



Temporary Erosion and Sediment Control (TESC) Manual

**Published by Castle Rock Water Department
Town of Castle Rock
100 N. Wilcox St.
Castle Rock, CO 80104
June 2019**



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Section 1. Introduction

Overview of Section 1

1.0

Section 1 addresses the following introductory topics:

Section 1.1, **The TESC Permit**, introduces the Town of Castle Rock's Temporary Erosion and Sediment Control (TESC) 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 TESC 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 TESC Permit**, indicates the types of land-disturbing activities within the Town of Castle Rock that require a TESC Permit.

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

1. *Low Impact TESC Permit*
2. *Standard TESC Permit*

The Standard TESC Permit is addressed in **Sections 2 through 6 and 8** of the *TESC Manual*. The Low Impact TESC Permit is covered in **Section 7**.

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

Section 1.7, **What Steps are Included in the TESC Permit Process?**, outlines the twenty steps involved in the Standard TESC Permit Process.

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

The Permit Steps. Each of the twenty steps in the Standard TESC Permit Process are highlighted in Section 2 through 6 and 8 of the TESC Manual. The ten steps in the Low Impact TESC 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.

Temporary Erosion and Sediment Control



Rates of erosion increase dramatically during construction.

The TESC Permit

1.1

The Town of Castle Rock has a permitting program for erosion and sediment control on public and private construction projects within the limits of the Town. The Temporary Erosion and Sediment Control (TESC) program covers all other development and construction projects. This TESC manual describes the permitting programs that have been adopted to promote environmentally-sound construction practices in the Town.

Terminology

The Temporary Erosion and Sediment Control Permit is termed simply the "TESC" Permit for short

Reasons for the TESC Permit

1.2

The goal of the TESC Permit program is to implement effective erosion and sediment control measures 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.

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.

The Town of Castle Rock is committed to protecting water resources and ensuring that future development continues in an environmentally-sound manner.



Eroded sediment can clog downstream receiving waters.



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 TESC 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 reduce or prevent the discharge of pollutants to the MS4 from applicable construction activities.

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.

Section 1. Introduction

Legislative Mandate, continued

In short, the Town must develop a stormwater management program that meets the requirements of the MS4 Permit 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 control measures 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 measures;*
- ◆ 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 TESC 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 measures 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 measures.

Section 1. Introduction

Projects Requiring a TESC Permit

1.4

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

Projects Requiring a Standard TESC Permit

- ◆ *New development and redevelopment, including residential projects. (Refer to Section 8 for Residential TESC 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 fifty 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.*
- ◆ *Vertical Residential Construction*

1.4.2 Projects that do not require a TESC Permit. Some types of projects, listed below, are automatically exempt from the TESC Permit Program. The projects shown that do not need a TESC Permit are not free from the obligation to control erosion and sediment; control measures shall still be required in accordance with the *TESC Manual*.

Projects that do not require a TESC Permit

- ◆ *Routine agricultural practices, including tilling, planting, harvesting, or livestock operations. (Activities not considered as routine agricultural practices, and therefore requiring a TESC 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 TESC Permit is not required, erosion and sediment control measures 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.*

Section 1. Introduction

Projects Requiring a TESC Permit, continued

Types of TESC Permits

The permit applications for Low Impact and Standard TESC Permits can be found at CRgov.com/TESC

1.4.3 Projects Covered Under Other Permits.

TESC 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.

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

1.5

The following two types of TESC Permits are issued by the Town of Castle Rock:

1. Low Impact TESC Permit,
2. Standard TESC Permit.

1.5.1 Low Impact TESC Permit. Some land-disturbing activities may have a negligible negative impact on adjacent properties and downstream receiving waters. For projects lasting three months or less 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 TESC Permit will be designated for the project.

1.5.2 Standard TESC Permit. A Standard TESC 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 TESC Permit.

1.5.3 Standard TESC Permit for a Temporary Batch Plant.



A Temporary Batch Plant requires its own control measures.

Because of their potential impact on land, vegetation, and receiving waters, temporary batch plants require specific control measures.

