMENTS OF THE *GRADING, EROSION, AND SEDIMENT CONTROL (GESC) MANUAL* OF THE TOWN OF CASTLE ROCK, AS AMENDED.

9. Town Acceptance Block (see Appendix F).

10. General Location Map at a Scale of 1-inch to 1000- feet to 8000-feet indicating:

    - General vicinity of the site location.
    - Major roadway names.
    - North arrow and scale.

3.18.2 GESC Drawing Index Sheet. For projects that require multiple plan-view sheets to adequately show the project area (based on the specified scale ranges), a single plan-view sheet shall be provided at a scale appropriate to show the entire site on one sheet. Areas of coverage of the multiple blow-up sheets are to be indicated as rectangles on the index sheet.

3.18.3 Initial GESC Drawing. This plan sheet shall provide grading, erosion and sediment controls for the initial clearing, grubbing and grading of a project. At a minimum, it shall contain:

1. Property Lines.
2. Existing and proposed easements.
3. Existing topography at one- or two-foot contour intervals, extending a minimum of 100 feet beyond the property line.
4. Location of any existing structures or hydrologic features within the mapping limits.
5. USGS Benchmark and note that NAVD88-Datum was used for project.
6. Limits of construction encompassing all areas of work, access points, storage and staging areas, borrow areas, stockpiles, and utility tie-in locations in on-site and off-site locations. Stream corridors and other resource areas to be preserved and all other areas outside the limits

Standard GESC Plan Drawing Requirements, continued

of construction shall be lightly shaded to clearly show area not to be disturbed.

7. Location of stockpiles, including topsoil, imported aggregates, and excess material.
8. Location of storage and staging areas for equipment, fuel, lubricant, chemicals (and other materials) and waste storage.
9. Location of borrow or disposal areas.
10. Location of temporary roads.
11. Location, map symbol, and letter callouts of all initial erosion and sediment control BMPs.
12. Information to be specified for each BMP, such as type and dimensions, as called for in the Standard Notes and Details.
13. The following note:
    SEE COVER SHEET OF TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS FOR LEGEND OF BMP NAMES AND SYMBOLS.
14. Town of Castle Rock approval block.
15. Other information as may be reasonably required by the Town of Castle Rock.

3.18.4 Interim GESC Drawing. This plan sheet shows BMPs to control grading, erosion and sediment during the initial overlot grading, site construction and site revegetation process. At a minimum, it shall contain the following information:

The Interim GESC Drawing shall show all the information included on the Initial GESC Drawing, as noted below:

1. Existing topography at one- or two-foot contour intervals extending a minimum of one hundred (100) feet beyond the property line, as shown on Initial GESC Drawing. **These contours shall be screened.**
2. Location of all existing erosion and sediment control measures on site, as shown on the **Initial** GESC Drawing Sheet. **These control measures shall be screened. Dimension information for initial stage BMPs shall not be shown.**
3. Items 1, 2, and 4 through 10 from the Initial GESC Drawing (see Section 3.18.3).

In addition, the Interim GESC Drawing shall include the following:

4. Proposed topography at one- or two-foot contour intervals, showing elevations, dimensions, locations, and slope of all proposed grading.
5. Outlines of cut and fill areas.
6. Location of all interim erosion and sediment controls, designed in

Standard GESC Plan Drawing Requirements, continued

conjunction with the proposed site topography, but also considering the controls designed in the Initial GESC Drawing.

7. Location of all buildings, drainage features and facilities, paved areas, retaining walls, cribbing, water quality facilities, or other permanent features to be constructed in connection with, or as a part of, the proposed work, per approved plat, Final Planned Development Site Plan (FPDSP), or other improvement plan.
8. The following notes:
   - SEE COVER SHEET OF TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS (SHEET 1 OF 14) FOR LEGEND OF BMP NAMES AND SYMBOLS.
   - SHADED BMPS WERE INSTALLED IN INITIAL STAGE AND SHALL BE LEFT IN PLACE IN INTERIM STAGE UNLESS OTHERWISE NOTED.
   - SEE PUBLIC IMPROVEMENT CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES SUCH AS DETENTION FACILITIES, WATER QUALITY FACILITIES, CULVERTS, AND STORM DRAINS.
9. Summary of cut and fill volumes showing how earthwork balances on site.
10. Town of Castle Rock acceptance block.
11. Design Engineer sign-off block.

3.18.5 Final GESC Drawing. This plan sheet shows controls for final completion of the site. At a minimum, this plan sheet shall contain the indicated information:

The Final GESC Drawing shall include all information shown on the Initial and Interim Plans, as noted below:

1. Existing topography in areas of proposed contours need not be shown.
2. Existing Initial and Interim BMPs shall be shown (**screened**). Dimension information shall not be shown.

In addition, the following information shall be shown:

3. Directional flow arrows on all drainage features.
4. Any Initial or Interim BMPs that are to be removed and any resulting disturbed area to be stabilized.
5. Location of all Final erosion and sediment control BMPs, permanent landscaping, and measures necessary to minimize the movement of sediment off site until permanent vegetation can be established.
6. Show area of buildings, pavement, sod, and permanent landscaping (define types) per approved plat, FPDSP, SIA, or other improvement plan or agreement.
7. Show seeding and mulching (SM) everywhere except buildings, pavement areas and permanent landscaping areas.

Standard GESC Plan Drawing Requirements, continued

8. Show other BMPs considered by the Designer Engineer to be appropriate.
9. Show the following BMPs to be removed at the end of construction:
   - dewatering (DW)
   - temporary stream crossings (SC)
   - stabilized staging area (SSA)
   - vehicle tracking control (VTC)
   - construction fence (CF)
10. Include the following notes:
    - SEE COVER SHEET OF THE TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS FOR LEGEND OF BMP NAMES AND SYMBOLS.
    - SHADED BMPS WERE INSTALLED IN INITIAL OR INTERIM GESC DRAWING AND, UNLESS OTHERWISE INDICATED, SHALL BE LEFT IN PLACE UNTIL REVEGETATION ESTABLISHMENT IS APPROVED BY THE TOWN.
    - SEE PUBLIC IMPROVEMENT CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES SUCH AS DETENTION FACILITIES, WATER QUALITY FACILITIES, CULVERTS, AND STORM DRAINS
11. Town of Castle Rock acceptance block.
12. Other information as may be reasonably required by the Town of Castle Rock.

3.18.6 GESC Plan Standard Notes and Details. A copy of the GESC Drawing Standard Notes and Details (included in Appendix B) shall be provided with each set of GESC Drawings.

3.18.7 GESC Drawing and Report Checklist. A copy of a GESC Drawing and Report Checklist is provided in Appendix G. It must be completely filled out, signed and stamped by the PE, and submitted with the GESC Drawing.

3.18.8 Drawing Requirements for Small Site and Utility GESC Drawings. These Drawing requirements are the same as for GESC Staged/ Phased Permit, although the erosion and sediment controls for the Initial, Interim, and Final Stages of construction may be shown on a single drawing, as long as this can be accomplished clearly.

3.18.9 Drawing Requirements for Staged and Phased GESC Drawings. GESC Drawing requirements for Staged and Phased GESC Drawings are the same as for Staged Plans, except that each phase of construction (less than 40 acres of disturbance, or 70 acres for overexcavation projects) shall be shown separately (with Initial, Interim, and Final stages shown on individual sheets).

Standard GESC Plan Drawing Requirements, continued

3.18.10 Submittal Requirements for Related Plans. GESC Drawing requirements for Temporary Batch Plant GESC Drawings, and Stand-alone GESC Drawings are described in Section 3.20.

Standard GESC Report Requirements

3.19

A GESC Report is required for all projects that require a GESC Permit.

3.19.1 GESC Projects that require a CDPHE General Permit. For GESC Projects that are also required to obtain a General Permit for the CDPHE, the State required Stormwater Management Plan (SWMP) can be utilized as the GESC Report as long as the below listed information is provided with the SWMP. Specific requirements for the development of the SWMP can be found on the CDPHE web site.

Projects that utilize the SWMP as the GESC Report shall provide the Town with the following information that may not be included in the SWMP.

1. Opinion of probable cost for installation of BMPs—An opinion of probable costs for erosion and sediment control, including anticipated maintenance during the construction phase, shall be submitted with the GESC Drawing(s). This will be reviewed by Town staff and used as a basis for Fiscal Surety (discussed in Section 4.10 of this GESC Manual).
2. Areas and Volumes—An estimate of the quantity (in cubic yards) of excavation and fill involved (showing earthwork balance), and the surface area (in acres) of the proposed disturbance.
3. Calculations—Any calculations made for the design of such items as sediment basins or erosion control blanket selection.

3.19.2 GESC projects that do not required a CDPHE General Permit. For GESC Projects that are not required to obtain a General Permit from the CDPHE, the applicant shall submit a GESC Report that contains the below information:

1. <u>Name, address, and telephone number of the applicant</u> – The name, address, and telephone number of the Design Engineer preparing the GESC Plan shall also be included, if different from the applicant.

2. <u>Project description</u> – A brief description of the nature and purpose of the land-disturbing activity, the total area of the site, the area of disturbance involved, related project reference, and project location

Standard GESC Report Requirements, continued

including township, range, section and quarter-section.

3. Existing site conditions – A description of the existing topography, vegetation, and drainage; a description of any wetlands on the site; and any other unique features of the property.
4. Adjacent areas – A description of neighboring areas such as streams, lakes, residential areas, roads, etc., which might be affected by the land disturbance.

5. Soils – A brief description of the soils on the site including information on soil type and names, mapping unit, erodibility, permeability, hydrologic soil group, depth, texture, soil structure, and construction limitations. (This information may be obtained from the soil report for the site, for adjacent sites if acceptable to the Town, or the applicable Soil Survey prepared by the Natural Resources Conservation Service (NRCS)).

6. Areas and Volumes – An estimate of the quantity (in cubic yards) of excavation and fill involved (showing an earthwork balance), and the surface area (in acres) of the proposed disturbance.

7. Erosion and sediment control measures – A description of the methods presented in this *GESC Manual* that will be used to control erosion and sediment on the site.
8. Timing/Phasing schedule – A schedule indicating the anticipated starting and completion time periods of the site grading and/or construction sequence, including the installation and removal of erosion and sediment control BMPs. Indicate the anticipated starting and completion time periods of individual project phases.

9. Permanent stabilization – A brief description, including applicable specifications, of how the site will be stabilized after construction is completed.

10. Stormwater management considerations – Explain how stormwater runoff from and through the site will be handled during construction.

11. Maintenance – Any special maintenance requirements over and above what is identified in the standard notes and details.

12. Opinion of probable cost for installation of BMPs – An opinion of probable costs for erosion and sediment control, including anticipated maintenance during the construction phase, shall be submitted with the GESC Plan. This will be reviewed by Town staff and used as a basis for Fiscal Surety (discussed in Section 4.9 of this *GESC Manual*).

Standard GESC Report Requirements, continued

A hardcopy of a spreadsheet that shall be used for preparing the opinion of probable costs for erosion and sediment control is included in Appendix I.

13. Calculations – Any calculations made for the design of such items as sediment basins/traps, channels, outlets, riprap aprons or erosion control matting selection.

14. Other information or data – As may be reasonably required by the Town of Castle Rock.

15. The following note – "THIS *GRADING, EROSION AND SEDIMENT CONTROL PLAN* HAS BEEN PLACED ON FILE AT THE TOWN OF CASTLE ROCK AND APPEARS TO FULFILL THE APPLICABLE TOWN OF CASTLE ROCK *GRADING, EROSION AND SEDIMENT CONTROL* CRITERIA. ADDITIONAL GRADING, EROSION AND SEDIMENT CONTROL MEASURES MAY BE REQUIRED OF THE OWNER OR HIS/HER AGENTS, DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT FUNCTION AS INTENDED. THE REQUIREMENTS OF THIS PLAN SHALL RUN WITH THE LAND AND BE THE OBLIGATION OF THE LAND OWNER, OR HIS/HER DESIGNATED REPRESENTATIVE(S) UNTIL SUCH TIME AS THE PLAN IS PROPERLY COMPLETED, MODIFIED OR VOIDED."
16. Signature Page For owner/developer acknowledging the review and acceptance of responsibility, and a statement by the Design Engineer acknowledging responsibility for the preparation of the GESC Plan.

Submittal Requirements for Related Plans

3.20

3.20.1 Submittal Requirements for Temporary Batch Plant/GESC Drawings. Submittal requirements for Temporary Batch Plant GESC Drawings are as follows:

- A GESC Drawing for the site in accordance with the requirements found in this *GESC Manual*. The Batch Plant GESC Drawing shall comprise two plan sheets, an Initial and Final GESC Drawing (example plans are shown in Appendix D). The Initial Plan shall utilize at a minimum the following BMPs:
    - Sediment Basin (3.17.10) at the low point on the site;
    - Diversion Ditch (3.17.6) to route all stormwater runoff to the sediment basin;
    - Vehicle Tracking Control pad (3.17.20) at each entrance and exit;
    - A Stabilized Staging Area/stabilized driving surface (3.17.16) from Vehicle Tracking Control pads to the silo chute; and
    - Limits of construction.

Submittal Requirements for Related Plans

The Final GESC Drawing shall include site clean up, regrading and revegetation and any additional temporary erosion and/or sediment controls.

- A narrative report describing: purpose of plant, proposed schedule of operation, including days and times, duration of plant operations, anticipated daily trip generation, and maximum gross vehicle weight (GVW) of hauling units.
- A posting of Fiscal Surety (see Section 4.9) for the installation and maintenance of the temporary erosion and sediment control and site reclamation.
- A lease agreement from the property owner (if applicable).
- A copy of all associated State and Federal permits.
- All access points to or from a construction site must be shown on the GESC Plans and reviewed and approved as part of the GESC Permit. No ramps of dirt, gravel, asphalt, wood, or other materials are allowed in the curb section.

Entire section 3.20.3 needs to be moved after 3.20.2 (below). The sections are numbered correctly, just out of order.

3.20.3 Submittal Requirements for Temporary Stockpiles. The Town recognizes that circumstances may arise in the planning and phasing of a project that warrant the need for a temporary stockpile. Requests for Early Grading GESC Permits, specifically for temporary stockpiles, must include application for a variance (see Section 3.22) using the standard variance process through Development Services. The variance shall address the following, at a minimum:

- Reason for variance.
- Amount of material to be stockpiled.
- Documented compliance with zoning and land-use regulations and written authorization from landowner.
- The general configuration of the temporary stockpile in accordance with Section 3.13.6.
- Authorization for Haul Route Application through Public Works.
- Drainage letter in lieu of a Phase II Drainage Report quantifying impacts to historic drainage patterns and applicable mitigation measures, prepared and signed by a Professional Engineer.
- Maintenance agreement during and after the revegetation process (Fiscal Surety may be required for the duration of the temporary stockpile.)

New paragraph in 3.20.3: If the variance is accepted, GESC Drawings shall be prepared for the export site in accordance with the *GESC Manual,* and applicable permits, fees and fiscal

3.20.2 Submittal Requirements for Early Grading GESC Permits. As discussed in Section 2.5.1, the Town of Castle Rock generally discourages requests for Early Grading ~~Permits~~ GESC ~~Drawing reviews, followed by applications for a GESC Permit~~, separate from and in advance of an "Entire Project" approval.

("Entire Project" refers to all documents, processes and hearings that are required by the Town of Castle Rock for a complete project submittal and approval.)

Submittal Requirements for Related Plans, continued

However, the Town of Castle Rock recognizes the fact that there may be an occasional circumstance where consideration may be made to accept an application for a GESC Permit in advance of the entire project acceptance, if the proposed grading is part of a site improvement or development project subject to additional submittal requirements and processes. Such a request is not generally preferred by the Town of Castle Rock, and it should not be considered to be a standard of practice.

The following considerations may be weighed in the determination to accept or deny an application for Early Grading GESC permit:

- If the anticipated entire project approval will occur in less than four weeks.
- If it is recognized that the entire project is just beginning the review process.
- If GESC Permit applications are considerably ahead of the formal Public Improvement Construction Drawings.
- If requests to begin grading in advance of the entire project approval are for an area less than five acres.
- The necessity for and approval of a Construction Permit through the Public Works Department for grading operations.
- The need for an administrative GESC Permit extension, Field Change Order or separate Permit and applicable inspection fee at the time of entire project approval.

If circumstances warrant this special consideration, a formal request shall be made to the Town. If the request is accepted a Early Grading GESC Drawing shall be submitted for review and acceptance. The Early Grading GESC Drawing Submittal shall include, but not be limited to, each of the following items:

- A detailed explanation why special consideration should be given to a request to begin grading in advance of acceptance of the entire project. The request will not be considered if the Applicant has failed to plan appropriately for the required processing time, or if there are repeated plan submittals resulting from poor plan preparation and/or failures to comply with Town standards.
- Payment of all review fees.
- A Early Grading GESC Drawing Set shall be submitted on 22” x 34” or 24” x 36” sheets containing a cover sheet, plan sheets, Town-approved details and notes per the Town of Castle Rock GESC Manual, and shall be signed and stamped by a Colorado Registered Professional Engineer.
- Submittal of a Phase II Drainage Report.
- Approval of a Construction Permit for grading operations, as applicable.

Submittal Requirements for Related Plans, continued

- Submittal of a "Hold Harmless" letter shall be provided with the written explanation for the GESC Permit request.

The review schedule for a Early Grading GESC Drawing is the same as required when a GESC Drawing is submitted as a part of the entire project. The initial review period will begin when the construction plans are submitted to the Town of Castle Rock. A new GESC Drawing and applicable review and inspection fees may be required at the time of full submittal.

BMP Cost Issues

3.20.4 Submittal Requirements for Permanent Drainage Facilities. Construction drawings and a Phase III Drainage Report shall be submitted in accordance with Town requirements for any permanent drainage or water quality facilities as part of the Public Improvement Construction Drawings. The design of permanent drainage facilities shall be accepted prior to issuing a Standard GESC Permit. At a minimum, a Phase II Drainage Report shall be approved prior to issuing an Early Grading GESC Permit.

3.21

Costs associated with grading, erosion, and sediment control BMPs include the following:

1. Installation of the BMPs indicated on the Initial, Interim, and Final GESC Drawings according to the number, types, dimensions, and quantities called for.
2. Provision of GESC Manager (see Section 5.1 for a description of the GESC Manager role) to supervise, inspect, and interface with the Town on the project's GESC Drawing.
3. Installation of additional BMPs that the Permittee(s) think are appropriate or that are called for by the GESC Inspector to address actual site conditions. (As stated in Section 1.7, the GESC Permit process is a dynamic, not static, process; the Permittee(s) are responsible for adapting the original GESC Drawing as necessary to effectively reduce erosion and sediment, and must comply with any modifications to the plan required by the GESC Inspector.)
4. Maintenance costs for BMPs. Maintenance costs will vary based on many factors, including the magnitude and number of storm events occurring during the project.

Permittee(s) are required to provide an opinion of probable cost associated with implementing the GESC Drawing. Appendix I provides approximate unit cost information that shall be used to generate a cost opinion.

Variances

3.22

The Town of Castle Rock may consider modifying criteria that are deemed inappropriate or too restrictive for site conditions. Variances

Variances, continued

Important! ***Variances requested after the work has been completed shall not be considered.***

may be granted at the time of plan submission or request for plan revision prior to the work being completed in the field. Variances requested after the work has been completed shall not be considered.

3.22.1 Variance Submittal Requirements. Any request for a variance shall be in a separate letter addressed to the Town Development Review Manager and copy the Stormwater Manager. The letter shall define:

- The criteria from which the applicant seeks a variance.
- The justification for not complying with the criteria.
- Alternate criteria or standard measures to be used in lieu of these criteria. The criteria and practices specified within this section of the *GESC Manual* relate to the application of specific erosion and sediment control practices. Other practices or modifications to specified practices may be used if approved by the Town of Castle Rock prior to installation. Such practices must be thoroughly described and detailed.

3.22.2 Approval of Variances. Variances shall be considered by the Utilities Department and require approval by the Utilities Director or designee.

Overview of Section 4

4.0

Section 4 addresses Steps 5 through 7 in the GESC Permit Process:

Permit Step 5: Submit the GESC Plan and related plans and permits to the Town for review and acceptance and revise documents as necessary to address Town comments.

Section 4.1, ***Submittal of the GESC Plan****, describes procedures for submitting a GESC Plan.*

Section 4.2, ***Completeness Check****, states that GESC Plans will be checked for a basic level of completeness and returned if incomplete without receiving a detailed review.*

Section 4.3, ***Detailed Review by Town Staff****, discusses the Town's review of GESC Plans based on the criteria presented in Section 3.*

Section 4.4, ***Review Schedule****, summarizes typical review schedules.*

Section 4.5, ***Revisions to Plan Based on Town Comments****, discusses the Design Engineer's revisions to the GESC Plan based on the Town's comments.*

Permit Step 6: After Town acceptance of the GESC Plan, submit the drawings for signatures.

Section 4.6, ***Preliminary Acceptance of the GESC Plan****, describes submittal requirements for the GESC Drawings to obtain the signatures of the Town.*

Section 4.7, ***Final Acceptance of the GESC Plan,*** *describes the Town signing and copying process for the GESC Plan.*

Permit Step 7: When ready, apply for a GESC Permit by submitting the GESC Plan copies, GESC Permit application, Fee and Fiscal Surety.

Section 4.8, ***Applying for a GESC Permit****, discusses filling out the GESC Permit Application Form and what the applicant must submit with the application.*

Section 4.9, ***Permit Fees****, covers procedures for paying permit fees.*

Section 4.10, ***Posting Fiscal Surety****, discusses acceptable forms and amounts of Fiscal Surety.*

Section 4.11, Section Removed.

Section 4.12, ***Duration of GESC Permit****, discusses the duration of GESC Permits and the need to renew GESC Permits prior to expiration.*

Section 4.13, ***Transfer of GESC Permits,*** *describes procedures for transferring a GESC Permit the Permittee(s) changes during the life of a GESC Permit..*

Permit Step 5: Submit the GESC Plan and related plans and permits to the Town for review and acceptance and revise documents as necessary to address Town comments.
Sections 4.1 through 4.5 discuss Step 5.

Submittal of the GESC Plan

4.1

After the GESC Plan has been prepared according to the requirements of Section 3, the drawings and report, along with the related plans and permits discussed in Section 2, shall be reviewed in a presubmittal meeting with the Development Services Department.

The GESC Plan shall not be accompanied by the GESC Permit Application Form, Fee, or Fiscal Surety at this time; these documents shall be submitted only after the GESC Plan is reviewed and accepted.

Completeness Check

4.2

During the presubmittal meeting, the Town shall pre-review the GESC Plan for completeness based on the submittal requirements described in Section 3. Any submittal that does not reflect a basic level of completeness shall be returned to the Design Engineer. This process shall be repeated until a complete GESC plan set is submitted to the Town. The review period on a GESC Plan shall not start until a complete GESC plan set is submitted.

GESC Plans will undergo a completeness check.

Information

Any incomplete submittal shall be returned to the Design Engineer. This process shall be repeated until a complete plan set is submitted to the Development Services Department, and then a detailed review shall start.

Detailed Review by Town Staff

4.3

The GESC Plan will be reviewed with an eye toward the effectiveness of the overall Plan. The appropriateness, timing, and placement of the proposed erosion and sediment controls will be reviewed.

After review, written comments and/or redlines will be provided to the applicant.

After passing the completeness check, GESC Plans will receive a detailed review by Town staff.

Review Schedule

4.4
Written review comments and/or redlines will be provided by the Town in a timely manner. Comments on resubmittals are also provided in a timely manner after the Town receives the revised plans and the summary of how previous comments were addressed.

The length of time required to achieve final Town acceptance is directly related to the level of accuracy, concurrence with the Town of Castle Rock design and construction criteria and standards, and the thoroughness of addressing written review comments.

Revisions to Plan Based on Town Comments

4.5
GESC Plan review comments are to be addressed by the applicant and the revised GESC Plan resubmitted to the Town for a follow-up review.

The applicant shall submit a letter or memorandum with the revised GESC Plan summarizing how each review comment was addressed.

If review comments are not addressed, the GESC Plan will not be accepted

Applicants are encouraged to call or meet with Town staff to discuss any questions they have regarding the Town's review comments or the applicant's proposed responses prior to resubmitting the GESC Plan. This may help to resolve issues quickly and avoid multiple reviews and resubmittals.

Information
Additional review fees shall be charged for each resubmittal starting with the third resubmittal.

Permit Step 6: After Preliminary Acceptance of the GESC Plan, submit the GESC Drawings for signatures.
Sections 4.6 through 4.7 discuss Step 6.

Preliminary Acceptance of the GESC Plan

4.6
When all GESC Plan review comments are addressed, the Applicants will be notified by the Town that the GESC Plan is preliminarily accepted (final acceptance occurs when the GESC Drawings are submitted to the Town and signed by the Utilities and Development Services Departments).

The set of GESC Drawings shall be signed and stamped by a Professional Engineer registered in the State of Colorado.

Final Acceptance of GESC Plan

4.7

Signed GESC Drawings. The GESC Plan will be considered accepted when signed by the Utilities and Development Services Departments. Applicants will be notified by the Town when the GESC plans have been signed and are ready to be picked up for the applicant to make copies.

The applicant will return the originals along with one 11" x 17" set, one copy of the GESC Report and an electronic copy of the scanned approved drawings when applying for the GESC Permit. The applicant should make additional copies for their use, including for the GESC Manager.

GESC Plans are considered valid for one year following the signature date if construction has not commenced. After this time, GESC Plans will need to be resubmitted to the Town for re-review and re-acceptance.

Applying for a GESC Permit

4.8

Once the Town has notified the Applicant that the GESC Plan is accepted, the Applicant may apply for a GESC Permit. The information required on the Temporary Batch Plant or Standard GESC Permit Application shall be filled out and the Form shall be signed by personnel who are legally authorized to sign on behalf of the company, corporation, entity, or organization.

Permit Step 7: When Ready, Apply for a GESC Permit by submitting the GESC Plan copies, GESC Permit Application, Fee and Fiscal Surety.
Sections 4.8 through 4.13 discuss Step 7.

Copies of the Temporary Batch Plant and Standard GESC Permit Applications are provided in Appendices J and K, respectively.

When the GESC Plan is accepted by the Town and copies have been made of the plan and the GESC Report, the applicant shall submit the following to obtain a GESC Permit.

If necessary, the Applicant must also apply for a Bulk Water Permit from the Town Utilities Department.

1. *One 11" x 17" copy of the approved GESC Drawings, an electronic copy of the scanned approved drawings, one signed GESC Report, Flood Plain Permit, and an approved copy of the Drainage Report.*
2. *Original approved GESC Drawings.*
3. *Completed GESC Permit Application (see Appendices J and K).*
4. *Permit fees paid in accordance with Section 4.9.*
5. *Fiscal Surety provided in accordance with Section 4.10.*

Permit Fees

4.9
Permit fees are to be paid to the Permit Clerk at the Development Services Department of the Town. Fees may be paid by check, cash or credit card. Fees for a GESC Permit consist of a fee based on the estimated cost of the work, and calculated based on the Development Fee Schedule, as amended and are collected to offset costs of administrating the GESC Program. These fees shall be paid with the submittal of the Permit Application and other documents shown in Section 4.8.

Posting Fiscal Surety

4.10
4.10.1 General. The Town of Castle Rock requires that all projects requiring a Temporary Batch Plant or Standard GESC Permit, as well as some projects requiring a Low Impact GESC Permit, post Fiscal Surety.

The conditions under which the GESC Fiscal Surety is held is separate from any other surety relating to the project site's Public Improvement Construction Plans, or any other permits relating to the site and may be held and released separately.

4.10.2 Amount of Fiscal Surety. The amount of Fiscal Surety for a GESC Permit is based on the probable cost of installing erosion and sediment controls required on a site. A copy of a worksheet to be used for preparing the opinion of probable costs for erosion and sediment control is included in Appendix I.

The probable cost worksheet shall be completely filled out and submitted as part of the GESC Report (see Section 3.19 for GESC Report requirements). The probable cost worksheet will be reviewed for acceptance by the Town of Castle Rock.

4.10.3 Forms of Fiscal Surety. The Town of Castle Rock accepts three different forms of Surety:

1. *Cash or check*
2. *Irrevocable Letter of Credit*
3. *Performance bond*

Financial institutions have varying guidelines for cashier's checks; the Applicant is advised to contact their financial institution to learn their regulations regarding cashier's checks.
Non-certified funds will need to clear the financial institution prior to issuance of a GESC Permit. Cash deposits will be held in a non-interest-bearing account.

The conditions of each form of Surety shall allow for the Surety to be held by the Town for a minimum of two (2) years. The two-year period

should allow for completion of all GESC and Site Improvement Plan requirements, including two growing seasons to allow time for revegetation to reach the required coverage (see Section 6.4). Information regarding the release of Fiscal Surety is provided in Section 6.8.

4.10.4 Expiration of Fiscal Surety. If the construction of the project and/or revegetation process takes longer than two 2 years, the Permittee shall extend the Fiscal Surety a minimum of fourteen (14) days prior to the expiration date. Failure to extend the Fiscal Surety, for a minimum of one (1) additional year, prior to the fourteen (14) day deadline shall result in the Town drawing upon the Fiscal Surety.

4.11 Section Removed.

Duration of GESC Permits

4.12

A GESC Permit is valid for a three (3) year period (one year active construction and a two year growing period for revegetation). In the event that active construction exceeds one year, the GESC Permit must be renewed.

Permittee(s) shall have a valid GESC Permit until all lots of a project are transferred to the Town's DESC Program for residential construction or until Final Close-out Acceptance (after vegetation is established).

Transfer of GESC Permits

4.13

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 Form, payment of a transfer fee, new Fiscal Surety (if new Owner), and another Preconstruction Meeting on site (the Preconstruction Meeting is discussed in Section 5.4). Failure to transfer the GESC Permit if the Owner or Contractor changes will result in issuance of a Stop Work Order and /or suspension of building permits, per Section 5.10. Projects that have transferred ownership without a new GESC Permit and Fiscal Surety within thirty (30) days of the sale of the property are subject to Default per Section 6.9.1.

Residential Projects. At the time of initial close-out acceptance, and prior to final closeout acceptance, projects that have been sold to one or more owners for the purpose of residential construction, the GESC Permit shall be transferred as follows:

- GESC Permit responsibility within empty lots and the protection of all downstream drainage systems becomes the responsibility of the new property owner(s). Prior to the issuance of any building permits, the new property owner(s) shall obtain a new GESC Permit and post a new Fiscal Surety in the amount of the original engineer's opinion of probable costs associated with the lots and protection of the MS4.

- GESC Permit responsibility within common areas including private open space tracts, public land dedications, drainage tracts, utility tracts and the like shall remain with the permittee(s) unless otherwise stated in the Developer Agreement or Subdivision Improvement Agreement until final close-out acceptance (after vegetation is established). Upon receipt of new Fiscal Surety(ies) covering all residential lots under separate ownership, the original permittee's Fiscal Surety may be reduced to the amount of the engineer's opinion of probable costs associated with these areas only.

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 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 Town 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 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 sediment and comply with any modifications to the Plan as required by the Town of Castle Rock.

Step 9. Install the Initial BMPs as shown on the accepted GESC Drawings and schedule a Preconstruction Meeting with the Town three 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 Traffic Control Plan approval 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 Town 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 Town, 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 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 Town'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 Town have the responsibility to review, understand, and comply with the general GESC Notes shown on Sheet 1 of the Town of Castle Rock GESC Plan Standard Notes and Details, included in Appendix B. This section highlights several of the Town'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 Town are scheduled by Permittee(s) and completed, and that corrections requested by the Town during these or any inspections are made.

*Section 5.9, **Town GESC Inspection Process**, discusses Inspection related to the Town 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 three 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.*
- *Apply to have GESC Permit reinstated and pay the GESC Permit fee at the Town of Castle Rock Development Services Department.*
- *Schedule a site inspection with the GESC Inspector through the Utilities Department.*
- *Obtain the reinstated GESC Permit after approval of the corrected work from a GESC 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 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 is the Permittee(s)' contact person with the Town 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 the Town 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 Town with a 24-hour emergency contact number. In the event 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), a Stop Work Order shall be issued.

5.1.4 Changing the GESC Manager or Alternate. Notification in writing shall be provided to the Town if the GESC Manager or Alternate leaves the company or the Permittee(s) intend to change personnel. A field meeting with the GESC 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 GESC 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 Town offices to pay a reinstated GESC Permit fee or reinspection fee.*

5.2.3 Review of the GESC Manual, GESC Plan, and Related Plans and Permits. Prior to the Preconstruction Meeting, the GESC Manager shall thoroughly review the GESC 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.

The Town of Castle Rock 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 the site at all times. Once the GESC Permit is obtained, it shall remain on 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 Town three days in advance of the meeting.
Section 5.3 discusses Step 9.

Preparation for the Preconstruction Meeting

5.3

5.3.1 Traffic Control Plans. Obtain approval of a Traffic Control Plan, as outlined in the *Public Works Regulations,* as amended. All access points to or from a construction site as approved in the GESC Plans must comply with the terms of the permit. 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 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 Town to install the Initial BMPs, other than receiving the signed GESC Drawings. However, all of the requirements of the GESC 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 the Town of Castle Rock Development Services Department (see contact information in Appendix A) to obtain acceptance of the proposed modifications prior to installing the BMPs.

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

5.3.3 Construction Shall Not Start. Other than the installation of the Initial BMPs shown on the GESC Plan, no stripping operations, haul

Preparation for the Preconstruction Meeting, continued

road grading, or other construction shall occur.

5.3.4 Scheduling the Preconstruction Meeting. The Permittee(s) shall contact the Town of Castle Rock Utilities Department (see contact information in Appendix A) to schedule the on site Preconstruction Meeting. Three business days notice (not including Saturdays and Sundays) shall be provided to schedule the meeting.

For instance, if the call to the Town takes place before 3:30 p.m. on a Monday, the Preconstruction Meeting can be scheduled for the next Thursday. If the call to the Town takes place before 3:30 p.m. 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 GESC and Public Works Inspectors, the following representatives shall attend:

1. **Owner or Owner's Representative** (the Contractor may **NOT** be the owner's representative)
2. **General Contractor**
3. **GESC Manager** and **Alternate GESC Manager** (one or both may be the same as the Owner or General Contractor Representative).
4. **Grading Sub-Contractor**, if different than the General Contractor.
5. **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 Town or the Permittee(s) determine that modifications to the GESC Plan are necessary).

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 if the installation of the Initial BMPs is not approved by the GESC Inspector, the meeting shall be rescheduled and the applicant will be assessed a reinspection fee. The fee shall be paid at the Town of Castle Rock Development Services Department prior to scheduling another Preconstruction Meeting.

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

Preconstruction Meeting, continued

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 Manual**. The GESC Inspector will confirm the Permittee(s)' understanding of the GESC Manual.
4. **Field Review of GESC Drawings**. The GESC Drawings for all stages 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 GESC Inspector will confirm if any corrections are required.
6. **Acceptance of Initial BMPs**. If the Initial BMPs are accepted by the GESC Inspector, as is or with minor corrections, the GESC Inspector will inform the Permittee(s), sign the GESC Permit Application, and submit the GESC Permit Application to the Development Services Permit Clerk for processing. **Construction shall not start until an executed GESC Permit is obtained from the Town as described in Section 5.5.**
7. **Coordination with Public Works Inspector and Public Improvement Construction.** Discuss timing, scheduling, and any other coordination issues relating to the GESC and public improvement construction and permits.

5.4.3 Corrections to the BMPs. If the GESC Inspector determines that significant modifications or corrections to the BMPs are necessary, the GESC Inspector will inform the Permittees that such corrections shall be made, that a follow-up inspection shall be scheduled with the Town, and that acceptance of the corrected BMPs by the GESC 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). The re-inspection requires one-day notice (by 3:30 pm the weekday prior to the inspection) and shall be scheduled through the Utilities Department (contact information is listed in Appendix A).

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. The Town 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.

The Executed GESC Permit, continued

5.5.2 Duration of GESC Permit. A GESC Permit is valid for a three (3) year period (one year active construction and a two year growing period for revegetation). In the event that active construction exceeds one year, the GESC permit must be renewed. A GESC Permit shall be renewed prior to its expiration. The Permittee(s) shall contact the Town 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 all lots of a project are transferred to the Town's DESC Program *(Refer to Section 8 for Residential DESC Permitting)* for residential construction, or until Final Close-out Acceptance (after vegetation is established).

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 Surety (if new Owner), and an additional Preconstruction Meeting on site (the Preconstruction Meeting is discussed in Section 5.4). Failure to transfer the GESC Permit if the Owner or Contractor changes will result in issuance of a Stop Work Order per Section 5.10.3.

Start of Construction

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 GESC 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 area indicated on the GESC Drawings.

5.6.3 Topsoil Inspection. The Permittee(s) shall call the Utilities Department (see contact information in Appendix A) to schedule an inspection after the topsoil is stripped and stockpiled. Failure to strip, stockpile, and obtain an inspection from the GESC Inspector shall result in the issuance

Start of Construction, continued

of a Stop Work Order (see Section 5.10). If inadequate quantities of topsoil have been stockpiled (sufficient to replace at least 6-inches of topsoil in all areas to receive vegetation), the Permittee(s) shall import an adequate quantity of topsoil to the site. The Stop Work Order shall remain in place until adequate, acceptable topsoil is imported to the site.

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 Manual are complied with. *Section 5.7 and Section 5.8 discuss Step 12.*

Correct Installation and Maintenance of BMPs

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 the Town of Castle Rock.

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

5.7

The overall effectiveness of the GESC Plan depends on the correct installation and maintenance of BMPs. With this goal in mind, the Town has prepared the GESC Plan Standard Notes and Details, a 14 sheet set of drawings that identifies correct installation and maintenance procedures for all of the Town-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 Town. The Standard Notes and Details allow Design Engineers and Permittee(s) to become familiar with one set of BMPs and consistent installation and maintenance requirements. Following are brief descriptions of the standard erosion and sedi-

Correct Installation and Maintenance of BMPs, continued

ment control BMPs accepted for use in the Town 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.

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 GESC Manager shall inspect check dams 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 ½ of the height of the crest.

DON'T *This check dam was not keyed in adequately to the channel bank, leading to its failure.*

DON'T *This disturbed drainageway was not protected by a check dam at the downstream site perimeter, allowing sediment to be conveyed off site.*

DO *Properly installed check dam.*

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 I 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 Town-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 a 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.
- Compost Blanket and Filter Berms shall be inspected weekly and during and after and 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.

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

DO *A properly installed concrete washout area with Vehicle Tracking Control.*

DON'T *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 Town-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 Town, 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.*

Correct Installation and Maintenance of BMPs, continued

5.7.5 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:

- The GESC Manager shall obtain a construction discharge (dewatering) permit from the Colorado Department of Public Health and Environment prior to any State regulated dewatering operations. All dewatering shall be in accordance with the requirements of the discharge permit and shall be coordinated with the GESC Inspector.
- Dewatering operations shall use one or more of the dewatering sumps shown in the GESC Plan Standard Notes and Details or other means approved by the Town to reduce the pumping of sediment, and shall provide a temporary basin for settling pumped discharges prior to release off site.
- A 4' square riprap pad shall be placed at the discharge point.
- The discharge end of the line shall be staked in places to prevent the movement of the line off the riprap pad.
- The GESC Manager shall inspect dewatering systems and perform any necessary repairs or maintenance on an hourly basis.

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

5.7.6 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 GESC Manager shall inspect all diversion ditches 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.*

DON'T *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

5.7.7 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) for all blankets except 100% straw, which may use an overlapping joint.
- The GESC Manager shall inspect erosion control blankets 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

5.7.8 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 Sheet 14 of the GESC Plan Standard Notes and Details (1-1/2" minus).
- Wire mesh shall be fabricated of 10-gauge wire twisted into a mesh with a maximum opening of 1.0 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 one 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 ½ - 1" 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 fence.
- The GESC Manager shall inspect inlet protection weekly and during and after any storm event and make repairs or clean out as necessary. More frequent inspections and repairs shall be required during winter conditions due to freeze/thaw problems.
- Inlet protection is to remain in place until the upstream disturbed area is stabilized and grass cover approved, unless the Town 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.*

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

DO *Properly installed area inlet protection.*

STOP WORK

This inlet protection is overdue for sediment removal.

DON'T

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

DO

DON'T *No gaps shall exist between sections of reinforced rock berm.*

DON'T *Blocking the inlet opening or use of alternate materials for inlet protection is prohibited.*

DON'T

Correct Installation and Maintenance of BMPs, continued

5.7.9 Reinforced Check Dam (RCD). A reinforced check dam is a rock dam contained within a twisted wire gabion, designed to withstand over-topping, 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 D_{50} median stone size of 12".
- The GESC Manager shall inspect check dams weekly and during and after any storm event and make repairs or clean out as necessary.
- Sediment accumulated upstream of check dams shall be re-moved when the sediment depth upstream of check dam is within half (1/2) of the height of the crest.

DO

Reinforced check dams are required in major drainage-ways to resist breaching from overtopping flows.

Correct Installation and Maintenance of BMPs, continued

5.7.10 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 sheet 14 of the GESC Plan Standard Notes and Details.
- Wire mesh shall be fabricated of 10-gauge wire twisted into a mesh with a maximum opening of 1.0-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" higher than the center of the berm.
- The GESC Manager shall inspect reinforced rock berm 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 half (1/2) the height 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

5.7.11 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 Sheet 14 of the GESC Plan Standard Notes and Details.
- Wire mesh shall be fabricated of 10-gauge wire twisted into a mesh with a maximum opening of 1.0-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 GESC Manager shall inspect reinforced rock berm 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 half (1/2) the height 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

5.7.12 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 1-1/2-inch rock around the pipe outlet shall be provided.
- The GESC Manager shall inspect sediment basin 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 1.0-feet deep.

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

- A Public Works Permit shall be obtained prior to installing the permanent outlet works.
- At least one-half 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

5.7.13 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 and promotes sediment deposition on its upstream side and a reduction in flow velocities.

Key Installation and Maintenance Requirements:

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

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

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

DO *Sediment control logs shall be placed along a contour.*

Correct Installation and Maintenance of BMPs, continued

5.7.14 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 GESC Manager shall inspect the sediment trap 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

5.7.15 Seeding and Mulching (SM). Seeding and mulching consists of drill seeding disturbed areas with the approved Town of Castle Rock (same as 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:

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

- 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 six-inches prior to spreading topsoil. If quantities of on-site topsoil are inadequate to provide a replaced depth of six-inches, the Permittee(s) will need to import topsoil or amend the existing soil as approved by the Town of Castle Rock.

- Soil shall be thoroughly loosened (tilled) to a depth of at least six-inches prior to seeding. The top six-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 six-inches shall be rejected.

- Seed shall be applied using a mechanical drill to a depth of not less than 1/4-inch and not more than 3/4-inch. Row spacing shall be no more than 6-inches. In small areas that are impossible to drill seed, the Permittee(s), with the Town's prior approval, may hand broadcast seed at twice the drilled rate, lightly rake to cover the seed, and crimp mulch.

DO *With the Town's approval seed may be hand broadcast, at twice the drilled rate, raked and crimp mulched in small area where it is not possible to drill seed.*

- Material used for mulch shall consist of long-stemmed straw. At least 50 percent 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 4-inches. Mulch shall be applied at a rate of 4000-pounds of straw per acre.

- Copies of seed tickets shall be provided to the GESC Inspector upon request and include pure live seed (PLS) percentage.

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

- See Section 6.4.2 of the *GESC Manual* for a definition of required vegetation coverage.

Correct Installation and Maintenance of BMPs, continued

5.7.15 Seeding and Mulching (SM), continued.

- Seeding and mulching operations must be undertaken when a GESC Permit expires and no renewal is granted.

DON'T *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.* DO

DON'T *Hydraulic seeding/mulching is not allowed.*

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

Correct Installation and Maintenance of BMPs, continued

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

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.*

DON'T *The lower edge of this silt fence is not anchored in a backfilled trench.*

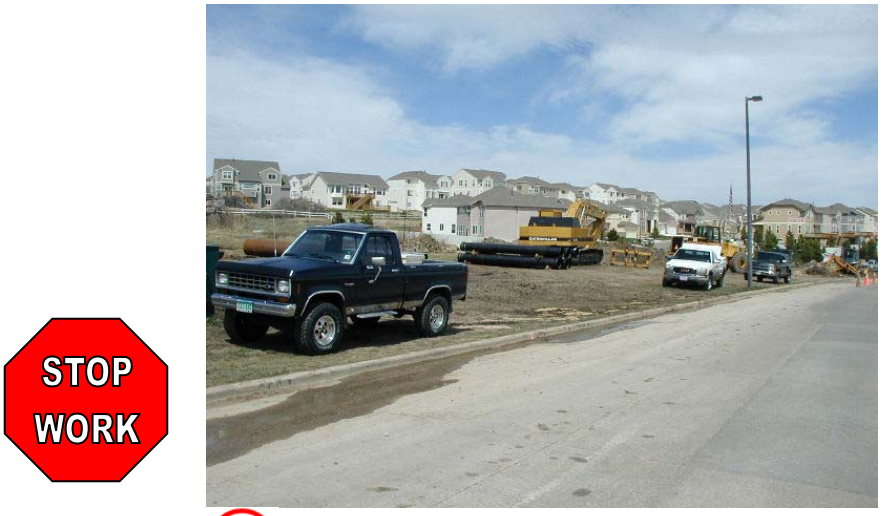
Correct Installation and Maintenance of BMPs, continued

5.7.17 Stabilized Staging Area (SSA). A stabilized staging area consists of stripping topsoil and spreading a layer of 1-1/2-inch gravel or recycled concrete 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

5.7.18 Surface Roughening Area (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 GESC Manager shall inspect surface roughening 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.*

DON'T *Surface roughening on this slope may have prevented this rill erosion.*

Correct Installation and Maintenance of BMPs, continued

5.7.19 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 GESC Manager shall inspect slope drains 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

5.7.20 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 GESC Manager shall inspect stream crossings 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*

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

Correct Installation and Maintenance of BMPs, continued

5.7.21 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 GESC Manager shall inspect terracing weekly and during and after any storm event and make repairs (repair rill erosion, re-roughen soil, or re-seed and mulch) as necessary.

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

Correct Installation and Maintenance of BMPs, continued

5.7.22 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. Access to the site may only be taken at a permitted access point, as approved in the GESC Plans (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 approximately 3 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 GESC Manager shall inspect the VTC 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.*

STOP WORK

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

STOP WORK

Correct Installation and Maintenance of BMPs, continued

5.7.23 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 the Town of Castle Rock 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 Town in cases where vehicle tracking control with wheel wash is required.

DO

A high-pressure washer effectively cleans mud from wheels. Wash water must drain to adjacent sediment trap.

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 Town. Permittee(s) working in the Town have the responsibility to review, understand, and comply with these notes. Several of the Town's requirements pertaining to general construction practices are highlighted in the following paragraphs.

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

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 of construction water shall also be within the limits of construction. Violating the limits ofconstruction 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 the Town of Castle Rock, and shall provide erosion and sediment control BMPs for the adjacent area.

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

5.8.2 Street Cleaning. Streets shall be kept clean throughout the life of a project. In the event of 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.

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

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

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.

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.

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 for more than 30-days shall be seeded and mulched within 14-days of stockpile construction.

As stated in Section 5.6, topsoil shall be stripped from all disturbed areas of a site, stockpiled, and inspected by the Town prior to other construction work on the site. Failure to strip and stockpile topsoil and call for an inspection 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, an authorization for Haul Route Application, is required. Any import of soil to a site or export of soil from a site without a GESC Permit and Authorization for Haul Route will result in the issuance of a Stop Work Order. A GESC Plan and Permit is required for the import/export site if located within the Town of Castle Rock. 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 Town shall be essentially free of debris, organic matter, frozen material, and particles greater than six inches in diameter.

General Construction Practices, continued

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 six inches and wetting or drying as necessary to meet moisture requirements. All material that is placed outside of the Right-of-Way shall be placed in accordance with recommendations from a Geotechnical Engineer.

Unless Town 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 used when the CDPHE has issued a recommendation of approval for a certificate of designation and a Use by Special Review acceptance per special use permit has been issued per Town of Castle Rock floodplain regulations.

Fill material that contains concrete, asphalt, or other non-earthen material that is generated on site may be disposed of on site provided that the CDPHE, Hazardous Materials and Waste Management Division, has issed 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 utilized as fill material provided that the CDPHE, Hazardous Material 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 Town for review and acceptance before any diversion work is undertaken. Plans shall be in accordance with the *Drainage Regulations* and *Volume 3*, as amended.

5.8.8 Utility Construction. As the Town of Castle Rock 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

General Construction Practices, continued

stormwater runoff from the installation and maintenance of underground activities.

Utility line installation shall comply with the following:

- All utility work within a Town of Castle Rock Right of Way shall be required to obtain a Town of Castle Rock Public Works Permit in accordance with the *Public Works Regulations,* and may require a Landscape/Irrigation Permit.
- Provide adequate erosion and sediment controls (see Section 3.15)
- No more than three hundred (300) 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, gutter, sidewalk or in a drain line.
- Trench dewatering devices must discharge in a manner that will not effect streams, wetlands, drainage systems, or off-site property. Discharge from the trench shall be free of any sediment. A rock rip rap 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 seven 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*.

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

General Construction Practices, continued

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.*

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. The Permittee(s) shall comply with the following construction site management practices for proper chemical control.

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.

Application rates shall conform to registered label directions. Disposal of excess pesticides and pesticide-related wastes shall conform to reg-

General Construction Practices, continued

istered label directions for the proper disposal and storage of pesticides and pesticide containers set forth in applicable Federal, State, and local regulations that govern their usage, handling, storage, and disposal. Pesticides and herbicides shall be used only in conjunction with Integrated Pest Management Plans. Pesticides should be the tool of last resort; methods that are the least disruptive to the environment and human health should be used first.