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

1.5.4 Standard TESC Permit for Vertical Residential Construction. A Standard TESC Permit for Vertical Residential construction is required prior to release of residential building permits and is required separate from the Standard TESC Permit for land development activities.



Information

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

Section 1. Introduction

Types of TESC Permits, continued

Several Town divisions have authority over the construction of residential projects. Castle Rock Water, through the TESC 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 TESC and Public Works Inspectors, the TESC 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 Castle Rock Water, (through a Standard TESC Permit for Vertical Residential construction or Low Impact TESC Permit for single-family custom homes), and the Development Services Building Division, (through the Building Permit).

Separate TESC Permits are required for each builder in a subdivision and will include all lots under common ownership. A Low Impact TESC Permit is required for each single custom lot within a subdivision.

All TESC Permits are issued through the Development Services Department, then are turned over to Castle Rock Water for inspection and close-out.

Multi-family residential projects, other than paired-home construction, are subject to the regulatory authority of the Standard TESC Permit Program from the start of grading operations through Final Close-out Acceptance (discussed in Section 6). They do not require a separate Standard TESC Permit for Vertical Residential construction.

Table 2-1 summarizes the permit types, acreage, duration, and other requirements for the three types of TESC Permits.

Table 1-1. Types of TESC Permits

Type of TESC Permit	Acreage	Duration	Other Requirements
<i>Low Impact</i>	<i>Less than 1 acre</i>	<i>Maximum of 3 months</i>	<ul style="list-style-type: none"> • <i>Project does <u>not</u> require any native revegetation</i> • <i>Project must be fully re-stabilized within the 3 months</i> • <i>Project involves <u>custom</u> single-family residential lots (one permit per lot)</i>
<i>Standard</i>	<i>Less than 1 acre</i>	<i>Max. of 12 months/ renewable</i>	<ul style="list-style-type: none"> • <i>Project will take longer than 3 months</i> • AND/OR • <i>Project requires native revegetation</i>
	<i>Greater than 1 acre</i>	<i>Max. of 12 months/ renewable</i>	<ul style="list-style-type: none"> • <i>Projects greater than 40 acres must be phased</i>
<i>Standard for Vertical Residential Construction</i>	<i>Any</i>	<i>Max. of 12 months/ renewable</i>	<i>Required prior to any single-family Building Permit issuance within a common plan of development of a single builder/ owner.</i>

Section 1. Introduction

Who Obtains a TESC Permit?

1.6

Typically, TESC Permits are signed by both the Project Owner and the Contractor. Prior to issuance of a TESC Permit, the Owner and the Contractor are referred to as “Applicants”. After the Permit is issued, both are considered “Permittee(s)”. A permittee is defined as “any person who is issued a TESC Permit by the Town”. The permittee(s) shall be legally responsible for compliance with the TESC 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 TESC Permit Program that are summarized in Section 1.5, and described in detail within the *TESC Manual*. Failure to meet the requirements of the TESC Permit may lead to enforcement action, as described in Section 5.

Important!

Failure to meet the requirements of a TESC Permit may lead to enforcement action against the Permittee(s).

What steps are included in the TESC Permit process?

1.7

A flow chart of the Town’s Development Review Process is shown in Figure 1-1. The twenty steps involved in the Town’s TESC Permit process for the Standard TESC Permit is shown in Figure 1.2.

Each page of Sections 2 through 8 of the TESC 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 TESC Permit Steps covered in the section and relates each subsection to one of the TESC Permit steps.

The Nine Steps involved in the Low Impact TESC Permit are outlined in Section 7. The Six Steps involved in the Vertical Residential TESC Permit are outlined in Section 8.

Although the TESC 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.