Pesticides shall be disposed of through either a licensed waste management firm or a permitted treatment, storage, and disposal (TSD) facility. Containers should be triple-rinsed before disposal, and rinse waters should be reused as product.

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.

5.8.11 Properly Store, Handle, Use, and Dispose of Petroleum Products. When storing petroleum products, follow these guidelines:

- Create a shelter around the area with cover and wind protection;
- Line the storage area with a double layer of plastic sheeting or similar material;
- Create an impervious berm around the perimeter with a capacity of 110 percent 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. Used oil for recycling shall not be mixed with degreasers, solvents, antifreeze, or brake fluid.

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

General Construction Practices, continued

5.8.12 Sanitary Facilities. Sanitary facilities shall be provided for constructions workers. Sanitary facilities shall be located in the stabilized staging area (SSA) away from drainageways. Sanitary facilities shall never be placed near storm sewer inlets.

DON'T *This sanitary facility is located too close to a storm inlet.*

5.8.13 Other Construction Site Pollutants. 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.

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. Never wash or dispose of pollutants into the storm drainage system. 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 for solid waste, including excess asphalt, concrete, wood, rebar and other construction wastes produced during construction.

5.8.14 Spills Response. **<u>All</u>** chemical or hazardous material spills which **<u>may</u>** 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 the Town of Castle Rock. 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, the Town of Castle Rock 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 clean up any spill shall result in issuance of a Stop Work Order.

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

Town GESC Inspection Process

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

5.9

5.9.1 Town GESC Inspections. During the construction phase, erosion and sediment controls will be inspected regularly by a GESC Inspector. GESC 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. GESC 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 GESC Inspectors, selected inspections may be provided by other Town of Castle Rock staff, including inspections of traffic control, any permanent drainage facilities, and other public improvements.

5.9.2 Mandatory Town Inspections. The Permittee(s) shall call the Utilities Department (contact information is shown in Appendix A) to schedule the following mandatory inspections:

1. Preconstruction Meeting/Inspection of Initial BMPs.
2. Topsoil Inspection (after topsoil is stripped and stockpiled).
3. Any time during construction when a new GESC Manager or Alternate GESC Manager is chosen.
4. Prior to issuance of a Construction Permit for construction of any public improvements (curb, gutter, waterlines, sidewalk, sanitary sewers, paving roadways, etc.).
5. Prior to flushing of water lines.
6. Initial Close-out Inspection prior to issuance of a Certificate of Occupancy or Temporary Certificate Occupancy for commercial, industrial, residential, and multifamily projects. At end of construction if no CO or TCO is requested, and prior to transition to the DESC Program for residential construction *(Refer to Section 8 for Residential DESC Permitting)* .

The GESC Inspectors regulate grading, erosion and sediment control requirements for residential projects from the commencement of the overlot grading operations through the Final Acceptance of the subdivision improvements. Once Initial Close-out Acceptance of the subdivision improvements for the entire project, or an approved phase, has been granted by the Public Works Inspector and GESC Inspector, the Town of Castle Rock's DESC Inspector shall assume regulatory authority for control of drainage, erosion and sediment control on individually permitted lots. The Permittee(s) shall refer to Section 8, for permitting and inspection requirements.

Town GESC Inspection Process, continued

7. Two years after initial close-out, or when grass has reached required vegetative cover in accordance with Section 6, prior to removal of on-site BMPs.

8. Final Close-out Inspection (after vegetation has been accepted and sediment controls have been removed).

9. 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 GESC Inspector finds the BMPs to be installed and maintained in accordance with the approved GESC Plan and GESC Manual, the GESC Inspector will sign the GESC Phasing Acceptance Sheet.*
5. *Once the GESC 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 seven calendar days from the GESC 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. See Section 3.7 for additional requirements.*

7. *This process shall be repeated for each additional phase until all earthwork is complete.*

All inspections shall be coordinated through the Town of Castle Rock Utilities Department. All inspection requests need to be called into the Utilities Department by 3:30 p.m. the day before the inspection (three 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 Permit or

Violations and Enforcement, continued

failure to obtain a GESC Permit, constitutes a violation of Chapter 15.12 of the Town of Castle Rock Municipal Code, 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"). A violation of the Town provision may result in penalties under the Municipal Code of $1,000 per day and/or one year in jail.

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

In addition, 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 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 Town may have for GESC Permit violations, the Town 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 GESC Inspector.

5.10.2 Levels of Violations. The Town of Castle Rock classifies violations in one of three 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 Town of Castle Rock 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:

Remove

- ***Clearing, grubbing or grading without a Town of Castle Rock 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 GESC Inspector.***

Violations and Enforcement, continued

Level II Violations are viewed by the Town of Castle Rock 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). Example

- ***Tracking of material onto roadways and adjacent paved areas.***
- ***Failure to make required plan revisions.***
- ***Failure to perform BMP maintenance as directed by the Town of Castle Rock GESC Inspector.***

Level II Violations are viewed by the Town of Castle Rock 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. Remediation for Level III Violations shall commence immediately after the Permittees are notified of the violation(s). Example Level III Violations include the following:

- ***Failure to provide routine maintenance for erosion and sediment controls.***
- ***Installation of non-Town of Castle Rock-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 and accepted GESC Drawings ~~and GESC Field Manual~~ on-site.***

5.10.3 Stop Work Orders. The Public Works Director or Utilities Director, or their 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 GESC Inspector of such activities.

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

Violations and Enforcement, continued

1. Correct the deficient practices that precipitated the Stop Work Order.
2. Pay the Permit reinstatement fee per the Development Services Fee Schedule at the Town of Castle Rock Development Services Department.
3. Call the Utilities Department to schedule a site inspection.
4. Obtain a reinstated GESC Permit after approval of the corrected work from a GESC Inspector.

A posted Stop Work Order shall not be removed from the site, except by the Town. A Town of Castle Rock Inspector is the only authorized agent to remove a posted Stop Work Order.

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

5.10.4 Re-inspection Fees. To offset the cost of additional inspections on non-compliant sites, the Town requires that re-inspection fees be paid in person at the Development Services Department 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.*
- *Permittee(s) fail to have the GESC Drawings on site during the Preconstruction Meeting.*
- *Permittee(s) receive a Stop Work Order (fee consists of new Permit fee in this case).*
- *Permittee(s) fail to obtain Vegetation Acceptance from the Town prior to requesting a final release of Fiscal Surety.*
- *Permittee(s) remove any BMPs prior to receiving authorization by the Town of Castle Rock.*
- *GESC 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 GESC Inspector to make the final determination of Interim and Final BMP installation time frames.

Overview of Section 6

6.0
Permit Steps 15 through 20: Project Acceptance and Close-Out

Section 6 addresses the following steps in the GESC Permit Process:

Step 15. Prepare the site for the Initial Close-out Inspection and schedule the inspection at least two weeks prior to an anticipated request for a Temporary Certificate of Occupancy (TCO), Certificate of Occupancy (CO), Building Permit, or Initial Close-out Acceptance.

Section 6.1, ***Preparation for the Initial Close-Out Inspection****, describes the tasks the Permittee(s) must complete prior to the Close-Out Inspection.*

Step 16. Attend Initial Close-Out Inspection, make any corrections requested by the Town, and obtain Initial Close-Out Acceptance.

Section 6.2, ***Initial Close-Out Acceptance****, discusses the requirements for the Initial Close-Out Inspection and Acceptance.*

Section 6.3, ***Partial Acceptance of Phased Single-Family Residential Projects****, discusses the special requirements for detached single-family residential projects.*

Step 17. Inspect the site monthly during the revegetation process. Make necessary corrections to the on site BMPs and control weeds as necessary. Make corrective actions as required by the Town of Castle Rock.

Section 6.4, ***Establishment of Vegetation****, describes procedures for accepting the establishment of permanent vegetation; it also provides a definition of the required vegetation coverage, free of noxious weeds.*

Section 6.5, ***Control of Noxious Weeds****, describes the eleven types of weeds designated by the Town as noxious. Noxious weeds are to be eradicated from the project site as part of the Contractor's revegetation requirements.*

Step 18. Schedule the Vegetation Acceptance Inspection when vegetative growth has reached the required coverage.

Section 6.6, ***Acceptance of Vegetation****,* requires that once vegetation has reached the required coverage as defined in Section 6.4, a Vegetation Acceptance Inspection should be scheduled.

Step 19. After receiving written acceptance of vegetation establishment from the Town, remove the on site BMPs and schedule the Final Close-Out Inspection.

Section 6.7, ***Final Close-Out Inspection****,* all on-site BMPs shall be removed and the Final Close-Out Inspection scheduled.

Step 20. After receiving written notice from the Town that all GESC requirements have been addressed, submit a signed Fiscal Surety Release Form to the Town. After the Fiscal Surety is released by the Town, the project is complete.

Section 6.8, ***Release of Fiscal Surety****, discusses the Procedures for releasing the project's Fiscal Surety.*

Section 6.9, ***Revocation of Fiscal Surety for Default by Permittee(s)****, procedures are described where the Town revokes the developer's Fiscal Surety and uses the funds to complete the GESC requirements.*

Section 6.10, ***Operation and Maintenance of Native and Landscaped Areas***

Permit Step 15: Prepare the site for the Initial Close-out Inspection and schedule the inspection at least two weeks prior to an anticipated request for a Temporary Certificate of Occupancy (TCO), Certificate of Occupancy (CO), Building Permit, or Initial Close-out Acceptance.
Section 6.1 discusses Step 15.

Preparation for Initial Close-out Inspection

6.1

6.1.1 Preparing for Inspection. In preparation for the Initial GESC Acceptance Inspection prior to the Permittee(s) leaving the site, the GESC Manager shall undertake the following:

1. *Clean all streets, sidewalks and flowlines of sediment with a street sweeper.* ***WASHING OF STREETS, SIDEWALKS AND FLOWLINES IS IN DIRECT VIOLATION OF TOWN OF CASTLE ROCK CRITERIA.*** *Clean all inlets, trickle channels and all other drainage features.*

2. *Remove temporary erosion and sediment controls (if directed by approved GESC Plan or GESC Inspector) and install/maintain erosion and sediment control BMPs per the Town of Castle Rock-approved Final GESC Plan.*

3. *Ensure all disturbed areas are drill seeded and crimp mulched, or otherwise stabilized, per Town of Castle Rock criteria.*

6.1.2 Scheduling the Inspection. Once all items are completed, the GESC Manager shall call the Town of Castle Rock Utilities Department prior to 3:30 p.m. the day before the inspection and schedule an Initial GESC Acceptance Inspection. This inspection should be scheduled at the same general time as the Public Improvements Initial Acceptance walkthrough with a Public Works Inspector, if possible. To allow time for resolution of issues, the Initial Acceptance Inspections should be scheduled a minimum of two weeks prior to a scheduled request for a Building Permit, Temporary Certificate of Occupancy (TCO) or Certificate of Occupancy (CO).

Important! ***It is imperative that the above-listed items are completed per this GESC Manual prior to the Initial Close-out Inspection. Failure to properly complete these items may result in a GESC hold being placed on the issuance of any Building Permits or Certificates of Occupancy. If all items are completed in accordance with GESC Criteria, the Town shall release any holds on issuance of Building Permits or Certificates of Occupancy.***

Permit Step 16: Attend the Initial Close-out Inspection, make any corrections requested by the Town, and obtain Initial Close-out Acceptance.
Section 6.2 and Section 6.3 discuss Step 16.

Initial Close-Out Acceptance

6.2

6.2.1 Attendees. Representatives of the Permittee(s), including the GESC Manager, shall attend the Initial Close-out Inspection along with the Public Works Inspector and GESC Inspector.

6.2.2 General Meeting Agenda. The following agenda items are addressed at the Initial Close-out Inspection:

- **Inspection of Final BMPs**. Installation of all Final BMPs are inspected, including topsoil spreading, soil preparation, and drill seeding and crimp mulching.
- **Inspection of Site Cleanup**. Cleanup of the site and adjoining streets is checked.
- **Transition to DESC Program**. For residential construction, the transition to the Town DESC Program is discussed.
- **Discussion of Vegetation Requirements**. For projects not moving into the DESC Program, the required vegetation inspections and coverage are described.

6.2.3 Residential Projects. Initial acceptance sign-offs are required from both the Public Works and GESC Inspectors and all applicable GESC Permit and surety transfers are to be complete per Section 4.13 prior to any release of holds on Building Permits. New land disturbing activities associated with residential construction are permitted under the DESC Program by individual lot or address. No other land disturbing activities shall be permitted under the open GESC Permit held by the builder except those required to establish vegetation or as specifically identified as off-site disturbances associated with open DESC Permit(s). The intent of the GESC Permit during the residential construction phase is to ensure compliance until minimum vegetative cover is established and/or all individual lot construction is initiated. *(Refer to Section 8 Residential DESC Permitting)*

If the filing is divided into separate grading phases, as discussed in Sections 2.4.4 and 3.7, Initial Close-out Acceptance (part of the GESC Permit Process) and Public Works Inspections are required for each phase until the entire filing is accepted. Additional information on partial acceptance of phased residential projects is provided in Section 6.3

6.2.4 Commercial and Industrial Projects. For commercial and industrial sites, the Public Works Inspector and the GESC Inspector must sign-off prior to release of a TCO or CO. An Initial Close-out Inspection shall be scheduled in accordance with Section 6.2. Prior to the inspections, the GESC Manager shall prepare the site in accordance with Section 6.1

Partial Acceptance of Phased Single-Family Residential Projects

6.2.5 Corrections to Site. The Permittee(s) shall make any corrections to the site as requested by the Town GESC Inspector. If the corrections are substantial, the GESC Inspector may require a follow-up inspection to be scheduled prior to issuing Initial Close-out Acceptance.

6.2.6 Public Improvements Acceptance. Public Improvements Acceptance shall be in accordance with the Public Works Regulations.

6.2.7 Permit Extension for Final Stabilization Due to Weather
Projects seeking a Temporary Certificate of Occupancy (TC) or release of Building Permits that are unable to complete final stabilization due to adverse weather conditions may apply for an active permit extension. All temporary sediment controls are to be installed and functional and temporary stabilization measures are to be implemented. Additionally, application for a GESC Permit extension shall be submitted for a period of six (6) months and applicable inspection fees paid prior to release of Building Permits or TCO. Final Stabilization, including seeding, mulching, erosion control blanket or other means of permanent landscaping are to be installed within 14 days of weather conditions conducive of such activities or within six (6) months, whichever comes first. Until such time that final stabilization is completed, Permittee shall fulfill all inspection, maintenance and repair r~~equirement~~ of all temporary BMPs.

Partial Acceptance of Phased Single-Family Residential Projects

6.3

6.3.1 Coordination with Public Improvement Plan. Phasing of the Public Improvements and lots shall be such that the streets and lots are accessible by a street that has already received preliminary acceptance by the Town of Castle Rock, or will receive preliminary acceptance as part of the accepted phase. As discussed in Section 3, careful consideration should be given when developing the Public Improvements Phasing Plan for GESC and Public Improvements, since the Public Improvements Phasing Plan will be the guide by which a phase will be released from the conveyance and building permit restriction. A phased GESC Plan that matches the phasing plan in the Public Improvement Plans, DA, SIA or PIA is required to be included with the approved construction plans. The phased GESC Plan includes erosion and sediment control measures for each phase in order to protect the phase that will obtain Initial Close-out Acceptance by the Town.

All site improvement requirements or subdivision improvement require-

Partial Acceptance of Phased Single-Family Residential Projects, continued

An aerial view of a phased single-family residential subdivision.

ments shall be complete for each phase for which Initial Close-out Acceptance is applied for, including all drainage improvements necessary to serve that phase. Detention and water quality facilities that serve one or more phases shall been installed when the first phase that drains to the facility is constructed. Once all the streets, curb and gutter and storm sewer drainage improvements have been completed in a phase and all the erosion and sediment controls have been installed or repaired per the Final GESC Plan, inspections shall be made by the Public Works Inspector and GESC Inspector, per Section 5.9 of the *GESC Manual*. If both the Public Works and GESC Inspectors find all items to be compliant with the Town of Castle Rock requirements, a release of Public Works Department hold shall be granted and a request to the Town may be made to obtain building permits. If there are deficient items, the Permittee(s) shall make the necessary corrections and re-schedule an inspection.

Permit Step 17: Inspect the site monthly during the revegetation process. Make corrections to the site revegetation and other Final BMPs and control weeds as necessary.
Section 6.4 and Section 6.5 discuss Step 17.

Inspection and maintenance requirements include the following:

1. *Seeded and mulched areas shall be inspected monthly by the Permittee(s) for a period of two years following initial seeding. Repairs and reseeding and mulching shall be undertaken at least once per year or as requested by the GESC Inspector for any areas failing to meet the required coverage.*
2. *Rill and gully erosion shall be filled with topsoil prior to reseeding. Reseeding method shall be approved by the Town.*
3. *Noxious weeds shall be controlled in a manner acceptable to the Town.*

Establishment of Vegetation

6.4

6.4.1 Required Inspections and Maintenance. The Permittee(s) shall undertake the following inspections and maintenance operations:
In addition, the GESC Inspector will make periodic inspections of the revegetation area.

6.4.2 Required Vegetation Coverage. Required vegetation coverage is defined as follows:

Required coverage for permanent, temporary and low growth seed mixes shall be defined as follows:

1. *At least three plants per square foot with a minimum height of three inches. The three plants per square foot shall be of the variety and species found in the Town of Castle Rock (same as Douglas County) approved mix (Appendix E).*
2. *No bare areas larger than 4 square feet, 2 feet x 2 feet or equivalent.*
3. *Free of eroded areas.*
4. *Free from infestation of noxious weeds in accordance with Section 6.5.*

Required coverage for turf grass areas shall be defined as follows:

1. *At least 80% vegetative cover of grass species planted.*
2. *No bare areas larger than 4 square feet, 2 feet x 2 feet or equivalent.*
3. *Free of eroded areas.*
4. *Free from infestation of noxious weeds in accordance with Section 6.5.*

Full vegetation coverage is required prior to release of Fiscal Surety.

Control of Noxious Weeds

6.5

The Town of Castle Rock requires landowners to control noxious weeds on their property. Noxious weeds negatively impact agriculture, water quality, recreational opportunities, and wildlife. For these reasons, all projects subject to acceptance for final revegetation shall be free of noxious weed infestation.

The Town of Castle Rock has designated the following as noxious weeds:

1. *Leafy spurge.*
2. *Diffuse knapweed.*
3. *Russian knapweed.*
4. *Spotted knapweed.*
5. *Musk thistle.*
6. *Canada thistle.*
7. *Scotch thistle.*
8. *Hoary cress.*
9. *Perennial pepperweed.*
10. *Yellow toadflax.*
11. *Dalmation toadflax.*

The following information is intended to be used as a guide for landowners, developers and Contractors to identify noxious weeds on project sites and to take early measures to control the weeds in the early stages of infestation. This will reduce the likelihood of costly eradication measures prior to final acceptance by the Town. Help in controlling noxious weeds may be found by contacting the Town of Castle Rock Water Conservation Technician.

Contact information for the Town of Castle Rock Water Conservation Technician can be found in Appendix A

Control of Noxious Weeds, continued

LEAFY SPURGE (*Euphorbia esula*) is a perennial, up to 3-feet tall; reproducing by vigorous rootstalks and seeds. Leaves are alternate, narrow, and 1- to 4-inches long. Stems are thickly clustered. Flowers are yellowish-green, very small, arranged in numerous small clusters. Roots are brown, containing numerous pink buds which may produce new shoots or roots. The entire plant contains a caustic milky sap, which cause dermatitis. Seeds purple, contained in a three-celled capsule, each cell with a single seed.

Yellow flowered Leafy Spurge

Spurge sprout by quarter

Spurge buds in spring

DIFFUSE KNAPWEED (***Centaurea diffusa***) is a diffusely branched annual or biennial, 1- to 2-feet tall. Stems are rough to the touch. Leaves are small, divided; flowering heads are numerous and narrow. Ray flowers are white to rose or sometimes purplish; leaflets around base of flower head are divided like the teeth of a comb, tipped with definite slender spines.

Pink and white flowered diffuse knapweed

SPOTTED KNAPWEED (***Centaurea maculosa***) is a short-lived perennial with a stout taproot, (like a dandelion). It can have one or more stems, branched 1- to 3-feet tall. Base leaves are up to six inches long, blades are narrowly oblong to lance shaped tapering at both ends, with feather-like ends; principal stem leaves are also featherlike. Flowering head is solitary, with

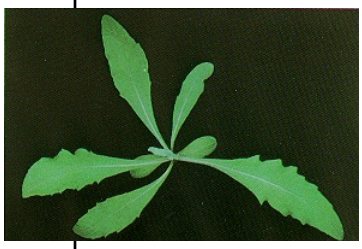
Control of Noxious Weeds, continued

terminating branches; the circle of leaflets below flower is stiff and tipped with a dark comb-like fringe. The flowers are pinkish-purple, or on rare occasions, cream colored.

Spotted Knapweed

Russian Knapweed

RUSSIAN KNAPWEED
(Centaurea repens) is a creeping perennial that reproduces from seed and vegetative buds in its root system. Stems wither away annually. Shoots are erect, about 18 to 36 inches tall, and many branched. Lower leaves are 2 to 4 inches long and deeply lobed; upper leaves are smaller generally with smooth margins, but can be slightly lobed. Shoots and leaves are covered with dense gray hairs. The cone-shaped flowering heads are solitary and occur on shoot tips; they generally are ¼- to ½-inches in diameter and have smooth papery bracts. Flower color can be pink, lavender, or white. Russian knapweed has horizontal roots that have a brown to black, scaly appearance. Russian knapweed forms dense, single species stands over time due to release of toxins and competition.



CANADA THISTLE
(***Cirsium arvense***) is a colony-forming perennial from deep underground and extensive horizontal roots. Stems are 1- to 4-feet tall, ridged, and branching. Leaves are alternate, lacking stalks, oblong or lance-shaped, divided into spiny tipped irregular lobes. Flowers are purple in heads ½- to ¾-inches in diameter; with a circle of leaflets below the flowers.

Canada Thistle

Control of Noxious Weeds, continued

SCOTCH THISTLE

(Cirsium arvense) Scotch thistle is a biennial, producing a large rosette of spiny leaves the first year. The second year the weed transforms into a coarse branching plant up to eight feet tall and five feet in diameter. Under poor growing conditions, the plants may stand less than a foot tall, but can produce nearly as many seeds as the larger plant.

Scotch Thistle

Scotch thistle leaves are deeply lobed or serrated with long, stiff spines along the margins. The leaves have winged appearance that continues down the stems of the plant. Fine hairs give the plant a grayish appearance. Purple flowers, more than an inch in diameter, are produced in the summer. Flower heads remain upright, rather than nodding as Musk thistle flowers do. Stocks supporting the flowers are leafy.

Scotch Thistle

MUSK THISTLE

(*Carduus nutans*) is biennial or sometimes a winter annual, which grows up to six feet tall. Leaves are dark green with light green midrib, deeply lobed, serrated or with spiny margins. Edges of leaves are often a grayish-silver color. The leaves extend onto the stem giving a winged appearance. Flower ends each branch, solitary, 1½- to 3-inches in diameter. It is usually bent over. Flowers are deep rose, violet, or purple, and occasionally white. Flowers have a base of long narrow, spine-tipped leaflets.

Musk Thistle

Control of Noxious Weeds, continued

HoaryCress

HOARY CRESS
(*Cardaria spp*.) is a colony-forming perennial from deep underground and extensive horizontal roots. Stems are 1- to 4-feet tall, ridged and branching. Leaves are alternate, lacking stems or stalks of a leaf, oblong or lance-shaped, and divided into spiny tipped irregular lobes. Flowers are purple in heads ½- to ¾-inches in diameter with clusters of spineless leaflets.

Hoary Cress

Perennial Pepperweed
Photo-Steve Dewey, Utah State University

PERENNIAL PEPPERWEED
(*Lepidium latifolium*) is a colony-forming perennial from deep underground and extensive horizontal roots. Stems are 1- to 4-feet tall, ridged, and branching. Leaves are alternate, oblong or lance-shaped, divided into spiny tipped irregular lobes. Flowers are purple in heads ½- to ¾-inches in diameter; with spineless leaflets.

YELLOW TOADFLAX
(***Linaria vulgaris)*** is a perennial, often over 3-feet tall. Numerous long and narrow pale green leaves are smooth and pointed. Flowers are snapdragon type 1- to 1½-inches long, bright yellow with deep orange centers. Vigorous roots are woody, creeping, and well branched, with multiple laterals. Yellow toadflax spreads by seeds and roots.

Yellow Toadflax

Control of Noxious Weeds, continued

DALMATION TOADFLAX
(***Linaria dalmatica)*** is a colony-forming perennial from deep underground and extensive horizontal roots. Stems are 1- to 4-feet tall, ridged, and branching. Leaves are alternate, oblong or lance-shaped, divided into spiny tipped irregular lobes. Flowers are purple in heads ½- to ¾-inches in diameter; with a circle of leaflets below the flower.

Dalmation Toadflax
Photos by the British Columbia Ministry of Agriculture

Dalmation Toadflax

Permit Step 18: Schedule the Vegetation Acceptance Inspection when vegetative growth has reached the required coverage.
Section 6.6 discusses Step 18.

Acceptance of Vegetation

6.6

6.6.1 Vegetation Acceptance Inspection. Once vegetation has reached the required coverage as defined in Section 6.4, the Permittee(s) shall call the Utilities Department (contact information is shown in Appendix A) to schedule a Vegetation Acceptance Inspection.

6.6.2 Written Acceptance. The GESC Inspector will confirm that vegetation has met the required coverage and that noxious weeds have been controlled. If the required coverage has been met, the GESC Inspector will issue written acceptance of the vegetation and give the Permittee(s) instructions to remove remaining on-site BMPs. If the required coverage is not met, repairs or corrections will have to be made by the Permittee(s) and a follow-up Vegetation Acceptance Inspection scheduled once the vegetation meets the required coverage.

Permit Step 19: After receiving written acceptance of vegetation establishment from the Town, remove the on site BMPs and schedule the Final Close-out Inspection.
Section 6.7 discusses Step 19.

Final Close-Out Inspection

6.7

6.7.1 Removal of On-site BMPs. After obtaining written acceptance of the vegetation coverage, the remaining on-site BMPs shall be removed and properly disposed. The site shall be cleaned up and any areas disturbed as a result of the BMP removal shall be seeded and mulched. The Final Close-out Inspection shall then be scheduled with the Town.

6.7.2 Final Close-out Inspection. The GESC Inspector will check the removal of BMPs and either accept the work or stipulate the corrections that have to be made. If corrections are substantial, the GESC Inspector may require that a follow-up inspection be scheduled with the Town.

Permit Step 20: After receiving written notice from the Town that all GESC requirements have been addressed, submit a signed Fiscal Surety Release Form to the Town. After the Fiscal Surety is released by the Town, the project is complete.
Section 6.8 and Section 6.9 discuss Step 20.

Release of Fiscal Surety

6.8

Once Final Close-out Acceptance has been obtained, the Permittee(s) may submit a Release of Grading, Erosion and Sediment Control Fiscal Surety Request Form to the Town of Castle Rock Utilities Department. A copy of this form is included in Appendix L. After the Utilities Department has received a completed request form, it will be signed-off by the GESC Inspector and the project's Fiscal Surety will be released.

Revocation of Fiscal Surety for Default by Permittee(s)

6.9

6.9.1 Default by Permittee(s). In the event there is a default by the Permittee(s) of any of the requirements of the GESC Permit, GESC Plan and/or *GESC Manual*, remedies will be in accordance with the remedies identified in this *GESC Manual*, remedies set forth in the *Public Works Regulations*, remedies listed in the Development Agreement, Subdivision Improvement Agreement, Public Improvement Agreement, and any other remedies provided by law. A Default by Permittee(s) shall be based on conditions including, but not limited to, the following:

Revocation of Fiscal Surety for Default by Permittee(s), continued

A Default by Permittee(s) shall be based on conditions including, but not limited to, the following:

(a) Permittee(s) fails to construct the improvements in substantial compliance with the GESC Plan and the other requirements of the GESC permit;
(b) Permittee(s) fails to complete construction of the GESC improvements by the completion date provided in the GESC Plan or Permit as the same may be extended;
(c) Permittee(s) fails to cure any noncompliance specified in any written notice of noncompliance within the timeframe specified in the notice of noncompliance;
(d) Permittee(s) otherwise breaches or fails to comply with any obligation of the GESC Permit;
(e) Permittee(s) becomes insolvent, files a voluntary petition of bankruptcy, is adjudicated as bankrupt pursuant to an involuntary petition in bankruptcy, or a receiver is appointed for the Permittee;
(f) Permittee(s) fails to maintain in full force and effect a letter of credit in the amounts specified above or in the GESC Permit. Notice of default as to any phase of the GESC improvements must be given prior to expiration of the warranty period for such phase of the Improvements as hereinafter provided.
(g) Permittee(s) and/or property owner(s) fail to transfer the GESC Permit and provide new fiscal surety within thirty (30) days of all or a portion of the project being sold to a new owner.

6.9.2 Notice of Default. If the Utilities or Public Works Directors, or their designated representatives, give notice that a Default by Permittee(s) exists, and if the Permittee(s) fails to cure such default within the time specified, the Town shall be entitled to: (a) make a draw on the Fiscal Surety for the amount reasonably determined by the Town to be necessary to cure the default in a manner consistent with the approved GESC Plan up to the face amount of the Fiscal Surety; (b) sue the Permittee(s) for recovery of any amount necessary to cure the default over and above the amount available under the Fiscal Surety; and (c) place a lien on the property for recovery of any amount necessary to cure the default absent of sufficient fiscal surety provided by the property owner.

6.9.3 Town Right to Complete Improvements. The Town shall have the right to complete the GESC Improvements, in substantial accordance with the GESC Plan, the opinion of probable costs, and other requirements of this *GESC Manual*, either itself or by contract with a third party or by assignment of its rights to a successor Permittee(s) who has acquired the subdivision/project by purchase, foreclosure, or otherwise. The Town, any Contractor under contract with the Town, or any such successor Permittee(s), their agents, subcontractors and employees shall have the non-exclusive right to enter upon the subject property for the purpose of completing the GESC Improvements.

Revocation of Fiscal Surety for Default by Permittee(s), continued

6.9.4 Use of Funds by Town. Any funds obtained by the Town under the Fiscal Surety, or recovered by the Town from the Permittee(s) by suit or otherwise, will be used by the Town to pay the costs of completion of the GESC Improvements substantially in accordance with the GESC Plan and the other requirements of this *GESC Manual* and to pay the reasonable costs and expenses of the Town in connection with the Default by Permittee(s), including reasonable attorneys' fees, with the surplus, if any, to be returned to the Permittee(s).

Operation and Maintenance of Native and Landscaped Areas

6.10 Operation and Maintenance of Native and Landscaped Areas

6.10.1 Long-term Maintenance. Once Final Close-out Acceptance has been obtained and the Fiscal Surety is released to the permittee, erosion and sediment control becomes the sole responsibility of the property owner. Because native grass cover is the primary means of controlling soil erosion in native non-irrigated areas, proper maintenance of native grass areas is a critical after the establishment of vegetation under the GESC permit. It is to be noted that for non-irrigated native grass areas in the Town of Castle Rock, some effort may be required to maintain or enhance the minimum vegetative cover as set forth in this chapter and to address rill and gully erosion as it may occur over time. The property owner shall conduct periodic inspections of their property throughout the year and after major rain and snow events to address any bare areas or visible soil erosion.

6.10.2 Violations. The criteria set forth in this chapter shall apply to all man-made vegetated slopes and landscape areas resulting from land disturbing activities as set forth in Section 1.4 of this manual after close of any GESC permit. Any such property found to be in non-compliance with the standards of this Manual shall be in violation of the Town of Castle Rock Municipal Code.

Overview of Section 7

7.0

The streamlined 10-step process provided in this section applies to a Low Impact GESC Permit. For Temporary Batch Plant and Standard GESC Permits, see Sections 2 through 6 of the GESC Manual.

Step 1. Confirm that a Low Impact GESC Permit is required (see Section 7.1).

Step 2. Prepare a Low Impact Permit Application and Drawing (see Section 7.2).

Step 3. Submit the Low Impact Permit Application and Drawing to the Town for review and acceptance and revise documents as necessary to address Town comments (see Section 7.3).

Step 4. After Town acceptance, pay fee, submit Fiscal Surety if required, and pick up Low Impact Permit, Accepted Low Impact GESC Drawing (see Section 7.4).

Step 5. Review GESC Manual and ensure that Permittee(s) understand Low Impact Permit requirements (see Section 7.5).

Step 6. Install Initial BMPs on the project site (see Section 7.6).

Step 7. Start construction, implementing erosion and sediment control in accordance with the Low Impact Permit Drawing. The Low Impact GESC Permit~~, Drawing,~~ are to be kept on site at all times during construction (see Section 7.7).

Step 8. Address issues raised during any Town GESC Inspections (see Section 7.8).

Step 9. Remove the on-site BMPs, the project is complete (see Section 7.9).

This section describes the GESC Permit Process for Low Impact GESC Permits. This process, consisting of nine steps, is more streamlined than the 20-step process described in Sections 2 through 6 for Temporary Batch Plant and Standard GESC Permits.

The nine-step process for Low Impact GESC Permits is shown in Figure 7-1, on page 7-3. The following sections describe this nine-step process.

Low Impact Permit Step 1: Confirm that a Low Impact GESC Permit is required.
Section 7.1 discusses Step 1.

Projects that Require a Low Impact GESC Permit

7.1

The first step in the process is to examine the information in Sections 1.4 and 1.5 to confirm that a Low Impact GESC Permit is required for the project. This Low Impact GESC Permit applies to projects with a disturbed area less than one acre that do not require re-establishment of native vegetation and where insignificant negative impact can be adequately demonstrated to Town staff.

Information

Even though the Low Impact GESC Permit offers streamlined application and inspection procedures, the erosion and sediment control practices discussed herein shall be adhered to and penalties for non-compliance will apply.

The Development Services Department can be contacted to clarify GESC Permit requirements and interpret which GESC Permit, if any, applies to a particular project. Contact information is provided in Appendix A.

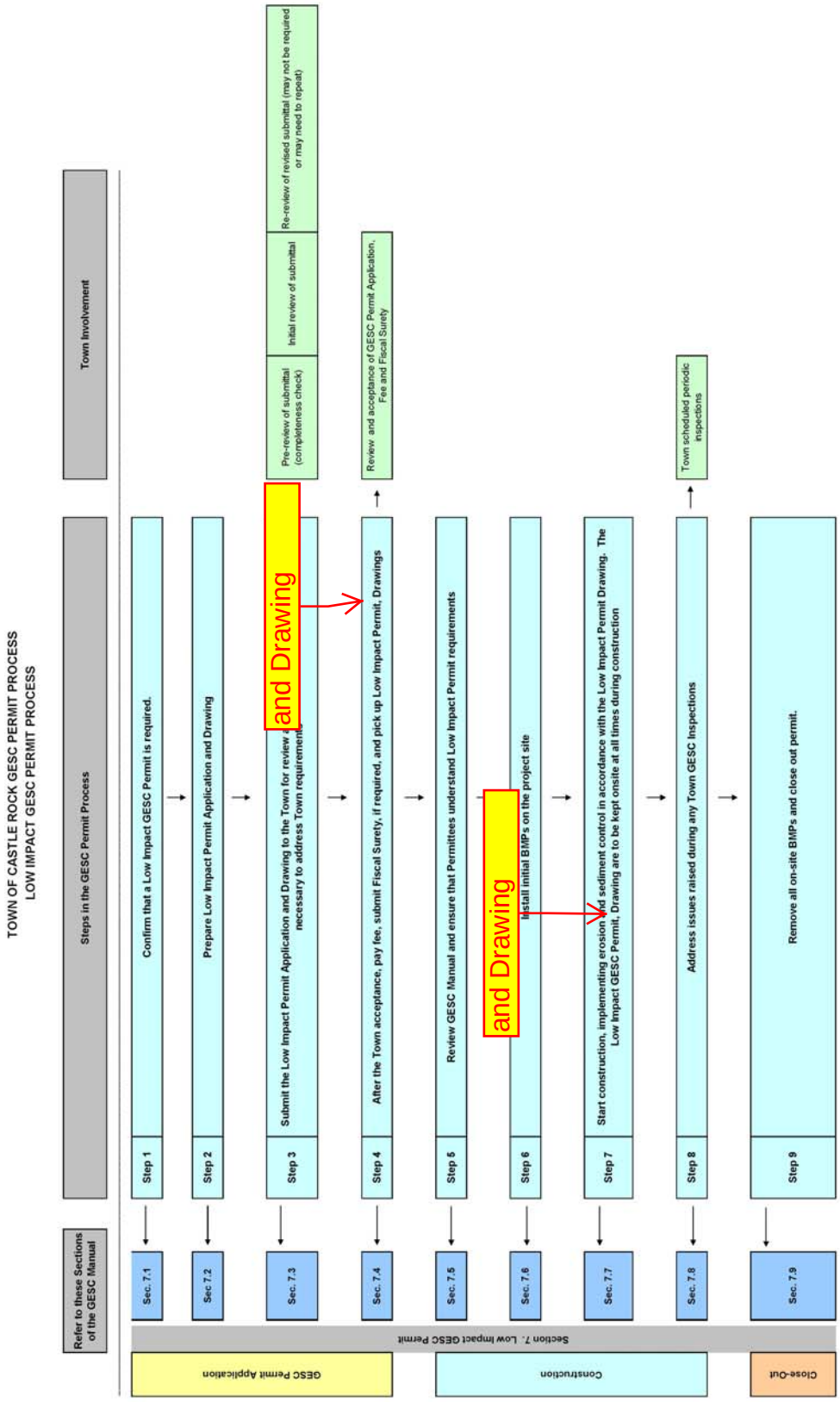
As shown in figure 7-1 on page 7-3, a simplified permitting process is associated with a Low Impact GESC Permit. A Low Impact GESC Permit does not require GESC Drawings to be prepared or stamped by a Professional Engineer because typically the work does not involve engineering design.

Even with streamlined application and inspection procedures, the erosion and sediment control practices discussed herein shall be followed. If the Town finds a Low Impact Permittee to be non-compliant, the Permit may be suspended and a Stop Work Order issued in accordance with Section 5.10.3.

Low Impact GESC Permit Application and Drawings

7.2

7.2.1 Low Impact Permit Application Requirements. For Low Impact Permits, GESC Drawings shall be accompanied by a completed Low Impact GESC Permit Application (a copy of the application form is included in Appendix M). No GESC Report is required for the Low Impact Permit, but the application form requires descriptive information regarding the proposed project.


TOWN OF CASTLE ROCK GESC PERMIT PROCESS
LOW IMPACT GESC PERMIT PROCESS
Refer to these Sections of the GESC Manual
Steps in the GESC Permit Process
Town Involvement
Sec. 7.1
Step 1
Confirm that a Low Impact GESC Permit is required.
Sec. 7.2
Step 2
Prepare Low Impact Permit Application and Drawing
Sec. 7.3
Step 3
Submit the Low Impact Permit Application and Drawing to the Town for review, and Drawing necessary to address Town requirements
Pre-review of submittal (completeness check)
Initial review of submittal
Re-review of revised submittal (may not be required or may need to repeat)
Sec. 7.4
Step 4
After the Town acceptance, pay fee, submit Fiscal Surety, if required, and pick up Low Impact Permit, Drawings
Review and acceptance of GESC Permit Application, Fee and Fiscal Surety
Sec. 7.5
Step 5
Review GESC Manual and ensure that Permittees understand Low Impact Permit requirements
Sec. 7.6
Step 6
Install initial BMPs on the project site and Drawing
Sec. 7.7
Step 7
Start construction, implementing erosion and sediment control in accordance with the Low Impact Permit Drawing. The Low Impact GESC Permit, Drawing are to be kept onsite at all times during construction
Sec. 7.8
Step 8
Address issues raised during any Town GESC Inspections
Town scheduled periodic inspections
Sec. 7.9
Step 9
Remove all on-site BMPs and close out permit.
Section 7. Low Impact GESC Permit
GESC Permit Application
Construction
Close-Out

Low Impact Permit Step 2: Prepare Low Impact Permit Application and Drawing.
Section 7.2 discusses Step 2.

7.2.2 Low Impact Drawing Requirements. Although a detailed GESC Plan need not be prepared for sites where a GESC Low Impact Permit is sought, the following drawings shall be prepared and submitted to the Town to provide enough information to determine if a Low Impact Permit is acceptable for the proposed work:

1. General location map – at a scale of 1-inch to 1000-feet to 1-inch to 8000-feet, indicating the general vicinity of the site location, including all roadways and north arrow.

2. Detailed plan showing:
   - North arrow.
   - Approximate scale of drawing.
   - Limits of work area.
   - Proximity of work area to property lines.
   - All surface water hydrologic features within 100-feet of proposed work area and directional flow arrows indicating stormwater runoff.
   - Erosion and sediment control BMPs in accordance with these criteria.

The principles described in Section 3 for preparing a GESC Plan also apply to a Low Impact GESC Drawing. Specifically, Section 3.1 discusses principles of erosion and sedimentation, Section 3.3 describes ten elements of an effective GESC Plan, and Section 3.17 provides design and sizing criteria for BMPs. An example GESC Drawing for a Low Impact GESC Permit is shown in Appendix C.

Low Impact Permit Step 3: Submit the Low Impact Permit Application and Drawing to the Town for review and acceptance and revise documents as necessary to address Town comments.
Section 7.3 discusses Step 3.

Submit Low Impact Application and Drawing; Address Town Comments

7.3

After the GESC Drawing has been prepared and a Low Impact Permit Application form has been filled out and signed, the items shall be submitted to the Town.

The GESC Plan will be reviewed with an eye toward

Section 3, especially Section 3.3, Ten Elements of an Effective GESC Plan, and Section 3.17, Design and Sizing Criteria for BMPs, provides guidance for preparing a Low Impact GESC Drawing.

An example GESC Drawing for a Low Impact GESC Permit is shown in Appendix C.

the effectiveness of the overall Plan. After review, written comments will be provided to the applicant.

Low Impact Permit Step 4: After Town acceptance, pay fee, submit Fiscal Surety if required, and pick up Low Impact Permit, Drawing.
Section 7.4 discusses Step 4.

Pay Permit Fee and Submit Fiscal Surety

7.4

Once the GESC Drawing and Permit have been accepted by the Town of Castle Rock, the Applicant shall pick up the Drawing, Permit. At the same time, the Applicant shall pay permit fees to the Town, and, if the Town requires, submit Fiscal Surety for the work. Permit fees shall be paid in accordance with Section 4.9 and Fiscal Surety shall be submitted in accordance with Section 4.10.

Low Impact Permit Step 5: Review GESC Manual and ensure that Permittees understand Low Impact Permit requirements.
Section 7.5 discusses Step 5.

Review GESC Manual

7.5

The Permittee(s) shall thoroughly review the GESC Manual, the GESC Drawing, and the GESC Plan Standard Notes and Details for any BMPs that will be installed to understand all of the requirements of the GESC Permit Process. Any subcontractors and field personnel also need to be made aware of the GESC requirements.

Low Impact Permit Step 6: Install Initial BMPs on the project site.
Section 7.6 discusses Step 6.

Install Initial BMPs

7.6

~~Once the a copy of the GESC Manual has been picked up and reviewed, the~~ Initial BMPs shown on the approved GESC Low Impact Drawing shall be installed.

Section 5, in particular Section 5.7, provides guidance on the correct installation and maintenance of BMPs.

Low Impact Permit Step 7: Start construction, implementing erosion and sediment control in accordance with the Low Impact Permit Drawing. The Low Impact GESC Permit, Drawing, are to be kept on site at all times during construction. *Section 7.7 discusses Step 7.*

Begin Construction

7.7

After installation of the Initial BMPs, construction may begin. The approved GESC Permit, the accepted construction drawings are to be kept on site in the Permittee(s)' possession at all times.

All GESC criteria shall be adhered to at all times during construction. If the Town of Castle Rock finds a Low Impact Permit holder to be non-compliant with the GESC Permit or any other GESC criteria, the Permit may be suspended and a Stop Work Order issued (see Section 5.10.3). The Town may then require the Permittee(s) to obtain a Standard GESC Permit per Sections 2 through 6.

Low Impact Permit Step 8: Address issues raised during any Town GESC inspections.
Section 7.8 discusses Step 8.

Address any GESC or Public Works Inspection Comments

7.8

Under a Low Impact GESC Permit, GESC Inspectors shall visit a Low Impact site regularly. Permittee(s) shall address any comments or corrections required by the GESC Inspector. Failure to correct issues raised by the Town may result in a Stop Work Order (see Section 5.10.3).

Section 5.10 provides information on violations and enforcement, including the Stop Work Order.

Low Impact Permit Step 9: Remove the on-site BMPs, the project is complete. *Section 7.9 discusses Step 9.*

Project Close Out

7.9

The Permittee(s) shall remove all on-site BMPs once construction is complete and the site is fully stabilized. GESC Inspector will confirm that all on-site BMPs have been removed and close-out the permit.

Overview of Section 8

8.0

Section 8 addresses the Residential Drainage, Erosion and Sediment Control (DESC) Regulations:

Section 8.1 **Purpose**, states the purpose of the DESC requirements.

Section 8.2 **Applicability**, states the application of this Chapter.

Section 8.3 **DESC Permit Requirements**, lists information required when applying for a DESC permit.

Section 8.4 **DESC Plan Submittal**, lists detailed information to include on a DESC Plan and associated attachments.

Section 8.5 **Minimum Erosion and Sediment Control Requirements**, describes the minimum requirements that the Permittee must comply with after receiving an approved DESC permit.

Section 8.6 **Minimum Drainage Requirements for Finished Grade**, identifies the design parameters that must be met before a Certificate of Occupancy can be issued.

Section 8.7 **DESC Program Inspection and Enforcement**, discusses inspections related to the Town's DESC Permitting Program and indentifies steps in the construction process that required mandatory inspections and acceptance before work may proceed.

Section 8.8 **Stop Work Orders**, provides general quidance regarding the Town's enforcement process.

Section 8.9 **Compliance with Other Laws, Regulations, Ordinances, Standards**, describes compliance with the DESC regulations in relation to other laws, regulations, ordinances and standards.

Section 8.10 **Town of Castle Rock not Responsible**, removes liability from the Town under these regulations.

Section 8.11 **DESC Permit Fees**, describes fees associated with the DESC Permit.

Purpose

8.1
The purpose of this chapter is to establish minimum drainage, erosion and sediment control requirements for residential lot construction in conformance with this manual and as follows:

- Protect to the greatest extent practicable, life, property and the environment from loss, injury and damage by stormwater runoff. Erosion, sediment transport, ponding, flooding, landslides, accelerated soil creep, settlement and subsidence, excessive dust and other potential hazards, caused by grading, construction activities and denuded soils.
- Protect surface waters, public right-of-way, private property, drainage systems, wetlands and watercourses from sediment loads.
- Protect the public interest in drainage control including lot drainage, drainage basins, drainage infrastructure and watercourses

Applicability

8.2
Effective June 15, 2004, all residential lot construction shall comply with the regulations set forth in this manual. This Section applies to drainage, erosion and sediment control for:

- Any new single-family residential construction and new construction requiring a building permit, including but not limited to additions and construction areas, and accessory structures on existing single-family residential lots.
- Multi-family structures, requiring a building permit, shall comply to the same requirements as single family residential construction projects.
- Grading, excavating and stockpiling of earth and landscape materials, for residential lots (not specifically limited to new construction) which results in the transport of any of these materials off site by any means including, but not limited to, wind or water erosion and vehicular tracking.

No residential building permits shall be issued until a DESC Permit is issued. The permittee is responsible for and is subject to any liability for drainage, erosion and sediment control for the permitted site. This Section shall apply to all residential building permit applications filed with the Town.

DESC Permit Requirements

8.3.
Refer to Sections 4.13 and 6.2.3 for applicable GESC transfer requirements prior to issuance of building permits. A DESC permit application must be filled out with the town prior to any initial DESC inspections being done on residential building projects.

Permittee shall compile for submittal, a copy of DESC permit application and one (1) copy of the DESC plan, designed by registered design professional, to the Town for initial plan review.

DESC Permit Requirements, continued

After initial plan review approval, a signed copy of the DESC permit guidelines, a copy of the approved DESC plan, and the DESC permit must be posted at the job site or lot with visible address for an initial DESC inspection.

DESC permit must be posted at the job site at all times during construction. DESC inspections will be completed in conjunction with each individual building inspection that is scheduled. Cancellation of building inspections will not nullify DESC inspections.

DESC Plan Submittals

8.4

The DESC plan shall be prepared by a registered design professional. Where special conditions exist, the Town may require additional information to the information required below. The DESC plan may be a plot plan modified to meet the requirements of this Chapter. The DESC plan will be reviewed for compliance with this Chapter and, when applicable, the approved drainage patterns set forth in the "overlot grading plan" approved by the Town.

A DESC plan shall be prepared and submitted for Town approval. One (1) hard copy or (1) electronic copy (Adobe pdf format), for each parcel, shall be submitted with the DESC permit application. The following items shall be clearly illustrated on the DESC plan:

- Illustrate all property lines, easements and setbacks.
- Illustrate planned improvements and permanent structures such as sidewalks, patios, swimming pools, driveways, porches, retaining walls, lined swales, etc.
- FEMA Floodplain limits shall be shown if lot is adjacent to a floodplain. See Town of Castle Rock municipal code, section 18, for Flood plain regulations.
- Provide a north arrow, the street address, subdivision, filing, lot and block (Section, Township and Range, if unplatted).
- The plan size for lot sizes of one (1) acre or less shall be 8.5" x 11" to 8.5” x 14”.The plan size for lots greater than one (1) acre shall be 24" x 36" or 11" x 17."
- A scale of one (1) inch equals twenty (20) feet shall be used unless the lot does not fit on legal paper; then a scale of one (1) inch equals thirty (30) feet may be used. Illustrate the scale used on all pages submitted.
- Spot elevations and drainage arrows shall be illustrated on the DESC plan in sufficient quantities to accurately illustrate the site drainage patterns. For sites one (1) acre or larger, these may be grouped around the foundation area (within one hundred [100] feet of the foundation or to the limits of disturbance).

DESC Plan Submittals, continued

- Illustrate high points and drainage arrows with percent slope twenty-five-foot intervals along drainage swales.
- Illustrate all slopes to the nearest one-tenth percent (.1%) in critical areas. Illustrate all elevations to the nearest one-tenth (1/10) foot.
- Illustrate top of foundation at each elevation change and driveway elevations at the garage entrance and at the point of discharge.
- Illustrate where storm water runoff enters the lot and discharges to adjacent rights-of-way, properties and ease ments. Illustrate all structural BMPs to be used and their locations. Include a schedule of nonstructural BMPs to be used.
- Include this general note on the plan: "All off-site disturbances and structural BMPs associated with the construction of the specific lot must be maintained in effective operating condition at all times and are subject to inspection and enforcement under the DESC Permit for this property."
- Check subdivision drainage plan to ensure drainage patterns are consistent with the approved plan.
- Attach GESC Standard Notes and Details on 11"x17" or larger (See Appendix B).

Minimum Erosion and Sediment Control Requirements

8.5

8.5.1 DESC Plan Approval. Lot specific and associated off-site structural and/or nonstructural BMPs that comply with this manual, shall be submitted to the Town for approval to reduce erosion and sediment transport on construction sites. The BMPs must be sufficient to prevent the transport of sediment and other pollutants offsite to a degree that causes any negative impact on adjacent and/or downstream properties, rights-of-ways, public improvements (including but not limited to storm sewers) and watercourses. Upon approval of the DESC Plan, the Permittee install or shall implement the BMPs as shown on the Plan.

8.5.2 Initial DESC Inspection. After installing or implementing BMPs, permittee shall request an initial DESC Inspection. Building inspections shall not occur until passing the initial DESC Inspection for all on- and off-site BMPs.

8.5.3 Inspections by Permittee. Permittee shall inspect and maintain all BMPs including off-site BMPs as identified on the DESC Plan at least every fourteen (14) days and after any precipitation, snowmelt or runoff event that causes surface erosion, sediment transport or vehicular tracking. All erosion and sediment control practices must be maintained in effective operating condition at all times.

Minimum Erosion and Sediment Control Requirements , continued

8.5.4 Corrections to the BMPs. If drainage, erosion or sediment problems become apparent during construction, such as when off-site sedimentation occurs, the DESC Inspector may require the BMP to be reevaluated and reimplemented by permittee in an effective manner.

8.5.5 Stop Work Orders. If earth materials or other pollutants are tracked, spilled, or washed onto streets, permittee shall clean the streets in accordance with Town approved methods, or as directed by the DESC Inspector. Failure to clean up tracking of material onto streets will result in an immediate stop work order.

Permittee shall not stockpile, place or store on streets, sidewalks or storm water flow lines earth materials and landscape materials, such as sod, compost, dirt, rock and mulch. Stockpiling of such materials in the right-of-way will result in an immediate stop work order.

Permittee shall not store construction materials, roll off containers, dumpsters, portable toilets, trailers or any other item(s) on streets or sidewalks. These items shall be stored on the construction site(s) or designated staging area(s) as shown on the approved DESC Plan.

8.5.6 Final DESC Inspection. The permittee shall be responsible for all drainage, erosion and sediment control related to the permitted site and all associated off-site BMPs as shown on the approved DESC Plan until a certificate of occupancy is issued. Prior to issuance of a certificate of occupancy, the following items must be completed:

- All off-site disturbances as shown on the DESC Plan are to be reclaimed in accordance with this Manual unless it can be demonstrated that these areas are required as part of another open DESC permit.
- Final grade on the property is to be established in accordance with the approved DESC Plan and requirements as set forth in Section 8.6.
- A Final Drainage Certificate is to be submitted and approved by the Town per Section 8.6.
- Temporary erosion and sediment control shall be properly designed and installed to remain effective until permanent erosion control is installed.

In cases where final grade cannot be established because of weather constraints at the time of the final inspection, the permittee may post a Fiscal Surety through the Town bonding policies until all items are completed and approved by the Town. Temporary sediment controls are required at all times regardless of weather conditions.

Minimum Erosion and Sediment Control Requirements , continued

8.5.7 Permanent Erosion Control. After issuance of a certificate of occupancy, the DESC permit is transferred to the property owner and drainage, erosion, and sediment control is the sole responsibility of the property owner. This does not absolve the home builder from applicable warranty issues associated with drainage and site work. The DESC Permit shall remain active until permanent erosion control is installed and a certificate of completion is issued. Temporary erosion and sediment controls are to be inspected and maintained by the property owner in accordance with Section 8.5.3 until permanent erosion control is installed.

Permanent erosion control measures must be in place within one hundred eighty (180) days from issuance of a certificate of occupancy. Failure to install permanent erosion control measures within that time frame shall constitute a violation of this chapter. The storm water engineering manager may grant an extension of up to ninety (90) days upon written request by the permittee. No more than two (2) extensions may be granted. Failure by the permittee to request an extension prior to the deadline or installation of permanent erosion control measures shall constitute a violation of the provisions of this chapter and each day after the expiration date shall be punishable as a separate offense.

Minimum Drainage Requirements for Finished Grade

8.6

8.6.1 Minimum Slopes. A minimum slope of ten percent (10%) and a maximum of thirty-three percent (33%) in the first ten (10) feet away from the foundation walls and window wells shall be established for pervious surfaces except when limited by property lines or when vegetation is to be preserved and documentation of adequate drainage is provided. All other pervious areas shall have a minimum of two percent (2%) slope (a two-and-a-half-percent (2.5%) slope is recommended for grassy areas) away from the foundation. All pervious and impervious areas shall slope continuously to the lowest point where storm water discharges from the lot. At this point, the discharge water shall be directed in a manner as to not cause harm to downslope properties. Where minimum slopes cannot be attained, another means to adequately convey the water from the lot shall be designed by a registered design professional and submitted for Town approval.

Impervious surfaces other than driveways adjacent to the foundation shall have adequate drainage away from the foundation as determined by a registered design professional (see International Residential Code for specific requirements under Chapter 4 Section R40 3.1.7 thru R40 3.1.9 as amended).

Driveways shall have a minimum slope of two percent (2%) away from the foundation for a minimum distance of 5 feet to allow adequate drainage away from the garage entrance as determined by a registered design professional.

8.6.2 Drainage Swales. Drainage swales shall not be located within the foundation backfill zones unless limited by property lines. Drainage

Minimum Drainage Requirements for Finished Grade, continued

swales shall have adequate depth, width and longitudinal gradient to convey the storm water off the lot in an effective, non-damaging manner. Drainage swales shall be designed to spread flows out as much as possible. Privacy fences shall be installed in a manner that will not affect approved drainage patterns and flow paths.

8.6.3 Retaining Wall(s). Manmade slopes greater than 33% grade require a properly designed retaining wall(s) when other approved means of stabilization cannot be achieved. Retaining walls shall not encroach onto adjacent properties. Retaining walls taller than four (4) feet (including footing) require a building permit and shall be designed by a registered design professional. Refer to current building codes for additional requirements. All retaining walls will be inspected by the DESC inspector to ensure that final grade meets plan requirements. All instances where means of stabilization other than retaining walls are proposed must be submitted to the Town of Castle Rock Stormwater Engineering Manager for approval.

8.6.4 Downspouts and Sump Pumps. Downspouts and sump pumps shall discharge a minimum of five (5) feet away from the foundation wall and outside the foundation backfill zone unless limited by property lines. For tract housing projects, downspouts shall be oriented in the general direction of the drainage swale flow (not perpendicular to or against the flow). Downspouts shall not directly discharge onto adjacent properties. Downspouts and sump pumps shall not discharge directly onto rights-of-way unless the discharge is associated with the implementation of a temporary BMP and appropriate safety precautions are implemented.

8.6.5 Allow for Overflow. Where catch basins or inlets are installed, finished grade elevations of adjoining areas shall provide for emergency surface overflow so that, in the event of failure of catch basins or inlets, building and window wells shall be protected against flooding.

8.6.6 Final Drainage Certificate. To ensure proper site drainage, adequate drainage away from the foundation and off the lot, a Final Drainage Certificate shall be certified by a registered design professional and approved by the Town before a certificate of occupancy can be issued. The following items shall be clearly illustrated on the Final Drainage Certificate:

- All vertical and horizontal deviations to grades, drains, spot elevations, slopes and drainage patterns throughout the lot as shown on the approved DESC Plan.
- Location of the sump pump discharge, if applicable.
- The plan shall be signed and stamped by a registered design professional.

DESC Program Inspection and Enforcement

8.7

The inspection process for the Town's DESC Program includes selected inspections by Town of Castle Rock DESC Administrators that include, but are not limited to, the following:

DESC Program Inspection and Enforcement, continued

- Proactive inspections by a DESC Administrator that occur randomly during construction.
- Mandatory inspections including initial, rough, and final for all DESC permitted sites.
- A post-construction inspection is performed to verify that permanent erosion control measures have been installed.
- Complaint-generated inspections based on input from the general public or referrals from Town Staff.

Enforcement of the DESC Program shall include re-inspection fees, notices of violation, Stop Work Orders, and/or criminal or civil prosecution in accordance with the DESC ordinance, as amended.

Stop Work Orders

8.8
Failure to meet the requirements of this Section may result in the issuance of a stop work order. The stop work order shall remain in effect until all items have been remediated and approved by the Town.

8.8.1 Penalties and Enforcement. Any person found to have violated any of the provisions of this Section shall be charged with a violation of Chapter 15.10 of the Town of Castle Rock Municipal Code, 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"). A violation of the Town provision may result in penalties under the Municipal Code of not more than one thousand dollars ($1,000) or by imprisonment not to exceed one (1) year, or by both such fine and imprisonment. Each such person shall be guilty of a separate offense for each and every day during any portion of which any violation of any provision of this Chapter is committed. (Ord. 2004-28 §1, 2004).

Compliance with Other Laws, Regulations, Ordinances and Standards

8.9
8.9.1 The requirements of these regulations are minimum requirements. They do not replace, repeal, abrogate, supersede or affect any other more stringent requirements, rules, regulations, covenants, standards or restrictions. Where these regulations impose requirements that are more protective of human health or the environment that those set forth elsewhere, the provisions of these regulations shall prevail.

8.9.2 Approvals and permits granted under these regulations are not waivers of the requirements of any other laws nor do they indicate compliance with any other laws. Compliance is still required with all applicable federal, state and local laws and regulations.

Town of Castle Rock Not Responsible

8.10
Nothing contained in these regulations is intended to be nor shall be construed to create or form the basis for any liability on the part of the Town, its officers, employees or agents for any injury or damage resulting from the failure of responsible parties to comply with the provisions of these regulations, or by reason or in consequence of any inspection, notice,

order, certificate, permission or approval authorized or issued or done in connection with the implementation or enforcement of these regulations, or by reason of any action or inaction on the part of the Town related in any manner to the enforcement of these regulations by its officers, employees or agents. The Chief Building Official, DESC inspector or any employee charged with the enforcement of these regulations, acting in good faith and without malice on behalf of the Town, shall not be personally liable for any damage that may accrue to persons or property as a result of any action required by the Town, or by reason of any act or omission in the discharge of these duties.

DESC Permit Fees

8.11 DESC Permit Fees

Every entity and person applying for a permit shall pay fees as set forth and published in the most recent Development Services fee schedule, as amended.

Acronyms

Following is a is a list of acronyms used in this Manual:

APEN	Air Pollutant Emission Notice
ASTM	American Society of Testing Materials
BMP	Best Management Practice
CB	Compost Blanket
CD	Check Dam
CDPHE	Colorado Department of Public Health and Environment
CDPS	Colorado Discharge Permit System
CF	Construction Fence
CFB	Compost Filter Berm
CFR	Code of Federal Regulations
CFS	Cubic Feet Per Second
CIF	Culvert Inlet Filter
CL	Crest Length
CLOMR	Conditional Letter of Map Revision
CM	Construction Markers
CO	Certificate of Occupancy
CWA	Concrete Washout Area
D	Depth, Diameter
D50	Riprap Mean-Diameter
DESC	Drainage, Erosion, and Sediment Control
DD	Diversion Ditch
DW	Dewatering
ECB	Erosion Control Blanket
FEMA	Federal Emergency Management Agency
GESC	Grading, Erosion and Sediment Control
HD	Hole Diameter
ILOC	Irrevocable Letter of Credit
IP	Inlet Protection
L	Length
LOC	Limits of Construction
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
MUTCD	Manual of Uniform Traffic Control Devices
N	Number of Columns
NPDES	National Pollutant Discharge Elimination System
PE	Professional Engineer
R	Radius
RCD	Reinforced Check Dam
RRB	Reinforced Rock Berm
RRC	Reinforced Rock Berm for Culvert Protection
SB	Sediment Basin
SCL	Sediment Control Log
SF	Silt Fence
SIA	Subdivision Improvements Agreement
SM	Seeding and Mulching
SR	Surface Roughening
SSA	Stabilized Staging Area
ST	Sediment Trap
TCO	Temporary Certificate of Occupancy

Acronyms, continued

TER	Terracing
TSC	Temporary Stream Crossing
TSD	Temporary Slope Drain
UDFCD	Urban Drainage and Flood Control District
VTC	Vehicle Tracking Control
W	Width
WW	Vehicle Tracking Control with Wheel Wash
Z	Slope

Glossary of Terms

Following is a glossary of some of the terms used in this Manual:

Administrative Variance refers to variances that are considered by the Town of Castle Rock to be complicated and which will require a more extensive review. These administrative variances shall be reviewed by the Town Utilities Director.

After construction refers to after a building has been completed but before a certificate of occupancy has been issued, or, for structures not eligible to receive a certificate of occupancy, before a final inspection has been performed.

Aggradation refers to the deposition of sediment in a stream in a manner and extent that the bed elevation of the stream rises.

Applicant(s) refers to the Owner and Contractor whom complete and sign the Grading, Erosion and Sediment Control (GESC) Permit Application.

Alternate Grading, Erosion and Sediment Control (GESC) Manager refers to an on-site representative who serves, in the absence of the GESC Manager, as the Permittee(s) contact person with the Town and who is responsible for ongoing compliance with the GESC Permit.

Backfill zone is the area to be backfilled between the foundation and the excavation wall.

Best Management Practice (BMP) refers in this Manual to a measure implemented by a Contractor to control construction site erosion or sediment. A physical, structural, or managerial practice or device that prevents or reduces erosion or sedimentation.

BMP, non-structural are those BMPs that require modified or additional operational or behavioral practices, such as street sweeping or phasing construction activities on a project.

BMP, structural are those BMPs that require the construction of a structure or other physical modification on the site such as silt fencing, downspout extensions or use of protective cover.

Glossary of Terms, continued

Cell is a group of lots in a tract housing development owned or under construction by one (1) specific builder.

Certification of completion is a certificate signed by the Permitee and approved by the Stormwater Engineering Manager or his/her designee certifying that the permittee has completed all requirements of the DESC permit.

Check Dam (CD) is a small rock dam, designed to withstand overtopping, that is placed in a small stream or drainageway. The purpose of the check dam is to trap water-borne sediment in the backwater zone upstream of the check and to reduce flow velocities in a channel.

Compost Blanket (CB) consists of a layer of Class I 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.

Compost Filter Berms (CFB) are used on slopes in conjunction with compost blanket to reduce flow length and control rill and gully erosion.

Concrete Washout Area (CWA) is a shallow excavation with a small perimeter berm to isolate concrete truck washout operations.

Construction refers to the implementation of a proposed plan of improvements by a Contractor that may include excavating, site grading, utility work, paving, building, and other activities that may contribute to the disturbance of land and elevated levels of erosion and sediment.

Construction Fence (CF) consists of orange plastic fencing, or other approved material, attached to support posts and used to control access to the construction site and delineate limits of construction.

Construction Markers (CM) consist of wooden lath or other markers, with tops painted orange, spaced at 100-foot centers to delineate limits of construction. Construction markers may be used as an alternative to construction fence if approved by the Town.

Culvert Inlet Filter (CIF) consists of a reinforced rock berm placed in front of a culvert to reduce sediment in runoff approaching the culvert.

Degradation refers to erosion of bed material from the bottom of a stream leading to a lowering of the channel invert.

DESC Permit refers to a Drainage, Erosion, and Sediment Control (DESC) Permit administered by the Town of Castle Rock Utilities Department for residential lot construction. The DESC Permit follows the grading and infrastructure work undertaken under a GESC Permit and a Construction Permit.

Glossary of Terms, continued

Design Engineer refers to the Professional Engineer responsible for the development of the GESC Plan.

Development refers to the process of creating new residential, commercial, office, or other land uses through the process of construction.

Dewatering (DW) consists of a gravel filter provided on the suction end of a pump to reduce the pumping of sediment and a rip rap pad at the discharge end of the pump to provide erosion protection. Dewatering includes settling the discharge water in a small basin or sediment pond before releasing to receiving waters.

Discharge point is the location to which drainage water from a specific site is released.

Diversion Ditch (DD) is a small earth channel used to divert and convey runoff to a sediment basin, check dam, or drainageway. Depending on slope, the diversion swale may need to be lined with erosion control matting, plastic (for temporary installations only), or riprap.

Drainage basin is the tributary area through which drainage water is collected, regulated, transported and discharged to receiving waters.

Drainage control refers to the management of drainage water. Drainage control is accomplished through the collection, conveyance and discharge of drainage water.

DESC Plan refers to a **Drainage, Erosion and Sediment Control Plan** for collecting, controlling, transporting and discharging drainage water falling upon, entering, flowing within and exiting the site. The plan includes a schedule of BMPs to be implemented to control erosion and sedimentation during construction. The plan shall be a plot plan modified to meet the minimum requirements set forth in Section 8.

Drainage Regulations refers to the Town of Castle Rock Storm Drainage Design and Technical Criteria Manual, the Municipal Code, or any other applicable drainage criteria adopted by the Town.

Drainage swale is a depression or defined channel that collects and conveys drainage water to a discharge point.

Drainageway is any natural or artificial watercourse, including but not limited to streams, rivers, creeks, ditches, channels, canals, waterways, gullies, ravines, or washes in which water flows in a definite direction or course, either continuously or intermittently, including any area adjacent to it that is subject to inundation by reason of overflow or floodwater and meets any of the following conditions:

Glossary of Terms, continued

- Provides for conveyance of stormwater runoff from an upstream property or development,
- Defined as "waters of the United States" by the Army Corps of Engineers,
- Supports riparian area or sensitive habitat,
- Tributary area equal to or greater than 20 acres,
- Alternation or filling will change the manner in which runoff is discharged onto a downstream property and potentially results in a negative impact to that downstream property.

Erosion is the process by which the land surface is worn away by the action of wind, water, ice and gravity.

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

Excavation is the displacement of earth material, including minor adjustments to the surface of the site in preparation for construction.

Existing grade is the natural or overlot graded surface contour of a site before foundation excavation.

Export means transporting material from a construction site to another location.

Eutrophication refers to the degradation in water quality of a lake or reservoir due to accelerated algal productivity, often a result of increased nutrient loading.

Fill refers to material deposited, placed, pushed, dragged or transported to a place other than from the place from where is was excavated.

Final drainage certificate refers to a record drawing depicting vertical and horizontal deviations to grades, spot elevations, slopes and drainage patterns throughout the lot as shown on the approved DESC Plan for residential properties.

Final grade is the grade after completion of construction, excavation and fill.

Fiscal Surety refers to a cash, check, performance bond or an irrevocable letter of credit that an owner submits to the Town of Castle Rock to be held as surety during the construction process and to be drawn upon in the case of nonperformance on the part of the Permittee(s).

Floodplain refers to the area adjoining any river, stream, watercourse, lake or other body of water which is subject to inundation of a 100-year flood. Refer to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) for more information.

Glossary of Terms, continued

Grading is excavation, fill, in-place ground modification or any combination thereof, including the establishment of a grade following demolition of a structure.

Grading, Erosion and Sediment Control (GESC) Drawings refers to the illustrative portion of the GESC Plan which show the location and extent of all grading, erosion and sediment control BMPs as well as other associated information required by the GESC Manual.

Grading, Erosion and Sediment Control (GESC) Inspector refers to the Town representative who visits construction sites to check for compliance with the GESC Permit.

Grading, Erosion and Sediment Control (GESC) Manager refers to an on-site representative who serves as the Permittee(s) contact person with the Town and who is responsible for ongoing compliance with the GESC Permit.

Grading, Erosion, and Sediment Control (GESC) Permit refers to the permit obtained from the Town of Castle Rock Development Services Department prior to commencement of land disturbing activities as defined in the Town of Castle Rock Grading, Erosion and Sediment Control Manual.

Grading, Erosion and Sediment Control (GESC) Permit Process refers to the process applicants proceed through to obtain a permit to commence land disturbing activities within the limits of the Town of Castle Rock.

Grading, Erosion and Sediment Control (GESC) Permit Program refers to the program developed and administered by the Town of Castle Rock to regulate land disturbing activities within the Town of Castle Rock.

Grading, Erosion and Sediment Control (GESC) Plan refers to the complete package of required information submitted to the Town of Castle Rock for review and acceptance which include GESC Drawings, GESC Report, GESC Drawing and Report Checklist, and Opinion of Probable Cost Worksheet.

Grading, Erosion and Sediment Control (GESC) Report refers to the report required to be submitted with the GESC Plan that details all aspects of the GESC plan such as Soils, Areas and Volumes, etc.

Impervious surface refers to any surface that water runs across as opposed to soaking in, including, but not limited to, paved streets, paved driveways, treated surfaces, walkways, roof surfaces and patios.

Import means transporting material from an off-site area to the project site to be used as fill.

Glossary of Terms, continued

Landscape materials refers to any rock, sod, bark, mulch, tree, shrubbery, topsoil, fertilizer, earth material or any other material associated with establishing permanent vegetation, erosion control or finished grade changes.

Level I Violations are viewed by the Town of Castle Rock to pose an immediate serious risk to the health, safety, or welfare of people and/ or the environment; and result in an immediate issuance of a stop work order.

Level II Violations are reviewed by the Town of Castle Rock 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 Permittees are notified of the violation(s).

Level III Violations are viewed by the Town of Castle Rock 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. Remediation for Level III Violations shall commence immediately after the Permittees are notified of the violation(s).

Limits of Construction refers to the area shown on the GESC Plan that delineates areas in which construction activities can take place including staging, storage, and stockpiling.

Permanent erosion control is a method to stabilize the soil to prevent soil particles from being dislodged by wind and water erosion.

Permittee(s) refers to the Owner and/or Contractor whom obtain a GESC or DESC Permit. This includes the homeowner to whom a DESC permit has been transferred.

Plan is a graphic or schematic representation, with accompanying notes, schedules, specifications and other related documents.

Plot Plan is a scaled map of a building site and adjacent public rights-of-way showing locations and dimensions of various existing and proposed features such as building, curbs, driveways, sidewalks, trees, grades, easements, lot lines, elevations and drainage patterns.

Professional Engineer refers to an individual currently registered with the Colorado State Board of Registration as a Professional Engineer, practicing engineering in accordance with State law (Title 12, Article 25, Part 1).

Registered design professional refers to an individual who is registered or licensed to practice their respective design profession as defined by statutory requirements of the professional registration laws of the State or Town, such practice to include drainage design and implementation of effective erosion and sediment control, including a landscape architect, surveyor and engineer.

Glossary of Terms, continued

Reinforced Check Dam (RCD) consists of rock placed within wire-reinforced gabions to provide additional resistance to the forces of water. It serves the same purpose as a check dam, and, due to its greater strength, may be used on larger drainageways than a check dam.

Reinforced Rock Berm (RRB) 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 as well as reducing flow velocities.

Rivulet refers to the onset of flow concentrations in small depressions or creases in the soil surface as flow transitions from sheet flow to rill flow.

Runoff refers to the flowing of water across the ground surface. Runoff includes, but is not limited to, storm water, snowmelt, yard watering and sump pump activity.

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

Sediment Control Log (SCL) refers to a cylindrical bundle of excelsior, straw, or coconut designed to form a semi-porous filter, able to withstand overtopping, and promote sediment deposition on the upstream side and reducing flow velocities.

Sediment Trap (ST) consists of a riprap berm with a small upstream basin that acts to trap coarse sediment particles.

Sedimentation means the transport and deposition of earthen materials dislodged by wind and water erosion.

Seeding and Mulching (SM) consists of drill seeding disturbed areas with permanent grasses and mechanical crimping of 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.

Silt Fence (SF) 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.

Slope is an inclined ground surface. The slope may be expressed as a percentage or a ratio**.**

Stabilized Staging Area (SSA) refers to stripping topsoil and spreading a layer of granular material 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.

Glossary of Terms, continued

Stage of Construction refers to the Initial, Interim, or the Final Stage of construction; BMPs are to be shown on the GESC Plan as being installed at one of these three stages.

Standard BMPs refers to any one of a number of BMPs that have been approved for use in the Town and for which standard notes and details have been prepared.

Staff Variance refers to a variance that is considered by the Town of Castle Rock to be minor in nature; these staff variances may be considered by the Town of Castle Rock Development Services Review Engineer and Stormwater Engineering Manager.

Stop Work Order refers to a written notice provided by a Town Inspector that suspends a GESC or DESC Permit as a result of a priority violation; Contractors receiving a Stop Work Order shall cease construction operations until the problem is addressed and a signed Stop Work Order Release Form is obtained.

Stormwater runoff refers to water originating from rainfall and other precipitation.

Structural BMP refers to those which require the construction of a structure or physical modification on the site such as silt fencing, downspout extensions or use of protective cover.

Subdivision Improvement Agreement (SIA) refers to an agreement between the subdividers and the Town, and identifies the public improvements (including regional facilities) required to be constructed to support the development. The SIA provides assurances that the public improvements will be constructed to established standards in a timely manner.

Surface Roughening (SR) 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.

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

Temporary Stream Crossing (TSC) refers to a rock layer placed temporarily in a stream to allow construction equipment to cross. A stream crossing may include culverts or provide a low-water crossing, or ford. In either case, excavation of the existing channel banks is to be avoided and, in general, disturbance is to be kept to a minimum.

Terracing (TER) 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.

Glossary of Terms, continued

Topsoil is weathered surface soil, usually including the organic layer, in which plants have most of their roots.

Tract housing refers to three (3) or more single-family houses of a similar or complementary design constructed by one (1) specific builder on a group of lots (cell) within a subdivision.

Vehicle Tracking Control (VTC) consists of a pad of approximately 3" rock at all entrance/exit points for a site that is intended to help strip mud from tires prior to vehicles leaving the construction site.

Vehicle Tracking Control with Wheel Wash (WW) consists of a gravel and riprap pad at the main entrance/exit point for the site with an adjacent washwater/sediment trap. If the Town requires a Permittee(s) 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.

Watercourse is a channel, natural depression, slough, artificial channel, gulch, arroyo, stream, creek, pond, reservoir or lake in which storm runoff and floodwater flows either regularly or intermittently, including major drainage ways for carrying urban storm runoff.

Bibliography

American Association of State Highway and Transportation Officials. *Compost for Erosion/Sediment Control (Filter Berms).* AASHTO Designation MP-9.

American Association of State Highway and Transportation Officials. *Compost for Erosion/Sediment Control (Compost Blankets).* AASHTO Designation MP-10.

City of Austin. *Environmental Criteria Manual*. City of Austin, Texas. 1988.

Center For Watershed Protection. *Watershed Protection Techniques*, Vol. 2, No. 3. February 1997.

Center For Watershed Protection. *The Practice of Watershed Protection.* 2000.

Colorado Weed Management Association. *What are Noxious Weeds Doing to Colorado?*

Cooperative Extension Service, University of Georgia College of Agricultural and Environmental Sciences. *Compost Utilization for Erosion Control.* August 2001.

Douglas County. *Residential Development Land Disturbance Regulations.* July 1, 2000.

Douglas County. *Storm Drainage Design and Technical Criteria*, *Addendum A, Erosion Control Criteria*. May 1993.

Douglas County. *Roadway Design and Construction Standards.* Amended April 1994.

Douglas County Weed Division. *Integrated Weed Management Brochures.*

Granite Seed Company. *Granite Seed Company Catalog*. 2000.

North Carolina Department of Environment, Health, and Natural Resources. *Erosion and Sediment Control Field Manual*. February 1991.

San Francisco Bay Region, Regional Water Quality Control Board. *Erosion and Sediment Control Field Manual*, Third Edition. July 1999.

Summit County Water Quality Committee. *Erosion and Sediment Control During Construction.* Prepared by B. Lorch and L. Wyatt. Summit County, Colorado. July, 2000.

Urban Drainage and Flood Control District (UDFCD). *Urban Storm Drainage Criteria Manual, Volume 3 — Best Management Practices*. Prepared by UDFCD. Denver, Colorado. 1992. Updated September, 1999.

List of Appendices

Appendix A Contact List

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Appendix A

Contact List

Contact Information

(Information is subject to change)

Town of Castle Rock
Utilities Department
Stormwater Engineering
(for GESC and DESC technical questions, and scheduling GESC inspections)
175 Kellogg Court
Castle Rock, CO 80109
Phone: 720-733-6000

Town of Castle Rock
Development Services Department
(for process, plan review, permit, and fiscal security questions)
100 N. Wilcox Street
Castle Rock, CO 80104
Phone: 720-733-2200

Town of Castle Rock
Public Works Department
(for scheduling Public Works inspections)
4175 N. Castleton Court
Castle Rock, CO 80109
Phone: 720-733-2462

Town of Castle Rock
Utilities Department
Water Conservation Technician
175 Kellogg Court
Castle Rock, CO 80109
Phone: 720-733-6000

Town of Castle Rock
Utilities Department
Stormwater Engineering Manager/Floodplain Manager
175 Kellogg Court
Castle Rock, CO 80109
Phone: 720-733-6000

Town of Castle Rock
Stormwater and Pollution Prevention Hotline
175 Kellogg Court
Castle Rock, CO 80109
Phone: 720-733-2235

Colorado Department of Public Health and Environment (CDPHE)
4300 Cherry Creek Drive South
Denver, CO 80246-1530
Phone: 303-692-2000
Website: www.cdphe.state.co.us

Department of the Army
Corps of Engineers, Omaha District
Tri-Lakes Project Office
9307 S. Wadsworth Blvd.
Littleton, CO 80128-6901
Phone: 303-979-4120

Colorado Department of Public Health and Environment (CDPHE)
Toll Free 24-Hour Environmental Emergency Spill Reporting Line
1-877-518-5608

National Response Center (24-Hour National Spill Response)
1-800-424-8802

United States Department of the Interior
Fish and Wildlife Service
134 Union Boulevard
Lakewood, CO 80228
Phone: 303-236-4255

Federal Emergency Management Agency (FEMA)
Region VIII
Denver Federal Center
Building 710, Box 25267
Denver, CO 80225-0267
Phone: 303-235-4800

Appendix B

Standard Notes and Details applicable for both GESC and DESC Plans

GRADING, EROSION, AND SEDIMENT CONTROL (GESC) GENERAL NOTES

1. THE UTILITIES DIRECTOR AND DEVELOPMENT SERVICES DEPARTMENT SIGNATURES AFFIXED TO THIS DOCUMENT INDICATE THE UTILITIES DEPARTMENT STORMWATER ENGINEERING DIVISION AND THE DEVELOPMENT SERVICES DEPARTMENT HAVE REVIEWED THE DOCUMENT AND FOUND IT IN GENERAL COMPLIANCE WITH THE TOWN OF CASTLE ROCK GRADING, EROSION AND SEDIMENT CONTROL (GESC) CRITERIA MANUAL. THE UTILITIES DIRECTOR AND DEVELOPMENT SERVICES DEPARTMENT, THROUGH ACCEPTANCE OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY (OTHER THAN STATED ABOVE) FOR THE COMPLETENESS AND/OR ACCURACY OF THESE DOCUMENTS.

2. THE ADEQUACY OF THIS GESC PLAN LIES WITH THE ORIGINAL DESIGN ENGINEER.

3. THE GESC PLAN SHALL BE CONSIDERED VALID FOR ONE (1) YEAR FROM THE DATE OF ACCEPTANCE BY THE TOWN, IF CONSTRUCTION HAS NOT COMMENCED, AFTER WHICH TIME THE PLAN SHALL BE VOID AND WILL BE SUBJECT TO RE-REVIEW AND RE-ACCEPTANCE BY THE TOWN OF CASTLE ROCK.

4. OVERLOT GRADING REQUIRES A CONSTRUCTION PERMIT THROUGH THE PUBLIC WORKS DEPARTMENT IN ADDITION TO THE GESC PERMIT. ALL EARTHWORK AND GRADING OPERATIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE TOWN OF CASTLE ROCK APPROVED CONSTRUCTION PLANS AND THE TOWN OF CASTLE ROCK PUBLIC WORKS REGULATIONS. WHERE THERE IS A CONFLICT BETWEEN THESE PLANS AND THE SPECIFICATIONS, OR ANY APPLICABLE STANDARDS, THE HIGHER QUALITY STANDARD SHALL APPLY.

5. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE TOWN OF CASTLE ROCK. THE TOWN RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO THE GESC MANUAL, GESC PLAN OR GESC PERMIT.

6. SEE CONSTRUCTION PLANS FOR ALL GEOTECHNICAL SAMPLING, TESTING AND INSPECTION REQUIREMENTS.

7. THE PLACEMENT OF EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMPs) SHALL BE IN ACCORDANCE WITH THE TOWN OF CASTLE ROCK ACCEPTED GESC PLAN AND THE TOWN OF CASTLE ROCK GESC MANUAL.

8. ANY VARIATION IN MATERIAL, TYPE OR LOCATION OF EROSION AND SEDIMENT CONTROL BMPs FROM THE TOWN OF CASTLE ROCK ACCEPTED GESC PLAN WILL REQUIRE APPROVAL FROM AN ACCOUNTABLE REPRESENTATIVE OF THE TOWN.

9. AFTER THE GESC PLAN HAS BEEN ACCEPTED, THE GESC PERMIT APPLIED FOR, FEES AND FISCAL SECURITY SUBMITTED TO THE TOWN, AND THE GESC MANUAL OBTAINED AND REVIEWED, THE CONTRACTOR MAY INSTALL THE INITIAL-STAGE EROSION AND SEDIMENT CONTROL BMPS INDICATED ON THE ACCEPTED GESC PLAN.

10. THE FIRST BMP TO BE INSTALLED ON THE SITE SHALL BE CONSTRUCTION FENCE, MARKERS, OR OTHER APPROVED MEANS OF DEFINING THE LIMITS OF CONSTRUCTION, INCLUDING CONSTRUCTION LIMITS ADJACENT TO STREAM CORRIDORS AND OTHER AREAS TO BE PRESERVED.

11. AFTER INSTALLATION OF THE INITIAL-STAGE EROSION AND SEDIMENT CONTROL BMPs, THE PERMITTEE SHALL CALL THE TOWN OF CASTLE ROCK UTILITIES DEPARTMENT AT 720-733-6000 TO SCHEDULE A PRECONSTRUCTION MEETING AT THE PROJECT SITE. THE REQUEST SHALL BE MADE A MINIMUM OF THREE (3) BUSINESS DAYS PRIOR TO THE REQUESTED MEETING TIME. NO CONSTRUCTION ACTIVITIES SHALL BE PLANNED WITHIN 24 HOURS AFTER THE PRECONSTRUCTION MEETING.

12. THE OWNER OR OWNER'S REPRESENTATIVE, THE GESC MANAGER, THE GENERAL CONTRACTOR, AND THE GRADING SUBCONTRACTOR, IF DIFFERENT FROM THE GENERAL CONTRACTOR, MUST ATTEND THE PRECONSTRUCTION MEETING. IF ANY OF THE REQUIRED PARTICIPANTS FAIL TO ATTEND THE PRECONSTRUCTION MEETING, OR IF THE GESC PLAN IS NOT ON SITE, OR IF THE INSTALLATION OF THE INITIAL BMPs ARE NOT APPROVED BY THE TOWN GESC INSPECTOR, THE APPLICANT WILL HAVE TO PAY A REINSPECTION FEE, ADDRESS ANY PROBLEMS WITH BMP INSTALLATION, AND CALL TO RESCHEDULE THE MEETING, WITH A CORRESPONDING DELAY IN THE START OF CONSTRUCTION. THE TOWN OF CASTLE ROCK STRONGLY ENCOURAGES THE APPLICANT TO HAVE THE ENGINEER OF RECORD AT THE PRECONSTRUCTION MEETING. FAILURE OF THE ENGINEER OF RECORD TO ATTEND MAY RESULT IN A DELAY OF THE START OF CONSTRUCTION.

13. CONSTRUCTION SHALL NOT BEGIN UNTIL THE TOWN GESC INSPECTOR APPROVES THE INSTALLATION OF THE INITIAL BMPs AND THE APPROVED GESC PERMIT IS PICKED UP FROM THE TOWN AND IS IN-HAND ON THE SITE. THE COMPLETED PERMIT WILL BE AVAILABLE WITHIN 24-HOURS AFTER THE INSTALLATION OF THE INITIAL BMPs ARE APPROVED.

14. THE GESC MANAGER SHALL STRICTLY ADHERE TO THE TOWN-APPROVED LIMITS OF CONSTRUCTION AT ALL TIMES. THE TOWN MUST APPROVE ANY CHANGES TO THE LIMITS OF CONSTRUCTION AND, AT THE DISCRETION OF THE TOWN, ADDITIONAL EROSION/SEDIMENT CONTROLS MAY BE REQUIRED IN ANY ADDITIONAL AREAS OF CONSTRUCTION.

15. THE MAXIMUM AREA OF CONSTRUCTION SHALL BE LIMITED TO 40 ACRES (70 ACRES IF APPROVED FOR SOIL MITIGATION OPERATIONS) TO REDUCE THE AMOUNT OF LAND DISTURBED AT ANY ONE TIME. LARGER SITES SHALL BE DIVIDED INTO PHASES THAT ARE EACH 40 (OR 70) ACRES OR LESS IN SIZE. THESE PROJECTS SHALL CONDUCT GRADING ACTIVITIES IN ACCORDANCE WITH THE ACCEPTED GESC PLAN. BMP INSTALLATION AND APPROVAL BY THE TOWN AT THE START AND COMPLETION OF EACH PHASE SHALL BE CONDUCTED IN ACCORDANCE WITH THE PROCEDURES OUTLINED IN THE GESC MANUAL.

16. PRIOR TO ACTUAL CONSTRUCTION, THE PERMITTEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES. FOR INFORMATION, CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 OR 1-800-922-1987.

17. NATURAL VEGETATION SHALL BE RETAINED AND PROTECTED WHEREVER POSSIBLE. EXPOSURE OF SOIL TO EROSION BY REMOVAL OR DISTURBANCE OF VEGETATION SHALL BE LIMITED TO THE AREA REQUIRED FOR IMMEDIATE CONSTRUCTION OPERATIONS.

18. THE GESC PERMIT SHALL BE VALID FOR A THREE (3) YEAR PERIOD (ONE YEAR ACTIVE CONSTRUCTION AND TWO YEAR REVEGETATION PERIOD). IN THE EVENT THAT ACTIVE CONSTRUCTION EXCEEDS ONE YEAR, THE GESC PERMIT MUST BE RENEWED.

19. A COPY OF THE GESC PERMIT, ACCEPTED GESC PLANS SHALL BE ON SITE AT ALL TIMES.

20. THE GESC MANAGER SHALL BE RESPONSIBLE FOR ENSURING THAT THE SITE REMAINS IN COMPLIANCE WITH THE GESC PERMIT AND SHALL BE THE PERMITTEE'S CONTACT PERSON WITH THE TOWN FOR ALL MATTERS PERTAINING TO THE GESC PERMIT. THE GESC MANAGER SHALL BE PRESENT AT THE SITE THE MAJORITY OF THE TIME AND SHALL BE AVAILABLE THROUGH A 24-HOUR CONTACT NUMBER. IN THE EVENT THAT THE CONTRACTOR'S GESC MANAGER IS NOT ON SITE AND CANNOT BE REACHED DURING A VIOLATION, THE ALTERNATE GESC MANAGER SHALL BE CONTACTED. IF NEITHER THE GESC MANAGER NOR ALTERNATE GESC MANAGER CAN BE CONTACTED DURING ANY VIOLATION, A STOP WORK ORDER SHALL BE ISSUED.

21. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE THROUGH A TOWN-APPROVED ACCESS POINT. A VEHICLE TRACKING CONTROL PAD IS REQUIRED AT ALL ACCESS POINTS ON THE SITE. ADDITIONAL STABILIZED CONSTRUCTION ENTRANCES MAY BE ADDED WITH AUTHORIZATION BY THE TOWN.

22. THE GESC MANAGER IS RESPONSIBLE FOR CLEANUP OF SEDIMENT OR CONSTRUCTION DEBRIS TRACKED ONTO ADJACENT PAVED AREAS. PAVED AREAS INCLUDING STREETS ARE TO BE KEPT CLEAN THROUGHOUT BUILD-OUT AND SHALL BE CLEANED, WITH A STREET SWEEPER OR SIMILAR DEVICE, AT FIRST NOTICE OF ACCIDENTAL TRACKING OR AT THE DISCRETION OF THE TOWN GESC INSPECTOR. STREET WASHING IS NOT ALLOWED. THE TOWN RESERVES THE RIGHT TO REQUIRE ADDITIONAL MEASURES TO ENSURE AREA STREETS ARE KEPT FREE OF SEDIMENT AND/OR CONSTRUCTION DEBRIS.

23. APPROVED EROSION AND SEDIMENT CONTROL BMPs SHALL BE MAINTAINED AND KEPT IN GOOD REPAIR FOR THE DURATION OF THIS PROJECT. AT A MINIMUM, THE GESC MANAGER SHALL INSPECT ALL BMPs IN ACCORDANCE WITH THE ACCEPTED GESC PLAN AND GESC MANUAL. ALL NECESSARY MAINTENANCE AND REPAIR ACTIVITIES SHALL BE COMMENCED IMMEDIATELY FOR ALL VIOLATIONS, OR AS DIRECTED BY A TOWN GESC INSPECTOR. ACCUMULATED SEDIMENT AND CONSTRUCTION DEBRIS SHALL BE REMOVED AND PROPERLY DISPOSED.

24. STRAW BALES ARE NOT A TOWN OF CASTLE ROCK GESC-ACCEPTED SEDIMENT CONTROL BMP.

25. TOPSOIL SHALL BE STRIPPED AND STOCKPILED IN THE LOCATION SHOWN ON THE ACCEPTED GESC PLAN. THE GESC MANAGER SHALL SCHEDULE AN INSPECTION WITH THE TOWN GESC INSPECTOR AS SOON AS TOPSOIL STRIPPING IS COMPLETED. FAILURE TO SCHEDULE SUCH INSPECTION OR FAILURE TO STOCKPILE TOPSOIL SHALL RESULT IN ISSUANCE OF A STOP WORK ORDER. THE STOP WORK ORDER SHALL REMAIN IN PLACE UNTIL TOPSOIL IS STOCKPILED ON SITE.

26. THE ACCEPTED GESC PLAN MAY REQUIRE CHANGES OR ALTERATIONS AFTER APPROVAL TO MEET CHANGING SITE OR PROJECT CONDITIONS OR TO ADDRESS INEFFICIENCIES IN DESIGN OR INSTALLATION. THE GESC MANAGER SHALL OBTAIN PRIOR APPROVAL FROM THE DESIGN ENGINEER AND THE TOWN FOR ANY PROPOSED CHANGES.

27. LINING OF TEMPORARY SWALES AND DITCHES SHALL BE IN ACCORDANCE WITH THE GESC CRITERIA MANUAL.

28. NO PERMANENT EARTH SLOPES GREATER THAN 3:1 SHALL BE ALLOWED.

29. ANY SEDIMENT OR SOIL ACCUMULATIONS BEYOND THE LIMITS OF CONSTRUCTION DUE TO GRADING OR EROSION SHALL BE REPAIRED IMMEDIATELY BY THE GESC MANAGER. THE GESC MANAGER SHALL BE HELD RESPONSIBLE FOR OBTAINING ACCESS RIGHTS TO ADJACENT PROPERTY, IF NEEDED, AND REMEDIATING ANY ADVERSE IMPACTS TO ADJACENT WATERWAYS, WETLANDS, PROPERTIES, ETC. RESULTING FROM WORK DONE AS PART OF THIS PROJECT.

30. A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.

31. SOILS THAT WILL BE STOCKPILED FOR MORE THAN THIRTY (30) DAYS SHALL BE SEEDED AND MULCHED WITHIN FOURTEEN (14) DAYS OF STOCKPILE CONSTRUCTION. NO STOCKPILES SHALL BE PLACED WITHIN ONE HUNDRED (100) FEET OF A DRAINAGE WAY UNLESS APPROVED BY THE TOWN OF CASTLE ROCK STORMWATER ENGINEERING DIVISION.

32. 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 THE TOWN. 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, THE TOWN OF CASTLE ROCK AND THE NATIONAL RESPONSE CENTER CAN BE FOUND IN APPENDIX A OF THE GESC MANUAL. SPILLS THAT POSE AN IMMEDIATE RISK TO HUMAN LIFE SHALL BE REPORTED TO 911. FAILURE TO REPORT AND CLEAN UP ANY SPILL SHALL RESULT IN ISSUANCE OF A STOP WORK ORDER.

33. ALL WORK ON SITE SHALL STAY A MINIMUM OF ONE HUNDRED (100) FEET AWAY FROM ANY DRAINAGE WAY, WETLAND, ETC. UNLESS OTHERWISE NOTED ON AN ACCEPTED TOWN OF CASTLE ROCK GESC PLAN.

34. THE PERMITEE SHALL HAVE A GESC PERMIT AND AUTHORIZATION FOR HAUL ROUTE IN HAND FOR THE IMPORT OR EXPORT SITE PRIOR TO ANY TRANSPORTING OF EARTHEN MATERIAL. THE GESC MANAGER SHALL NOTIFY THE TOWN GESC INSPECTOR OF THE LOCATION AND PERMIT NUMBERS OF BOTH THE EXPORTING AND IMPORTING SITES PRIOR TO ANY IMPORT/ EXPORT OPERATIONS.

35. THE USE OF REBAR, STEEL STAKES OR STEEL FENCE POSTS FOR STAKING OR SUPPORT OF ANY EROSION OR SEDIMENT CONTROL BMP IS PROHIBITED (EXCEPT STEEL TEE-POSTS FOR USE IN SUPPORTING CONSTRUCTION FENCE).

36. THE CLEANING OF CONCRETE DELIVERY TRUCK CHUTES IS RESTRICTED TO APPROVED CONCRETE WASH OUT LOCATIONS ON THE JOB SITE. THE DISCHARGE OF WATER CONTAINING WASTE CONCRETE TO THE STORM SEWER SYSTEM IS PROHIBITED. ALL CONCRETE WASTE SHALL BE PROPERLY CLEANED UP AND DISPOSED AT AN APPROPRIATE LOCATION.

37. ALL DEWATERING ON SITE SHALL BE COORDINATED WITH A TOWN GESC INSPECTOR AND BE FREE OF SEDIMENT IN ACCORDANCE WITH THE GESC CRITERIA MANUAL.

38. ALL PERMANENT INSTALLATIONS OF PIPES FOR STORM SEWERS, SLOPE DRAINS, AND CULVERTS, TOGETHER WITH RIPRAP APRONS OR OTHER INLET AND OUTLET PROTECTION, REQUIRE INSPECTION BY TOWN OF CASTLE ROCK PUBLIC WORKS (SEPARATE FROM GESC INSPECTIONS).

39. ALL DISTURBED AREAS SHALL BE DRILL SEEDED AND CRIMP MULCHED IN ACCORDANCE WITH THE GESC CRITERIA MANUAL WITHIN THIRTY (30) DAYS OF INITIAL EXPOSURE OR WITHIN SEVEN (7) DAYS OF SUBSTANTIAL COMPLETION (AS DEFINED BY THE TOWN) OF AN AREA, WHICHEVER IS LESS. THIS MAY REQUIRE MULTIPLE MOBILIZATIONS FOR SEEDING AND MULCHING. AREAS TO BE PERMANENTLY HARDSCAPED THAT WILL REMAIN EXPOSED FOR MORE THAN THIRTY (30) DAYS AFTER FINAL GRADE SHALL BE STABILIZED AS APPROVED BY THE TOWN.

40. HYDRAULIC SEEDING AND HYDRAULIC MULCHING ARE NOT AN ACCEPTABLE METHOD OF SEEDING OR MULCHING IN THE TOWN OF CASTLE ROCK.

41. NO BUILDING PERMITS SHALL BE ISSUED UNTIL ALL DISTURBED AREAS ARE DRILL SEEDED AND CRIMP MULCHED (OR OTHER MEANS OF TEMPORARY STABILIZATION AS APPROVED PER NOTE 26 ABOVE) AND ALL RETAINING WALLS AS SHOWN ON THE PLAN ARE INSTALLED AND ACCEPTED.

42. A FINAL GESC INSPECTION SHALL BE CONDUCTED A MINIMUM OF TWO (2) WEEKS PRIOR TO THE ANTICIPATED REQUEST FOR CERTIFICATE OR TEMPORARY CERTIFICATE OF OCCUPANCY OR INITIAL ACCEPTANCE.