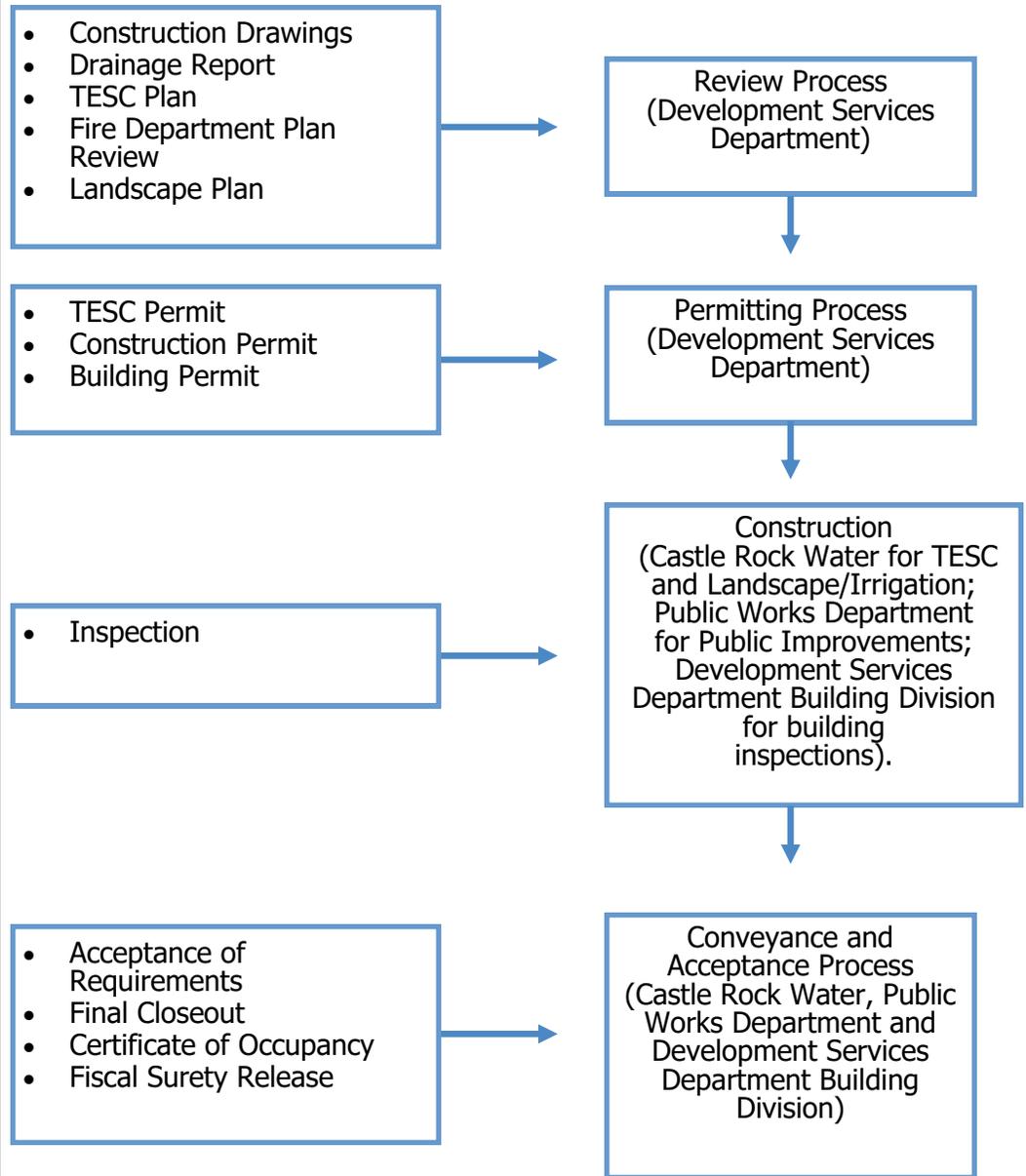


Information

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

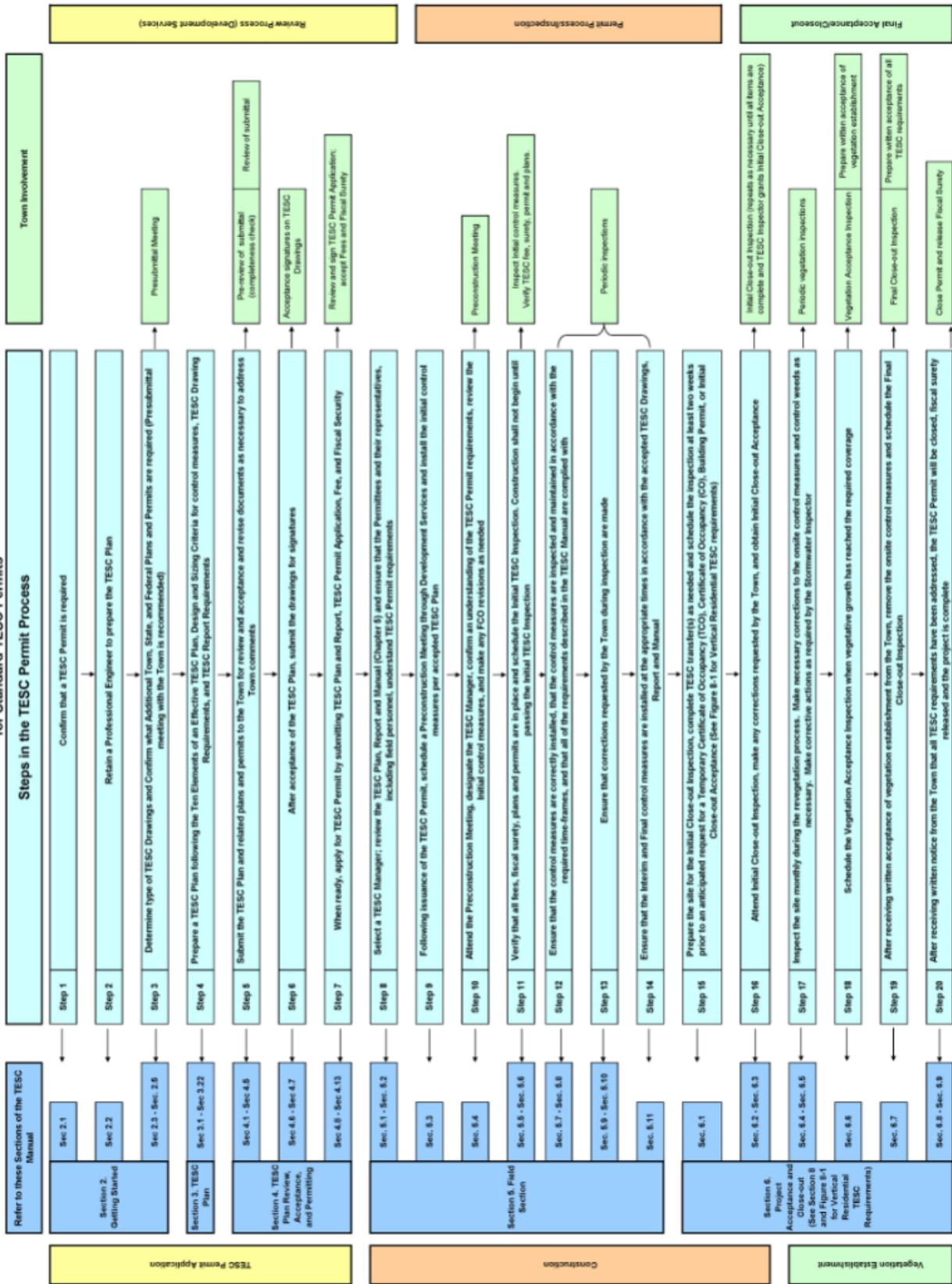
Stages of Development Process

**Town of Castle Rock
Stages of Development Process
Figure 1.1**



Section 1. Introduction

Figure 1.2
Town of Castle Rock TESC Permit Process
for Standard TESC Permits



Section 1. Introduction

Authorization of the TESC Manual

1.8

The *TESC Manual* is authorized by the Town of Castle Rock Town Council through Ordinance #2019-013 adopting the Town of Castle Rock Temporary Erosion and Sediment Control (TESC) Manual as a primary code.

1.8.1 Jurisdiction. The TESC 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 Director of Castle Rock Water, 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 Development Services, Castle Rock Water and the Public Works Department, shall enforce the provisions of the *TESC Manual*.

1.8.4 Review and Acceptance. The Development Services Department will manage the review of all TESC 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 record 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 *TESC 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 *TESC 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, 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**



The TESC Permit Program is designed to fulfill a legislative mandate and significantly reduce construction pollution.