DETAIL NO.	SHEET NO.	BMP LEGEND	
1	2	CD	CHECK DAM
2	2	CB	COMPOST BLANKET
3	2	CFB	COMPOST FILTER BERM
4	3	CWA	CONCRETE WASHOUT AREA
5	3	CF	CONSTRUCTION FENCE
6	3	CM	CONSTRUCTION MARKERS
7	4	DW	DEWATERING
8	4	DD	DIVERSION DITCH
9	5	ECB	EROSION CONTROL BLANKET
10	6	IP	INLET PROTECTION
11	7	RCD	REINFORCED CHECK DAM
12	7	RRB	REINFORCED ROCK BERM
13	7	RRC	RRB FOR CULVERT PROTECTION
14	8	SB	SEDIMENT BASIN
15	9	SCL	SEDIMENT CONTROL LOG
16	9	ST	SEDIMENT TRAP
17	10	SM	SEEDING AND MULCHING
18	11	SF	SILT FENCE
19	11	SSA	STABILIZED STAGING AREA
20	11	SR	SURFACE ROUGHENING
21	12	TSD	TEMPORARY SLOPE DRAIN
22	12	TSC	TEMPORARY STREAM CROSSING
23	13	TER	TERRACING
24	13	VTC	VEHICLE TRACKING CONTROL
25	13	WW	VTC WITH WHEEL WASH
	14		ROCK AND RIPRAP GRADATIONS
		LOC	LIMITS OF CONSTRUCTION

Sheet Revisions			
R1	3/11	GESC MANUAL UPDATES	DVD
R2	5/15	GESC MANUAL UPDATES	DVD

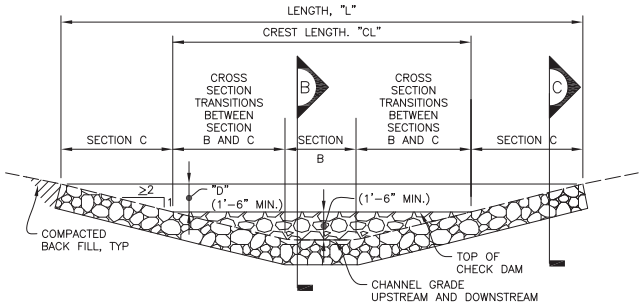
NOTE: SCALES SHOWN ARE FOR 22"x34" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.

TOWN OF CASTLE ROCK COLORADO

UTILITIES DEPARTMENT
Stormwater Engineering Division

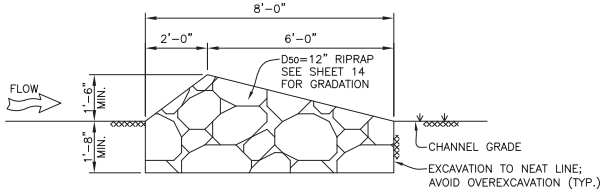
GESC — GRADING, EROSION, AND SEDIMENT CONTROL

GESC PLAN STANDARD NOTES AND DETAILS



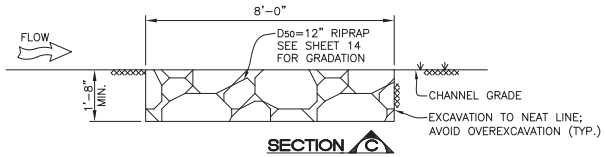
ELEVATION

SCALE: 1" = 5'-0"



SECTION B

SCALE: 1/2" = 1'-0"



SECTION C

SCALE: 1/2" = 1'-0"

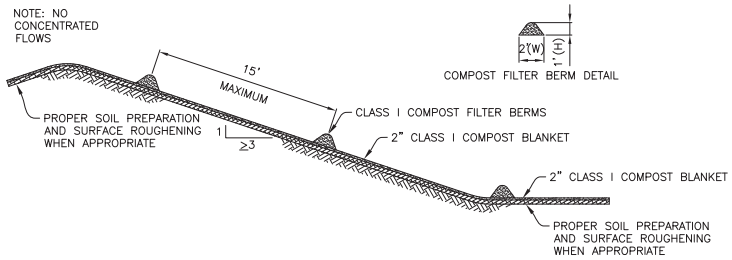
CHECK DAM INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATIONS OF CHECK DAMS.
   - CHECK DAM TYPE (CHECK DAM OR REINFORCED CHECK DAM).
   - LENGTH, "L", CREST LENGTH, "CL", AND DEPTH, "D".
2. CHECK DAMS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED AFTER CONSTRUCTION FENCE, BUT PRIOR TO ANY UPSTREAM LAND-DISTURBING ACTIVITIES.
3. RIPRAP UTILIZED FOR CHECK DAMS SHALL HAVE A D_{50} MEDIAN STONE SIZE OF 12".
4. RIPRAP PAD SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 1'-8".
5. THE ENDS OF THE CHECK DAM SHALL BE A MINIMUM OF 1'-6" HIGHER THAN THE CENTER OF THE CHECK DAM.

CHECK DAM MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT CHECK DAMS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY.
2. 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.
3. CHECK DAMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY THE TOWN.
4. WHEN CHECK DAMS ARE REMOVED, EXCAVATIONS SHALL BE FILLED WITH SUITABLE COMPACTED BACK FILL. ANY DISTURBED AREA SHALL BE SEEDED AND MULCHED AND COVERED WITH EROSION CONTROL BLANKET OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE TOWN.

CD CHECK DAM 1



COMPOST BLANKET AND COMPOST FILTER BERM

SCALE: 1" = 5'-0"

COMPOST BLANKET NOTES:

1. SEE PLAN VIEW FOR AREA OF COMPOST BLANKET.
2. MAY BE USED IN PLACE OF STRAW MULCH OR EROSION CONTROL BLANKET IN AREAS WHERE ACCESS IS DIFFICULT DUE TO LANDSCAPING OR OTHER OBJECTS OR IN AREAS WHERE A SMOOTH TURF GRASS FINISH IS DESIRED.
3. SHALL ONLY BE UTILIZED IN AREAS WHERE SHEET FLOW CONDITIONS PREVAIL; SHALL BE PROHIBITED IN AREAS OF POSSIBLE CONCENTRATED FLOW.
4. SOIL PREPARATION SHALL BE COMPLETE PER THE SPECIFICATIONS OUTLINED IN THESE CRITERIA PRIOR TO APPLICATION.
5. WHEN TURF GRASS FINISH IS NOT DESIRED, SURFACE ROUGHENING ON SLOPES SHALL TAKE PLACE PRIOR TO APPLICATION.
6. SHALL BE EVENLY APPLIED AT A DEPTH OF 2 INCH.
7. MAYBE APPLIED UTILIZING PNEUMATIC BLOWER, OR BY HAND.
8. SEEDING SHALL BE DRILLED PRIOR TO THE APPLICATION OF COMPOST OR SEED MAY BE COMBINED AND BLOWN WITH THE PNEUMATIC BLOWER.
9. COMPOST FILTER BERM SHALL BE UTILIZED ON SLOPES WITH A MAXIMUM SPACING OF 15 FEET PER THE REQUIREMENTS FOUND IN THE COMPOST FILTER BERM SECTION.
10. THE GESC MANAGER SHALL INSPECT WEEKLY, DURING AND AFTER ANY STORM EVENT.
11. COMPOST USED IN THE APPLICATION OF THE COMPOST BLANKET SHALL BE A CLASS I COMPOST AS DEFINED BY THE FOLLOWING PHYSICAL, CHEMICAL, AND BIOLOGICAL PARAMETERS:

PARAMETERS	CLASS I COMPOST FOR COMPOST BLANKET
MINIMUM STABILITY INDICATOR	STABLE TO VERY STABLE
SOLUBLE SALTS	MAXIMUM 5mmhos/cm
PH	6.0 – 8.0
AG INDEX	> 10
MATURITY INDICATOR EXPRESSED AS PERCENTAGE OF GERMINATION/VIGOR	80+/80+
MATURITY INDICATOR EXPRESSED AS AMMONIA N/ NITRATE N RATIO	< 4
MATURITY INDICATOR EXPRESSED AS CARBON TO NITROGEN RATIO	20:1
TESTED FOR CLOPYRALID	YES/NEGATIVE RESULT
MOISTURE CONTENT	30–60 %
ORGANIC MATTER CONTENT	25–45 % OF DRY WEIGHT
PARTICLE SIZE DISTRIBUTION	3" (75mm) 100% PASSING 1" (25mm) 95% TO 100% PASSING 3/4" (19mm) 85% TO 90% PASSING 3/8" (9.5mm) 50% TO 60% PASSING #4 20 TO 35% PASSING
PRIMARY, SECONDARY NUTRIENTS; TRACE ELEMENT	MUST BE REPORTED
TESTING AND TEST REPORT SUBMITTAL REQUIREMENTS	STA + CLOPYRALID
ORGANIC MATTER PER CUBIC YARD	MUST REPORT
CHEMICAL CONTAMINANTS	MEET OR EXCEED US EPA CLASS A STANDARD, 40 CFR 503.1 TABLES 1 & 3 LEVELS
MINIMUM MANUFACTURING/PRODUCTION REQUIREMENT	FULLY PERMITTED UNDER COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, HAZARDOUS MATERIALS AND WASTE MANAGEMENT DIVISION
RISK FACTOR RELATING TO PLANT GERMINATION AND HEALTH	LOW

NOTE: CLOPYRALID IS THE COMMON NAME OF A HERBICIDE THAT KILLS BROAD-LEAVED WEEDS SUCH AS DANDELIONS, CLOVER AND THISTLE.

CB COMPOST BLANKET 2

COMPOST FILTER BERM NOTES:

1. SEE PLAN VEW FOR LENGTH OF COMPOST FILTER BERM.
2. SHALL BE APPLIED TO ALL SLOPES RECEIVING A COMPOST BLANKET AT 15' INCREMENTS.
3. FILTER BERMS SHALL RUN PARALLEL TO THE CONTOUR.
4. FILTER BERMS SHALL BE A MINIMUM OF 1' H x 2' W.
5. FILTER BERMS SHALL BE APPLIED UTILIZING PNEUMATIC BLOWER, OR BY HAND.
6. SHALL ONLY BE UTILIZED IN AREAS WHERE SHEET FLOW CONDITIONS PREVAIL; SHALL BE PROHIBITED IN AREAS OF POSSIBLE CONCENTRATED FLOW.
7. SOIL PREPARATION SHALL BE COMPLETE PER THE SPECIFICATIONS OUTLINED IN THESE CRITERIA PRIOR TO APPLICATION.
8. WHEN TURF GRASS FINISH IS NOT DESIRED, SURFACE ROUGHENING ON SLOPES SHALL TAKE PLACE PRIOR TO APPLICATION.
9. SEEDING SHALL BE DRILLED BEFORE THE APPLICATION OF COMPOST OR SEED MAY BE COMBINED AND BLOWN WITH THE PNEUMATIC BLOWER.
10. THE GESC MANAGER SHALL INSPECT WEEKLY, DURING AND AFTER ANY STORM EVENT.
11. COMPOST USED IN THE APPLICATION OF THE COMPOST BLANKET SHALL BE A CLASS I COMPOST AS DEFINED BY THE FOLLOWING PHYSICAL, CHEMICAL, AND BIOLOGICAL PARAMETERS:

PARAMETERS	CLASS I COMPOST FOR COMPOST FILTER BERM
MINIMUM STABILITY INDICATOR	STABLE TO VERY STABLE
SOLUBLE SALTS	MAXIMUM 5mmhos/cm
PH	6.0 – 8.0
AG INDEX	> 10
MATURITY INDICATOR EXPRESSED AS PERCENTAGE OF GERMINATION/VIGOR	80+/80+
MATURITY INDICATOR EXPRESSED AS AMMONIA N/ NITRATE N RATIO	< 4
MATURITY INDICATOR EXPRESSED AS CARBON TO NITROGEN RATIO	20:1
TESTED FOR CLOPYRALID	YES/NEGATIVE RESULT
MOISTURE CONTENT	30–60 %
ORGANIC MATTER CONTENT	25–45 % OF DRY WEIGHT
PARTICLE SIZE DISTRIBUTION	3" (75mm) 100% PASSING 1" (25mm) 95% TO 100% PASSING 3/4" (19mm) 85% TO 90% PASSING 3/8" (9.5mm) 50% TO 60% PASSING #4 20 TO 35% PASSING
PRIMARY, SECONDARY NUTRIENTS; TRACE ELEMENT	MUST BE REPORTED
TESTING AND TEST REPORT SUBMITTAL REQUIREMENTS	STA + CLOPYRALID
ORGANIC MATTER PER CUBIC YARD	MUST REPORT
CHEMICAL CONTAMINANTS	MEET OR EXCEED US EPA CLASS A STANDARD, 40 CFR 503.1 TABLES 1 & 3 LEVELS
MINIMUM MANUFACTURING/PRODUCTION REQUIREMENT	FULLY PERMITTED UNDER COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, HAZARDOUS MATERIALS AND WASTE MANAGEMENT DIVISION
RISK FACTOR RELATING TO PLANT GERMINATION AND HEALTH	LOW

NOTE: IF A BIOSOLID COMPOST IS TO BE UTILIZED IT SHALL BE PRODUCED BY A FACILITY IN POSSESSION OF A VALID NOTICE OF AUTHORIZATION (NOA) FOR THE UNRESTRICTED USE AND DISTRIBUTION BY THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT. THE NOA SHALL BE PROVIDED UPON REQUEST TO THE TOWN.

NOTE: A LAB TEST DETAILING THE CHEMICAL, PHYSICAL, AND BIOLOGICAL PARAMETERS SHALL BE PROVIDED UPON REQUEST BY THE TOWN.

CFB COMPOST FILTER BERM 3

Sheet Revisions			
R1	3/11	GESC MANUAL UPDATES	DVD
R2	5/15	GESC MANUAL UPDATES	DVD

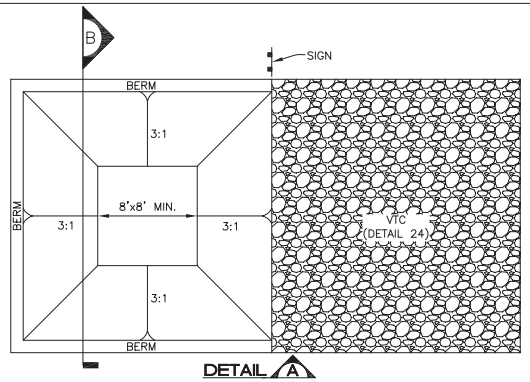
NOTE: SCALES SHOWN ARE FOR 22"x34" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.

TOWN OF CASTLE ROCK COLORADO

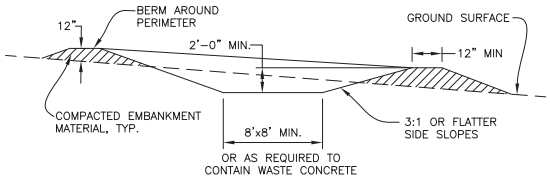
UTILITIES DEPARTMENT
Stormwater Engineering Division

GESC GRADING, EROSION, AND SEDIMENT CONTROL

GESC PLAN STANDARD NOTES AND DETAILS



DETAIL A
SCALE: 1" = 5'-0"



SECTION B
SCALE: 1" = 5'-0"

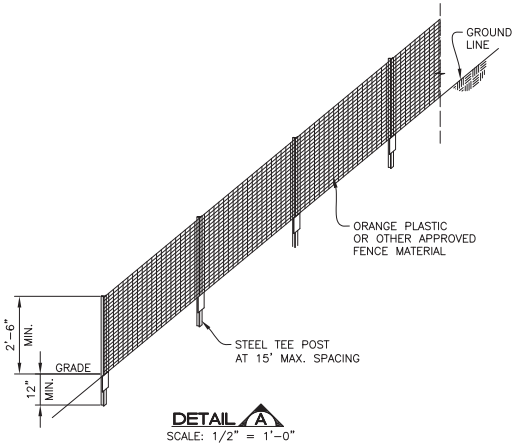
CONCRETE WASHOUT AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATIONS OF CONCRETE WASHOUT AREA.
   - LOCATION OF VTC IF REQUIRED
2. THE CONCRETE WASHOUT AREA SHALL BE INSTALLED PRIOR TO ANY CONCRETE PLACEMENT ON SITE.
3. VEHICLE TRACKING CONTROL (DETAIL 24) IS REQUIRED AT THE ACCESS POINT IF LEADING TO AN IMPERVIOUS SURFACE SUCH AS A STREET OR PARKING LOT.
4. 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.
5. EXCAVATED MATERIAL SHALL BE UTILIZED IN PERIMETER BERM CONSTRUCTION.

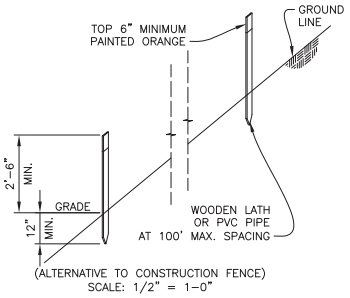
CONCRETE WASHOUT AREA MAINTENANCE NOTES

1. THE CONCRETE WASHOUT AREA SHALL BE REPAIRED AND ENLARGED OR CLEANED OUT AS NECESSARY TO MAINTAIN CAPACITY FOR WASTED CONCRETE.
2. AT THE END OF CONSTRUCTION, ALL CONCRETE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT AN APPROVED WASTE SITE.
3. WHEN THE CONCRETE WASHOUT AREA IS REMOVED, THE DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE TOWN.
4. INSPECT WEEKLY, DURING AND AFTER ANY STORM EVENT.

CWA **CONCRETE WASHOUT AREA** 4



DETAIL A
SCALE: 1/2" = 1'-0"



(ALTERNATIVE TO CONSTRUCTION FENCE)
SCALE: 1/2" = 1-0"

CONSTRUCTION FENCE INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - TYPE OF CONSTRUCTION LIMIT INDICATOR (FENCE OR MARKERS).
   - LOCATION AND LENGTH OF FENCE OR LINE OF MARKERS.
2. CONSTRUCTION FENCE OR MARKERS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO OTHER BMPS AND ANY LAND-DISTURBING ACTIVITIES.
3. STEEL TEE POSTS SHALL BE UTILIZED FOR SUPPORT OF CONSTRUCTION FENCE. MAXIMUM SPACING FOR TEE POSTS SHALL BE 15'.

CONSTRUCTION FENCE MAINTENANCE NOTES

1. ANY DAMAGED FENCE OR MARKERS SHALL BE REPAIRED ON A DAILY BASIS.
2. FENCE OR MARKERS SHALL BE REMOVED AT THE END OF CONSTRUCTION. IF ANY DISTURBED AREA EXISTS AFTER FENCE REMOVAL, IT SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE TOWN.

CF **CONSTRUCTION FENCE** 5

CM **CONSTRUCTION MARKERS** 6

Sheet Revisions			
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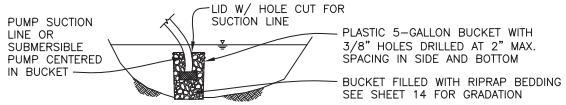
TOWN OF CASTLE ROCK COLORADO

UTILITIES DEPARTMENT
Stormwater Engineering Division

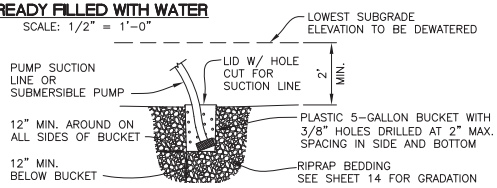
GESC

GRADING, EROSION, AND SEDIMENT CONTROL

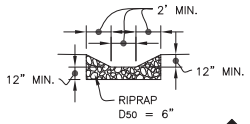
GESC PLAN STANDARD NOTES AND DETAILS



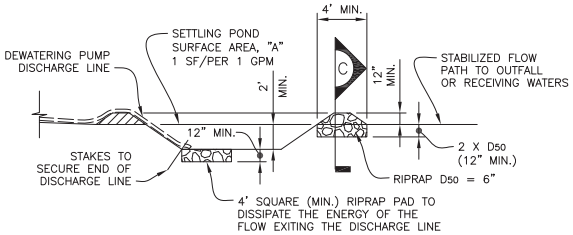
ALTERNATIVE FOR DRAINING POND ALREADY FILLED WITH WATER
SCALE: 1/2" = 1'-0"



DEWATERING SUMP FOR SUBMERSIBLE PUMP - DETAIL A
SCALE: 1/2" = 1'-0"



BASIN OUTLET - SECTION C
SCALE: 1" = 5'-0"



SUMP DISCHARGE SETTLING BASIN - DETAIL B
SCALE: 1" = 5'-0"

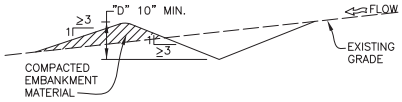
DEWATERING INSTALLATION NOTES

1. THE GESC MANAGER SHALL OBTAIN A CONSTRUCTION DISCHARGE (DEWATERING) PERMIT FROM THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT PRIOR TO ANY DEWATERING OPERATIONS. ALL DEWATERING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE DISCHARGE PERMIT AND SHALL BE COORDINATED WITH THE TOWN GESC INSPECTOR.
2. THE GESC MANAGER SHALL PROVIDE, OPERATE, AND MAINTAIN DEWATERING SYSTEMS OF SUFFICIENT SIZE AND CAPACITY TO PERMIT EXCAVATION AND SUBSEQUENT CONSTRUCTION IN DRY CONDITIONS AND TO LOWER AND MAINTAIN THE GROUNDWATER LEVEL A MINIMUM OF 2-FEET BELOW THE LOWEST POINT OF EXCAVATION AND CONTINUOUSLY MAINTAIN EXCAVATIONS FREE OF WATER UNTIL BACKFILLED TO FINAL GRADE.
3. DEWATERING OPERATIONS SHALL USE ONE OR MORE OF THE DEWATERING SUMPS SHOWN ABOVE OR OTHER MEANS APPROVED BY THE TOWN TO REDUCE THE PUMPING OF SEDIMENT, AND SHALL PROVIDE A TEMPORARY BASIN FOR SETTLING PUMPED DISCHARGES PRIOR TO RELEASE OFF SITE OR TO A RECEIVING WATER. SEDIMENT BASIN PER DETAIL 14 MAY BE USED IN LIEU OF SUMP DISCHARGE SETTLING BASIN SHOWN ABOVE.
4. A 4' SQUARE RIPRAP PAD SHALL BE PLACED AT DISCHARGE POINT.
5. THE DISCHARGE END OF THE LINE SHALL BE STAKED IN PLACE TO PREVENT MOVEMENT OF RIPRAP PAD.

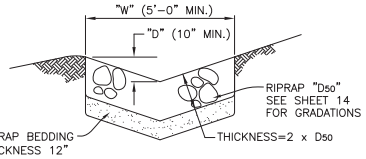
DEWATERING MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT DEWATERING SYSTEMS AND PERFORM ANY NECESSARY REPAIRS OR MAINTENANCE ON A HOURLY BASIS.
2. TEMPORARY SETTLING BASINS SHALL BE REMOVED WHEN NO LONGER NEEDED FOR DEWATERING OPERATIONS. ANY DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE TOWN.

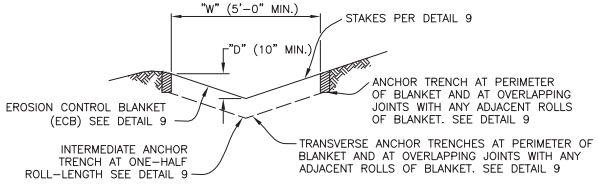
DW **DEWATERING** 7



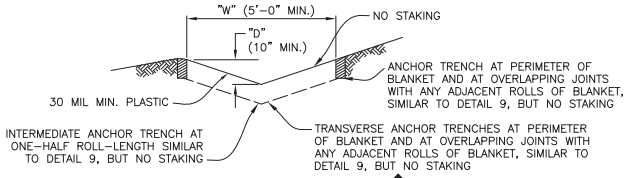
UNLINED - DETAIL A
LONGITUDINAL SLOPE ≤ 0.5%
SCALE: 1/2" = 1'-0"



RIPRAP LINED - DETAIL D
LONGITUDINAL SLOPE 3% TO 33%
SCALE: 1/2" = 1'-0"



EROSION CONTROL BLANKET (ECB) LINED - DETAIL B
LONGITUDINAL SLOPE 0.5% TO 3%
SCALE: 1/2" = 1'-0"



PLASTIC LINED - DETAIL C
LONGITUDINAL SLOPE 3% TO 33%
SCALE: 1/2" = 1'-0"

DIVERSION DITCH INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION OF DIVERSION DITCH.
   - TYPE OF DITCH (UNLINED, ECB LINED, PLASTIC LINED, RIPRAP LINED OR ENGINEERED).
   - LENGTH OF EACH TYPE OF DITCH.
   - DEPTH, "D", AND WIDTH, "W" DIMENSIONS.
   - FOR ECB LINED DITCH, EROSION CONTROL BLANKET TYPE (SEE DETAIL 9).
   - FOR RIPRAP LINED DITCH, SIZE OF RIPRAP, "D50".
2. SEE DRAINAGE PLANS FOR DETAILS OF ANY PERMANENT CONVEYANCE FACILITIES OR DIVERSION DITCHES EXCEEDING A 2-YEAR FLOW RATE OF 10 CFS.
3. DIVERSION DITCHES INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.
4. FOR ECB LINED DITCHES, INSTALLATION OF EROSION CONTROL BLANKET SHALL CONFORM TO THE REQUIREMENTS OF DETAIL 9.
5. IN LOCATIONS WHERE CONSTRUCTION TRAFFIC MUST CROSS A DIVERSION DITCH, THE PERMITTEES SHALL INSTALL A TEMPORARY CULVERT WITH A MINIMUM DIAMETER OF 12-INCHES.

DIVERSION DITCH MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT DIVERSION DITCHES WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY.
2. DIVERSION DITCHES ARE TO REMAIN IN PLACE UNTIL THE END OF CONSTRUCTION, OR, IF APPROVED BY THE TOWN, LEFT IN PLACE.
3. IF DIVERSION DITCHES ARE REMOVED, THE DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE TOWN.

DD **DIVERSION DITCH** 8

	Sheet Revisions		
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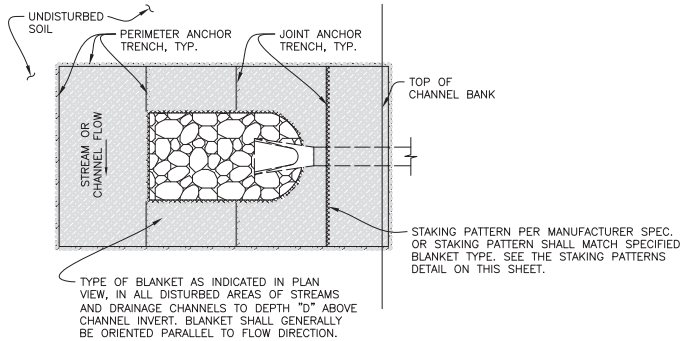
TOWN OF CASTLE ROCK COLORADO

UTILITIES DEPARTMENT
Stormwater Engineering Division

GESC

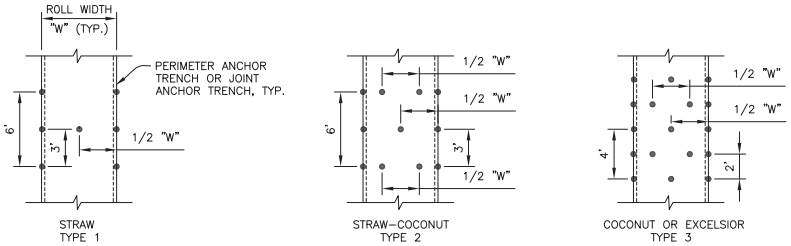
GRADING, EROSION, AND SEDIMENT CONTROL

GESC PLAN STANDARD NOTES AND DETAILS



IN DISTURBED AREAS OF STREAMS AND DRAINAGE CHANNELS - DETAIL A

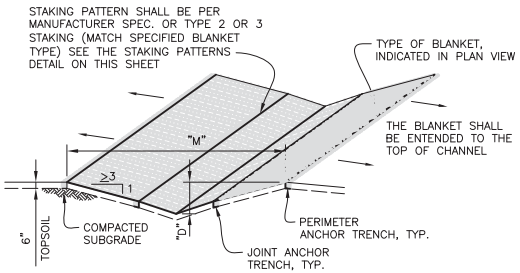
SCALE: 1" = 10'-0"



STAKING PATTERNS

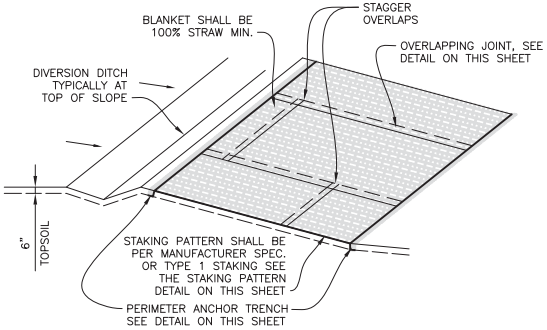
SCALE: 1" = 10'-0"

SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATION. IF NO MANUFACTURER'S SPECIFICATION IS AVAILABLE USE THE ACCEPTABLE STAKING PATTERN (AS SHOWN ABOVE),



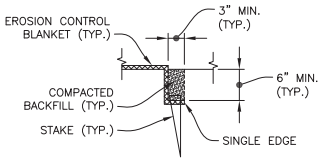
IN DIVERSION DITCH OR SMALL DITCH DRAINAGEWAY - DETAIL B

SCALE: 1" = 10'-0"



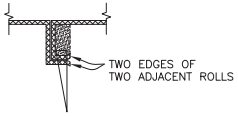
OUTSIDE OF STREAMS AND DRAINAGE CHANNELS - DETAIL C

SCALE: 1" = 10'-0"



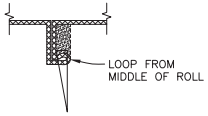
PERIMETER ANCHOR TRENCH

SCALE: 1/2" = 1'-0"



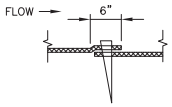
JOINT ANCHOR TRENCH

SCALE: 1/2" = 1'-0"



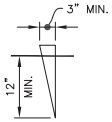
INTERMEDIATE ANCHOR TRENCH

SCALE: 1/2" = 1'-0"



OVERLAPPING JOINT

SCALE: 1/2" = 1'-0"



WOOD STAKE DETAIL

SCALE: 1/2" = 1'-0"
MINIMUM THICKNESS 1/2"

EROSION CONTROL BLANKET INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION OF PERIMETER OF EROSION CONTROL BLANKET.
   - TYPE OF BLANKET (STRAW, STRAW-COCONUT, COCONUT, OR EXCELSIOR).
   - AREA "A" IN SQUARE YARDS OF EACH TYPE OF BLANKET.
   - DEPTH "D" BLANKET SHALL BE INSTALLED ABOVE CHANNEL INVERT.
2. ALL EROSION CONTROL BLANKETS AND NETTING SHALL BE MADE OF 100% NATURAL AND BIODEGRADABLE MATERIAL; NO PLASTIC OR OTHER SYNTHETIC MATERIAL, EVEN IF PHOTO DEGRADABLE, SHALL BE ALLOWED.
3. IN AREAS WHERE EROSION CONTROL BLANKET IS SHOWN ON THE PLANS, THE PERMITTEE SHALL PLACE TOPSOIL AND PERFORM FINAL GRADING, SURFACE PREPARATION, AND SEEDING BELOW THE BLANKET IN ACCORDANCE WITH THE REQUIREMENTS OF DETAIL 17, SEEDING AND MULCHING. SUBGRADE SHALL BE SMOOTH AND MOIST PRIOR TO BLANKET INSTALLATION AND THE BLANKET SHALL BE IN FULL CONTACT WITH SUBGRADE, NO GAPS OR VOIDS SHALL EXIST UNDER THE BLANKET.
4. EROSION CONTROL BLANKET SHALL BE PLACED SMOOTHLY, BUT LOOSELY, ON THE SOIL SURFACE, WITHOUT STRETCHING.
5. PERIMETER ANCHOR TRENCH SHALL BE USED AT OUTSIDE PERIMETER OF ALL BLANKET AREAS.
6. JOINT ANCHOR TRENCH SHALL BE USED TO JOIN ROLLS OF BLANKETS TOGETHER (LONGITUDINALLY AND TRANSVERSELY) FOR ALL BLANKETS EXCEPT STRAW, WHICH MAY USE AN OVERLAPPING JOINT.
7. INTERMEDIATE ANCHOR TRENCH SHALL BE USED AT SPACING OF ONE-HALF THE ROLL LENGTH FOR COCONUT AND EXCELSIOR BLANKETS.
8. THE OVERLAPPING JOINT DETAIL SHALL BE USED TO JOIN ROLLS OF BLANKETS TOGETHER FOR BLANKETS ON SLOPES.
9. MATERIAL SPECIFICATIONS OF EROSION CONTROL BLANKET SHALL CONFORM TO TABLE 7.1. A SAMPLE OF BLANKET SHALL BE SUBMITTED AT LEAST TWO WEEKS IN ADVANCE OF ITS USE FOR APPROVAL BY THE TOWN GESC INSPECTOR.

EROSION CONTROL BLANKET INSTALLATION NOTES – CONTINUED

10. ANY AREAS OF SEEDING AND MULCHING DISTURBED IN THE PROCESS OF INSTALLING EROSION CONTROL BLANKET SHALL BE RESEEDED AND MULCHED IN ACCORDANCE WITH DETAIL 17.
11. SEE DRAINAGE DESIGN PLANS FOR MAJOR DRAINAGEWAY STABILIZATION MEASURES THAT MAY EXCEED THE DESIGN CONDITIONS ASSOCIATED WITH THE DETAILS ABOVE.

TABLE 7.1 – EROSION CONTROL BLANKET TYPE

TYPE	COCONUT CONTENT	STRAW CONTENT	EXCELSIOR CONTENT	NETTING MIN.
STRAW*	–	100%	–	DOUBLE/NATURAL
STRAW-COCONUT	30% MIN.	70% MAX.	–	DOUBLE/NATURAL
COCONUT	100%	–	–	DOUBLE/NATURAL
EXCELSIOR	–	–	100%	DOUBLE/NATURAL

* FOR OUTSIDE OF STREAMS AND DRAINAGE CHANNELS

EROSION CONTROL BLANKET MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT EROSION CONTROL BLANKETS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS AS NECESSARY.
2. EROSION CONTROL BLANKET IS TO BE LEFT IN PLACE UNLESS REQUESTED TO BE REMOVED BY THE TOWN.
3. ANY EROSION CONTROL BLANKET PULLED OUT, TORN, OR OTHERWISE DAMAGED SHALL BE RE-INSTALLED. ANY SUBGRADE AREAS BELOW THE BLANKET THAT HAVE ERODED TO CREATE A VOID UNDER THE BLANKET, OR THAT REMAIN DEVOID OF GRASS SHALL BE REPAIRED, RESEEDED AND MULCHED AND THE EROSION CONTROL BLANKET REINSTALLED.

ECB EROSION CONTROL BLANKET 9

Sheet Revisions			
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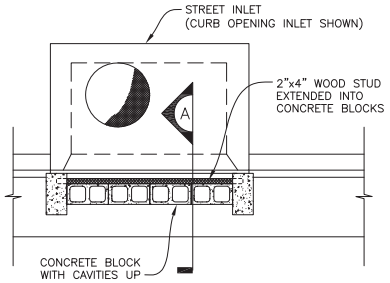
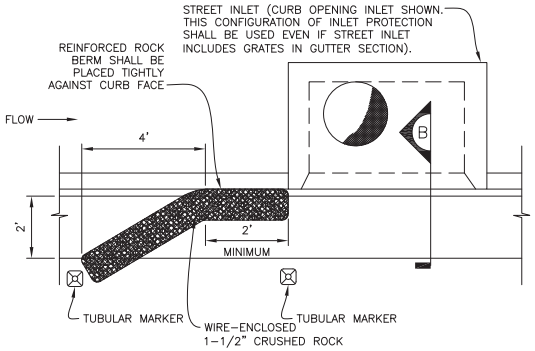
UTILITIES DEPARTMENT
Stormwater Engineering Division

GESC GRADING, EROSION, AND SEDIMENT CONTROL

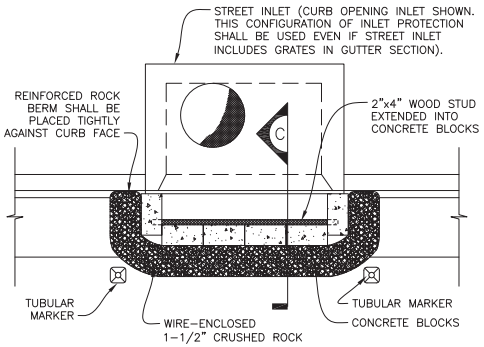
GESC PLAN STANDARD NOTES AND DETAILS



INTERIM CONFIGURATION (BEFORE PAVING) STREET INLET - PLAN
SCALE: 1/2" = 1'-0"

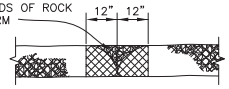


STREET INLET ON CONTINUOUS GRADE (AFTER PAVING) - PLAN
SCALE: 1/2" = 1'-0"

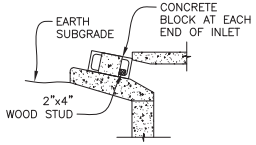


STREET INLET IN SUMP (AFTER PAVING) - PLAN
SCALE: 1/2" = 1'-0"

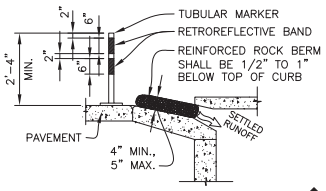
ANY GAP AT JOINT SHALL BE FILLED WITH 1 1/2" CRUSHED ROCK AND WRAPPED WITH ADDITIONAL WIRE MESH SECURED TO ENDS OF ROCK REINFORCED BERM



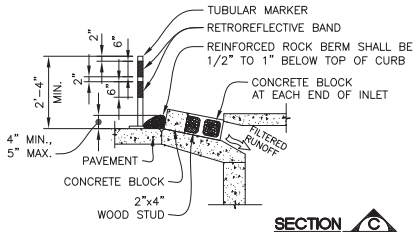
JOINT DETAIL
SCALE: 1/2" = 1'-0"



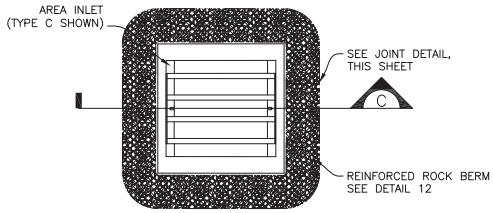
SECTION A
SCALE: 1/2" = 1'-0"



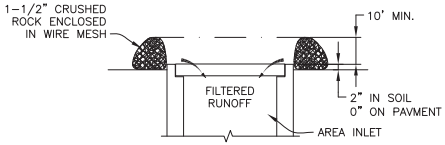
SECTION B
SCALE: 1/2" = 1'-0"



SECTION C
SCALE: 1/2" = 1'-0"



AREA INLET - PLAN
SCALE: 1/2" = 1'-0"



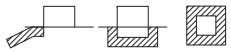
SECTION C
SCALE: 1/2" = 1'-0"

INLET PROTECTION INSTALLATION NOTES

1. INTERIM CONFIGURATION OF INLET PROTECTION IN STREETS SHALL BE INSTALLED WITHIN 48-HOURS OF POURING INLET. INLET PROTECTION (AFTER PAVEMENT) SHALL BE INSTALLED WITHIN 48 HOURS AFTER PAVING IS PLACED.
2. INLET PROTECTION AT AREA INLETS SHALL BE INSTALLED WITHIN 48-HOURS OF POURING INLET.
3. CRUSHED ROCK SHALL BE FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON SHEET 14 (1-1/2" MINUS). RECYCLED CONCRETE MEETING THIS GRADATION MAY BE USED.
4. WIRE MESH SHALL BE FABRICATED OF 10 GAUGE WIRE TWISTED INTO A MESH WITH A MAXIMUM OPENING OF 1.0 INCH (COMMONLY TERMED "CHICKEN WIRE"). ROLL WIDTH SHALL BE 48-INCHES.
5. 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.
6. REINFORCED ROCK BERM SHALL BE CONSTRUCTED IN ONE PIECE OR SHALL BE CONSTRUCTED USING JOINT DETAIL.
7. TUBULAR MARKERS SHALL MEET REQUIREMENTS OF MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), AS AMENDED.
8. THE TOP OF REINFORCED ROCK BERM SHALL BE 1/2"-1" BELOW TOP OF CURB.

INLET PROTECTION MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT INLET PROTECTION WEEKLY, 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.
2. SEDIMENT ACCUMULATED UPSTREAM OF INLET PROTECTION SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF ROCK BERM IS WITHIN 2-1/2 INCHES OF THE CREST.
3. INLET PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED, UNLESS THE TOWN APPROVES EARLIER REMOVAL OF INLET PROTECTION IN STREETS.
4. WHEN INLET PROTECTION AT AREA INLETS ARE REMOVED, THE DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE TOWN.



IP INLET PROTECTION 10

Sheet Revisions			
R1	3/11	GESC MANUAL UPDATES	DVD
R2	5/15	GESC MANUAL UPDATES	DVD

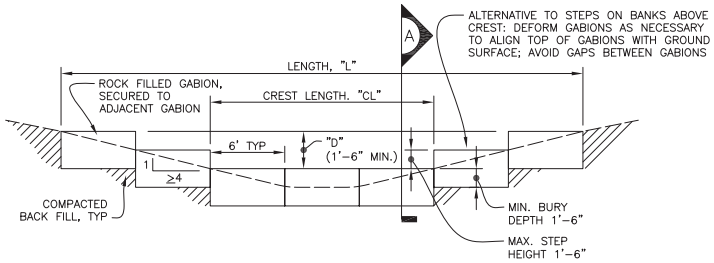
NOTE: SCALES SHOWN ARE FOR 22"x34" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.

TOWN OF CASTLE ROCK COLORADO

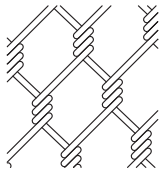
UTILITIES DEPARTMENT
Stormwater Engineering Division

GESC GRADING, EROSION, AND SEDIMENT CONTROL

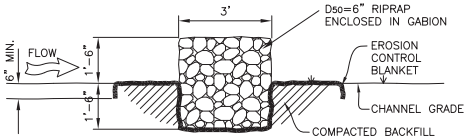
GESC PLAN STANDARD NOTES AND DETAILS



REINFORCED - ELEVATION
SCALE: 1" = 5'-0"



BLOW UP OF TWISTED WIRE GABION
SCALE: NTS



REINFORCED - SECTION A
SCALE: 1/2" = 1'-0"

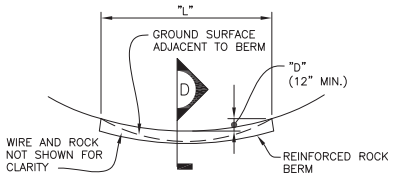
REINFORCED CHECK DAM INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATIONS OF CHECK DAMS.
   - CHECK DAM TYPE (CHECK DAM OR REINFORCED CHECK DAM).
   - LENGTH, "L", CREST LENGTH, "CL", AND DEPTH, "D".
2. CHECK DAMS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED AFTER CONSTRUCTION FENCE, BUT PRIOR TO ANY UPSTREAM LAND-DISTURBING ACTIVITIES.
3. REINFORCED CHECK DAMS, GABIONS SHALL HAVE GALVANIZED TWISTED WIRE NETTING WITH A MAXIMUM OPENING DIMENSION OF 4-1/2" AND A MINIMUM WIRE THICKNESS OF 0.10". WIRE "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.
4. RIPRAP UTILIZED FOR CHECK DAMS SHALL HAVE A D_{50} MEDIAN STONE SIZE OF 6".
5. THE CHECK DAM SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 1'-6".
6. EROSION 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.

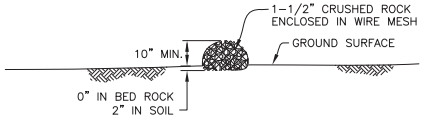
REINFORCED CHECK DAM MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT CHECK DAMS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY.
2. SEDIMENT ACCUMULATED UPSTREAM OF CHECK DAMS SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF CHECK DAM IS WITHIN $\frac{1}{2}$ OF THE HEIGHT OF THE CREST.
3. CHECK DAMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY THE TOWN.
4. WHEN CHECK DAMS ARE REMOVED, EXCAVATIONS SHALL BE FILLED WITH SUITABLE COMPACTED BACK FILL. ANY DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED AND COVERED WITH EROSION CONTROL BLANKET OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE TOWN.

RCD **REINFORCED CHECK DAM** 11

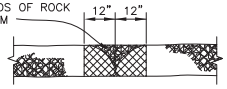


DETAIL A
SCALE: 1" = 5'-0"



SECTION D
SCALE: 1/2" = 1'-0"

ANY GAP AT JOINT SHALL BE FILLED WITH 1 1/2" CRUSHED ROCK AND WRAPPED WITH ADDITIONAL WIRE MESH SECURED TO ENDS OF ROCK REINFORCED BERM



JOINT DETAIL
SCALE: 1/2" = 1'-0"

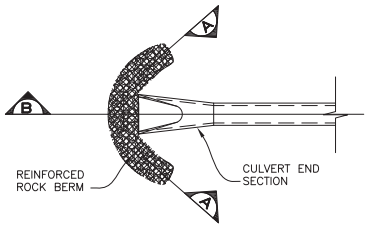
REINFORCED ROCK BERM INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATIONS OF REINFORCED ROCK BERMS.
   - LENGTH, "L", AND DEPTH, "D" DIMENSIONS.
2. REINFORCED ROCK BERM SECTION APPLIES TO CULVERT INLET FILTER AND INLET PROTECTION.
3. CRUSHED ROCK SHALL BE FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON SHEET 14 (1-1/2" MINUS). RECYCLED CONCRETE MEETING THIS GRADATION MAY BE USED.
4. WIRE MESH SHALL BE FABRICATED OF 10 GAUGE WIRE TWISTED INTO A MESH WITH A MAXIMUM OPENING OF 1.0 INCH (COMMONLY TERMED "CHICKEN WIRE"). ROLL WIDTH SHALL BE 48-INCHES.
5. 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.
6. FOR CONCENTRATED FLOW AREAS THE ENDS OF THE REINFORCED ROCK BERM SHALL BE 12" HIGHER THAN THE CENTER OF THE BERM.

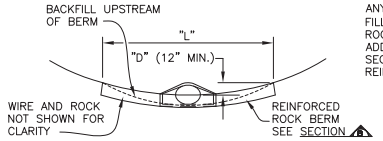
REINFORCED ROCK BERM MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT REINFORCED ROCK BERM WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY.
2. SEDIMENT ACCUMULATED UPSTREAM OF REINFORCED ROCK BERM SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF FILTER IS WITHIN 5 INCHES OF THE CREST.
3. REINFORCED ROCK BERMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED.
4. WHEN REINFORCED ROCK BERMS ARE REMOVED, ANY DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE TOWN.

RRB **REINFORCED ROCK BERM** 12

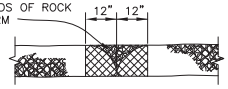


PLAN
SCALE: 1" = 5'-0"

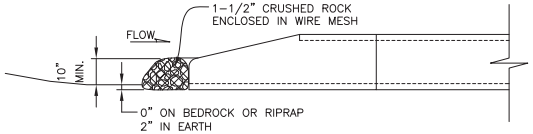


SECTION A
SCALE: 1" = 5'-0"

ANY GAP AT JOINT SHALL BE FILLED WITH 1-1/2" CRUSHED ROCK AND WRAPPED WITH ADDITIONAL WIRE MESH SECURED TO ENDS OF ROCK REINFORCED BERM



JOINT DETAIL
SCALE: 1/2" = 1'-0"



SECTION B
SCALE: 1/2" = 1'-0"

INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATIONS OF CULVERT INLET FILTERS.
   - LENGTH, "L", AND DEPTH, "D".
2. CRUSHED ROCK SHALL BE FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON SHEET 14 (1-1/2" MINUS). RECYCLED CONCRETE MEETING THIS GRADATION MAY BE USED.
3. WIRE MESH SHALL BE FABRICATED OF 10 GAUGE WIRE TWISTED INTO A MESH WITH A MAXIMUM OPENING OF 1.0 INCH (COMMONLY TERMED "CHICKEN WIRE").
4. 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.
5. THE ENDS OF THE REINFORCED ROCK BERM SHALL BE 12" HIGHER THAN THE CENTER OF THE BERM.

MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT CULVERT INLET FILTER WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY.
2. SEDIMENT ACCUMULATED UPSTREAM OF CULVERT INLET FILTER SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF FILTER IS $\frac{1}{2}$ THE HEIGHT OF THE REINFORCED ROCK BERM.
3. RRB FOR CULVERT PROTECTION ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY THE TOWN.
4. WHEN CULVERT INLET FILTERS ARE REMOVED, ANY DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE TOWN.