Section 1. Introduction

Authorization of the TESC Manual, continued

govern. In the event that there is a discrepancy in the interpretation of the *TESC Manual*, the Director of Castle Rock Water shall have the final determination of the intent of the *TESC Manual*. Should a person disagree with a final determination by the Director, a written appeal may be submitted to the Town. If the Castle Rock Water Commission denies the appeal, the applicant can appeal to Town Council for a final ruling.

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

1.8.6 Relationship to Other Standards. 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. 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.

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.

1.8.7 Town of Castle Rock not Responsible. 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 Director of Castle Rock Water, Chief Building Official, Stormwater 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.

Overview of Section 2

2.0

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

Step 1. Confirm that a Standard TESC Permit is required.

Section 2.1, **Projects that Require a Standard TESC Permit**, identifies the kinds of projects that require a Standard TESC Permit.

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

Section 2.2, **Who Prepares TESC Plans?** confirms that the State Board of Registration has stipulated that a TESC 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 TESC Drawings and identify what additional Town, State, and Federal plans and permits are required for the project (a pre-submittal meeting with the Town is recommended).

Section 2.3, **Pre-submittal Meeting**, points out that an efficient way to clarify TESC 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 TESC Plan.

Section 2.4, **Types of TESC Drawings**, discusses the types of TESC 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, Staged and Phased, Vertical Residential, or Early/Rough Grading Final Drawing 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 TESC Plan, including the following:

- ◆ Construction plans for the project
- ◆ Drainage Plans
- ◆ Plot Plan (for residential construction projects). (Refer to Section 8 for Vertical Residential TESC Permitting)
- ◆ Landscape/Irrigation Plans
- ◆ Construction Permit
- ◆ Floodplain Development Permit

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

- ◆ Construction General Permit
- ◆ 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 Standard TESC Permit is Required.
Section 2.1 provides background information related to Step 1.

Projects that Require a Standard TESC Permit

Information *If a Low Impact TESC 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 Standard TESC Permit is required for the project. These TESC Permits apply to most land disturbing activities in the Town other than small (less than one acre) projects with negligible negative impact (requiring a Low Impact TESC Permit) and most agricultural or emergency activities (exempt activities).

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

Important! *If a TESC Permit is not required, the process described herein is not applicable; however, control measures 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 TESC Plan.
Section 2.2 discusses Step 2.

Who Prepares TESC 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 TESC 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 TESC Plan, but they must conduct their work under the supervision of the Design Engineer.



TESC 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 TESC plans. If the Design Engineer determines that any TESC requirements, as applied to their specific project, pose a safety hazard, it is the Design Engineer's responsibility to notify the Town of Castle Rock of

**Who Prepares TESC Plans?
continued**

these issues, as well as to recommend an approach to alleviate the concerns.

The Design Engineer is responsible for preparing the TESC Plan in accordance with the requirements of this *TESC 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 TESC 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.

Pre-submittal Meeting

2.3

Prior to preparing TESC 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 TESC Plan appropriate for a specific development site. The meeting will help to clarify the TESC 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 TESC Permit requirements.

It is anticipated that the Owner and/or the Design Engineer of the TESC 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 TESC permit.*
- ◆ *Anticipated plans and permits to accompany TESC Plan.*

Types of TESC Drawings

2.4

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

Table 2-1. Types of TESC Drawings for Standard TESC Permits

Type of TESC Permit	Type of TESC Drawing	Site Size Criteria	Drawing Format
Standard TESC Permit	Temporary Batch Plant	No size criteria	Projects shall be organized into an Initial (Site Plan) and Final (Reclamation) Plan.
	Small Site/Utility	Less than 1 acre	Initial, Interim, and Final Stage control measures 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 control measures 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 control measures on separate sheets.
	Vertical Residential Construction	No size criteria	Projects shall include all temporary control measures required to cover over-excavation and vertical construction activities shown on a single sheet. Lot level controls are designated by lot grading type (A or B) and corresponding Standard Detail.
	Early/Rough Grading Final	No size criteria	Projects shall be organized into Initial, Interim and Final (Reclamation) Plan separate from the Interim and Final Plans for Infrastructure.