RRC **RRB FOR CULVERT PROTECTION** 13

Sheet Revisions			
R1	3/11	GESC MANUAL UPDATES	DVD
R2	5/15	GESC MANUAL UPDATES	DVD

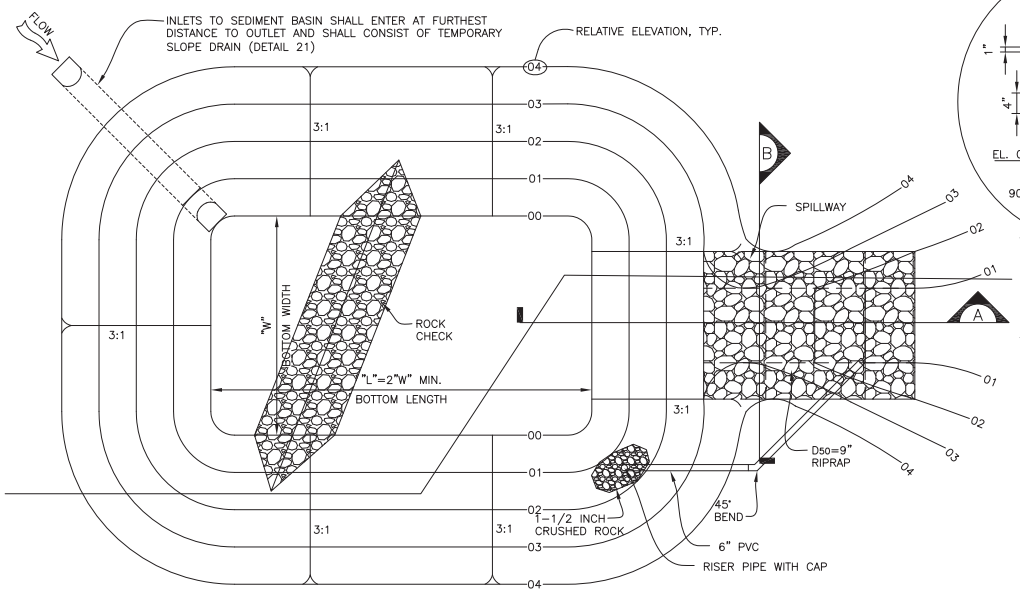
NOTE: SCALES SHOWN ARE FOR 22"x34" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.

TOWN OF CASTLE ROCK COLORADO

UTILITIES DEPARTMENT
Stormwater Engineering Division

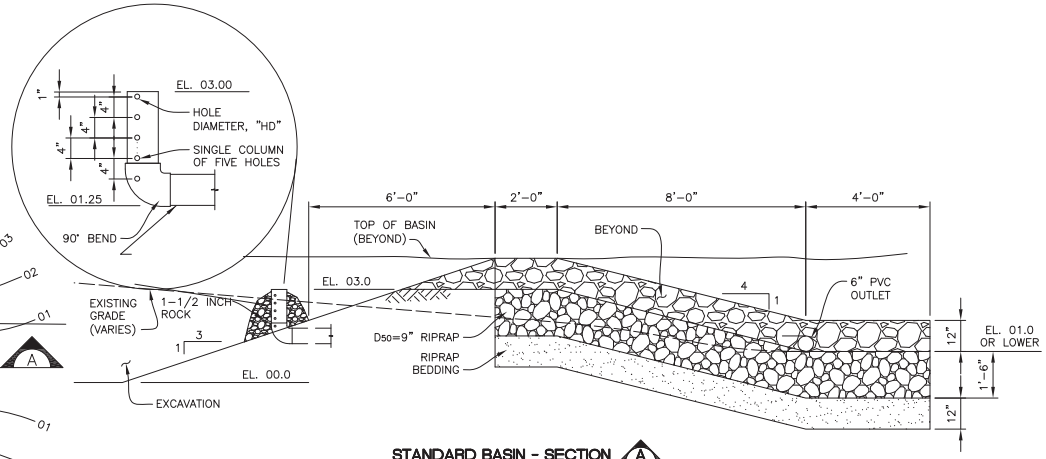
GESC — GRADING, EROSION, AND SEDIMENT CONTROL

GESC PLAN STANDARD NOTES AND DETAILS



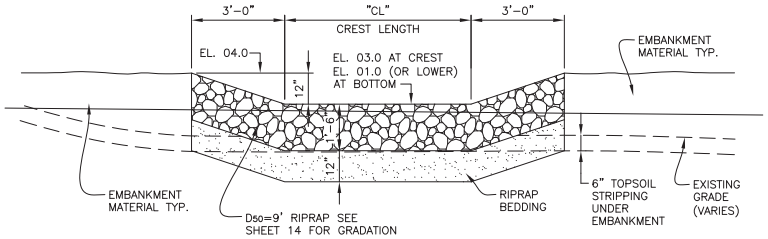
STANDARD BASIN - PLAN

SCALE: 1" = 5'-0"



STANDARD BASIN - SECTION A

SCALE: 1/2" = 1'-0"



STANDARD BASIN - SECTION B

SCALE: 1/2" = 1'-0"

SEDIMENT BASIN INSTALLATION NOTES

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

SEDIMENT BASIN MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT SEDIMENT BASIN WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY.
2. SEDIMENT ACCUMULATED IN SEDIMENT BASIN SHALL BE REMOVED WHEN THE SEDIMENT DEPTH IS WITHIN 2.0 FEET OF THE CREST OF THE SPILLWAY.
3. SEDIMENT BASINS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY THE TOWN.
4. IF SEDIMENT BASINS ARE REMOVED, THE DISTURBED AREA SHALL BE SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE TOWN.

SB SEDIMENT BASIN 14

Sheet Revisions			
R1	3/11	GESC MANUAL UPDATES	DVD
R2	5/15	GESC MANUAL UPDATES	DVD

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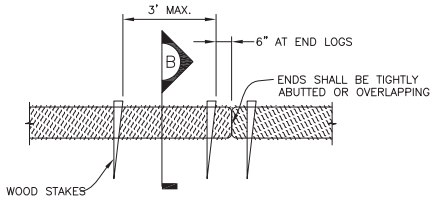
TOWN OF CASTLE ROCK COLORADO

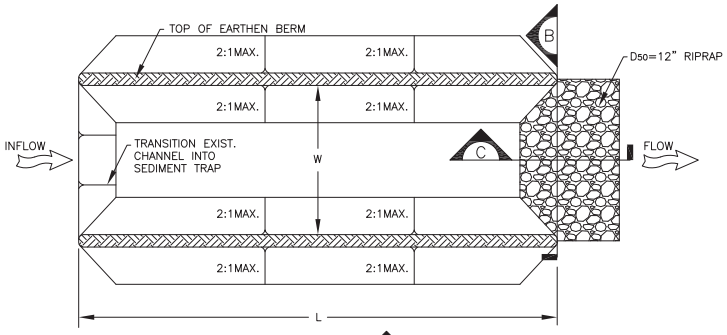
UTILITIES DEPARTMENT
Stormwater Engineering Division

GESC GRADING, EROSION, AND SEDIMENT CONTROL

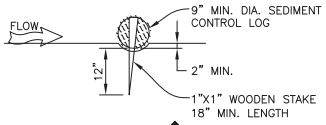
GESC PLAN STANDARD NOTES AND DETAILS



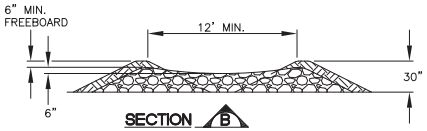
DETAIL A
SCALE: 1/2" = 1'-0"



DETAIL A
SCALE: 1" = 5'-0"



SECTION B
SCALE: 1/2" = 1'-0"



SECTION B
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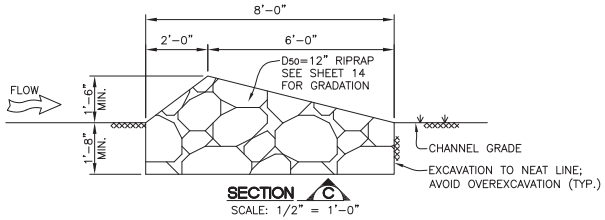

SECTION C
SCALE: 1/2" = 1'-0"

SEDIMENT CONTROL LOG INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   – LOCATION AND LENGTH OF SEDIMENT CONTROL LOG.
2. SEDIMENT CONTROL LOGS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY LAND–DISTURBING ACTIVITIES.
3. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR, OR COCONUT FIBER.
4. NOT FOR USE IN CONCENTRATED FLOW AREAS.
5. THE SEDIMENT CONTROL LOG SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 2".

SEDIMENT CONTROL LOG MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT SEDIMENT CONTROL LOGS DAILY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
2. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOGS SHALL BE REMOVED WHEN THE UPSTREAM SEDIMENT DEPTH IS WITHIN ½ THE HEIGHT OF THE CREST OF LOG.
3. SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION. IF ANY DISTURBED AREA EXISTS AFTER REMOVAL, IT SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE TOWN.

SCL **SEDIMENT CONTROL LOG** 15

SEDIMENT TRAP INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   – LOCATION, LENGTH AND WIDTH OF SEDIMENT TRAP.
2. SEDIMENT TRAPS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY LAND–DISTURBING ACTIVITIES.
3. SEDIMENT TRAP BERM SHALL BE CONSTRUCTED FROM MATERIAL FROM EXCAVATION. THE BERM SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D698.
4. RIPRAP OUTLET SHALL BE CONSTRUCTED WITH D =12" RIPRAP WITH A MINIMUM OVERFLOW OF 6".
5. THE TOP OF THE EARTHEN BERM SHALL BE A MINIMUM OF 6" HIGHER THAN THE TOP OF THE RIPRAP OUTLET STRUCTURE.
6. THE ENDS OF THE RIPRAP OUTLET STRUCTURE SHALL BE MINIMUM OF 6" HIGHER THAN THE CENTER OF THE OUTLET STRUCTURE.

SEDIMENT TRAP MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT SEDIMENT TRAPS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
2. SEDIMENT ACCUMULATED UPSTREAM OF RIPRAP SHALL BE REMOVED WHEN THE UPSTREAM SEDIMENT DEPTH IS WITHIN ½ THE HEIGHT OF THE RIPRAP OUTLET STRUCTURE.
3. SEDIMENT TRAPS SHALL REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVERAGE IS APPROVED BY THE TOWN.
4. WHEN SEDIMENT TRAPS ARE REMOVED THE DISTURBED AREA SHALL BE DRILLED SEEDED AND CRIMP MULCHED OR STABILIZED IN A MANNER APPROVED BY THE TOWN.

ST **SEDIMENT TRAP** 16

	Sheet Revisions		
R1	3/11	GESC MANUAL UPDATES	DVD
R2	5/15	GESC MANUAL UPDATES	DVD

NOTE: SCALES SHOWN ARE FOR 22"x34" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.

TOWN OF CASTLE ROCK COLORADO

UTILITIES DEPARTMENT
Stormwater Engineering Division

GESC

GRADING, EROSION, AND SEDIMENT CONTROL

GESC PLAN STANDARD NOTES AND DETAILS

SEEDING AND MULCHING INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - AREA OF SEEDING AND MULCHING.
   - TYPE OF SEED MIX (PERMANENT, TEMPORARY, OR LOW-GROWTH).
2. ALL BRANDS FURNISHED SHALL BE FREE FROM SUCH NOXIOUS SEEDS AS RUSSIAN OR CANADIAN THISTLE, COARSE FESCUE, EUROPEAN BINDWEED, JOHNSON GRASS, KNAP WEED AND LEAFY SPURGE.
3. THE SEEDER SHALL FURNISH TO THE CONTRACTOR A SIGNED STATEMENT CERTIFYING THAT THE SEED FURNISHED IS FROM A LOT THAT HAS BEEN TESTED BY A RECOGNIZED LABORATORY. SEED WHICH HAS BECOME WET, MOLDY, OR OTHERWISE DAMAGED IN TRANSIT OR IN STORAGE WILL NOT BE ACCEPTABLE. SEED TICKETS SHALL BE PROVIDED TO THE TOWN OF CASTLE ROCK UPON REQUEST.
4. DRILL SEEDING MIX SHALL CONFORM TO THE TABLE ON THE RIGHT:
5. IF THE SEED AVAILABLE ON THE MARKET DOES NOT MEET THE MINIMUM PURITY AND GERMINATION PERCENTAGES SPECIFIED, THE SUBCONTRACTOR MUST COMPENSATE FOR A LESSER PERCENTAGE OF PURITY OR GERMINATION BY FURNISHING SUFFICIENT ADDITIONAL SEED TO EQUAL THE SPECIFIED PRODUCT. THE TAGS FROM THE SEED MIXES MUST BE SUPPLIED TO CONTRACTOR AND FORWARDED TO THE TOWN GESC INSPECTOR.
6. THE FORMULA USED FOR DETERMINING THE QUANTITY OF PURE LIVE SEED (PLS) SHALL BE (POUNDS OF SEED) X (PURITY) X (GERMINATION) = POUNDS OF PURE LIVE SEED (PLS).
7. PERMANENT SEED MIX SHALL BE USED UNLESS OTHERWISE APPROVED BY THE TOWN. THE USE OF TEMPORARY NURSERY CROP IN PERMANENT AND LOW GROW MIXES IS PROHIBITED.
8. ALL AREAS TO BE SEEDED AND MULCHED SHALL HAVE NATIVE TOPSOIL SPREAD TO A DEPTH OF AT LEAST 6 INCHES (LOOSE DEPTH). HAUL ROADS AND OTHER COMPACTED AREAS SHALL BE LOOSENED TO A DEPTH OF 6 INCHES PRIOR TO SPREADING TOPSOIL.
9. FOR PERMANANTLY IRRIGATED AREAS OR FOR AREAS WITH INADEQUATE TOPSOIL SHALL BE AMENDED PRIOR TO SEEDING. SOIL AMENDMENTS SHALL BE IN COMPLIANCE WITH THE TOWN OF CASTLE ROCK LANDSCAPE REGULATIONS. MINIMUM SOIL AMENDMENTS SHALL BE 3 CUBIC YARDS OF ORGANIC MATTER PER 1,000 SQUARE FEET OF SEEDED AREAS, AND SHALL BE TILLED TO A MINIMUM DEPTH OF 6 INCHES. SOIL AMENDMENTS SHALL BE TESTED TWO WEEKS IN ADVANCE OF ITS USE AND RESULTS SUBMITTED FOR APPROVAL BY THE TOWN GESC INSPECTOR.
10. SOIL IS TO 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 THOROUGHLY LOOSENED SHALL BE REJECTED. SEED BED SHALL BE FREE OF WEEDS.
11. SEED IS TO BE APPLIED USING A MECHANICAL DRILL TO A DEPTH NOT LESS THAN 1/4 INCH AND NOT MORE THAN 3/4 INCH. ROW SPACING SHALL BE NO MORE THAN 6 INCHES. MATERIAL USED FOR MULCH SHALL CONSIST OF WEED-FREE LONG-STEMMED STRAW. AT LEAST 50 PERCENT OF THE MULCH, BY WEIGHT, SHALL BE 10 INCHES OR MORE IN LENGTH. MULCH SHALL BE APPLIED AND MECHANICALLY ANCHORED TO A DEPTH OF AT LEAST 4 INCHES. MULCH SHALL BE APPLIED AT A RATE OF 4000 LB. OF STRAW PER ACRE.
12. IF THE PERMITTEE DEMONSTRATES TO THE TOWN THAT IT IS NOT POSSIBLE TO DRILL SEED, SEED IS TO BE UNIFORMLY BROADCAST AT TWO TIMES THE DRILLED RATE, THEN LIGHTLY HARROWED TO PROVIDE A SEED DEPTH OF APPROXIMATELY 1/4 INCH, THEN ROLLED TO COMPACT, THEN MULCHED AS SPECIFIED ABOVE.
13. SEEDING AND MULCHING SHALL BE COMPLETED WITHIN 30 DAYS OF INITIAL EXPOSURE OR 7 DAYS AFTER GRADING IS SUBSTANTIALLY COMPLETE IN A GIVEN AREA (AS DEFINED BY THE TOWN). THIS MAY REQUIRE MULTIPLE MOBILIZATIONS FOR SEEDING AND MULCHING.
14. ALL SEEDED AREAS SHALL BE MULCHED, CRIMPED AND TACKIFIED WITHIN 24-HOURS AFTER SEEDING.
15. TACKIFIER SHOULD BE UTILIZED TO HELP WITH STRAW DISPLACEMENT. THE TACKIFIER MATERIAL SHALL CONSIST OF A FREE-FLOWING, NON-CORROSIVE POWDER PRODUCED FROM THE NATURAL PLAT GUM OF PLANTAGO INSULARIS, (DESERT INDIANWHEAT), APPLIED IN A SLURRY WITH WATER AND WOOD FIBER. THE POWDER SHALL POSSESS THE FOLLOWING PROPERTIES: PROTEIN CONTENT = 1.6 +/-0.2%; ASH CONTENT = 2.7 +/-0.2%; FIBER = 4.0 +/-0.4%; PH 1% SOLUTION = 6.5 - 8.0. THE MATERIAL SHALL NOT CONTAIN ANY MINERAL FILLER, RECYCLED CELLULOSE FIBER, CLAYS, OR OTHER SUBSTANCES, WHICH MAY INHIBIT GERMINATION OR GROWTH OF PLANTS. THE WOOD FIBER AND WATER USED SHALL CONFORM TO THE COLORADO HIGHWAY SPECIFICATIONS, SUBSECTION 213.02 - PAR. 8, AND SUBSECTION 209.02, RESPECTIVELY. APPLY TACKIFIER WITH A SPRAY NOZZLE, DISPENSING A MIST THAT WILL UNIFORMLY COVER THE SURFACE.

SEEDING AND MULCHING MAINTENANCE NOTES

1. ALL SEEDED AREAS SHALL BE KEPT IN A DAMP CONDITION, FOR AT LEAST 14 DAYS AFTER SEEDING, TO AID IN GERMINATION. SOME FORM OF IRRIGATION MAY BE REQUIRED TO ACHIEVE THIS GOAL, AND IT IS THE RESPONSIBILITY OF THE GESC MANAGER TO PERFORM ANY AND ALL NECESSARY OPERATIONS TO THAT END. THE MEANS OF IRRIGATION SHALL BE APPROVED BY THE TOWN AND PROPER PERMITS OBTAINED PRIOR TO IMPLEMENTATION. DIRECT FLOWS FROM LARGE HOSES, WHICH COULD DAMAGE THE MULCH, WILL NOT BE PERMITTED.
2. SEEDED AND MULCHED AREAS SHALL BE INSPECTED FOR REQUIRED COVERAGE MONTHLY FOR A PERIOD OF TWO YEARS FOLLOWING INITIAL SEEDING. REPAIRS AND RE-SEEDING AND MULCHING SHALL BE UNDERTAKEN AFTER THE FIRST AND SECOND GROWING SEASON OR AS REQUESTED BY THE GESC INSPECTOR FOR ANY AREAS FAILING TO MEET THE REQUIRED COVERAGE.
3. RILL AND GULLY EROSION SHALL BE FILLED WITH TOPSOIL PRIOR TO RESEEDING. THE RESEEDING METHOD SHALL BE APPROVED BY THE TOWN.
4. NOXIOUS WEEDS SHALL BE CONTROLLED IN A MANNER ACCEPTABLE TO THE TOWN.
5. REQUIRED COVERAGE FOR STANDARD, OPEN SPACE AND LOW GROWTH SEED MIXES SHALL BE DEFINED AS FOLLOWS:
   - 5.1. THREE (3) PLANTS PER SQUARE FOOT WITH A MINIMUM HEIGHT OF 3 INCHES. THE 3 PLANTS PER SQUARE FOOT SHALL BE OF THE VARIETY AND SPECIES FOUND IN THE TOWN OF CASTLE ROCK-APPROVED MIX.
   - 5.2. NO BARE AREAS LARGER THAN 4 SQUARE FEET (TWO-FEET BY TWO-FEET OR EQUIVALENT).
   - 5.3. FREE OF ERODED AREAS.
   - 5.4. FREE FROM INFESTATION OF NOXIOUS WEEDS IN ACCORDANCE WITH SECTION 6.4 OF THE GESC CRITERIA MANUAL.
6. REQUIRED COVERAGE FOR TURF GRASS AREAS SHALL BE DEFINED AS FOLLOWS:
   - 6.1. AT LEAST 80% VEGETATIVE COVER OF GRASS SPECIES PLANTED.
   - 6.2. NO BARE AREAS LARGER THAN 4 SQUARE FEET (TWO-FEET BY TWO-FEET OR EQUIVALENT).
   - 6.3. FREE OF ERODED AREAS.
   - 6.4. FREE FROM INFESTATION OF NOXIOUS WEEDS IN ACCORDANCE WITH SECTION 6.4 OF THE GESC CRITERIA MANUAL.

DOUGLAS COUNTY AND CASTLE ROCK PERMANENT DRILL SEEDING MIX

SPECIES	VARIETY	NOTES	% IN MIX	POUNDS OF PLS PER ACRE
BIG BLUESTEM	KAW	PNWS	10	1.1
YELLOW INDIANGRASS	CHEYENNE	PNWS	10	1
SWITCHGRASS	BLACKWELL	PNWS	10	0.4
SIDEOATS GRAMA	VAUGHN	PNWB	10	0.9
WESTERN WHEATGRASS	ARRIBA	PNCS	10	1.6
BLUE GRAMA	HACHITA	PNWB	10	0.3
THICKSPIKE WHEATGRASS	CRITANA	PNCS	10	1
PRAIRIE SANDREED	GOSHEN	PNWS	10	0.7
GREEN NEEDLEGRASS	LODORM	PNCB	10	1
SLENDER WHEATGRASS	PRYOR	PNCB	5	0.6
STREAMBANK WHEATGRASS	SODAR	PNCS	5	0.6
			TOTAL	9.2

DOUGLAS COUNTY AND CASTLE ROCK TEMPORARY DRILL SEEDING MIX

SPECIES	VARIETY	NOTES	% IN MIX	POUNDS OF PLS PER ACRE
SMOOTH BROMEGRASS	LINCOLN	PICS	30	3.9
INTERMEDIATE WHEATGRASS	OAHE	PICS	30	4.5
PUBESCENT WHEATGRASS	LUNA	PICS	30	4.2
ANNUAL RYEGRASS	N/A	AICB	10	0.8
			TOTAL	13.4

DOUGLAS COUNTY AND CASTLE ROCK LOW-GROWTH DRILL SEEDING MIX

SPECIES	VARIETY	NOTES	% IN MIX	POUNDS OF PLS PER ACRE
BUFFALOGRASS	TEXOKA	PNWS	20	3.2
BLUE GRAMA	HACHITA	PNWB	20	0.6
WESTERN WHEATGRASS	ARRIBA	PNCS	20	3.2
SIDEOATS GRAMA	VAUGHN	PNWB	20	1.8
THICKSPIKE WHEATGRASS	CRITANA	PNCS	10	1
STREAMBANK WHEATGRASS	SODAR	PNCS	10	1.2
			TOTAL	11.0

SM SEEDING AND MULCHING 17

Sheet Revisions			
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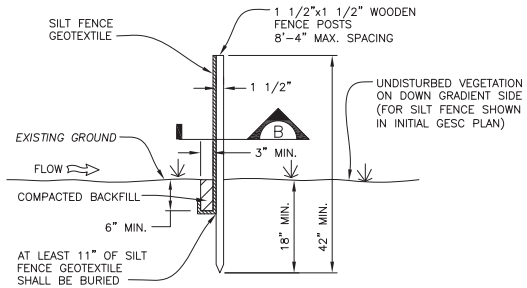
TOWN OF CASTLE ROCK COLORADO

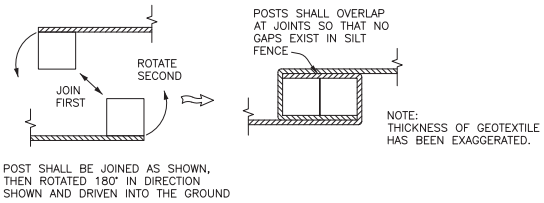
UTILITIES DEPARTMENT
Stormwater Engineering Division

GESC GRADING, EROSION, AND SEDIMENT CONTROL

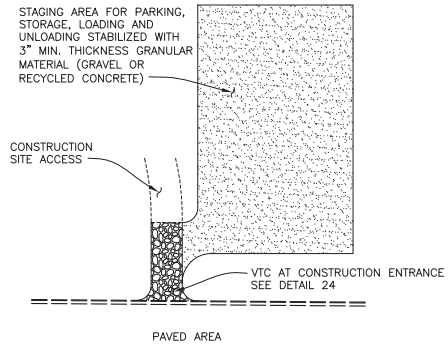
GESC PLAN STANDARD NOTES AND DETAILS



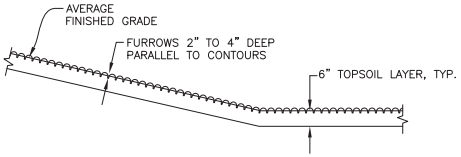
DETAIL A
SCALE: 1" = 1'-0"



JOINTS - SECTION B
SCALE: N.T.S.



PLAN
SCALE: 1" = 40'-0"



SECTION A
SCALE: 1/2" = 1'-0"

SILT FENCE INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION AND LENGTH OF FENCE.
2. ANCHOR TRENCH SHALL BE EXCAVATED WITH TRENCHER, OR WITH SILT FENCE INSTALLATION MACHINE; NO ROAD GRADERS, BACKHOES, ETC. SHALL BE USED. TRENCH SHALL BE COMPACTED BY HAND, WITH "JUMPING JACK", OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.
3. SILT FENCE GEOTEXTILE SHALL MEET THE FOLLOWING REQUIREMENTS:
   - 6-TO 12-GALLONS PER MINUTE PER SQUARE FOOT FLOW CAPACITY.
   - 90 LB. TENSILE STRENGTH PER ASTM D4622.
   - UV DESIGN AT 500 HRS MIN. 70% STRENGTH RETAINED PER ASTM D 4355.
4. SILT FENCE INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.

SILT FENCE MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT SILT FENCE DAILY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
2. SEDIMENT ACCUMULATED UPSTREAM OF SILT FENCE SHALL BE REMOVED WHEN THE UPSTREAM SEDIMENT REACHES A DEPTH OF 6-INCHES.
3. SILT FENCE SHALL BE REMOVED WHEN THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY THE TOWN. IF ANY DISTURBED AREA EXISTS AFTER REMOVAL, IT SHALL BE SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE TOWN.

STABILIZED STAGING AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR GENERAL LOCATION OF STAGING AREA. CONTRACTOR MAY MODIFY LOCATION AND SIZE OF STABILIZED STAGING AREA WITH TOWN APPROVAL.
2. STABILIZED STAGING AREA SHALL BE LARGE ENOUGH TO FULLY CONTAIN PARKING, STORAGE, AND UNLOADING AND LOADING OPERATIONS.
3. IF REQUIRED BY THE TOWN, SITE ACCESS ROADS SHALL BE STABILIZED IN THE SAME MANNER AS THE STAGING AREA.
4. STAGING AREA SHALL BE STABILIZED PRIOR TO ANY OTHER OPERATIONS ON THE SITE.
5. THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM OF 3" OF GRANULAR MATERIAL (GRAVEL OR RECYCLED CONCRETE).

STABILIZED STAGING AREA MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT THE STABILIZED STAGING AREA WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS AS NECESSARY.
2. GESC MANAGER SHALL PROVIDE ADDITIONAL THICKNESS OF GRANULAR MATERIAL IF ANY RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.
3. STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING AND LOADING OPERATIONS.
4. ANY ACCUMULATED DIRT OR MUD SHALL BE REMOVED FROM THE SURFACE OF THE STABILIZED STAGING AREA.
5. THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY THE TOWN, USED ON SITE, AND THE AREA TOPSOILED, DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED.

SURFACE ROUGHENING INSTALLATION NOTES

1. SURFACE ROUGHENING SHALL BE PROVIDED ON ALL FINISHED GRADES (SLOPES AND "FLAT" AREAS) WITHIN 2 DAYS OF COMPLETION OF FINISHED GRADE (FOR AREAS NOT RECEIVING TOPSOIL) OR WITHIN 2 DAYS OF TOPSOIL PLACEMENT.
2. AREAS WHERE BUILDING FOUNDATIONS, PAVEMENT, OR SOD IS TO BE PLACED WITHIN 7-DAYS OF FINISHED GRADING DO NOT NEED TO BE SURFACE ROUGHENED.
3. DISTURBED SURFACES SHALL BE ROUGHENED USING RIPPING OR TILLING EQUIPMENT ON THE CONTOUR OR TRACKING UP AND DOWN A SLOPE USING EQUIPMENT TREADS.

SURFACE ROUGHENING MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT THE SURFACE ROUGHENING WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS AS NECESSARY.
2. VEHICLES AND EQUIPMENT SHALL GENERALLY BE CONFINED TO ACCESS DRIVES AND SHALL NOT BE DRIVEN OVER AREAS THAT HAVE BEEN SURFACE ROUGHENED.
3. IN NON-TURF GRASS FINISHED AREAS, SEEDING AND MULCHING SHALL TAKE PLACE DIRECTLY OVER SURFACE ROUGHENED AREAS WITHOUT FIRST SMOOTHING OUT THE SURFACE.
4. IN AREAS NOT SEEDED AND MULCHED AFTER SURFACE ROUGHENING, SURFACES SHALL BE RE-ROUGHENED AS NECESSARY TO MAINTAIN GROOVE DEPTH AND SMOOTH OVER ANY RILL EROSION.

SF — SILT FENCE 18

SSA — STABILIZED STAGING AREA 19

SR — SURFACE ROUGHENING 20

Sheet Revisions			
R1	3/11	GESC MANUAL UPDATES	DVD
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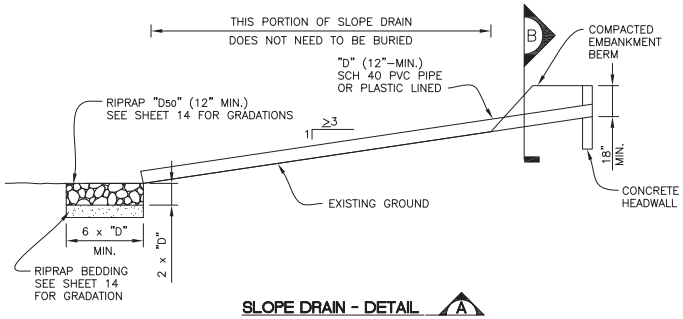
TOWN OF CASTLE ROCK COLORADO

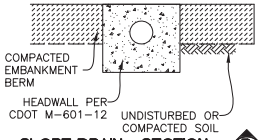
UTILITIES DEPARTMENT
Stormwater Engineering Division

GESC — GRADING, EROSION, AND SEDIMENT CONTROL

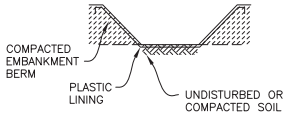
GESC PLAN STANDARD NOTES AND DETAILS



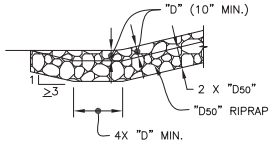
SLOPE DRAIN - DETAIL A
SCALE: 1" = 5'-0"



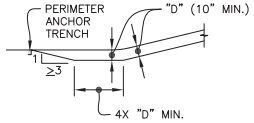
SLOPE DRAIN - SECTION B
SCALE: 1" = 5'-0"



PLASTIC LINED DRAIN - SECTION E
SCALE: 1" = 5'-0"



TERMINATION OF RIPRAP LINED SLOPE DRAIN - DETAIL D
SCALE: 1" = 5'-0"



TERMINATION OF PLASTIC LINED SLOPE DRAIN - DETAIL C
SCALE: 1" = 5'-0"

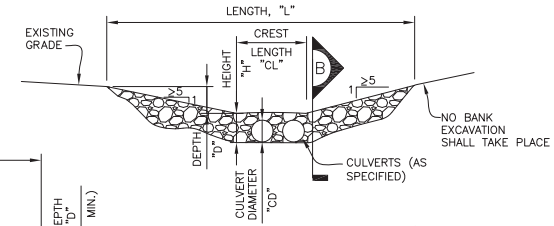
SLOPE DRAIN INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION AND LENGTH OF SLOPE DRAIN.
   - TYPE OF SLOPE DRAIN (PIPE, RIPRAP LINED, PLASTIC LINED OR ENGINEERED)
   - PIPE DIAMETER, "D", AND RIPRAP SIZE, "D_{50}".
2. SLOPE DRAIN DIMENSIONS SHALL BE CONSIDERED MINIMUM DIMENSIONS; CONTRACTOR MAY ELECT TO INSTALL LARGER FACILITIES. ANY DAMAGE TO SLOPE OR SLOPE DRAIN DURING RUNOFF EVENTS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
3. SLOPE DRAINS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY UPSTREAM LAND-DISTURBING ACTIVITIES.
4. FOR TEMPORARY SLOPE DRAINS, PIPE MAY BE INSTALLED ON TOP OF SLOPE; HOWEVER, 12" MIN. COVER AT TOP OF SLOPE SHALL BE PROVIDED.
5. A RIPRAP PAD SHALL BE PLACED AT THE OUTFALL OF THE SLOPE DRAIN.

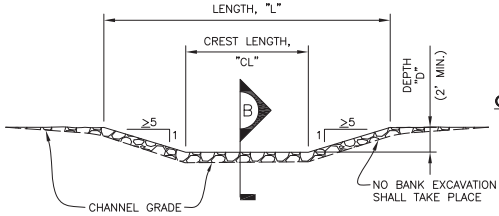
SLOPE DRAIN MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT SLOPE DRAINS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS AS NECESSARY.
2. TEMPORARY SLOPE DRAINS ARE TO REMAIN IN PLACE UNTIL NO LONGER NEEDED, BUT SHALL BE REMOVED PRIOR TO THE END OF CONSTRUCTION. WHEN SLOPE DRAINS ARE REMOVED, THE DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE TOWN.

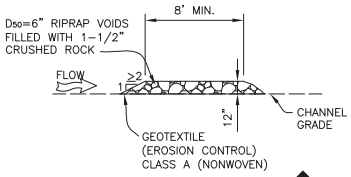
TSD **TEMPORARY SLOPE DRAIN** 21



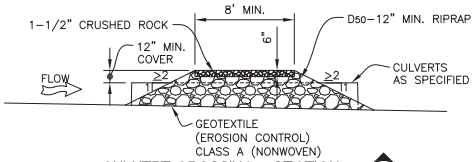
CULVERT CROSSING - DETAIL A
SCALE: 1" = 5'-0"



FORD CROSSING - DETAIL A
SCALE: 1" = 5'-0"



FORD CROSSING - SECTION B
SCALE: 1" = 5'-0"



CULVERT CROSSING - SECTION B
SCALE: 1" = 5'-0"

TEMPORARY STREAM CROSSING INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATIONS OF TEMPORARY STREAM CROSSING.
   - STREAM CROSSING TYPE (FORD OR CULVERT).
   - FOR FORD CROSSING: LENGTH, "L", CREST LENGTH, "CL", AND DEPTH, "D".
   - FOR CULVERT CROSSING : LENGTH, "L", CREST LENGTH, "CL", CROSSING HEIGHT, "H", DEPTH, "D", CULVERT DIAMETER, "CD", AND NUMBER, TYPE AND CLASS OR GAUGE OF CULVERTS.
2. TEMPORARY STREAM CROSSING DIMENSIONS, D50, AND NUMBER OF CULVERTS INDICATED (FOR CULVERT CROSSING) SHALL BE CONSIDERED MINIMUM DIMENSIONS; ENGINEER MAY ELECT TO INSTALL LARGER FACILITIES. ANY DAMAGE TO STREAM CROSSING OR EXISTING STREAM CHANNEL DURING BASEFLOW OR FLOOD EVENTS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
3. SEE SHEET 14 FOR RIPRAP AND 1-1/2" CRUSHED ROCK GRADATIONS.
4. FOR A TEMPORARY STREAM CROSSING THAT WILL CARRY LOADS, THE TEMPORARY STREAM CROSSING MUST BE DESIGNED BY THE DESIGN ENGINEER.

TEMPORARY STREAM CROSSING MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT STREAM CROSSINGS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
2. 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).
3. STREAM CROSSINGS ARE TO REMAIN IN PLACE UNTIL NO LONGER NEEDED, BUT SHALL BE REMOVED PRIOR TO THE END OF CONSTRUCTION.
4. WHEN STREAM CROSSINGS ARE REMOVED, THE DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED AND COVERED WITH EROSION CONTROL BLANKET OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE TOWN.

TSC **TEMPORARY STREAM CROSSING** 22

Sheet Revisions			
R1	3/11	GESC MANUAL UPDATES	DVD
R2	5/15	GESC MANUAL UPDATES	DVD

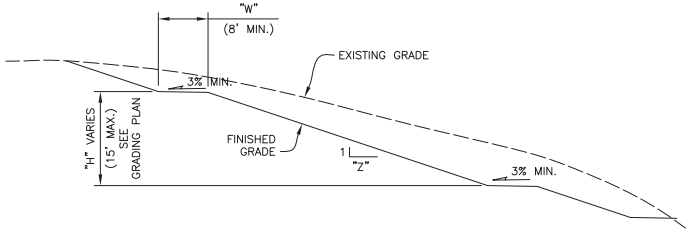
NOTE: SCALES SHOWN ARE FOR 22"x34" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.

TOWN OF CASTLE ROCK COLORADO

UTILITIES DEPARTMENT
Stormwater Engineering Division

GESC — GRADING, EROSION, AND SEDIMENT CONTROL

GESC PLAN STANDARD NOTES AND DETAILS



SECTION A
SCALE: 1" = 10'-0"

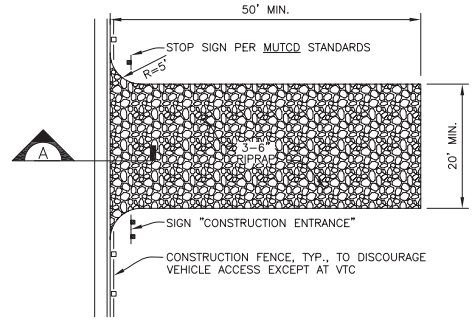
TERRACING INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - WIDTH, "W", HEIGHT, "H", AND SLOPE, "Z".
2. TERRACING IS NOT REQUIRED FOR SLOPES OF 4 TO 1 OR FLATTER.
3. EARTH (VEGETATED) SLOPES STEEPER THAN 3 TO 1 ARE NOT ALLOWED ON THE SITE.

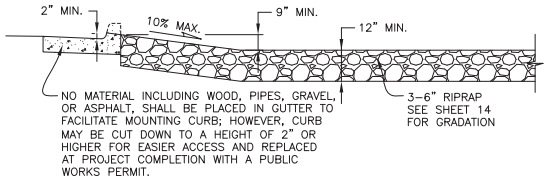
TERRACING MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT THE SURFACE ROUGHENING WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
2. ANY RILL EROSION OCCURRING ON SLOPES SHALL BE REPAIRED AND RESEEDED AND MULCHED IN ACCORDANCE WITH DETAIL 17.

TER **TERRACING** 23



PLAN
SCALE: 1" = 10'-0"



SECTION A
SCALE: 1/2" = 1'-0"

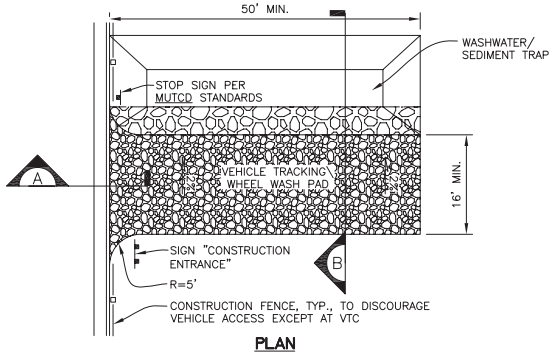
VEHICLE TRACKING CONTROL INSTALLATION NOTES

1. VEHICLE TRACKING CONTROL PADS SHALL BE INSTALLED AT EVERY ACCESS POINT TO SITE.
2. 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" WITH A MAXIMUM SIZE OF 6". THE STONE SHALL HAVE A SPECIFIC GRAVITY OF AT LEAST 2.6. CONTROL OF GRADATION WILL BE BY VISUAL INSPECTIONS.
3. ANY CRACKED OR DAMAGED CURB AND GUTTER AND SIDEWALK SHALL BE REPLACED BY PERMITTEE.
4. ALL ACCESS POINTS TO THE SITE SHALL BE APPROVED AS PART OF THE GESC PERMIT AND BE SHOWN ON THE GESC PLANS.
5. A STOP SIGN INSTALLED IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), AS AMENDED, SHALL BE INSTALLED FOR EXITING TRAFFIC AT THE VTC.

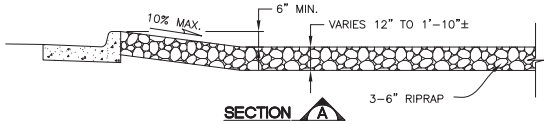
VEHICLE TRACKING CONTROL MAINTENANCE NOTES

1. GESC MANAGER SHALL INSPECT VEHICLE TRACKING CONTROL DAILY. STONE SURFACE SHALL BE CLEAN AND LOOSE ENOUGH TO RUT SLIGHTLY UNDER WHEEL LOADS AND CAUSE LOOSE STONE TO DISLODGE MUD FROM TIRES. WHEN STONE BECOMES COMPACTED OR FILLED WITH SEDIMENT SO THAT THE EFFECTIVENESS OF THE PAD IS DIMINISHED, CONTRACTOR SHALL RIP, TURN OVER, OR OTHERWISE LOOSEN STONE, PLACE ADDITIONAL NEW STONE, OR REPLACE WITH NEW STONE AS NECESSARY TO RESTORE EFFECTIVENESS.
2. VEHICLE TRACKING CONTROL SHALL BE REMOVED AT THE END OF CONSTRUCTION, THE STONE MATERIAL REMOVED OR, IF APPROVED BY THE TOWN, USED ON SITE, AND THE AREA TOPSOILED, DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED.

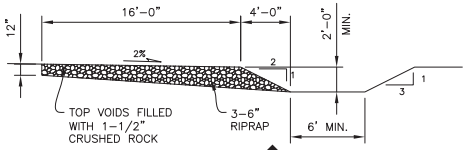
VTC **VEHICLE TRACKING CONTROL** 24



PLAN
SCALE: 1" = 10'-0"



SECTION A
SCALE: 1/2" = 1'-0"



SECTION B
SCALE: 1" = 5'-0"

VEHICLE TRACKING CONTROL WITH WHEEL WASH INSTALLATION NOTES

1. ALTHOUGH NOT NORMALLY USED, THE TOWN RESERVES THE RIGHT TO REQUIRE VEHICLE TRACKING CONTROL WITH WHEEL WASH FACILITIES AT SITES WHERE TRACKING ONTO PAVED AREAS BECOMES A SIGNIFICANT PROBLEM.
2. IF VEHICLE TRACKING CONTROL WITH WHEEL WASH FACILITIES ARE REQUIRED, ALL WHEELS ON EVERY VEHICLE LEAVING THE SITE SHALL BE CLEANED OF MUD USING A PRESSURE-WASHER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A WATER SOURCE.
3. 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" WITH A MAXIMUM SIZE OF 6". THE STONE SHALL HAVE A SPECIFIC GRAVITY OF AT LEAST 2.6. CONTROL OF GRADATION WILL BE BY VISUAL INSPECTIONS.
4. ANY CRACKED OR DAMAGED CURB AND GUTTER AND SIDEWALK SHALL BE REPLACED BY CONTRACTOR.
5. A STOP SIGN INSTALLED IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), AS AMENDED, SHALL BE INSTALLED FOR EXITING TRAFFIC AT THE VTC.

VEHICLE TRACKING CONTROL WITH WHEEL WASH MAINTENANCE NOTES

1. GESC MANAGER SHALL INSPECT VEHICLE TRACKING CONTROL WITH WHEEL WASH FACILITIES DAILY. ACCUMULATED SEDIMENTS SHALL BE REMOVED FROM PAD SURFACE.
2. ACCUMULATED SEDIMENT IN THE WASHWATER/SEDIMENT TRAP SHALL BE REMOVED WHEN THE SEDIMENT DEPTH REACHES AN AVERAGE OF 12-INCHES.
3. VEHICLE TRACKING CONTROL WITH WHEEL WASH FACILITY SHALL BE REMOVED AT THE END OF CONSTRUCTION, THE RIPRAP MATERIAL REMOVED OR, IF APPROVED BY THE TOWN, USED ON SITE, AND THE AREA TOPSOILED, DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED.

WW **VTC WITH WHEEL WASH** 25

Sheet Revisions			
R1	3/11	GESC MANUAL UPDATES	DVD
R2	5/15	GESC MANUAL UPDATES	DVD

NOTE: SCALES SHOWN ARE FOR 22"x34" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.

TOWN OF CASTLE ROCK COLORADO

UTILITIES DEPARTMENT
Stormwater Engineering Division

GESC GRADING, EROSION, AND SEDIMENT CONTROL

GESC PLAN STANDARD NOTES AND DETAILS

ROCK AND RIPRAP GRADATIONS

TABLE 1. RIPRAP GRADATIONS

D50 MEDIAN STONE SIZE (INCHES)	% OF MATERIAL SMALLER THAN TYPICAL STONE	TYPICAL STONE EQUIVALENT DIAMETER (INCHES)	TYPICAL STONE WEIGHT (POUNDS)
6	70 – 100 50 – 70 35 – 50 2 – 10	12 9 6 2	85 35 10 0.4
9	70 – 100 50 – 70 35 – 50 2 – 10	15 12 9 3	160 85 35 1.3
12	70 – 100 50 – 70 35 – 50 2 – 10	21 18 12 4	440 275 85 3
18	100 50 – 70 35 – 50 2 – 10	30 24 18 6	1280 650 275 10
24	100 50 – 70 35 – 50 2 – 10	42 33 24 9	3500 1700 650 35

TABLE 2. RIPRAP BEDDING

SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
	CLASS A
3"	100
1 1/2"	20 – 90
NO. 4	0 – 20
NO. 200	0 – 3
MATCHES SPECIFICATIONS FOR CDOT CLASS A FILTER MATERIAL AND UDFCD TYPE 1 BEDDING. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES.	

TABLE 3. 1 1/2" CRUSHED ROCK

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

Appendix C

Example GESC Drawings

- Small Site GESC Drawings
- Utility GESC Drawings
- Staged GESC Drawings
- Staged and Phased GESC Drawings
- Temporary Batch Plant/GESC Drawings
- Low Impact GESC Drawing

Appendix C

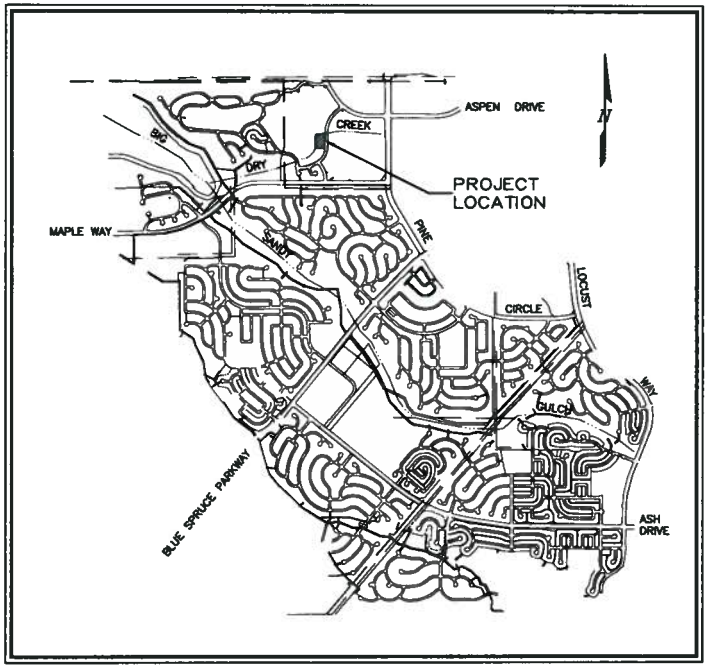
Example GESC Drawings

Small Site GESC Drawings

CONTRACT DRAWINGS FOR CONSTRUCTION OF

BUSINESS SITE A
GRADING, EROSION AND SEDIMENT CONTROL PLAN

EXAMPLE
TOWN OF CASTLE ROCK
SMALL SITE GESC DRAWINGS



PROJECT LOCATION: SOUTHWEST QUARTER OF SECTION 9
TOWNSHIP 6S, RANGE 68W

LOCATION MAP

SCALE 1"=1500'

LIST OF DRAWINGS

SHEET	DRAWING NO	TITLE
	GENERAL DRAWINGS	
1	G-1	COVER SHEET
	GESC DRAWINGS	
2	E-1	SMALL SITE GESC PLAN
	GESC STANDARD NOTES AND DETAILS	
3	SHEET 1	GESC GENERAL NOTES AND LEGEND
4 - 15	SHEETS 2 - 13	GESC DETAILS AND INSTALLATION AND MAINTENANCE NOTES
16	SHEETS 14	ROCK AND RIPRAP GRADATIONS

THE GRADING, EROSION AND SEDIMENT CONTROL PLAN INCLUDED HEREIN IS ON FILE AT THE TOWN OF CASTLE ROCK AND APPEARS TO FULFILL APPLICABLE TOWN OF CASTLE ROCK GRADING, EROSION AND SEDIMENT CONTROL CRITERIA. ADDITIONAL GRADING, EROSION AND SEDIMENT CONTROL MEASURES MAY BE REQUIRED OF THE OWNER OR HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT FUNCTION AS INTENDED. THE REQUIREMENTS OF THIS PLAN SHALL RUN WITH THE LAND AND SHALL BE THE OBLIGATION OF THE LANDOWNER, OR HIS OR HER DESIGNATED REPRESENTATIVE, UNTIL SUCH TIME AS THE PLAN IS PROPERLY COMPLETED, MODIFIED OR VOIDED.

THE GRADING, EROSION AND SEDIMENT CONTROL PLAN INCLUDED HEREIN HAS BEEN PREPARED UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH THE REQUIREMENTS OF THE GRADING, EROSION, AND SEDIMENT CONTROL (GESC) MANUAL OF THE TOWN OF CASTLE ROCK.

GESC PLANS PREPARED BY:

AUSTIN ENGINEERING COMPANY INC. DATE PE NUMBER

THE CONSTRUCTION PLANS INCLUDED HEREIN WERE PREPARED UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH THE REQUIREMENTS OF THE PUBLIC WORKS REGULATIONS AND THE DRAINAGE REGULATIONS OF THE TOWN OF CASTLE ROCK.

CONSTRUCTION PLANS PREPARED BY:

AUSTIN ENGINEERING COMPANY INC. DATE PE NUMBER

CALL UTILITY NOTIFICATION CENTER OF COLORADO
1-800-922-1987
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

Sheet Revisions		

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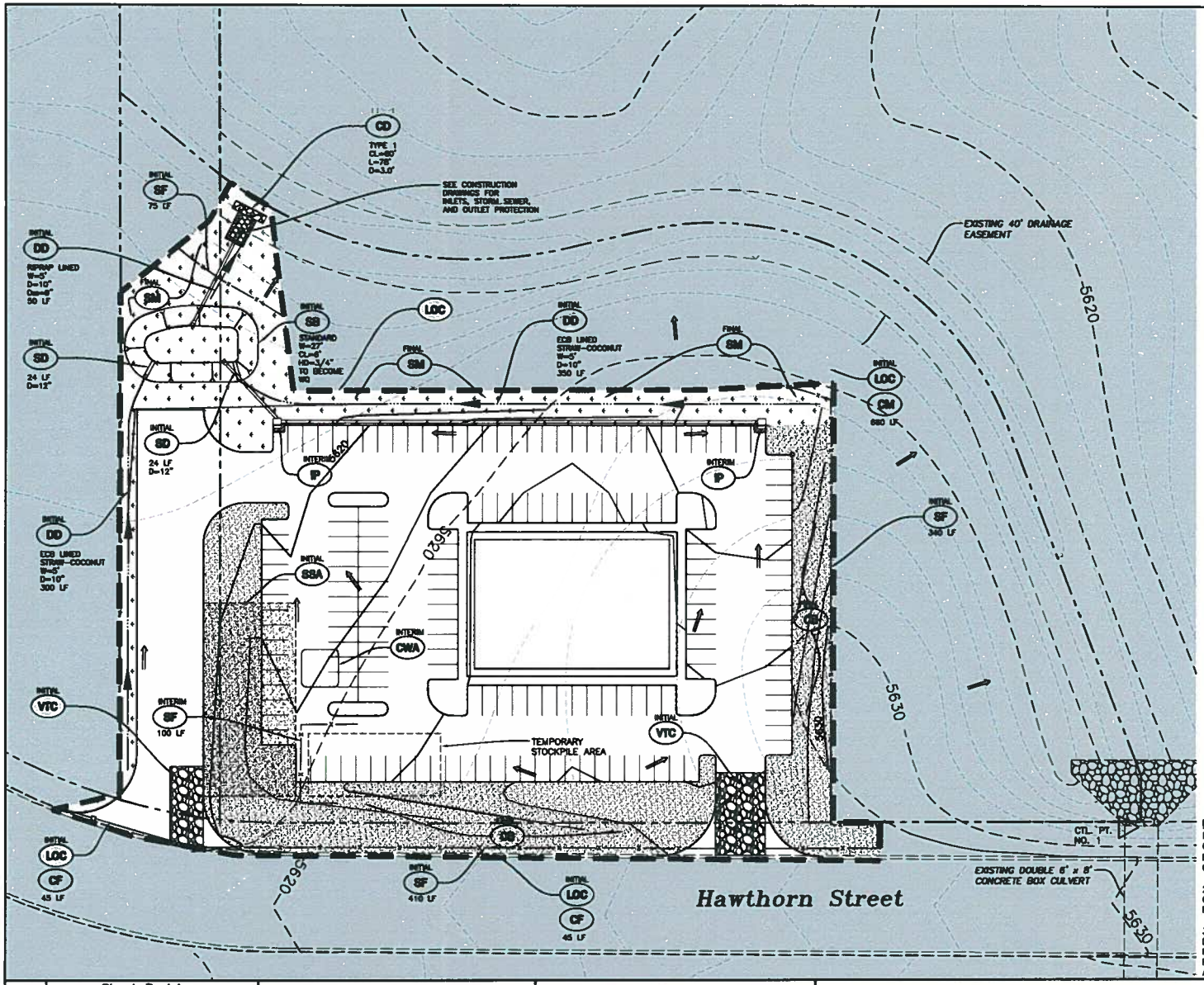
FAX: (303) 289-1084

BUSINESS SITE A

COVER SHEET

DRAWING G-1



BMP LEGEND

CD	CHECK DAM
CB	COMPOST BLANKET
CFB	COMPOST FILTER BERM
CWA	CONCRETE WASHOUT AREA
CF	CONSTRUCTION FENCE
CM	CONSTRUCTION MARKER
DW	DEWATERING
DD	DIVERSION DITCH
ECB	EROSION CONTROL BLANKET
IP	INLET PROTECTION
RCD	REINFORCED CHECK DAM
RRB	REINFORCED ROCK BERM
RRC	RRB FOR CULVERT PROTECTION
SB	SEDIMENT BASIN
SCL	SEDIMENT CONTROL
ST	SEDIMENT TRAP
SM	SEEDING AND MULCHING
SF	SILT FENCE
SSA	STABILIZED STAGING AREA
SR	SURFACE ROUGHENING
TSD	TEMPORARY SLOPE DRAIN
TSC	TEMPORARY STREAM CROSSING
TER	TERRACING
VTC	VEHICLE TRACKING CONTROL
WW	VTC WITH WHEEL WASH
	ROCK AND RIPRAP GRADATIONS
LOC	LIMITS OF CONSTRUCTION

EXISTING 2' CONTOUR
EXISTING 10' CONTOUR
PROPOSED 2' CONTOUR
PROPOSED 10' CONTOUR
FLOW DIRECTION ARROW

AREA OUTSIDE LIMITS OF CONSTRUCTION

AREA TO BE DRILL SEEDED AND CRIMP MULCHED.

NOTES:

1.) SEE COVER SHEET OF THE TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS (SHEET 1 OF 14) FOR LEGEND OF BMP NAMES AND SYMBOLS.

2.) CONTROL POINT NO. 1: 3" BRASS CAP ON SOUTH CORNER OF WEST HEADWALL, USGS ELEVATION 5628.23.

3.) SEE CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES SUCH AS DETENTION FACILITIES, CULVERTS, STORM DRAINAGE AND INLET AND OUTLET PROTECTION.

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

EXAMPLE TOWN OF CASTLE ROCK SMALL SITE GESC DRAWINGS

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BUSINESS SITE A

SMALL SITE GESC PLAN

DRAWING
E-1

TOWN OF CASTLE ROCK STANDARD GESC NOTES AND DETAILS TO GO HERE

	Sheet Revisions	NOTE: SCALES SHOWN ARE FOR 22"x34" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.	TOWN OF CASTLE ROCK COLORADO	UTILITIES DEPARTMENT Stormwater Engineering Division	GESC GRADING, EROSION, AND SEDIMENT CONTROL	GESC PLAN STANDARD NOTES AND DETAILS	SHEET 1 OF 14

Appendix C

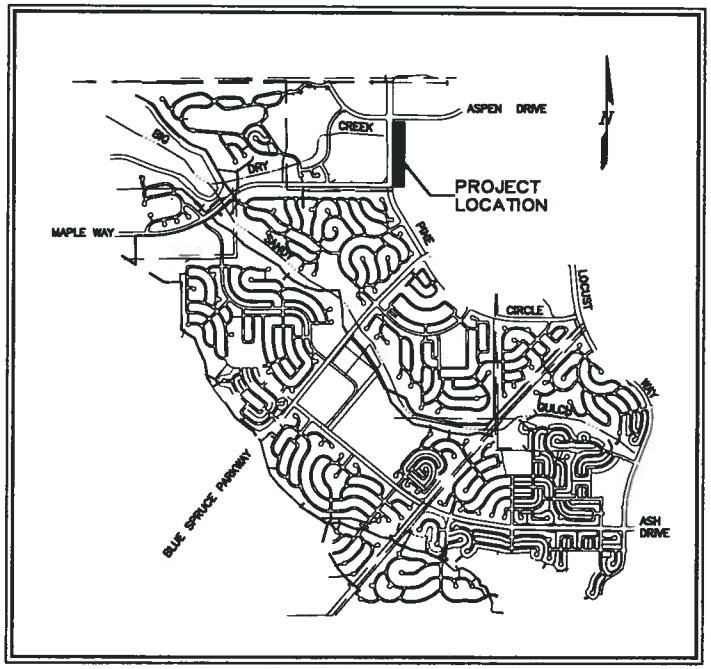
Example GESC Drawings

Utility GESC Drawings

CONTRACT DRAWINGS FOR CONSTRUCTION OF

UTILITY
GRADING, EROSION AND SEDIMENT CONTROL PLAN

EXAMPLE
TOWN OF CASTLE ROCK
UTILITY GESC DRAWINGS



PROJECT LOCATION: SOUTHWEST QUARTER OF SECTION 9
TOWNSHIP 6S, RANGE 68W

LOCATION MAP

SCALE 1"=1500'

LIST OF DRAWINGS

SHEET	DRAWING NO	TITLE
	GENERAL DRAWINGS	
1	G-1	COVER SHEET
	GESC DRAWINGS	
2	U-1	UTILITY GESC PLAN
3	U-2	UTILITY GESC PLAN
	GESC STANDARD NOTES AND DETAILS	
4	SHEET 1	GESC GENERAL NOTES AND LEGEND
5 – 16	SHEETS 2 – 13	GESC DETAILS AND INSTALLATION AND MAINTENANCE NOTES
17	SHEETS 14	ROCK AND RIPRAP GRADATIONS

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GESC PLANS PREPARED BY:

AUSTIN ENGINEERING COMPANY INC. | DATE | PE NUMBER

THE CONSTRUCTION PLANS INCLUDED HEREIN WERE PREPARED UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH THE REQUIREMENTS OF THE PUBLIC WORKS REGULATIONS AND THE DRAINAGE REGULATIONS OF THE TOWN OF CASTLE ROCK.

CONSTRUCTION PLANS PREPARED BY:

AUSTIN ENGINEERING COMPANY INC. | DATE | PE NUMBER

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CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

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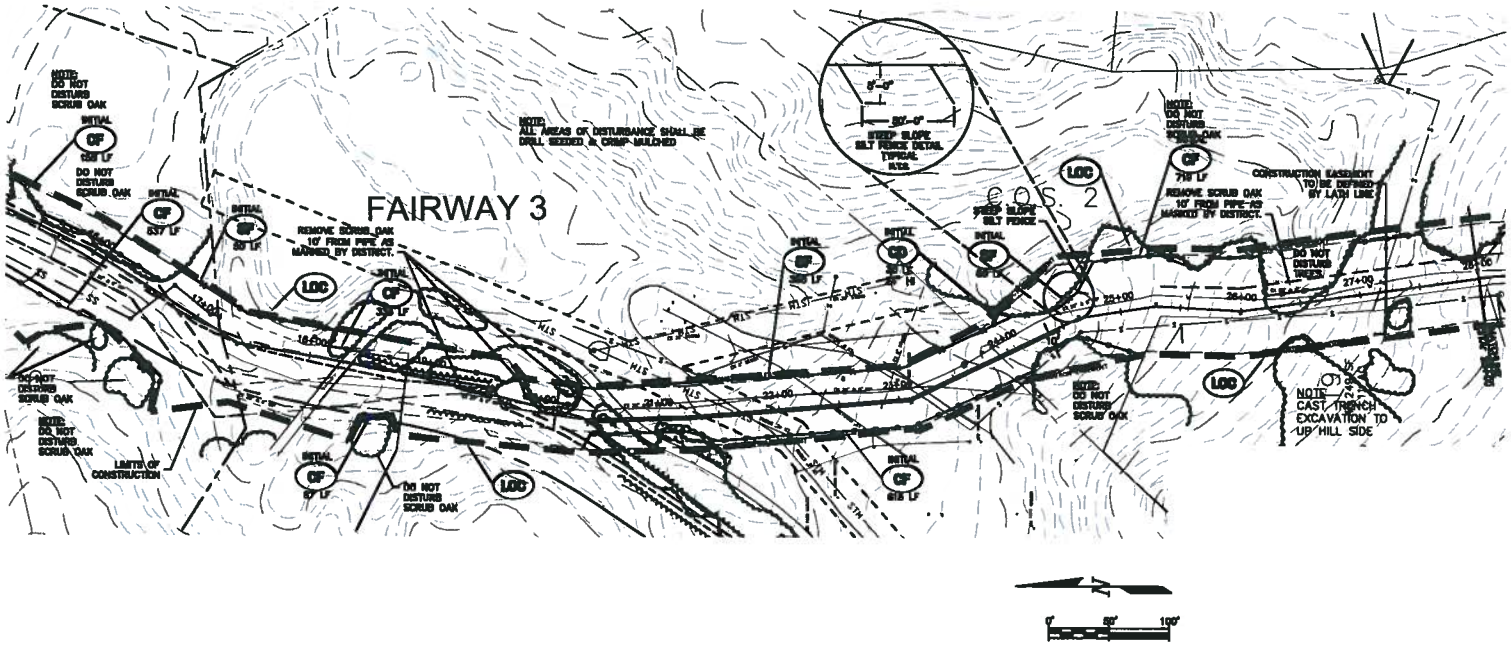
UTILITY
GESC PLAN

COVER SHEET

DRAWING
G-1



EXAMPLE
TOWN OF CASTLE ROCK
UTILITY GESC DRAWINGS

EXISTING 2' CONTOUR
EXISTING 10' CONTOUR
PROPOSED 2' CONTOUR
PROPOSED 10' CONTOUR
FLOW DIRECTION ARROW

AREA OUTSIDE LIMITS OF CONSTRUCTION

AREA TO BE DRILL SEEDED AND CRIMP MULCHED.

NOTES:

1.) SEE COVER SHEET OF THE TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS (SHEET 1 OF 14) FOR LEGEND OF BMP NAMES AND SYMBOLS.

2.) CONTROL POINT NO. 1: 3" BRASS CAP ON SOUTH CORNER OF WEST HEADWALL, USGS ELEVATION 5626.23.

3.) SEE CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES SUCH AS DETENTION FACILITIES, CULVERTS, STORM DRAINAGE AND INLET AND OUTLET PROTECTION.

CALL UTILITY NOTIFICATION CENTER OF COLORADO
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DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

Sheet Revisions		

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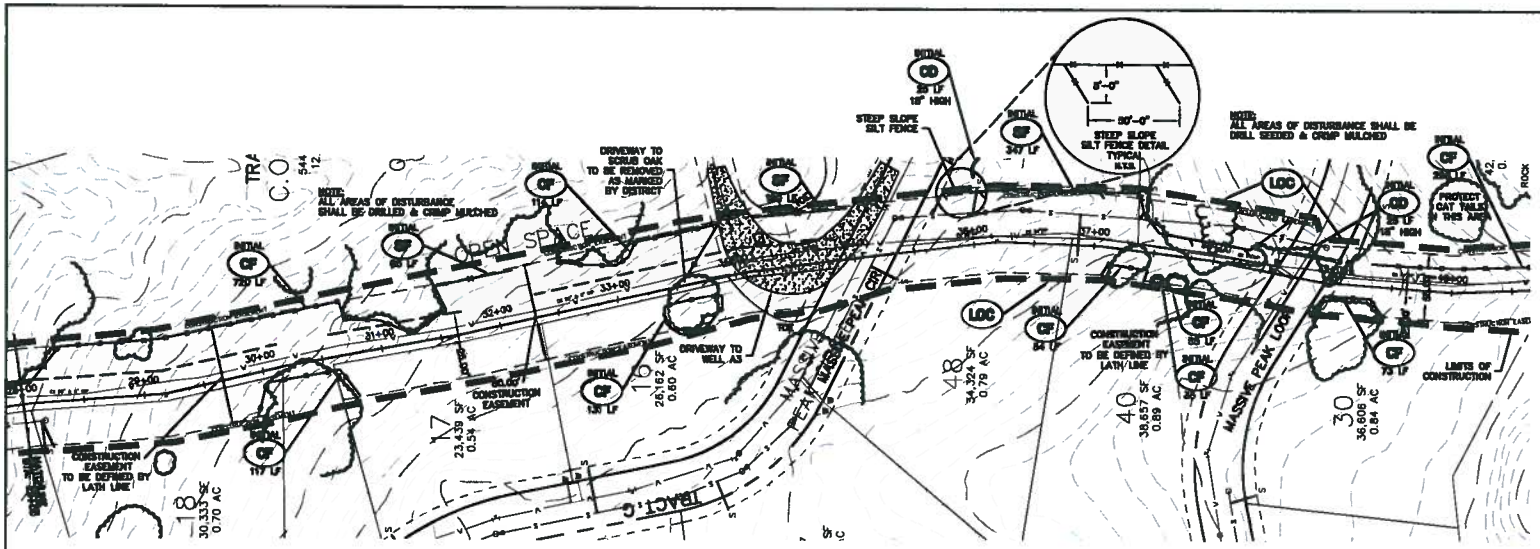
UTILITY GESC PLAN

WATERLINE PLAN

DRAWING U-1



NOTE
CAST TRENCH EXCAVATION TO UP HILL SIDE

EXAMPLE
TOWN OF CASTLE ROCK
UTILITY GESC DRAWINGS

EXISTING 2' CONTOUR
EXISTING 10' CONTOUR
PROPOSED 2' CONTOUR
PROPOSED 10' CONTOUR
FLOW DIRECTION ARROW

AREA OUTSIDE LIMITS OF CONSTRUCTION

AREA TO BE DRILL SEEDED AND CRIMP MULCHED.

NOTES:

1.) SEE COVER SHEET OF TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS (SHEET 1 OF 14) FOR LEGEND OF BMP NAMES AND SYMBOLS.

2.) CONTROL POINT NO. 1: 3" BRASS CAP ON SOUTH CORNER OF WEST HEADWALL, USGS ELEVATION 5628.23.

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CALL UTILITY NOTIFICATION CENTER OF COLORADO
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TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

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DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

Sheet Revisions		

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UTILITY GESC PLAN

WATERLINE PLAN

DRAWING U-2

TOWN OF CASTLE ROCK STANDARD GESC NOTES AND DETAILS TO GO HERE

Sheet Revisions			NOTE: SCALES SHOWN ARE FOR 22"x34" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.	TOWN OF CASTLE ROCK COLORADO	UTILITIES DEPARTMENT Stormwater Engineering Division	GESC GRADING, EROSION, AND SEDIMENT CONTROL	GESC PLAN STANDARD NOTES AND DETAILS	SHEET 1 OF 14

Appendix C

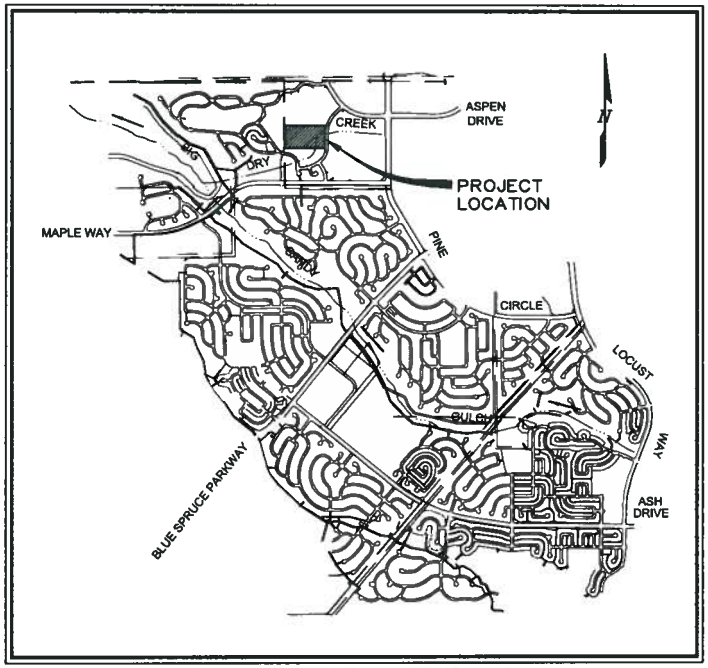
Example GESC Drawings

Staged GESC Drawings

CONTRACT DRAWINGS FOR CONSTRUCTION OF

DRY CREEK BUSINESS PARK
FILING NO. 1
GRADING, EROSION AND SEDIMENT CONTROL PLAN

EXAMPLE
TOWN OF CASTLE ROCK
STAGED GESC DRAWINGS
(ONE GRADING PHASE)



PROJECT LOCATION: SOUTHWEST QUARTER OF SECTION 9
TOWNSHIP 6S, RANGE 68W

LOCATION MAP

SCALE 1"=1500'

LIST OF DRAWINGS

SHEET	DRAWING NO	TITLE
	GENERAL DRAWINGS	
1	G-1	COVER SHEET
	GESC DRAWINGS	
2	E-1	INITIAL GESC PLAN
3	E-2	INTERIM GESC PLAN
4	E-3	FINAL GESC PLAN
	GESC STANDARD NOTES AND DETAILS	
5	SHEET 1	GESC GENERAL NOTES AND LEGEND
6 - 17	SHEETS 2 - 13	GESC DETAILS AND INSTALLATION AND MAINTENANCE NOTES
18	SHEET 14	ROCK AND RIPRAP GRADATIONS

THE GRADING, EROSION AND SEDIMENT CONTROL PLAN INCLUDED HEREIN IS ON FILE AT THE TOWN OF CASTLE ROCK AND APPEARS TO FULFILL APPLICABLE TOWN OF CASTLE ROCK GRADING, EROSION AND SEDIMENT CONTROL CRITERIA. ADDITIONAL GRADING, EROSION AND SEDIMENT CONTROL MEASURES MAY BE REQUIRED OF THE OWNER OR HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT FUNCTION AS INTENDED. THE REQUIREMENTS OF THIS PLAN SHALL RUN WITH THE LAND AND SHALL BE THE OBLIGATION OF THE LANDOWNER, OR HIS OR HER DESIGNATED REPRESENTATIVE, UNTIL SUCH TIME AS THE PLAN IS PROPERLY COMPLETED, MODIFIED OR VOIDED.

THE GRADING, EROSION AND SEDIMENT CONTROL PLAN INCLUDED HEREIN HAS BEEN PREPARED UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH THE REQUIREMENTS OF THE GRADING, EROSION, AND SEDIMENT CONTROL (GESC) MANUAL OF THE TOWN OF CASTLE ROCK.

GESC PLANS PREPARED BY:

AUSTIN ENGINEERING COMPANY INC. _____ DATE _____ PE NUMBER _____

THE CONSTRUCTION PLANS INCLUDED HEREIN WERE PREPARED UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH THE REQUIREMENTS OF THE PUBLIC WORKS REGULATIONS AND THE DRAINAGE REGULATIONS OF THE TOWN OF CASTLE ROCK.

CONSTRUCTION PLANS PREPARED BY:

AUSTIN ENGINEERING COMPANY INC. _____ DATE _____ PE NUMBER _____

CALL UTILITY NOTIFICATION CENTER OF COLORADO
1-800-922-1987
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT _____ DATE

UTILITIES DIRECTOR OR DESIGNEE _____ DATE

Sheet Revisions		

AUSTIN ENGINEERING CO., INC.
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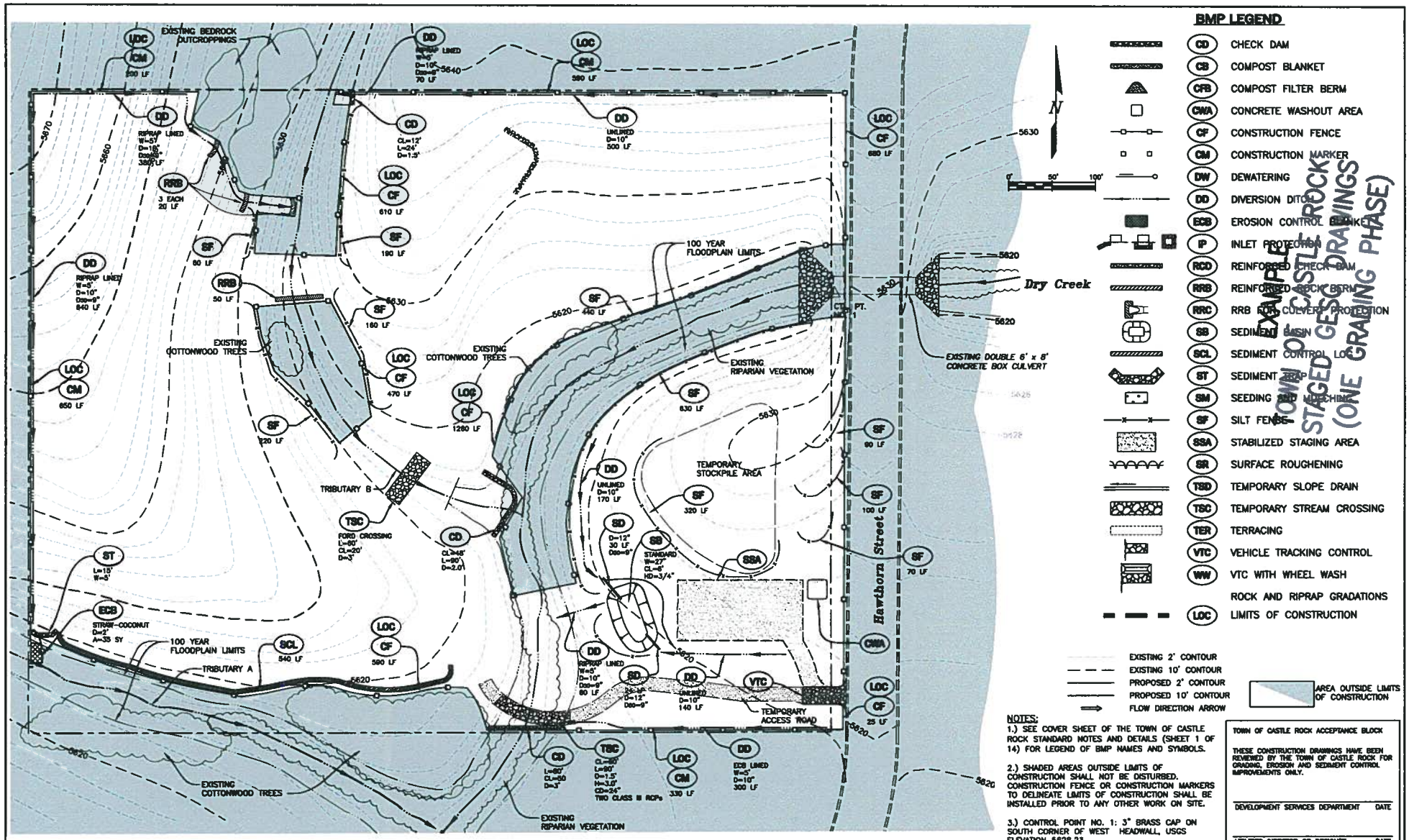
7901 GRANT STREET
DENVER, COLORADO 80229
(303) 287-1722
FAX: (303) 289-1084

DRY CREEK BUSINESS PARK FILING NO. 1

COVER SHEET

DRAWING G-1



NOTES:

1.) SEE COVER SHEET OF THE TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS (SHEET 1 OF 14) FOR LEGEND OF BMP NAMES AND SYMBOLS.

2.) SHADED AREAS OUTSIDE LIMITS OF CONSTRUCTION SHALL NOT BE DISTURBED. CONSTRUCTION FENCE OR CONSTRUCTION MARKERS TO DELINEATE LIMITS OF CONSTRUCTION SHALL BE INSTALLED PRIOR TO ANY OTHER WORK ON SITE.

3.) CONTROL POINT NO. 1: 3" BRASS CAP ON SOUTH CORNER OF WEST HEADWALL, USGS ELEVATION 5628.23.

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

Sheet Revisions		

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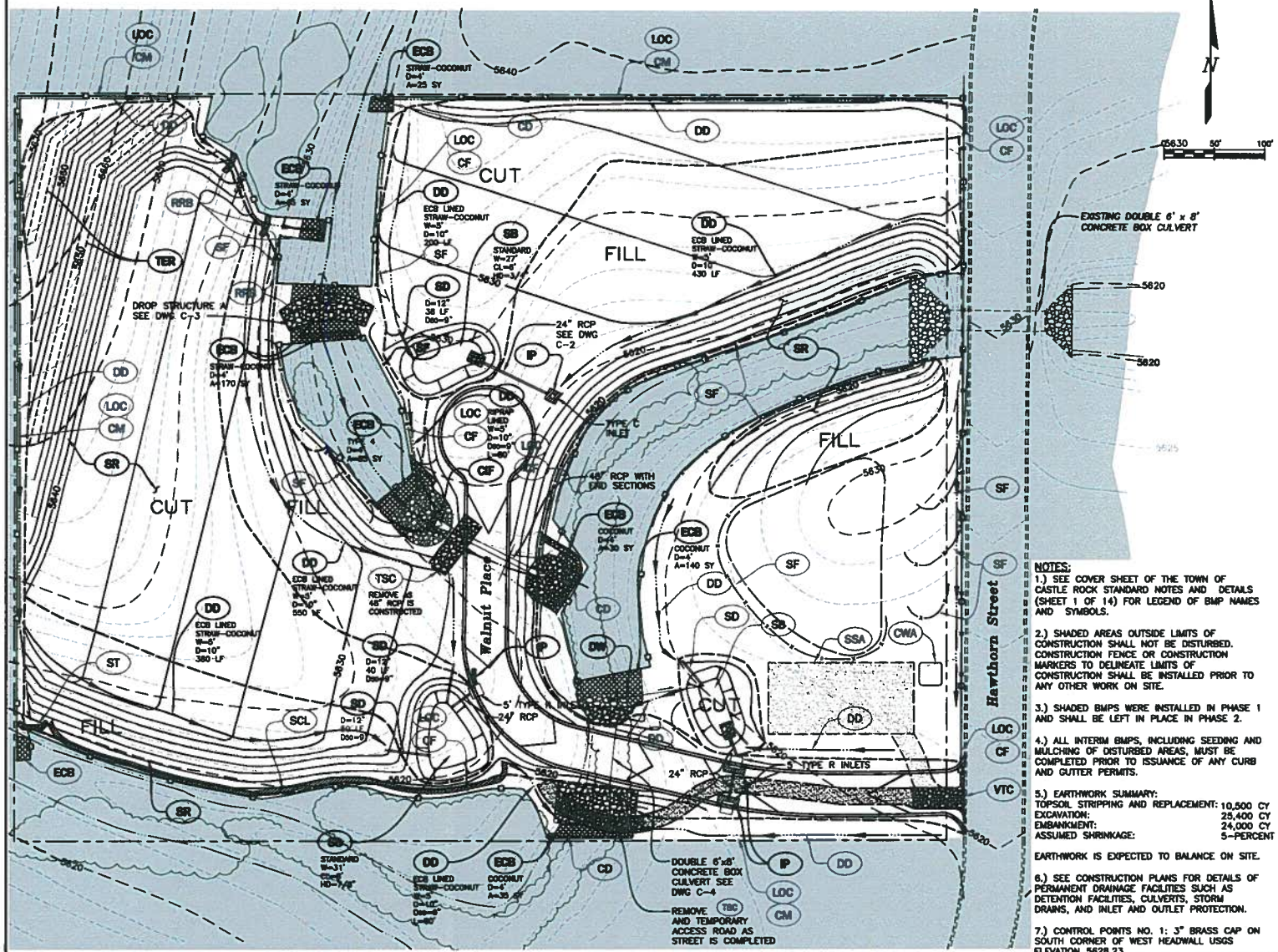
DRY CREEK BUSINESS PARK FILING NO. 1

INITIAL GESC PLAN

DRAWING E-1



BMP LEGEND

CD	CHECK DAM
CB	COMPOST BLANKET
CFB	COMPOST FILTER BERM
CWA	CONCRETE WASHOUT AREA
CF	CONSTRUCTION FENCE
CM	CONSTRUCTION MARKER
DW	DEWATERING
DD	DIVERSION DITCH
ECB	EROSION CONTROL BLANKET
IP	INLET PROTECTION
RCD	REINFORCED CHECK DAM
RRB	REINFORCED ROCK BERM
RRC	RRB FOR CULVERT PROTECTION
SB	SEDIMENT BASIN
SCL	SEDIMENT CONTROL LOG
ST	SEDIMENT TRAP
SM	SEEDING AND MULCHING
SF	SILT FENCE
SSA	STABILIZED STAGING AREA
SR	SURFACE ROUGHENING
TSD	TEMPORARY SLOPE DRAIN
TSC	TEMPORARY STREAM CROSSING
TER	TERRACING
VTC	VEHICLE TRACKING CONTROL
WW	VTC WITH WHEEL WASH
	ROCK AND RIPRAP GRADATIONS
LOC	LIMITS OF CONSTRUCTION

EXISTING 2' CONTOUR
EXISTING 10' CONTOUR
PROPOSED 2' CONTOUR
PROPOSED 10' CONTOUR
FLOW DIRECTION ARROW
AREA OUTSIDE LIMITS OF CONSTRUCTION

NOTES:

1.) SEE COVER SHEET OF THE TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS (SHEET 1 OF 14) FOR LEGEND OF BMP NAMES AND SYMBOLS.

2.) SHADED AREAS OUTSIDE LIMITS OF CONSTRUCTION SHALL NOT BE DISTURBED. CONSTRUCTION FENCE OR CONSTRUCTION MARKERS TO DELINEATE LIMITS OF CONSTRUCTION SHALL BE INSTALLED PRIOR TO ANY OTHER WORK ON SITE.

3.) SHADED BMPS WERE INSTALLED IN PHASE 1 AND SHALL BE LEFT IN PLACE IN PHASE 2.

4.) ALL INTERIM BMPS, INCLUDING SEEDING AND MULCHING OF DISTURBED AREAS, MUST BE COMPLETED PRIOR TO ISSUANCE OF ANY CURB AND GUTTER PERMITS.

5.) EARTHWORK SUMMARY:

TOPSOIL STRIPPING AND REPLACEMENT:	10,500 CY
EXCAVATION:	25,400 CY
EMBANKMENT:	24,000 CY
ASSUMED SHRINKAGE:	5-PERCENT

EARTHWORK IS EXPECTED TO BALANCE ON SITE.

6.) SEE CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES SUCH AS DETENTION FACILITIES, CULVERTS, STORM DRAINS, AND INLET AND OUTLET PROTECTION.

7.) CONTROL POINTS NO. 1: 3" BRASS CAP ON SOUTH CORNER OF WEST HEADWALL USGS ELEVATION 5628.23.

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

EXAMPLE TOWN OF CASTLE ROCK STAGED GESC DRAWINGS (ONE GRADING PHASE)

Sheet Revisions			

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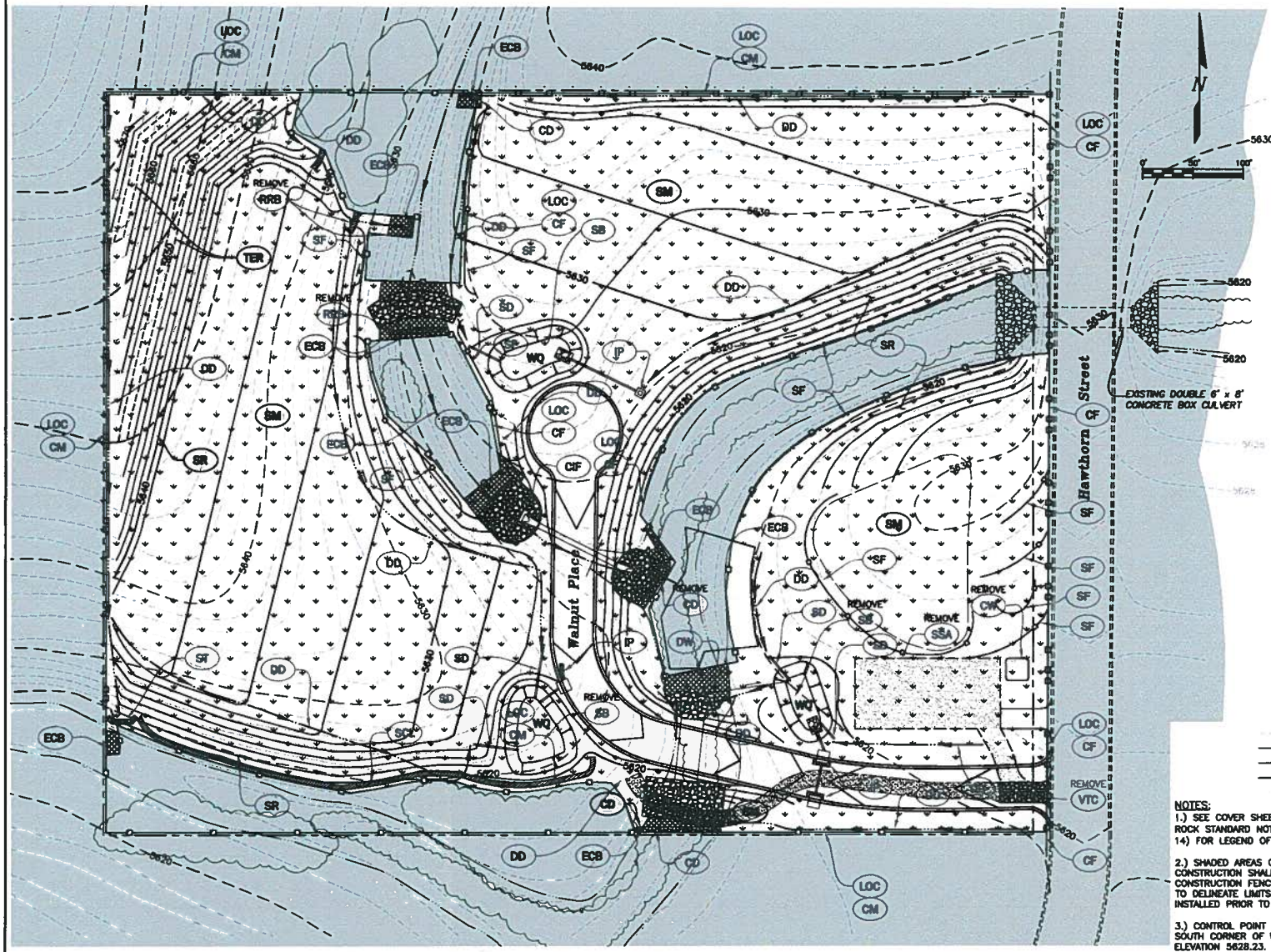
DRY CREEK BUSINESS PARK FILING NO. 1

INTERIM GESC PLAN

DRAWING
E-2



BMP LEGEND

CD	CHECK DAM
CB	COMPOST BLANKET
CFB	COMPOST FILTER BERM
CWA	CONCRETE WASHOUT AREA
CF	CONSTRUCTION FENCE
CM	CONSTRUCTION MARKER
DW	DEWATERING
DD	DIVERSION DITCH
ECB	EROSION CONTROL BLANKET
IP	INLET PROTECTION
RCD	REINFORCED CHECK DAM
RRB	REINFORCED ROCK BERM
RRC	RRB FOR CULVERT PROTECTION
SB	SEDIMENT BASIN
SCL	SEDIMENT CONTROL LOG
ST	SEDIMENT TRAP
SM	SEEDING AND MULCHING
SF	SILT FENCE
SSA	STABILIZED STAGING AREA
SR	SURFACE ROUGHENING
TSD	TEMPORARY SLOPE DRAIN
TSC	TEMPORARY STREAM CROSSING
TER	TERRACING
VTC	VEHICLE TRACKING CONTROL
WW	VTC WITH WHEEL WASH
	ROCK AND RIPRAP GRADATIONS
LOC	LIMITS OF CONSTRUCTION

EXISTING 2' CONTOUR
EXISTING 10' CONTOUR
PROPOSED 2' CONTOUR
PROPOSED 10' CONTOUR
FLOW DIRECTION ARROW

AREA OUTSIDE LIMITS OF CONSTRUCTION

AREA TO BE DRILL SEEDED AND CRIMP MULCHED.

NOTES:

1.) SEE COVER SHEET OF THE TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS (SHEET 1 OF 14) FOR LEGEND OF BMP NAMES AND SYMBOLS.

2.) SHADED AREAS OUTSIDE LIMITS OF CONSTRUCTION SHALL NOT BE DISTURBED. CONSTRUCTION FENCE OR CONSTRUCTION MARKERS TO DELINEATE LIMITS OF CONSTRUCTION SHALL BE INSTALLED PRIOR TO ANY OTHER WORK ON SITE.

3.) CONTROL POINT NO. 1: 3" BRASS CAP ON SOUTH CORNER OF WEST HEADWALL, USGS ELEVATION 5628.23.

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

BUILDING PERMIT PLAN
STAGED GESC DRAWINGS
(ONE GRADING PHASE)

Sheet Revisions		

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DRY CREEK BUSINESS PARK FILING NO. 1

FINAL GESC PLAN

DRAWING
E-3

TOWN OF CASTLE ROCK STANDARD GESC NOTES AND DETAILS TO GO HERE

	Sheet Revisions	NOTE: SCALES SHOWN ARE FOR 22"x34" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.	TOWN OF CASTLE ROCK COLORADO	UTILITIES DEPARTMENT Stormwater Engineering Division	GESC GRADING, EROSION, AND SEDIMENT CONTROL	GESC PLAN STANDARD NOTES AND DETAILS	SHEET 1 OF 14

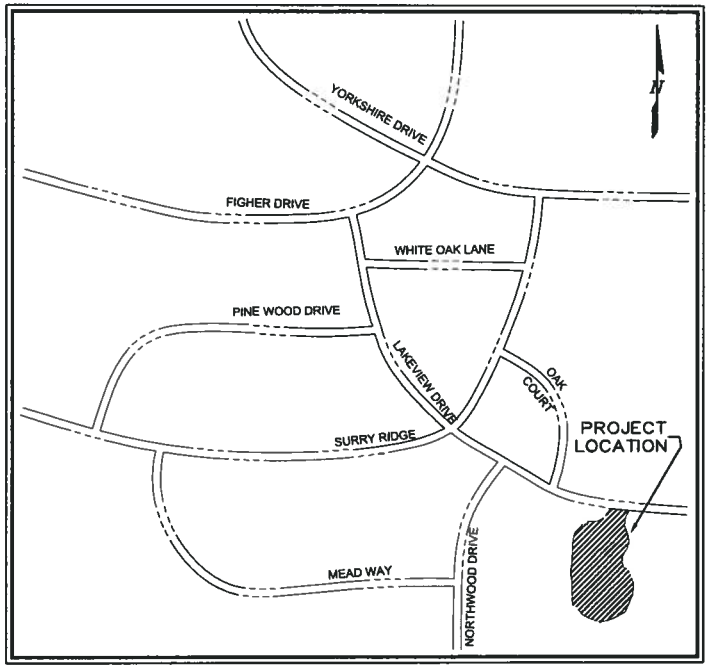
Appendix C

Example GESC Drawings

Staged and Phased GESC Drawings

CONTRACT DRAWINGS FOR CONSTRUCTION OF

RESIDENTIAL SITE A
GRADING, EROSION AND SEDIMENT CONTROL PLAN



PROJECT LOCATION: SOUTHWEST QUARTER OF SECTION 11
TOWNSHIP 6S, RANGE 68W

LOCATION MAP

SCALE 1"=1500'

LIST OF DRAWINGS

SHEET	DRAWING NO	TITLE
	GENERAL DRAWINGS	
1	G-1	COVER SHEET
	GESC DRAWINGS	
2	E-1	PHASE I INITIAL GESC PLAN
3	E-2	PHASE I INTERIM GESC PLAN
4	E-3	PHASE I FINAL GESC PLAN
5	E-4	PHASE II INITIAL GESC PLAN
6	E-5	PHASE II INTERIM GESC PLAN
7	E-6	PHASE II FINAL GESC PLAN
8	E-7	PHASE I EARTHWORK BALANCE PLAN
9	E-8	PHASE II EARTHWORK BALANCE PLAN
	GESC STANDARD NOTES AND DETAILS	
10	SHEET 1	GESC GENERAL NOTES AND LEGEND
11 - 22	SHEETS 2 - 13	GESC DETAILS AND INSTALLATION AND MAINTENANCE NOTES
23	SHEETS 14	ROCK AND RIPRAP GRADATIONS

EXAMPLE
TOWN OF CASTLE ROCK
STAGED & PHASED
GESC DRAWINGS
(MULTIPLE GRADING PHASE)

THE GRADING, EROSION AND SEDIMENT CONTROL PLAN INCLUDED HEREIN IS ON FILE AT THE TOWN OF CASTLE ROCK AND APPEARS TO FULFILL APPLICABLE TOWN OF CASTLE ROCK GRADING, EROSION AND SEDIMENT CONTROL CRITERIA. ADDITIONAL GRADING, EROSION AND SEDIMENT CONTROL MEASURES MAY BE REQUIRED OF THE OWNER OR HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT FUNCTION AS INTENDED. THE REQUIREMENTS OF THIS PLAN SHALL RUN WITH THE LAND AND SHALL BE THE OBLIGATION OF THE LANDOWNER, OR HIS OR HER DESIGNATED REPRESENTATIVE, UNTIL SUCH TIME AS THE PLAN IS PROPERLY COMPLETED, MODIFIED OR VOIDED.

THE GRADING, EROSION AND SEDIMENT CONTROL PLAN INCLUDED HEREIN HAS BEEN PREPARED UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH THE REQUIREMENTS OF THE GRADING, EROSION, AND SEDIMENT CONTROL (GESC) MANUAL OF THE TOWN OF CASTLE ROCK.

GESC PLANS PREPARED BY:

AUSTIN ENGINEERING COMPANY INC. DATE PE NUMBER

THE CONSTRUCTION PLANS INCLUDED HEREIN WERE PREPARED UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH THE REQUIREMENTS OF THE PUBLIC WORKS REGULATIONS AND THE DRAINAGE REGULATIONS OF THE TOWN OF CASTLE ROCK.

CONSTRUCTION PLANS PREPARED BY:

AUSTIN ENGINEERING COMPANY INC. DATE PE NUMBER

CALL UTILITY NOTIFICATION CENTER OF COLORADO
1-800-922-1987
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITES.

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

Sheet Revisions					

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7901 GRANT STREET
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FAX: (303) 289-1084

RESIDENTIAL SITE A

COVER SHEET

DRAWING G-1

BMP LEGEND

CD	CHECK DAM
CB	COMPOST BLANKET
CFB	COMPOST FILTER BERM
CWA	CONCRETE WASHOUT AREA
CF	CONSTRUCTION FENCE
CM	CONSTRUCTION MARKER
DW	DEWATERING
DD	DIVERSION DITCH
ECB	EROSION CONTROL BLANKET
IP	INLET PROTECTION
RCD	REINFORCED CHECK DAM
RRB	REINFORCED ROCK BERM
RRC	RRB FOR CULVERT PROTECTION
SB	SEDIMENT BASIN
SCL	SEDIMENT CONTROL LOG
ST	SEDIMENT TRAP
SM	SEEDING AND MULCHING
SF	SILT FENCE
SSA	STABILIZED STAGING AREA
SR	SURFACE ROUGHENING
TSD	TEMPORARY SLOPE DRAIN
TSC	TEMPORARY STREAM CROSSING
TER	TERRACING
VTC	VEHICLE TRACKING CONTROL
WW	VTC WITH WHEEL WASH
	ROCK AND RIPRAP GRADATIONS
LOC	LIMITS OF CONSTRUCTION

EXISTING 2' CONTOUR
EXISTING 10' CONTOUR
PROPOSED 2' CONTOUR
PROPOSED 10' CONTOUR
FLOW DIRECTION ARROW

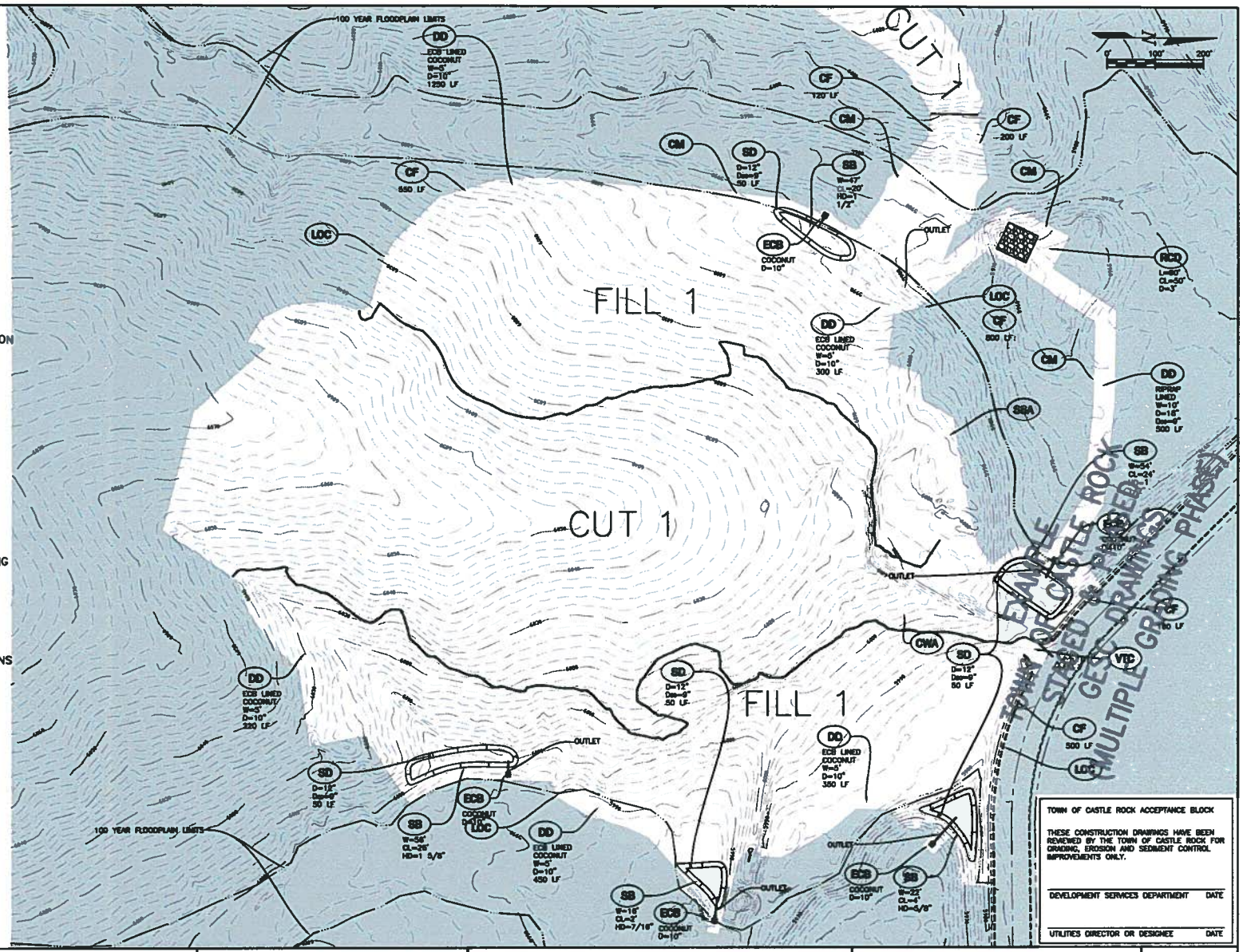
AREA OUTSIDE LIMITS OF CONSTRUCTION

NOTES:

1.) SEE COVER SHEET OF THE TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS (SHEET 1 OF 14) FOR LEGEND OF BMP NAMES AND SYMBOLS.