A brief description of each type of TESC drawing follows.

2.4.1 Temporary Batch Plant TESC Drawing. Temporary Batch Plant TESC Drawings shall be organized into two stages. Initial control measures shall be shown on a Batch Plant Site Drawing and Final control measures 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 TESC 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).

Types of TESC Drawings, continued

2.4.3 Staged TESC Drawing. For disturbed areas greater than one acre, separate TESC 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.

2.4.4 Staged and Phased TESC 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 Stormwater 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 TESC Plan cannot 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.

2.4.5 Vertical Residential TESC Drawing. A separate standard TESC Drawing is required for each builder within a subdivision to cover vertical residential building in addition to a Standard TESC Plan for land development (See Section 3)

Other Town Plans and Permits

2.5

TESC 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 TESC Permit Process.

2.5.1 Complete Submittal Package. The TESC 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,

Other Town Plans and Permits

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. Over-excavation due to soil mitigation for pavement design requires an active TESC 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 TESC Permit. No ramps of dirt, gravel, asphalt, wood, or other materials are allowed in the curb section.

2.5.4 Drainage Plans. The TESC 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 TESC Plans, Low Impact TESC Plans or Temporary Stockpiles. At a minimum, the Phase II Drainage Plan shall be submitted, reviewed, and accepted by the Town before a TESC Permit is issued.

i At a minimum, the Phase II Drainage Plan shall be submitted, reviewed, and accepted by the Town before a TESC 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. TESC Plan control measures 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.

2.5.5 Plot Plan. A Plot Plan must be submitted to the Town of Castle Rock for all single-family 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 TESC Permit.

The objective of this permit is to ensure that the proposed project activities are in compliance with approved floodplain



Other Town Plans and Permits, continued

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 TESC 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.

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 Construction General Permit. 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 control measures 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)*, as amended, the surface stabilization measures identified for control of precipitation-induced erosion generally inhibit soils from becoming

**State Permitting,
continued**

windborne. However, measures and requirements to control airborne emissions shall be addressed in the TESC Plan. In addition, applicable State regulations pertaining to air quality shall be addressed.

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.



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

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 maprevision 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).

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

**Federal Permitting,
continued**

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*

Section 3. Preparing a TESC Plan

Overview of Section 3

3.0

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

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

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

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

Section Highlight – Standard Control Measure Drawings

A set of TESC Plan Standard Notes and Details, included in Appendix B, has been prepared to establish a consistent approach to control measure implementation in the Town. These shall be attached to each TESC Drawing set.

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

Section Highlight – Ten Elements of an Effective TESC Plan

These ten elements provide Design Engineers with a step-by-step approach for selecting control measures to include on a TESC Plan.

Section 3.14, **Special Requirements for Vertical Residential Construction**, describes erosion and sediment control requirements for Vertical Residential Construction.

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 measures to use for Temporary Batch Plants.

Section 3.17, **Design and Sizing Criteria for Control Measures**, identifies the design parameters to be specified for each control measure on the TESC Plan and provides criteria for sizing control measures.

Sections 3.18, 3.19, and 3.20, **Standard TESC Drawing Requirements, Report Requirements, and Submittal Requirements for Related Plans**, list detailed information to in-

Section Highlight – Example TESC Drawings

Several example sets of TESC Drawings have been prepared to illustrate the selection and depiction of erosion and sediment control measures and can be found in the appendices.

clude on the various TESC documents. A checklist of requirements is included in Appendix G.

Section 3.21, **Control Measure Cost Issues**, Cost issues associated with the installation and maintenance of control measures are discussed.

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

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

Principles of Erosion and Sedimentation

Once vegetation is removed, erosion proceeds unchecked.

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 control measures 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 District Volume 3*.

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:

Raindrop Erosion. Raindrops detach soil particles and splash them

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.

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.

Rill Erosion. As the flow changes from a shallow sheet to a concentrated flow, the

Principles of Erosion and Sedimentation, continued

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.



Rill erosion



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 TESC Plan will

focus on the following:

- Controlling erosion potential by limiting the area and duration of disturbance.
- Requiring timely re-stabilization 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 non-eroding 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.