2.) CONTROL POINT NO. 7: 3" ALUMINUM INSIDE RANGE BOX, USGS ELEVATION 5958.37.

3.) SEE CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES SUCH AS DETENTION FACILITIES, CULVERTS, STORM DRAINAGE AND OUTLET PROTECTION.



TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

Sheet Revisions		

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RESIDENTIAL SITE A

PHASE I INITIAL GESC PLAN

DRAWING
E-1

BMP LEGEND

CD	CHECK DAM
CB	COMPOST BLANKET
CFB	COMPOST FILTER BERM
CWA	CONCRETE WASHOUT AREA
CF	CONSTRUCTION FENCE
CM	CONSTRUCTION MARKER
DW	DEWATERING
DD	DIVERSION DITCH
ECB	EROSION CONTROL BLANKET
IP	INLET PROTECTION
RCD	REINFORCED CHECK DAM
RRB	REINFORCED ROCK BERM
RRC	RRB FOR CULVERT PROTECTION
SB	SEDIMENT BASIN
SCL	SEDIMENT CONTROL LOG
ST	SEDIMENT TRAP
SM	SEEDING AND MULCHING
SF	SILT FENCE
SSA	STABILIZED STAGING AREA
SR	SURFACE ROUGHENING
TSD	TEMPORARY SLOPE DRAIN
TSC	TEMPORARY STREAM CROSSING
TER	TERRACING
VTC	VEHICLE TRACKING CONTROL
WW	VTC WITH WHEEL WASH
	ROCK AND RIPRAP GRADATIONS
LOC	LIMITS OF CONSTRUCTION

EXISTING 2' CONTOUR
EXISTING 10' CONTOUR
PROPOSED 2' CONTOUR
PROPOSED 10' CONTOUR
FLOW DIRECTION ARROW

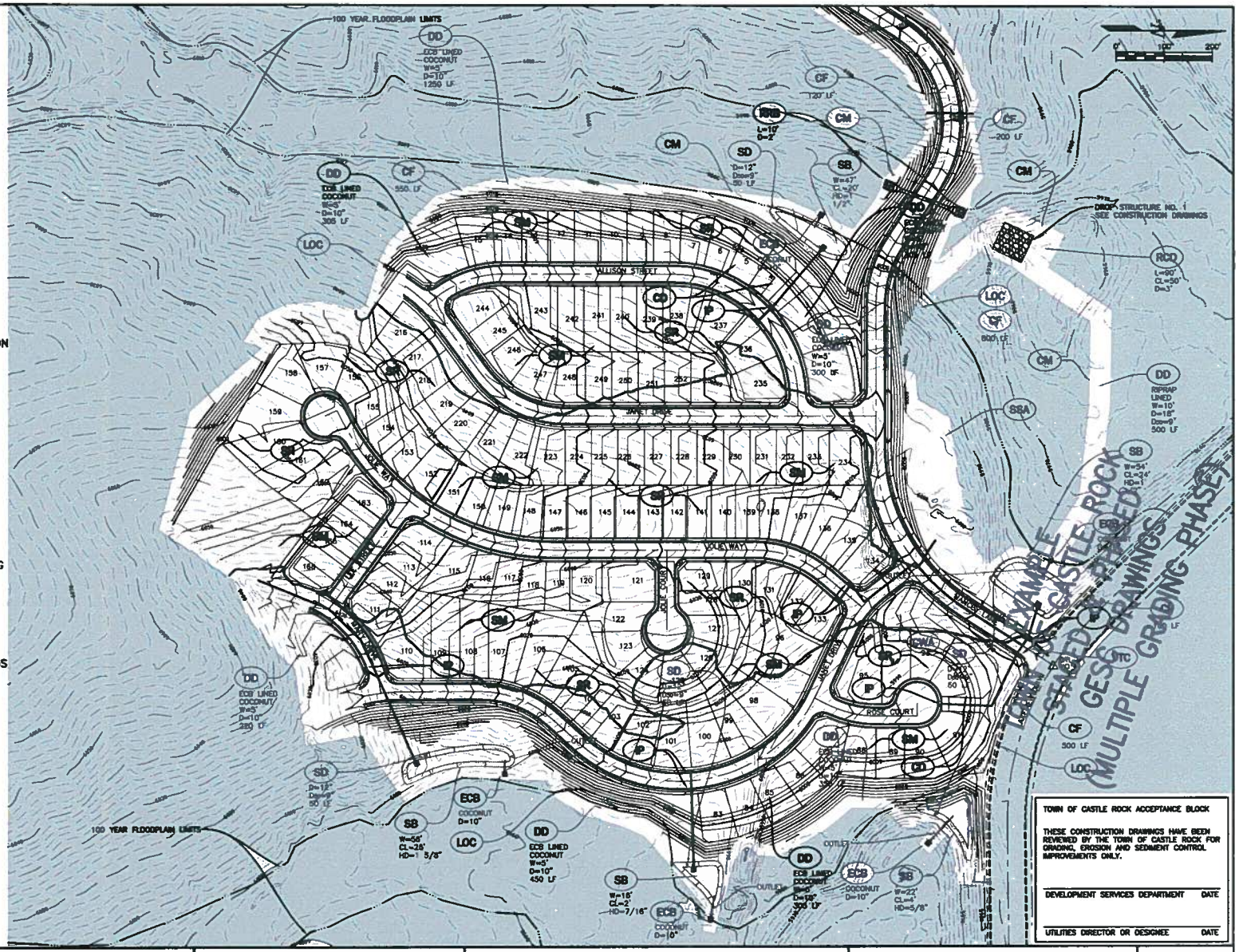
AREA OUTSIDE LIMITS OF CONSTRUCTION

NOTES:

1.) SEE COVER SHEET OF THE TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS (SHEET 1 OF 11) FOR LEGEND OF BMP NAMES AND SYMBOLS.

2.) CONTROL POINT NO. 7: 3" ALUMINUM INSIDE RANGE BOX, USGS ELEVATION 5958.37.

3.) SEE CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES SUCH AS DETENTION FACILITIES, CULVERTS, STORM DRAINAGE AND OUTLET PROTECTION.



TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

Sheet Revisions		

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RESIDENTIAL SITE A

PHASE I INTERIM GESC PLAN

DRAWING **E-2**

BMP LEGEND

CD	CHECK DAM
CB	COMPOST BLANKET
CFB	COMPOST FILTER BERM
CWA	CONCRETE WASHOUT AREA
CF	CONSTRUCTION FENCE
CM	CONSTRUCTION MARKER
DW	DEWATERING
DD	DIVERSION DITCH
ECB	EROSION CONTROL BLANKET
IP	INLET PROTECTION
RCD	REINFORCED CHECK DAM
RRB	REINFORCED ROCK BERM
RRC	RRB FOR CULVERT PROTECTION
SB	SEDIMENT BASIN
SCL	SEDIMENT CONTROL LOG
ST	SEDIMENT TRAP
SM	SEEDING AND MULCHING
SF	SILT FENCE
SSA	STABILIZED STAGING AREA
SR	SURFACE ROUGHENING
TSD	TEMPORARY SLOPE DRAIN
TSC	TEMPORARY STREAM CROSSING
TER	TERRACING
VTC	VEHICLE TRACKING CONTROL
WW	VTC WITH WHEEL WASH
	ROCK AND RIPRAP GRADATIONS
LOC	LIMITS OF CONSTRUCTION

EXISTING 2' CONTOUR
EXISTING 10' CONTOUR
PROPOSED 2' CONTOUR
PROPOSED 10' CONTOUR
FLOW DIRECTION ARROW

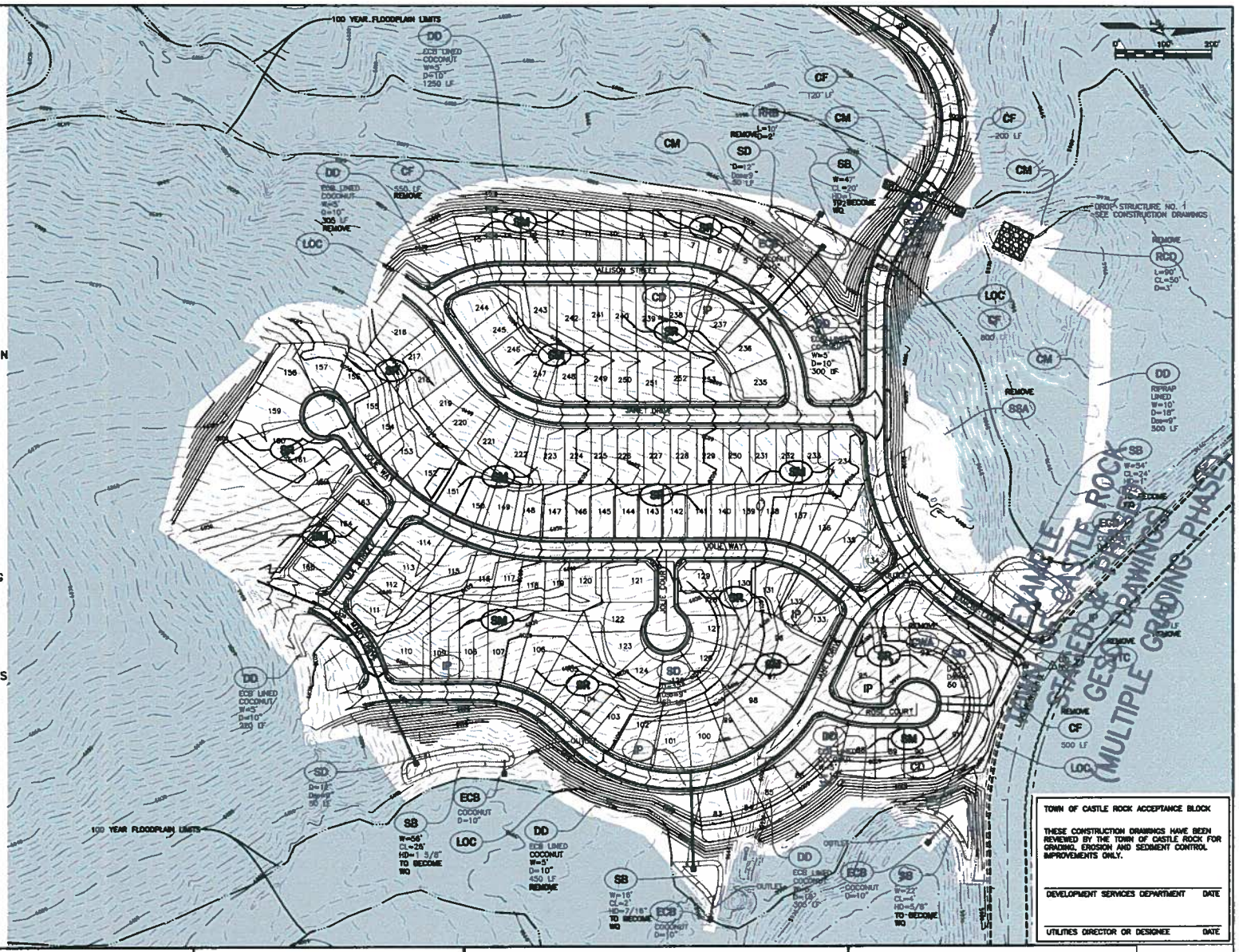
AREA OUTSIDE LIMITS OF CONSTRUCTION

NOTES:

1.) SEE COVER SHEET OF THE TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS (SHEET 1 OF 11) FOR LEGEND OF BMP NAMES AND SYMBOLS.

2.) CONTROL POINT NO. 7: 3" ALUMINUM INSIDE RANGE BOX, USGS ELEVATION 5958.37.

3.) SEE CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES SUCH AS DETENTION FACILITIES, CULVERTS, STORM DRAINAGE AND OUTLET PROTECTION.



TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

Sheet Revisions		

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RESIDENTIAL SITE A

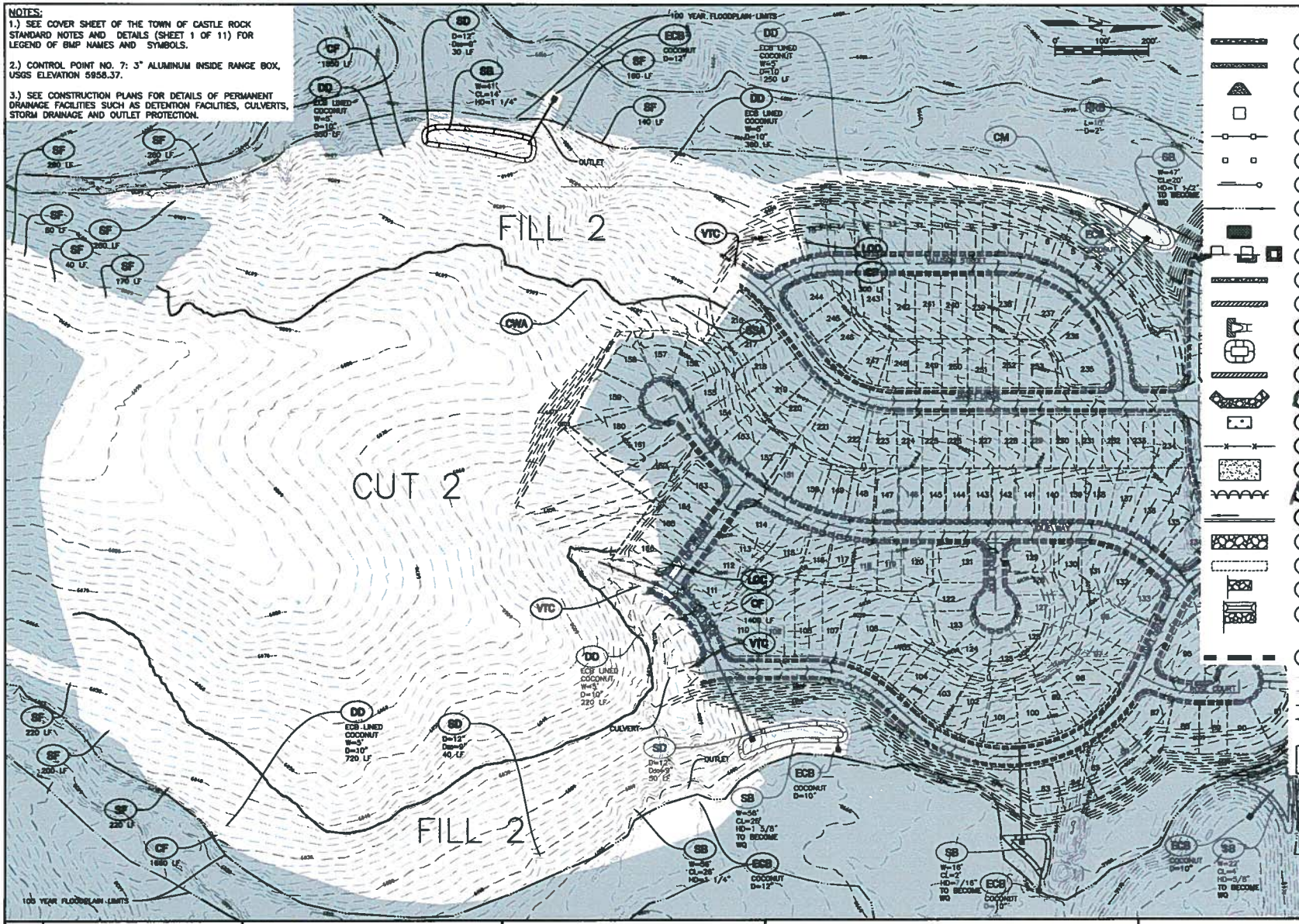
PHASE I FINAL GESC PLAN

DRAWING
E-3

NOTES:
1.) SEE COVER SHEET OF THE TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS (SHEET 1 OF 11) FOR LEGEND OF BMP NAMES AND SYMBOLS.

2.) CONTROL POINT NO. 7: 3" ALUMINUM INSIDE RANGE BOX, USGS ELEVATION 5958.37.

3.) SEE CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES SUCH AS DETENTION FACILITIES, CULVERTS, STORM DRAINAGE AND OUTLET PROTECTION.



BMP LEGEND

CD	CHECK DAM
CB	COMPOST BLANKET
CFB	COMPOST FILTER BERM
CWA	CONCRETE WASHOUT AREA
CF	CONSTRUCTION FENCE
CM	CONSTRUCTION MARKER
DW	DEWATERING
DD	DIVERSION DITCH
ECB	EROSION CONTROL BLANKET
IP	INLET PROTECTION
RCD	REINFORCED CHECK DAM
RRB	REINFORCED ROCK BERM
RRC	RRB FOR CULVERT PROTECTION
SB	SEDIMENT BASIN
SCD	SEDIMENT CONTROL DOG
SD	SEDIMENT DRAIN
SM	SEEDING AND MULCHING
SF	SILT FENCE
SSA	STABILIZED STAGING AREA
SR	SURFACE ROUGHENING
TSD	TEMPORARY SLOPE DRAIN
TSC	TEMPORARY STREAM CROSSING
TER	TERRACING
VTC	VEHICLE TRACKING CONTROL
WW	VTC WITH WHEEL WASH
	ROCK AND RIPRAP GRADATIONS
LOC	LIMITS OF CONSTRUCTION

EXISTING 2' CONTOUR
EXISTING 10' CONTOUR
PROPOSED 2' CONTOUR
PROPOSED 10' CONTOUR
FLOW DIRECTION ARROW

AREA OUTSIDE LIMITS OF CONSTRUCTION

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

TOWN OF CASTLE ROCK
STAMPED & PHASED
GESC DRAWINGS
(MULTIPLE GRADING PHASE)

Sheet Revisions		

AUSTIN ENGINEERING CO., INC.
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FAX: (303) 334-4991

JAMESTOWN DEVELOPMENT CO., INC.
7901 GRANT STREET
DENVER, COLORADO 80229
(303) 287-1722
FAX: (303) 289-1064

RESIDENTIAL SITE A

PHASE II INITIAL GESC PLAN

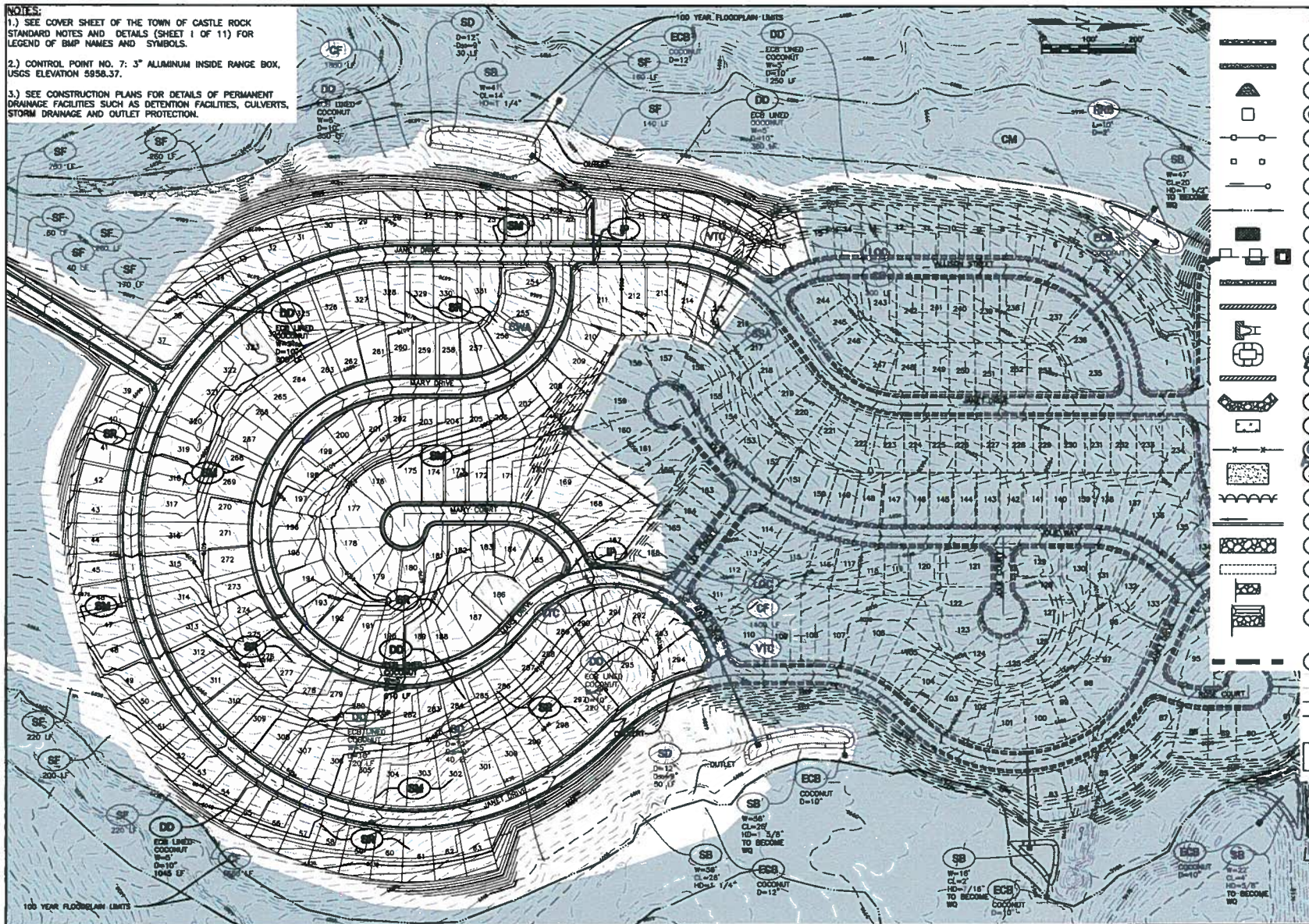
DRAWING E-4

NOTES:

1.) SEE COVER SHEET OF THE TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS (SHEET 1 OF 11) FOR LEGEND OF BMP NAMES AND SYMBOLS.

2.) CONTROL POINT NO. 7: 3" ALUMINUM INSIDE RANGE BOX, USGS ELEVATION 5958.37.

3.) SEE CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES SUCH AS DETENTION FACILITIES, CULVERTS, STORM DRAINAGE AND OUTLET PROTECTION.



BMP LEGEND

CD	CHECK DAM
CB	COMPOST BLANKET
CFB	COMPOST FILTER BERM
CWA	CONCRETE WASHOUT AREA
CF	CONSTRUCTION FENCE
CM	CONSTRUCTION MARKER
DW	DEWATERING
DD	DIVERSION DITCH
ECB	EROSION CONTROL BLANKET
IP	INLET PROTECTION
RCD	REINFORCED CHECK DAM
RRB	REINFORCED ROCK BERM
RRC	RRB FOR CULVERT PROTECTION
SB	SEDIMENT BASIN
SCL	SEDIMENT CONTROL LOG
ST	SEDIMENT TRAP
SM	SEEDING AND MULCHING
SF	SILT FENCE
SSA	STABILIZED STAGING AREA
SR	SURFACE ROUGHENING
TSD	TEMPORARY SLOPE DRAIN
TSC	TEMPORARY STREAM CROSSING
TER	TERRACING
VTC	VEHICLE TRACKING CONTROL
WW	VTC WITH WHEEL WASH
	ROCK AND RIPRAP GRADATIONS
LOC	LIMITS OF CONSTRUCTION
	EXISTING 2' CONTOUR
	EXISTING 10' CONTOUR
	PROPOSED 2' CONTOUR
	PROPOSED 10' CONTOUR
	FLOW DIRECTION ARROW
	AREA OUTSIDE LIMITS OF CONSTRUCTION

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

TOWN OF CASTLE ROCK
SMALL & PHASED
GESC DRAWINGS
(MULTIPLE GRADING PHASE)

Sheet Revisions		

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RESIDENTIAL SITE A

PHASE II INTERIM GESC PLAN

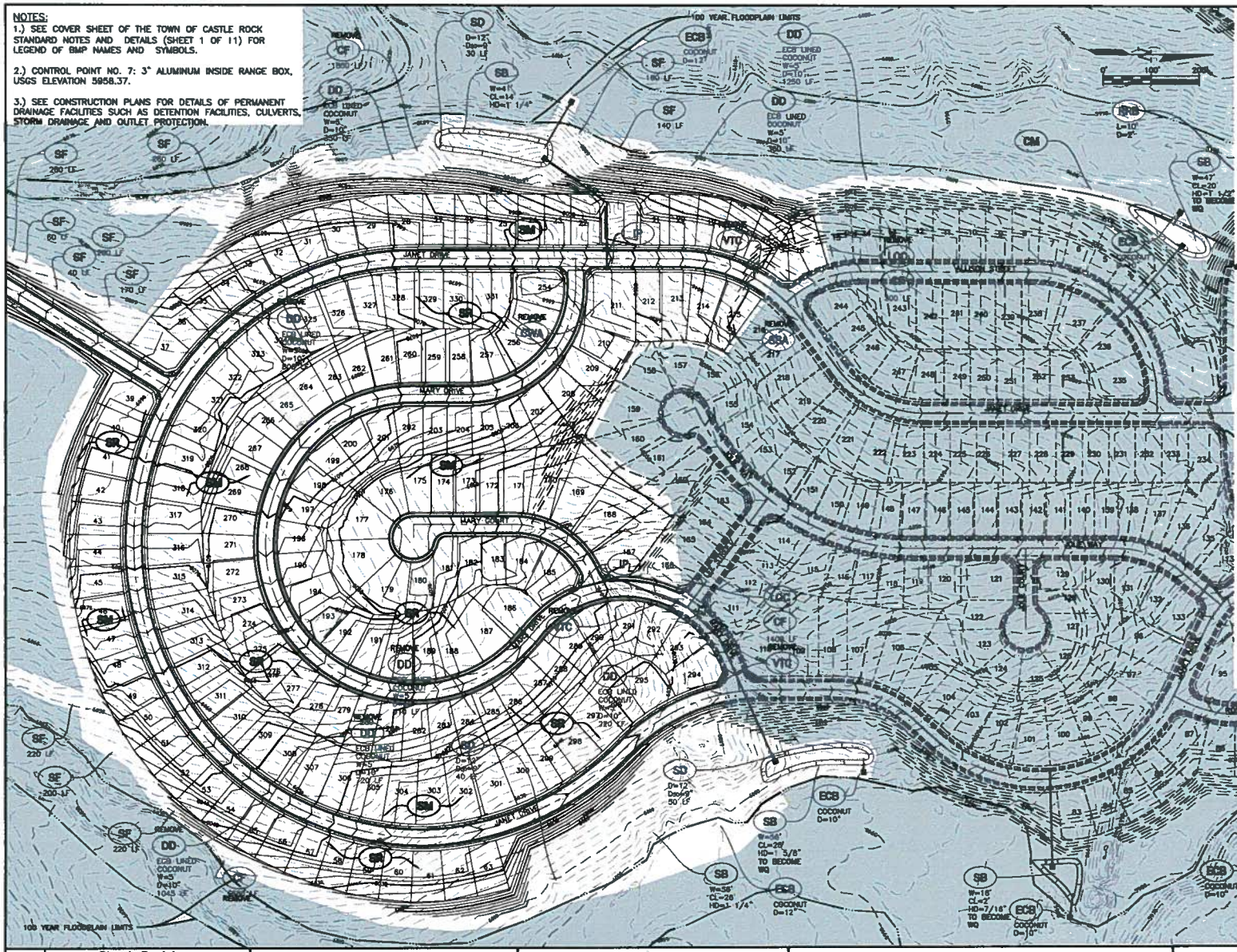
DRAWING
E-5

NOTES:

1.) SEE COVER SHEET OF THE TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS (SHEET 1 OF 11) FOR LEGEND OF BMP NAMES AND SYMBOLS.

2.) CONTROL POINT NO. 7: 3" ALUMINUM INSIDE RANGE BOX, USGS ELEVATION 5958.37.

3.) SEE CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES SUCH AS DETENTION FACILITIES, CULVERTS, STORM DRAINAGE AND OUTLET PROTECTION.



BMP LEGEND

CD	CHECK DAM
CB	COMPOST BLANKET
CFB	COMPOST FILTER BERM
CWA	CONCRETE WASHOUT AREA
CF	CONSTRUCTION FENCE
CM	CONSTRUCTION MARKER
DW	DEWATERING
DD	DIVERSION DITCH
ECB	EROSION CONTROL BLANKET
IP	INLET PROTECTION
RCD	REINFORCED CHECK DAM
RRB	REINFORCED ROCK BERM
RRB	RRB FOR CULVERT PROTECTION
SB	SEDIMENT BASIN
SCL	SEDIMENT CONTROL LOG
ST	SEDIMENT TRAP
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SSA	STABILIZED STAGING AREA
SR	SURFACE ROUGHENING
TSD	TEMPORARY SLOPE DRAIN
TSC	TEMPORARY STREAM CROSSING
TER	TERRACING
VTC	VEHICLE TRACKING CONTROL
WW	VTC WITH WHEEL WASH
	ROCK AND RIPRAP GRADATIONS
LOC	LIMITS OF CONSTRUCTION
	EXISTING 2' CONTOUR
	EXISTING 10' CONTOUR
	PROPOSED 2' CONTOUR
	PROPOSED 10' CONTOUR
	FLOW DIRECTION ARROW
	AREA OUTSIDE LIMITS OF CONSTRUCTION

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

EXAMPLE TOWN OF CASTLE ROCK STAMPED & APPROVED GESC DRAWINGS (MULTIPLE GRADING PHASE)

Sheet Revisions

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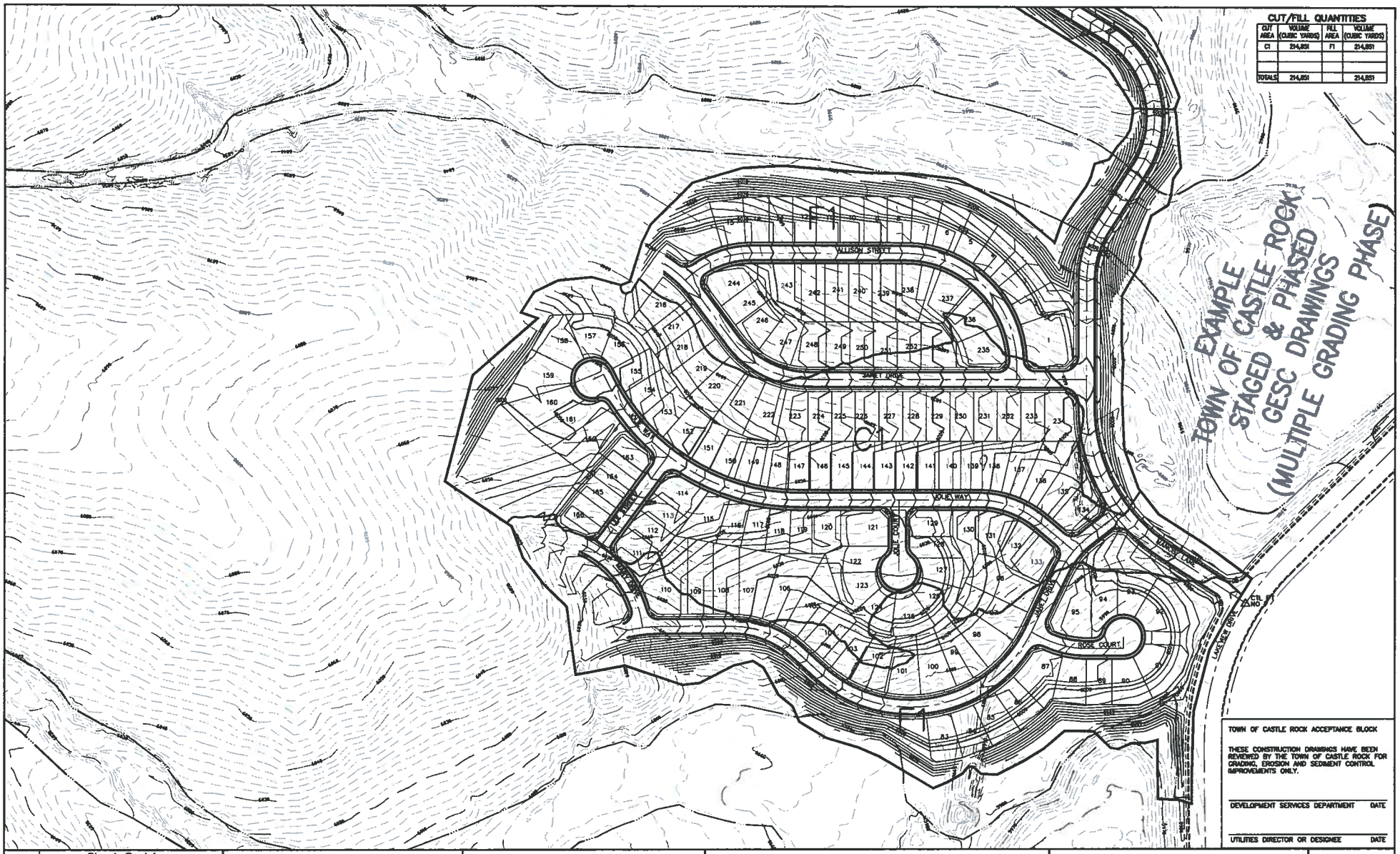
RESIDENTIAL SITE A

PHASE II FINAL GESC PLAN

DRAWING E-6



CUT/FILL QUANTITIES

CUT AREA	VOLUME (CUBIC YARDS)	FILL AREA	VOLUME (CUBIC YARDS)
C1	214,851	F1	214,851
TOTALS	214,851		214,851

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

Sheet Revisions		

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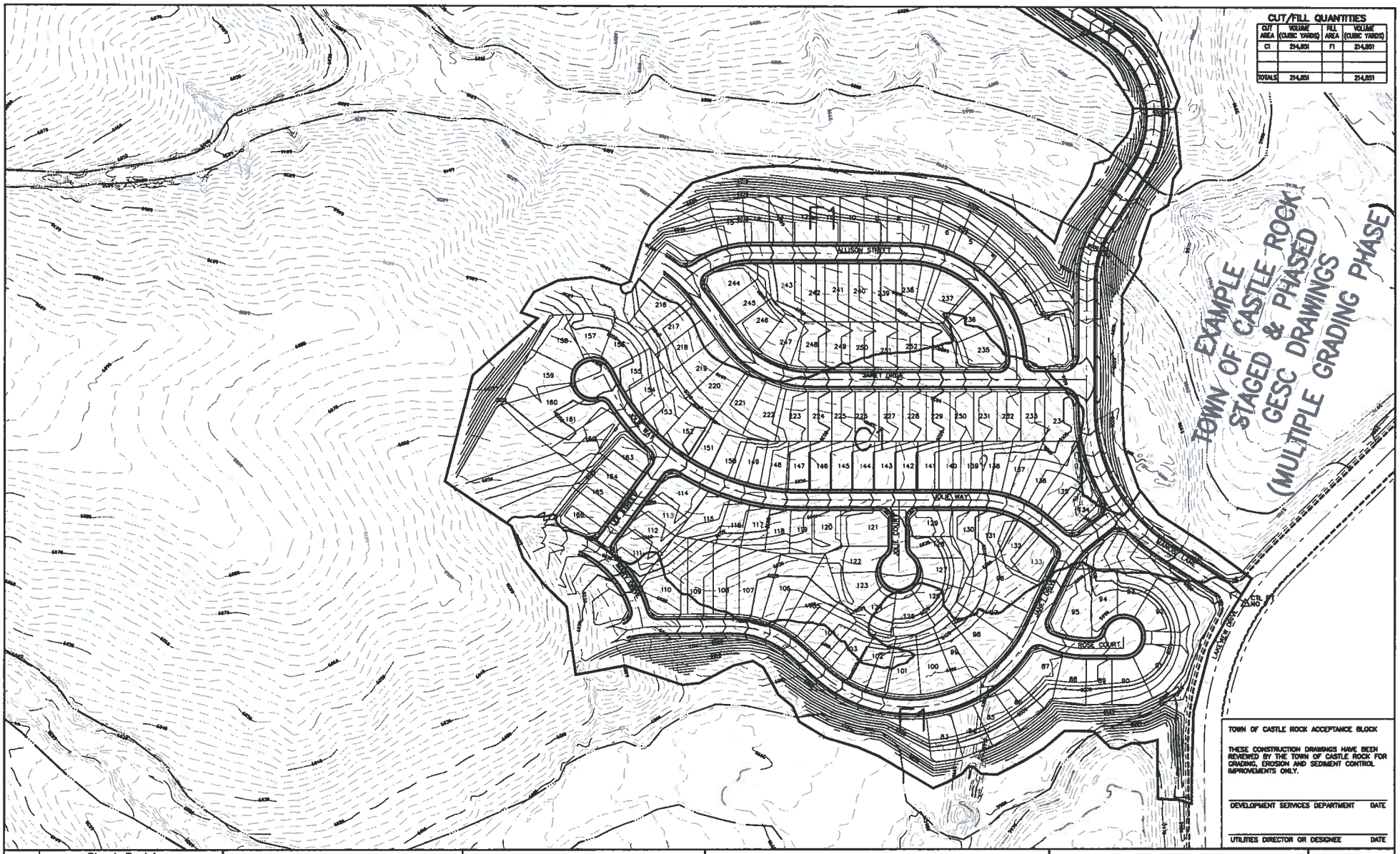
RESIDENTIAL SITE A

PHASE I EARTHWORK BALANCE PLAN

DRAWING
E-7



CUT/FILL QUANTITIES

CUT AREA	VOLUME (CUBIC YARDS)	FILL AREA	VOLUME (CUBIC YARDS)
C1	214,851	F1	214,851
TOTALS	214,851		214,851

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

Sheet Revisions		

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DENVER, COLORADO 80229
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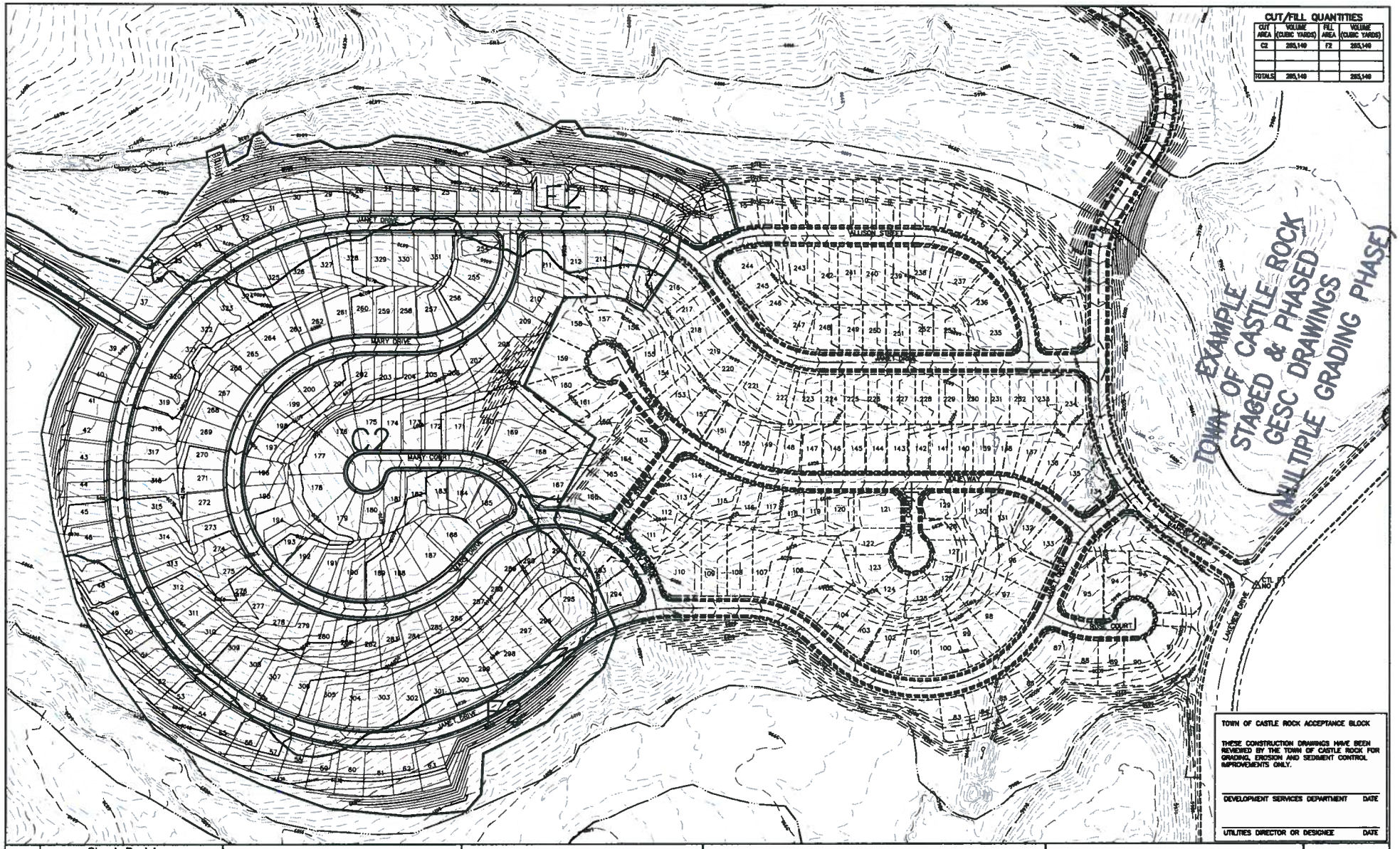
RESIDENTIAL SITE A

PHASE I EARTHWORK BALANCE PLAN

DRAWING
E-7



CUT/FILL QUANTITIES

CUT AREA	VOLUME (CUBIC YARDS)	FILL AREA	VOLUME (CUBIC YARDS)
C2	285,149	F2	285,149
TOTALS	285,149		285,149

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

Sheet Revisions		

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DENVER, COLORADO 80229
(303) 287-1722
FAX: (303) 289-1084

RESIDENTIAL SITE A

PHASE II EARTHWORK BALANCE PLAN

DRAWING
E-8

TOWN OF CASTLE ROCK STANDARD GESC NOTES AND DETAILS TO GO HERE

Sheet Revisions			NOTE: SCALES SHOWN ARE FOR 22"x34" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.	TOWN OF CASTLE ROCK COLORADO	UTILITIES DEPARTMENT Stormwater Engineering Division	GESC GRADING, EROSION, AND SEDIMENT CONTROL	GESC PLAN STANDARD NOTES AND DETAILS	SHEET 1 OF 14

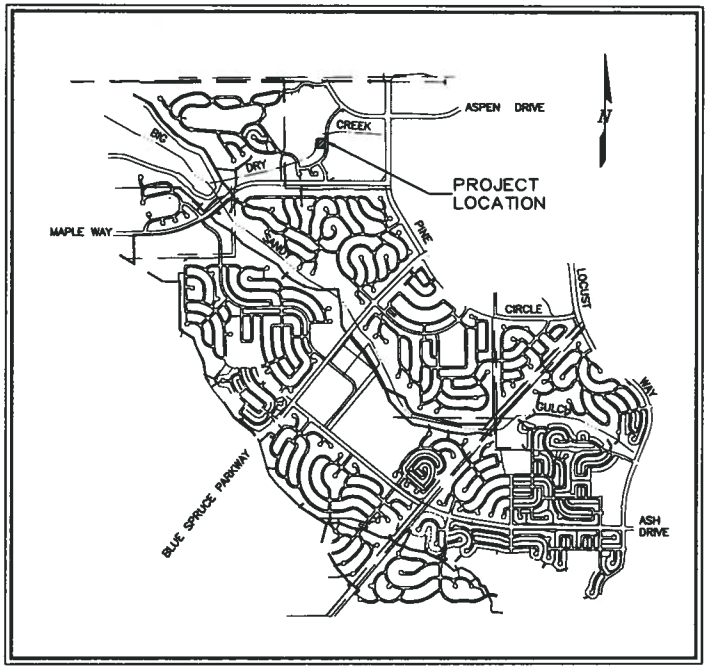
Appendix C

Example GESC Drawings

Temporary Batch Plant/ GESC Drawings

CONTRACT DRAWINGS FOR CONSTRUCTION OF

TEMPORARY BATCH PLANT
9429 HAWTHORN STREET



PROJECT LOCATION; SOUTHWEST QUARTER OF SECTION 9
TOWNSHIP 6S, RANGE 68W

LOCATION MAP

SCALE 1"=1500'

LIST OF DRAWINGS

SHEET	DRAWING NO	TITLE
1	B-1	COVER SHEET
2	B-2	TEMPORARY BATCH PLANT SITE PLAN
3	B-3	TEMPORARY BATCH PLANT RECLAMATION PLAN
4	B-4	TOWN OF CASTLE ROCK STANDARD NOTES & DETAILS
	GESC STANDARD NOTES AND DETAILS	
5	SHEET 1	GESC GENERAL NOTES AND LEGEND
6 - 17	SHEETS 2 - 13	GESC DETAILS AND INSTALLATION AND MAINTENANCE NOTES
18	SHEET 14	ROCK AND RIPRAP GRADATIONS

EXAMPLE
TOWN OF CASTLE ROCK
TEMPORARY BATCH PLANT
GESC DRAWINGS

THE GRADING, EROSION AND SEDIMENT CONTROL PLAN INCLUDED HEREIN IS ON FILE AT THE TOWN OF CASTLE ROCK AND APPEARS TO FULFILL APPLICABLE TOWN OF CASTLE ROCK GRADING, EROSION AND SEDIMENT CONTROL CRITERIA. ADDITIONAL GRADING, EROSION AND SEDIMENT CONTROL MEASURES MAY BE REQUIRED OF THE OWNER OR HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT FUNCTION AS INTENDED. THE REQUIREMENTS OF THIS PLAN SHALL RUN WITH THE LAND AND SHALL BE THE OBLIGATION OF THE LANDOWNER, OR HIS OR HER DESIGNATED REPRESENTATIVE, UNTIL SUCH TIME AS THE PLAN IS PROPERLY COMPLETED, MODIFIED OR VOIDED.

THE GRADING, EROSION AND SEDIMENT CONTROL PLAN INCLUDED HEREIN HAS BEEN PREPARED UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH THE REQUIREMENTS OF THE GRADING, EROSION, AND SEDIMENT CONTROL (GESC) MANUAL OF THE TOWN OF CASTLE ROCK.

GESC PLANS PREPARED BY:

AUSTIN ENGINEERING COMPANY INC. | DATE | PE NUMBER

THE CONSTRUCTION PLANS INCLUDED HEREIN WERE PREPARED UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH THE REQUIREMENTS OF THE PUBLIC WORKS REGULATIONS AND THE DRAINAGE REGULATIONS OF THE TOWN OF CASTLE ROCK.

CONSTRUCTION PLANS PREPARED BY:

AUSTIN ENGINEERING COMPANY INC. | DATE | PE NUMBER

CALL UTILITY NOTIFICATION CENTER OF COLORADO
1-800-922-1987
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

Sheet Revisions		

AUSTIN ENGINEERING CO., INC.
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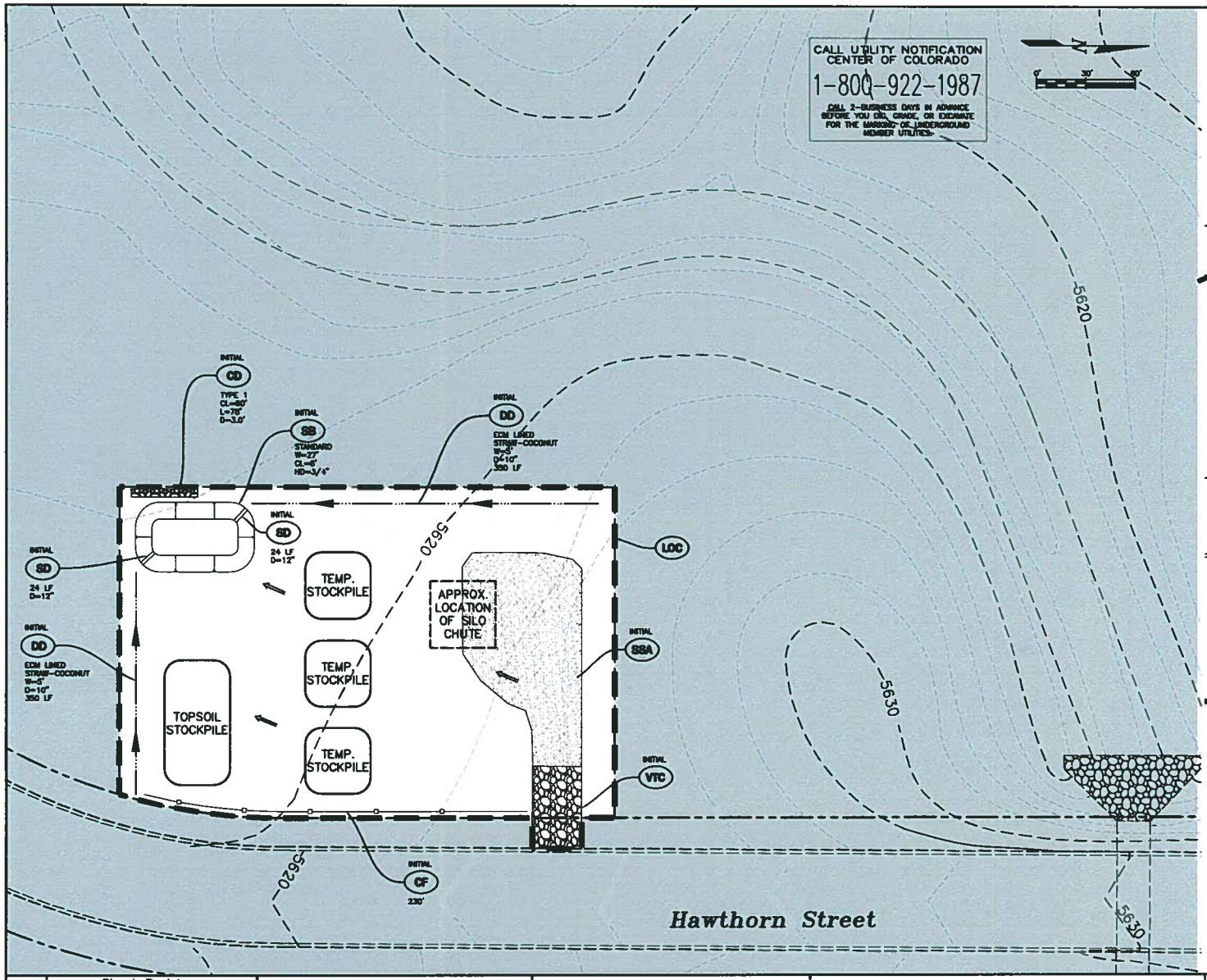
TEMPORARY BATCH PLANT

COVER SHEET

DRAWING B-1



BMP LEGEND

CD	CHECK DAM
CB	COMPOST BLANKET
CFB	COMPOST FILTER BERM
CWA	CONCRETE WASHOUT AREA
CF	CONSTRUCTION FENCE
CM	CONSTRUCTION MARKER
DW	DEWATERING
DD	DIVERSION DITCH
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TSC	TEMPORARY STREAM CROSSING
TER	TERRACING
VTC	VEHICLE TRACKING CONTROL
WW	VTC WITH WHEEL WASH
	ROCK AND RIPRAP GRADATIONS
LOC	LIMITS OF CONSTRUCTION

EXISTING 2' CONTOUR
EXISTING 10' CONTOUR
PROPOSED 2' CONTOUR
PROPOSED 10' CONTOUR
FLOW DIRECTION ARROW

AREA OUTSIDE LIMITS OF CONSTRUCTION

AREA TO BE DRILL SEEDED AND CRIMP MULCHED.

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

TOWN OF CASTLE ROCK
TEMPORARY BATCH PLANT
GESC DRAWINGS

Sheet Revisions

AUSTIN ENGINEERING CO., INC.
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86 PLAZA DRIVE, SUITE 200
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7901 GRANT STREET
DENVER, COLORADO 80229
(303) 287-1722
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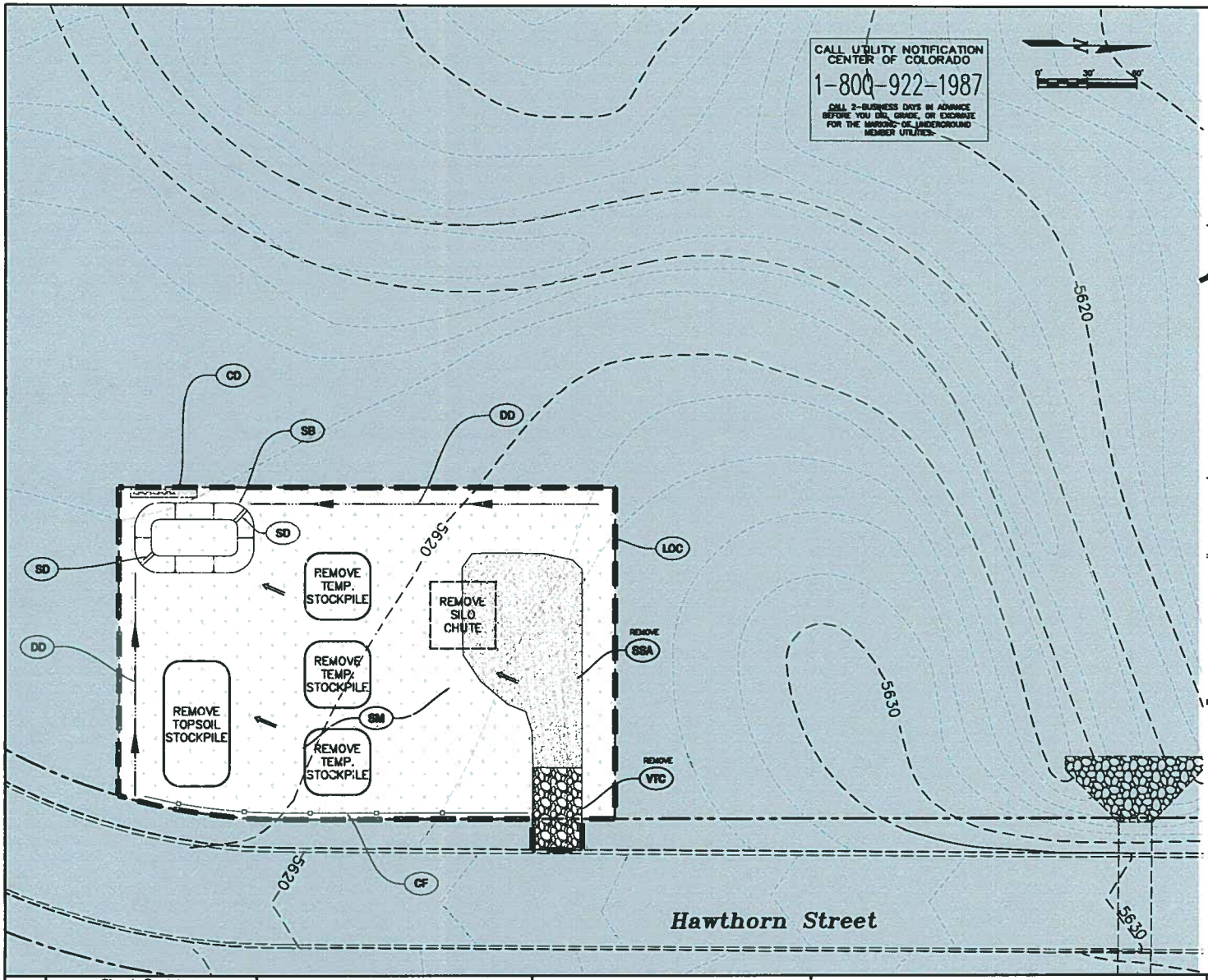
TEMPORARY BATCH PLANT

BATCH PLANT SITE PLAN

DRAWING B-2



BMP LEGEND

CD	CHECK DAM
CB	COMPOST BLANKET
CFB	COMPOST FILTER BERM
CWA	CONCRETE WASHOUT AREA
CF	CONSTRUCTION FENCE
CM	CONSTRUCTION MARKER
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WW	VTC WITH WHEEL WASH
	ROCK AND RIPRAP GRADATIONS
LOC	LIMITS OF CONSTRUCTION

EXISTING 2' CONTOUR
EXISTING 10' CONTOUR
PROPOSED 2' CONTOUR
PROPOSED 10' CONTOUR
FLOW DIRECTION ARROW

AREA OUTSIDE LIMITS OF CONSTRUCTION

AREA TO BE DRILL SEEDED AND CRIMP MULCHED.

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

EXAMPLE
TOWN OF CASTLE ROCK
TEMPORARY BATCH PLANT
GESC DRAWINGS

Sheet Revisions		

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TEMPORARY BATCH PLANT

BATCH PLANT RECLAMATION PLAN

DRAWING
B-3

TOWN OF CASTLE ROCK STANDARD GESC NOTES AND DETAILS TO GO HERE

Sheet Revisions			NOTE: SCALES SHOWN ARE FOR 22"x34" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.	TOWN OF CASTLE ROCK COLORADO	UTILITIES DEPARTMENT Stormwater Engineering Division	GESC GRADING, EROSION, AND SEDIMENT CONTROL	GESC PLAN STANDARD NOTES AND DETAILS	SHEET 1 OF 14

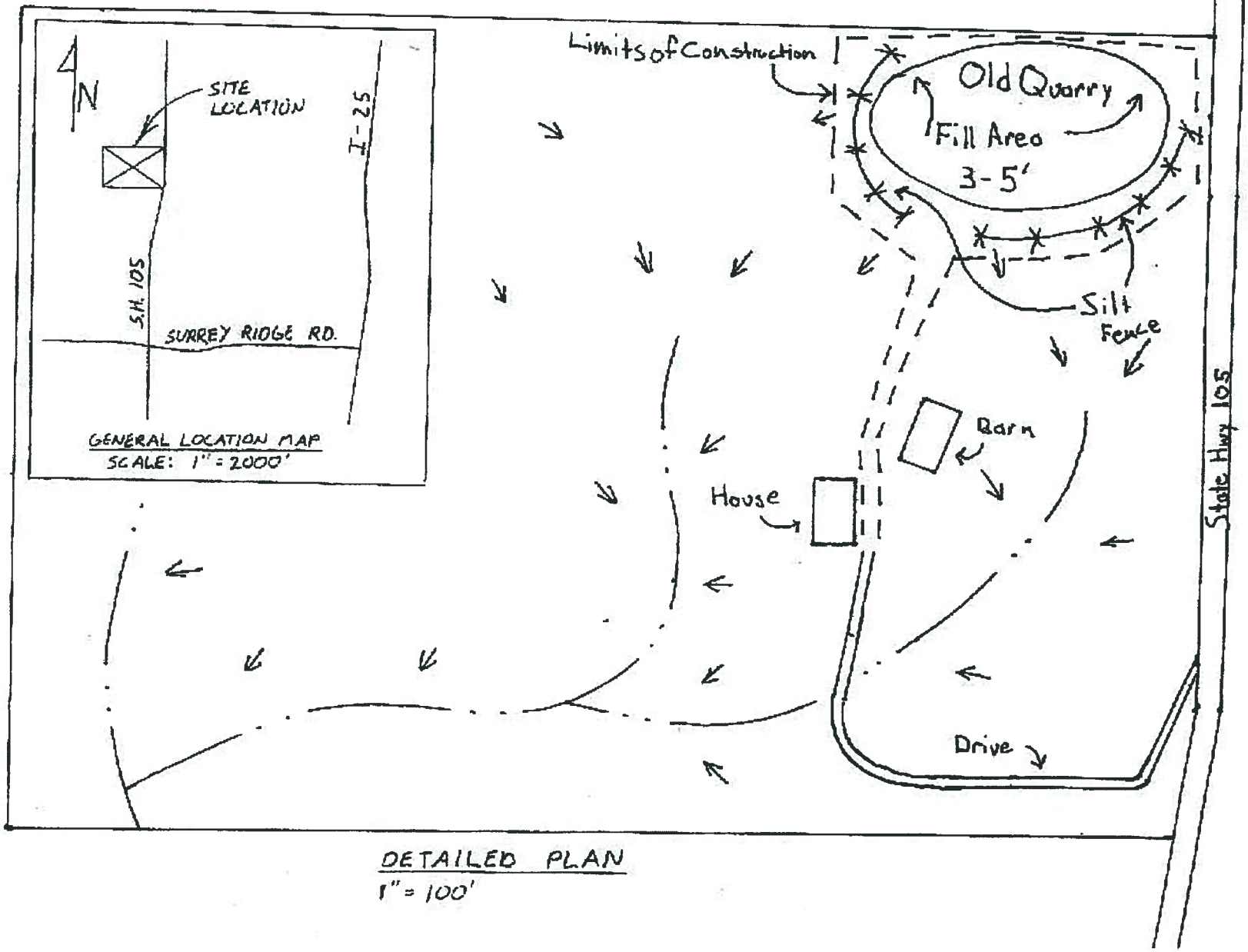
Appendix C

Example GESC Drawings

Low Impact GESC Drawing

N

13506 State Highway 105



DETAILED PLAN
1" = 100'

Appendix D

Checklist for Developing a GESC Plan

CHECKLIST FOR DEVELOPING A GESC PLAN
Selecting BMPs Based On Ten Elements of an Effective GESC Plan

Element 1. Preserve and Stabilize Drainageways

A. Drainageways Shall Not Be Filled, Regraded or Realigned

Yes___No___ 1. Determine design discharges for drainageways (2-year and 100-year at a minimum).

Yes___No___ 2. Delineate floodplain limits for all drainageways.

Yes___No___ 3. Show limits of fill adjacent to drainageways and channel area to be preserved (shade undisturbed areas on drawings).

Yes___No___ 4. Show **Construction Fence (CF)** or, if approved, **Construction Markers (CM)** around all stream preservation areas.

B. Ample Freeboard Above the 100-year Floodplain Shall be Provided.

Yes___No___ 1. Provide ample freeboard above the 100-year floodplain to lot grades and lowest floor elevations (including basements in fill). Refer to the Town of Castle Rock Drainage Regulations, as amended, and consider potential rise in 100-year water surface over the long term due to increased channel vegetation, roughness, and sediment deposition.

C. Existing Drainageways Shall be Stabilized

Yes___No___ 1. Design grade control structures in all drainage channels, as necessary. Refer to the Town of Castle Rock Drainage Regulations, as amended.

Yes___No___ 2. Design bank stabilization improvements, as necessary.

Yes___No___ 3. Emulate natural systems in the design of Items C1 and C2, above.

D. Disturbance to Existing Drainageways Shall be Minimized and Quickly Restored

Yes___No___ 1. Identify features whose construction within drainageways is unavoidable, such as the following:

Yes___No___ a. grade control structures

Yes___No___ b. bank stabilization

Yes___No___ c. road crossings (bridges or culverts)

Yes___No___ d. storm sewer outfalls

Yes___No___ e. utility crossings

Yes___No___ f. temporary stream crossings for construction access

Yes___No___ 2. Determine limits of construction around the features identified in Item D.1. above that are just large enough to allow construction, but no larger than necessary, to minimize disturbance.

Yes___No___ 3. Show **Construction Fence (CF)** or, if approved, **Construction Markers (CM)** to delineate the limits of construction determined in Item D.2. above

Yes___No___ 4. Identify coordinates or other means of locating **Construction Fence (CF)** or **Construction Markers (CM)** for contractor.

Yes___No___ 5. Show **Check Dam (CD)** or **Reinforced Check Dam (RCD)** immediately downstream of each disturbed area in the stream. Check sizing criteria in Section 3.17 of the GESC Manual

Yes___No___ 6. Show **Temporary Stream Crossings (TSC)**, as necessary. Stream crossings shall be limited to the minimum number necessary (no more than one per 2000 lineal feet of stream unless otherwise approved).

Yes___No___ 7. Show **Erosion Control Blanket (ECB)** in all disturbed areas of streams (within construction fence defining limits of construction) up to the top of the bank, to be installed immediately after construction in the stream is complete.

E. Any Additional Drainageways Shall be Designed and Stabilized

Yes___No___ 1. Identify any additional small drainageways that are necessary to manage stormwater runoff on the site.
Yes___No___ 2. Determine design discharges and size the drainageways.
Yes___No___ 3. Design stabilization improvements as necessary for drainageways, including any drop structures or lining. For 2-year flows less than 10 cfs, criteria for **Diversion Ditches (DD)** may be used.

F. Stream-Related Permitting Shall be Completed

Yes___No___ 1. Determine if the following permits (and any others) are necessary. If so, complete the required documentation and submit applications:
Yes___No___ a. Town of Castle Rock Floodplain Development Permit
Yes___No___ b. US Army Corps of Engineers Section 404 Permit
Yes___No___ c. US Fish and Wildlife Service Threatened and Endangered Species approvals.
Yes___No___ d. Conditional Lettere of Map Revision

Element 2. Avoid the Clearing and Grading of Sensitive Areas

Yes___No___ 1. Conduct a resource inventory on the site and identify on the GESC Plan the type and areal extent of features such as the following:
Yes___No___ a. Protected habitat for endangered species
Yes___No___ b. Wetlands
Yes___No___ c. Nesting bird habitat
Yes___No___ d. Riparian buffer zones
Yes___No___ e. Forrested areas
Yes___No___ f. Mature cottonwood stands
Yes___No___ g. Bedrock outcroppings
Yes___No___ h. Steep slopes
Yes___No___ i. Potential stormwater infiltration areas
Yes___No___ j. Historic, cultural, or archeological resources
Yes___No___ k. Areas of unique or pristine vegetation or habitat
Yes___No___ 2. Endeavor to avoid, or minimize, disturbance to the sensitive areas identified in 1. a-j.

Element 3. Balance Earthwork Onsite

Yes___No___ 1. Endeavor to balance earthwork quaitities on site through the following tasks.
Yes___No___ a. Develop initial grading plan
Yes___No___ b. Check earthwork quantities for balance (consider shrink/swell)
Yes___No___ c. Raise or lower portions of the site as necessary to try to balance earthwork
Yes___No___ d. Repeats Steps b and c until balance is achieved
Yes___No___ 2. If it is impossible to balance earthwork quantities on site, prepare letter requesting variance per the information in Section 3.22 of the GESC Manual

Element 4. Limit the Size of Grading Phases to Reduce Soil Exposure

Yes___No___ 1. For large projects, determine separate grading phases, each disturbing less than 40 acres (70 acres for soil mitigation projects).

Yes___No___ 2. Balance earthwork for each phase following the guidance from Element 3, above.

Element 5. Stabilize Soils in a Timely Manner

Yes___No___ 1. Show **Surface Roughening (SR)** for all areas of grading, to be performed immediately after portions of grading are complete.

Yes___No___ 2. Indicate **Seeding and Mulching (SM)** in all areas to be seeded.

Yes___No___ 3. Indicate **Erosion Control Blanket (ECB)** or **Compost Blanket (CB)** on slopes steeper than 4:1 and in all areas where an extra measure of stabilization is appropriate.

Element 6. Implement Perimeter Controls

A. Upslope Perimeters

Yes___No___ 1. Show **Construction Fence (CF)** or **Construction Markers (CM)** to delineate the limits of construction along the site perimeter, unless an existing fence is located there.

Yes___No___ 2. Use **Diversion Ditch (DD)** to capture runoff entering the site via sheet flow. Follow design guidance in Section 3.17 of the GESC Manual.

Yes___No___ 3. For steep reaches, such as where the ditch conveys runoff down a channel bank to the bottom of a stream, the diversion ditch is to be lined based on the criteria shown in Section 3.17 of the GESC Manual.

Yes___No___ 4. For an alternative to a lined ditch in steep sections, consider a **Temporary Slope Drain**.

B. Downslope Perimeters

Yes___No___ 1. Show **Construction Fence (CF)** or **Construction Markers (CM)** to delineate the limits of construction along the site perimeter, unless an existing fence is located there.

Yes___No___ 2. If the upslope disturbed drainage area exceeds 1.0 acre, use a **Divesion Ditch (DD)** or permanent drainageway to convey runoff to a **Sediment Basin (SB)**.

Yes___No___ 3. If the upslope disturbed drainage areas is less than 1.0 acre, use a **Diversion Ditch (DD), Reinforced Rock Berm (RRB), Sediment Control Log (SCL), or Silt Fence (SF)**. In general, the latter three BMPs are to be used on the contour. Check Section 3.17 of the GESC Manual for specific guidance pertaining to the use of these downslope perimeter controls.

Yes___No___ 4. Use a **Check Dam (CD)** or **Reinforced Check Dam (RCD)** across a stream or drainage channel at the downslope perimeter of the site.

Element 7. Treat Runoff in a Sediment Basin

Yes___No___ 1. Runoff from all disturbed areas greater than 1.0 acre shall be treated in a **Sediment Basin (SB)**. Use the standard design for drainage areas

less than 15 acres. For acres less than 1.0 acre, a **Sediment Trap (ST)** may be used.

Yes___No___ 2. If a non-standard design is used, construction drawings detailing the storage volume enbankment, spillway, and outlet are required. Refer to the Town of Castle Rock Drainange Regulations, as amended.

Yes___No___ 3. Wherever possible, sediment basins are to be located within any permanent water quality or quantity detention facilities. Permanent water quality or quantity detention facilities shall have a sediment basin incorporated within them.

Element 8. Protect Steep Slopes

A. Proposed Slopes Shall be no Steeper than 3 to 1.

Yes___No___ 1. Ensure that no slopes are proposed that are steeper than 3H to 1V, except small areas of riprap outlet protection near outfalls and culverts.

Yes___No___ 2. Show **Erosion Control Blanket (ECB)** on slopes steeper than 4:1.

B. Runoff Shall be Diverted Away From Steep Slopes

Yes___No___ 1. Use **Diversion Ditch (DD)** at the top of steep slopes to capture runoff before it flows down the slope.

C. Terracing Shall be Incorporated into the Grading of Steep Slopes

Yes___No___ 1. Use **Terracing (TER)** in steep slopes to break up the flow of incidential water and reduce the development of rill and gully erosion runoff before it flows down the slope.

Element 9. Protect Inlets, Storm Sewer Outfalls, and Culverts

Yes___No___ 1. Show **Inlet Protection (IP)** at all street and area inlets.

Yes___No___ 2. Show **Reinforced Rock Berm for Culvert Protection (RRP)** at all culvert inlets.

Yes___No___ 3. Design outlet protection for all storm sewer outfalls and culvert outlets per the Town of Castle Rock Drainage Regulations, as amended.

Yes___No___ 4. Show **Erosion Control Blanket (ECB)** in stream areas disturbed by the construction of the outfall or culvert.

Element 10. Provide Access and General Construction Controls.

Yes___No___ 1. Identify all limits of construction. Use **Construction Fence (CF)** or **Construction Markers (CM)** to delineate the limits of construction.

Yes___No___ 2. Provide one or more **Vehicle Tracking Controls (VTC)** at all entrance/exit points from a public street to a site.

Yes___No___ 3. Show a **Stabilized Staging Area (SSA)** near the main access point.

Yes___No___ 4. Show a **Concrete Washout Area (CWA)** near all concrete work areas.

Yes___No___ 5. Show temporary access roads and stockpile areas.

Yes___No___ 6. Select areas for the vehicle tracking control, stabilized staging area , access roads, and stockpile areas that avoid disturbance to trees, desirable vegetation, steep areas, and low, wet areas.

Appendix E

Seed Mix Information

DOUGLAS COUNTY AND CASTLE ROCK SEED MIX INFORMATION

Douglas County and Castle Rock Permanent Drill Seed Mix

Common Name	Botanical Name	Variety	Notes	%in Mix	Pounds of PLS Per Acres
Big Bluestem	Andropogon gerardi	Kaw	PNWS	10	1.1
Yellow Indiangrass	Sorghastrum nutans	Cheyenne	PNWS	10	1
Switchgrass	Panicum virgatum	Blackwell	PNWS	10	0.4
Sideoats Grama	Bouteloua curtipendula	Vaughn	PNWB	10	0.9
Western Wheatgrass	Pascopyrum Smithii	Arriba	PNCS	10	1.6
Blue Grama	Bouteloua gracilis	Hachita	PNWB	10	0.3
Thickspike Wheatgrass	Elymus lanceolatus ssp. dasystachyum	Critana	PNCS	10	1
Prairie Sandreed	Calamovilfa longifolia	Goshen	PNWS	10	0.7
Green Needlegrass	Stipa viridula	Lodorm	PNCB	10	1
Slender Wheatgrass	Elymus trachycaulus ssp. Trachycaulus	Pryor	PNCB	5	0.6
Streambank Wheatgrass	Elymus lanceolatus ssp. riparium	Sodar	PNCS	5	0.6

Douglas County and Castle Rock Temporary Drill Seeding Mix

Common Name	Botanical Name	Variety	Notes	%in Mix	Pounds of PLS Per Acres
Smooth Bromegrass	Bromus inermis	Lincoln	PICS	30	3.9
Intermediate Wheatgrass	Elytrigia intermedia ssp. Intermedia	Oahe	PICS	30	4.5
Pubescent Wheatgrass	Elytrigia intermedia ssp. Trichophorum	Luna	PICS	30	4.2
Annual Ryegrass	Lolium multiflorum	N/A	AICB	10	0.8

Douglas County and Castle Rock Low Growth Drill Seed Mix

Common Name	Botanical Name	Variety	Notes	%in Mix	Pounds of PLS Per Acres
Buffalograss	Buchloe dactyloides	Texoka	PNWS	20	3.2
Blue Grama	Bouteloua gracilis	Hachita	PNWB	20	0.6
Western Wheatgrass	Pascopyrum smithii	Arriba	PNCS	20	3.2
Sideoats Grama	Boutelous curtipendula	Vaughn	PNWB	20	1.8
Thickspike Wheatgrass	Elymus lanceolatus ssp. Dasystachyum	Critana	PNCS	10	1
Streambank Wheatgrass	Elymus lanceolatus ssp. Riparium	Sodar	PNCS	10	1.2

Appendix F

Town of Castle Rock GESC

Acceptance Block

4”

3”

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

TOWN OF CASTLE ROCK COLORADO

Sheet Revisions		

GESC

GRADING, EROSION, AND SEDIMENT CONTROL

GESC DRAWINGS ACCEPTANCE BLOCK

Appendix G

GESC Drawing and Report Checklist

DRAWINGS AND REPORT CHECKLIST FOR STANDARD GESC PERMITS

A. DRAWINGS

I. COVER SHEET

Yes___No___ 1. Project name.
Yes___No___ 2. Project address (if applicable).
Yes___No___ 3. Owner address.
Yes___No___ 4. Design firm's name and address.
Yes___No___ 5. Plan sheet index.
Yes___No___ 6. Designer's Signature Block.
Yes___No___ 7. The following note:

THE ***GRADING, EROSION AND SEDIMENT CONTROL PLAN*** INCLUDED HEREIN IS ON FILE AT THE TOWN OF CASTLE ROCK AND APPEARS TO FULFILL APPLICABLE TOWN OF CASTLE ROCK GRADING, EROSION AND SEDIMENT CONTROL CRITERIA, AS AMENDED. ADDITIONAL GRADING, EROSION AND SEDIMENT CONTROL MEASURES MAY BE REQUIRED OF THE PERMITTEES DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT FUNCTION AS INTENDED. THE REQUIREMENTS OF THIS PLAN SHALL RUN WITH THE LAND AND BE THE OBLIGATION OF THE PERMITTEES, UNTIL SUCH TIME AS THE PLAN IS PROPERLY COMPLETED, MODIFIED OR VOIDED.

Yes___No___ 8. GESC Plan Designer's signature block with name, date, and Professional Engineer registration number. Signature block shall include the following note:

THE ***GRADING, EROSION AND SEDIMENT CONTROL PLAN*** INCLUDED HEREIN HAS BEEN PREPARED UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH THE REQUIREMENTS OF THE GRADING, EROSION, AND SEDIMENT CONTROL (GESC) MANUAL OF THE TOWN OF CASTLE ROCK AS AMENDED.

Yes___No___ 9. Town Acceptance Block.
Yes___No___ 10. General Location Map at a Scale of 1-inch to 1000- feet to 8000-feet indicating:

- general vicinity of the site location.
- major roadway names.
- north arrow and scale.

II. GESC DRAWING INDEX SHEET

For projects that require multiple plan-view sheets to adequately show the project area (based on the specified scale ranges), a single plan-view sheet shall be provided at a scale appropriate to show the entire site on one sheet. Areas of coverage of the multiple blow-up sheets are to be indicated as rectangles on the index sheet.

III. INITIAL GESC PLAN

This plan sheet shall provide grading, erosion and sediment controls for the initial clearing, grubbing and grading of a project. At a minimum, it shall contain:

Yes___No___ 1. Property Lines.
Yes___No___ 2. Existing and proposed easements.
Yes___No___ 3. Existing topography at one- or two-foot contour intervals, extending a minimum of 100 feet beyond the property line.
Yes___No___ 4. Location of any existing structures or hydrologic features within the mapping limits.
Yes___No___ 5. USGS Benchmark used for project and note that NAVD88 Datum was used.
Yes___No___ 6. Limits of construction encompassing all areas of work, access points, storage and staging areas, borrow areas, stockpiles, and utility tie-in locations in on-site and off-site locations. Stream corridors and other resource areas to be preserved and all other areas outside the limits of construction shall be lightly shaded to clearly show area not to be disturbed.
Yes___No___ 7. Location of stockpiles, including topsoil, imported aggregates, and excess material.
Yes___No___ 8. Location of storage and staging areas for equipment, fuel, lubricant, chemical (and other materials) and waste storage.
Yes___No___ 9. Location of borrow or disposal areas.
Yes___No___ 10. Location of temporary roads.
Yes___No___ 11. Location, map symbol, and letter callouts of all initial erosion and sediment control BMPs.
Yes___No___ 12. Information to be specified for each BMP, such as type and dimensions, as called for in the Standard Notes and Details.
Yes___No___ 13. The following note:
SEE COVER SHEET FOR THE TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS FOR LEGEND OF BMP NAMES AND SYMBOLS.
Yes___No___ 14. Town of Castle Rock approval block.
Yes___No___ 15. Other information as may be reasonably required by the Town of Castle Rock.

IV. INTERIM GESC PLAN

This plan sheet shows BMPs to control grading, erosion and sediment during the initial overlot grading, site construction and site revegetation process. At a minimum, it shall contain the following information:

The Interim GESC Plan shall show all the information included on the Initial GESC Plan, as noted below:

Yes___No___ 1. Existing topography at one- or two-foot contour intervals extending a minimum of 100 feet beyond the property line, as shown on Initial GESC Plan. **These contours shall be screened.**
Yes___No___ 2. Location of all existing erosion and sediment control measures on site, as shown on the **Initial** GESC Plan Sheet. **These control measures shall be screened. Dimension information for initial stage BMPs shall not**

be shown.

Yes___No___ 3. Items 1, 2, and 4 through 10 from the Initial GESC Plan (see Section 3.17.3).

In addition, the Interim GESC Plan shall include the following:

Yes___No___ 4. Proposed topography at one- or two-foot contour intervals, showing elevations, dimensions, locations, and slope of all proposed grading.

Yes___No___ 5. Outlines of cut and fill areas.

Yes___No___ 6. Location of all interim erosion and sediment controls, designed in conjunction with the proposed site topography, but also considering the controls designed for the existing topography.

Yes___No___ 7. Locations of all buildings, drainage features and facilities, paved areas, retaining walls, cribbing, water quality facilities, or other permanent features to be constructed in connection with, or as a part of, the proposed work, per approved plat, FPDSP, or other improvement plan.

Yes___No___ 8. The following notes:

- SEE COVER SHEET OF THE TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS FOR LEGEND OF BMP NAMES AND SYMBOLS.
- SHADED BMPS WERE INSTALLED IN INITIAL STAGE AND SHALL BE LEFT IN PLACE IN INTERIM STAGE.
- ALL INTERIM BMPS MUST BE COMPLETED PRIOR TO ISSUANCE OF ANY PUBLIC WORKS PERMITS.
- SEE PUBLIC IMPROVEMENT CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES SUCH AS DETENTION FACILITIES, WATER QUALITY FACILITIES, CULVERTS, AND STORM DRAINS.

Yes___No___ 9. Summary of cut and fill volumes.

Yes___No___ 10. Town of Castle Rock acceptance block.

Yes___No___ 11. Other information or data as may be reasonably required by the Town of Castle Rock.

V. Final GESC Plan.

This plan sheet shows controls for final completion of the site. At a minimum, this plan sheet shall contain the indicated information.

The Final GESC Plan shall include all information shown on the Initial and Interim Plans, as noted below:

Yes___No___ 1. Existing topography in areas of proposed contours need not be shown.

Yes___No___ 2. Existing Initial and Interim BMPs shall be shown, (**screened**). Dimension information shall not be shown.

In addition, the following information shall be shown:

Yes___No___ 3. Directional flow arrows on all drainage features.

Yes___No___ 4. Any Initial or Interim BMPs that are to be removed and any resulting disturbed area to be stabilized.

Yes___No___ 5. Location of all Final erosion and sediment control

BMPs (including seeding and mulching of any areas not stabilized in the Interim Plan), permanent landscaping, and measures necessary to minimize the movement of sediment off site until permanent vegetation can be established.

Yes___No___ 6. Show area of buildings, pavement, sod, and permanent landscaping (define types) per accepted plat, FPDSP, SIA, or other improvement plan or agreement.

Yes___No___ 7. Show seeding and mulching (SM) everywhere except buildings and pavement areas.

Yes___No___ 8. Show other BMPs considered by the designer to be appropriate.

Yes___No___ 9. Show the following BMPs to be removed prior to end of construction:

- Indicate dewatering (DW) to be removed.
- Indicate temporary stream crossings (TSC) to be removed.
- Indicate stabilized staging area (SSA) to be removed.
- Indicate vehicle tracking control (VTC) to be removed.
- Indicate construction fence (CF) to be removed.

Yes___No___ 10. Include the following notes:

- SEE COVER SHEET OF THE TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS FOR LEGEND OF BMP NAMES AND SYMBOLS.
- SHADED BMPS WERE INSTALLED IN INITIAL OR INTERIM GESC PLAN AND, UNLESS OTHERWISE INDICATED, SHALL BE LEFT IN PLACE UNTIL REVEGETATION ESTABLISHMENT IS APPROVED BY THE TOWN.
- SEE PUBLIC IMPROVEMENT CONSTRUCTION PLANS FOR DETAILS OF PERMANENT DRAINAGE FACILITIES, SUCH AS DETENTION FACILITIES, WATER QUALITY FACILITIES, CULVERTS AND STORM DRAINS.

Yes___No___ 11. Town of Castle Rock Acceptance block.

Yes___No___ 12. Other information as may be reasonably required by Town of Castle Rock.

VI. GESC DRAWING AND REPORT CHECKLIST.

A copy of this GESC Drawing and Report Checklist must be completely filled out, signed by the designer, and submitted with the GESC Plan.

B. REPORT

I. REPORT REQUIREMENTS FOR STANDARD GESC PERMITS

The narrative report shall contain the following information:

Yes___No___ 1. Name, address, and telephone number of the applicants – The name, address, and telephone number of the Professional Engineer preparing (or supervising the preparation of) the GESC Plan shall also be included, if different from the Applicants.

Yes___No___ 2. Project description – A brief description of the nature and purpose of the land-disturbing activity, the total area of the site, the area of disturbance involved, and project location including township, range, section and quarter-section, or the latitude and longitude, of the approximate center of the project.

Yes___No___ 3. Existing site conditions – A description of the existing topography, vegetation, and drainage; a description of any wetlands on the site; and any other unique features of the property.

Yes___No___ 4. Adjacent areas – A description of neighboring areas such as streams, lakes, residential areas, roads, etc., which might be affected by the land disturbance.

Yes___No___ 5. Soils – A brief description of the soils on the site including information on soil type and names, mapping unit, erodibility, permeability, hydrologic soil group, depth, texture, and soil structure (this information may be obtained from the soil report for the site, for adjacent sites if acceptable to the Town, or the applicable Soil Survey prepared by the Natural Resources Conservation Service).

Yes___No___ 6. Areas and Volumes – An estimate of the quantity (in cubic yards) of excavation and fill involved (indicating a balance onsite), and the surface area (in acres) of the proposed disturbance.

Yes___No___ 7. Erosion and sediment control measures – A description of the methods presented in the GESC Manual that will be used to control erosion and sediment on the site.

Yes___No___ 8. Timing/Phasing schedule – A schedule indicating the anticipated starting and completion time periods of the site grading and/or construction sequence, including the installation and removal of erosion and sediment control BMPs. Indicate the anticipated starting and completion time periods of individual project phases.

Yes___No___ 9. Permanent stabilization – A brief description, including applicable specifications, of how the site will be stabilized after construction is completed.

Yes___No___ 10. Stormwater management considerations – Explain how stormwater runoff from and through the site will be handled during construction.

Yes___No___ 11. Maintenance – Any special maintenance requirements over and above what is identified in the standard notes and details.

Yes___No___ 12. Opinion of probable cost for installation and maintenance of controls – An opinion of probable costs for erosion and sediment control, including anticipated maintenance

during the construction phase, shall be submitted with the GESC Plan. This will be reviewed by Town staff and used as a basis for fiscal security. A copy of a spreadsheet to be used for preparing the opinion of probable costs for erosion and sediment control is included in Appendix I of the GESC Manual. An electronic copy of the spreadsheet is available from the Town of Castle Rock Utilities Department OR THE Plan Review Engineer. Unit costs used to develop probable erosion and sediment control costs shall be those shown in the spreadsheet.

Yes___No___ 13. Calculations – Any calculations made for the design of such items as sediment basins or erosion control blanket selection.

Yes___No___ 14. Other information or data – As may be reasonably required by the Town of Castle Rock.

Yes___No___ 15. The following note – "This *Grading, Erosion and Sediment Control Plan* is on file at the Town of Castle Rock and appears to fulfill the applicable Town of Castle Rock G*rading, Erosion and Sediment Control Criteria*, as amended. I understand that additional grading, erosion and sediment control measures may be required of the Permittees, due to unforeseen erosion problems or if the submitted plan does not function as intended. The requirements of this plan shall run with the land and be the obligation of the Permittees until such time as the plan is properly completed, modified or voided."

Yes___No___ 16. Signature Page For Permittees acknowledging the review and acceptance of responsibility, and a statement by the Professional Engineer acknowledging responsibility for the preparation of the GESC Plan.

Appendix H

Opinion of Probable Cost

Example Worksheet

Town of Castle Rock
GESC Permit - Cost Opinion Spreadsheet
Project # GES___-_____
[Type Project Name / Description Here]

BMP NO.	BMP	ID	Unit	Installation Unit Cost	Quanitity	Cost
1	Check Dam	CD	LF	$ 24.00		$
2	Compost Blanket	CB	SF	$ 0.36		$
3	Compost Filter Berm	CFB	LF	$ 2.00		$
4	Concrete Washout Area	CWA	EA	$ 100.00		$
5	Construction Fence	CF	LF	$ 2.00		$
6	Construction Markers	CM	LF	$ 0.20		$
7	Dewatering	DW	EA	$ 600.00		$
8	Diversion Ditch	DD	LF	$ 1.60		$
9	Erosion Control Blanket	ECB	SY	$ 5.00		$
10	Inlet Protection	IP	LF	$ 20.00		$
11	Reinforced Check Dam	RCD	LF	$ 36.00		$
12	Reinforced Rock Berm	RRB	LF	$ 9.00		$
13	RRB for Culvert Protection	RRC	LF	$ 9.00		$
14	Sediment Basin	SB	AC	$ 1,100.00		$
15	Sediment Control Log	SCL	LF	$ 2.00		$
16	Sediment Trap	ST	EA	$ 600.00		$
17	Seeding and Mulching	SM	AC	$ 2,500.00		$
18	Silt Fence	SF	LF	$ 2.00		$
19	Stabilized Staging Area	SSA	SY	$ 2.00		$
20	Surface Roughening	SR	AC	$ 600.00		$
21	Temporary Slope Drain	TSD	LF	$ 30.00		$
22	Temporary Stream Crossing	TSC	EA	$ 1,000.00		$
23	Terracing	TER		N/A		$
24	Vehicle Tracking Control	VTC	EA	$ 1,000.00		$
25	VTC with Wheel Wash	WW		N/A		$
26	Temporary Batch Plant Restoration		AC	$ 5,000.00		$

Total BMP Cost	$
10% Contingency	$
Grand Total	$
Total Surety Amount (Grand Total x 1.15)	$

Appendix I

Temporary Batch Plant Application Permit

GRADING, EROSION AND SEDIMENT CONTROL TEMPORARY BATCH PLANT PERMIT APPLICATION

PERMIT NO. G-_____

PAID DATE _____
AMOUNT _____
CHECK _____
CHECK # _____
CASH _____

ıtely answered. No action can be taken on this application until all questions have been answered. PLEASE PRINT, except for signature.

PROPERTY OWNER

Name:	Name:
Address:	Address:
Contact Name: Phone:	Contact Name: Phone:
Section _____, Township _____, Range _____	Acres (Including grading/excavation/fill)
Location:	
Dates of Operation: _____ to _____	Hours of operation: _____a.m. to _____p.m.
Maximum GVW of Hauling Units:	Anticipated daily trip generation:

By signing below, both applicants hereby apply for a Town of Castle Rock Temporary Batch Plant Permit for the aforementioned property and certify as follows:

1. To the best of my/our knowledge, the information provided herein is correct;
2. A GESC Plan for the disturbed area on this site was prepared and submitted in accordance with the *Town of Castle Rock GESC Manual* (GESC), as amended.
3. I certify I am legally authorized to sign on behalf of and bind the above listed entity(s). The Batch Plant Permit is granted with the explicit understanding that it is the Permittees' responsibility to:
   - Allow the Town unrestricted access to the site to conduct regular site inspections;
   - Comply with all requirements of the *GESC Manual*, accepted GESC plan, and GESC Permit;
   - Immediately cease land-disturbing activities upon receipt of a written Stop Work Order from an authorized representative of the Town of Castle Rock. A Stop Work Order shall be issued and this Permit revoked if the Permittees are not in compliance with the GESC Permit, GESC Plan and/or *GESC Manual*, or the Permittees fail to take corrective action within the time specified on the written notification of such non-compliance;
   - Understand that in addition to other remedies, a violation of this GESC Permit shall constitute a violation of Section 15.12 of the Town of Castle Rock Municipal Code; and
   - Understand any approval obtained from the Town of Castle Rock does not obviate your need to comply with the requirements of Sections 7 and 9 of the Endangered Species Act of 1973, 16 U.S.C. 1531, et seq., as amended, or with any other applicable federal, state or local laws or regulations.

Property Owner _____ **Date** _____ **Contractor** _____ **Date** _____

Signature _____ **Signature** _____

Print Name _____ **Title** _____ **Print Name** _____ **Title** _____

PERMIT APPROVAL (for Town Use Only)

Engineer's Estimate for Grading, Erosion and Sediment Control (GESC): $_____	Review Fee: $_____ Use Tax: $_____ Inspection Fee: $_____ **Total GESC Fee: $** _____

Engineer's GESC Estimate $_____(x 1.15) = Total Fiscal Surety $ _____	Fiscal Surety Received: ❒Y ❒N ❒SIA	Date GESC Plan Accepted: _____

STAFF APPROVALS

Batch Plant Plans Approved ❒Yes ❒No Development Services _____ Date _____	GESC Inspector _____ Date _____

Original – Applicant Pink – Building Department Canary – Utilities Department Goldenrod – Development Services

Appendix J

Standard GESC

Permit Application

GRADING, EROSION AND SEDIMENT CONTROL (GESC) PERMIT APPLICATION

GSC_____

Paid Date _____	
Amount _____	
Check ☐	Cash ☐
Check # _____	

☐ **Standard GESC Permit** – Valid for one year active construction and two years revegetation.
☐ **Active Transfer** - New ownership on a currently active site. (Example: Over-excavation of home lots)
☐ **Inactive Transfer** - No disturbance permitted; revegetation only. (Example: Seeded lots; from developer to home builder)
☐ **Re-Activation of Inactive Permit** - No transfer of ownership. (Example: Adding to a stockpile during revegetation)

All information is required. No action can be taken on this application until all information is provided. PLEASE PRINT, *except for signature.*

PROPERTY OWNER	CONTRACTOR
Company:	Company:
Address:	Address:
City: State: Zip:	City: State: Zip:
Contact Name: Phone:	Contact Name: Phone:
Email:	Email:

Project Name:	Duration of Active Construction: months
Location:	
Total Disturbed Area: acres	Estimated Material Volume: cubic yards

By signing below, both applicants hereby apply for a Town of Castle Rock GESC Permit for the aforementioned property and certify as follows:

1. To the best of my/our knowledge, the information provided herein is correct;
2. A GESC Plan for the disturbed area on this site was prepared and submitted in accordance with the GESC Manual, as amended; and
3. I certify I am legally authorized to sign on behalf of and bind the above-listed entity. The GESC Permit is granted with the explicit understanding that it is the Permittees' responsibility to:
   - Allow the Town unrestricted access to the site to conduct regular site inspections;
   - Comply with all requirements of the GESC Manual, accepted GESC Plan, and GESC Permit;
   - Immediately cease land-disturbing activities upon receipt of a written Stop Work Order from an authorized representative of the Town of Castle Rock. A Stop Work Order shall be issued and this Permit revoked if the Permittees are not in compliance with the GESC Permit, GESC Plan and/or GESC Criteria Manual or the Permittees fail to take corrective action within the time specified on the written notification of such non-compliance;
   - Understand that in addition to other remedies, a violation of this GESC Permit shall constitute a violation of Section 15.34 of the Town of Castle Rock Municipal Code; and
   - Understand any approval obtained from the Town does not obviate your need to comply with the requirements of Sections 7 and 9 of the Endangered Species Act of 1973, 16 U.S.C. 1531, et seq., as amended, or with any other applicable federal, state or local laws or regulations.

Property Owner

Print Name:_____

Title:_____

Signature:_____**Date:**_____

Contractor

Print Name:_____

Title:_____

Signature:_____**Date:**_____

PERMIT APPROVAL (Town Use Only)

Engineer's Cost Estimate (GESC only) $_____

Above amount x 1.15 = $_____ Total Fiscal Surety

Surety Type: _____ Surety # _____ Expiration _____(minimum 24 months)

Review Fee $_____ Inspection Fee: $_____ **Total GESC Fee: $**_____	Renewal $_____ Transfer $_____	Fiscal Security Received ☐ Yes ☐ No ☐ SIA	Date GESC Plan Accepted: _____

STAFF APPROVALS

Drainage Report Approved: ☐ Yes ☐ No Phase: I II III DS/Util.:_____ Date: _____	GESC Inspector: _____ Phone: _____

Appendix K

Release of Surety

Request Form

RELEASE OF SURETY FOR GRADING, EROSION AND SEDIMENT CONTROL PERMIT

GESC PERMIT NUMBER: _____

PROJECT NAME: _____

LOCATION: _____

PROPERTY OWNER NAME: _____

ADDRESS: _____

AMOUNT OF SURETY: _____

TYPE OF SURETY: _____ **SURETY #:** _____

PROPERTY OWNER: _____ **DATE:** _____
Signature

FOR TOWN USE ONLY

TEMPORARY EROSION CONTROL HAS BEEN REMOVED: Y/N

EROSION CONTROL INSPECTOR SIGNATURE:

APPROVAL: _____ **DATE:** _____

-OR-

DENIAL: _____ **DATE:** _____

REASON FOR DENIAL: _____

_____

_____

ENGINEERING INSPECTIONS MANAGER:

SIGNATURE: _____ **DATE:** _____

Appendix L

Low Impact GESC Permit

LOW IMPACT GRADING, EROSION AND SEDIMENT CONTROL (GESC) PERMIT APPLICATION

GSC_____

Paid Date	_____
Amount	_____
Check ☐	**Cash** ☐
Check #	_____

APPLICABILITY – Projects with a disturbed area less than one acre that do not require re-establishment of native vegetation and where insignificant negative impact can be adequately demonstrated to Town staff. Valid for four inspections.

All information is required. No action can be taken on this application until all information is provided. PLEASE PRINT, *except for signature.*

PROPERTY OWNER	CONTRACTOR
Company:	Company:
Address:	Address:
City: State: Zip:	City: State: Zip:
Contact Name: Phone:	Contact Name: Phone:
Email:	Email:

Project Name:	Duration of Active Construction: months
Location:	
Total Disturbed Area: acres (must be <1 acre)	Estimated Material Volume: cubic yards

By signing below, both applicants hereby apply for a Town of Castle Rock GESC Permit for the aforementioned property and certify as follows:

1. To the best of my/our knowledge, the information provided herein is correct;
2. A GESC Plan for the disturbed area on this site was prepared and submitted in accordance with the GESC Manual, as amended; and
3. I certify I am legally authorized to sign on behalf of and bind the above-listed entity. The GESC Permit is granted with the explicit understanding that it is the Permittees' responsibility to:
   - Allow the Town unrestricted access to the site to conduct regular site inspections;
   - Comply with all requirements of the GESC Manual, accepted GESC Plan, and GESC Permit;
   - Immediately cease land-disturbing activities upon receipt of a written Stop Work Order from an authorized representative of the Town of Castle Rock. A Stop Work Order shall be issued and this Permit revoked if the Permittees are not in compliance with the GESC Permit, GESC Plan and/or GESC Criteria Manual or the Permittees fail to take corrective action within the time specified on the written notification of such non-compliance;
   - Understand that in addition to other remedies, a violation of this GESC Permit shall constitute a violation of Section 15.34 of the Town of Castle Rock Municipal Code; and
   - Understand any approval obtained from the Town does not obviate your need to comply with any other applicable federal, state or local laws or regulations.

Property Owner

Print Name:_____

Title:_____

Signature:_____**Date:**_____

Contractor

Print Name:_____

Title:_____

Signature:_____**Date:**_____

PERMIT APPROVAL (Town Use Only)	
Total GESC Fee: $_____	Date GESC Plan Accepted: _____
STAFF APPROVALS	
Development Services:_____ Date: _____	**PLEASE CALL FOR REQUIRED PRECON MEETING** GESC Inspector: _____ Phone: _____