Section 3. Preparing a TESC Plan

Principles of Erosion and Sedimentation, continued



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

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.

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, TESC 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.

Control Measures to Address Erosion and Sediment

3.2

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

Table 3-1. Erosion and Sediment Control Measures

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

Section 3. Preparing a TESC Plan

Control Measures 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.

All control measures shall be indicated in the TESC Plans as being part of the Initial Stage, Interim Stage or Final Stage of construction.

The Town of Castle Rock TESC Plan Standard Notes and Details provide permittee(s) with comprehensive installation and maintenance information for all of the control measures accepted for use in the Town.

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 TESC Plan Standard Notes and Details, included in Appendix B. To take less space on the drawing, control measures are called out on a TESC Drawing using the two or three letter identifier and symbol shown in the Legend.

3.2.2 Type of Control. Three general types of control measures are shown:

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

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

- Initial Stage. These control measures 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 control measures shall be based on proposed grades and drainage features and are installed after initial site grading. For some control measures such as Inlet Protection, interim controls are installed after the construction of site infrastructure.
- Final Stage. Control measures shown in the Final Stage TESC Drawing shall be installed as one of the last steps in the construction process, such as final seeding and mulching.

3.2.4 TESC Drawings are to Use the Standard Control Measures.

When preparing TESC Drawings, the Design Engineer shall use the standard control measures shown in Table 3-1. These control measures 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 control measures (the Town of Castle Rock TESC Plan Standard Notes and Details - see Appendix B), has been prepared to illustrate the control measures shown in Table 3-1. All TESC Plans shall also include a scale and north arrow.

Section 3. Preparing a TESC Plan

Control Measures to Address Erosion and Sediment, continued

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

If the Town approves additional control measures in the future (see Section 3.2.5), documentation of the additional control measures will be made available on the Town’s website (*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 *TESC Manual* that may be prepared prior to a complete updating of the *TESC Manual*.

3.2.5 Use of Alternative or Innovative Control Measures. The Town recognizes that there will be new advances in the development of erosion and sediment control measures 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 measures other than the standard control measures 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 control measure shall also be submitted. The pilot program, if allowed, shall be undertaken for no more than 12 months. If the Town finds the control measure to be effective at the end of the testing period, a revision to the *TESC Manual* may be considered (revisions will be made available on the Town’s website (*CRgov.com/TESC*) or at the Development Services Department to all holders of the *TESC Manual* for inclusion in Section 11).

The use of alternative or innovative erosion or sediment control measures 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 control measure proposed for the pilot program, either during the review period or during the field trial, if the pilot control measure does not perform with sufficient effectiveness. In the case of an unsuccessful field trial, one or more of the Town of Castle Rock standard control measures listed in Table 3-1 shall replace the failed pilot control measure at the Owner’s expense.

3.2.6 TESC Plan Standard Notes and Details. As discussed in Section 3.2.4, the Town of Castle Rock TESC Plan Standard Notes and Details, has been prepared to depict the control measures shown in Table 3-1. Construction details and notes provide direction to the permittee(s) regarding installation and maintenance requirements for each control measure. The Town of Castle Rock Standard Notes and

Control Measures to Address Erosion and Sediment, continued

Details shall be submitted with all TESC Drawings. They are available on the Town’s website (*CRgov.com*) or in Appendix B.

The TESC 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 TESC Plan Standard Notes and Details serve several purposes:

- ◆ **Increased consistency.** Consistent details and notes for a standard set of control measures will increase the likelihood that control measures 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 control measures, and as field personnel gain experience constructing the standard control measures, 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 TESC Plan to locate and size the control measures. This will reduce the likelihood that information needed on the plans will be missing or unclear, or that control measures are improperly sized.

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



The goal of TESC Plan Standard Notes and Details is to avoid the prevalence of improper control measure installations and insufficient maintenance.

Section 3. Preparing a TESC Plan

Ten Elements of an Effective TESC Plan



Information

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

3.3

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

Ten Elements of an Effective TESC 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 TESC 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 TESC Drawings. Figure 3.1 relates the Ten Elements to the example TESC Drawings.

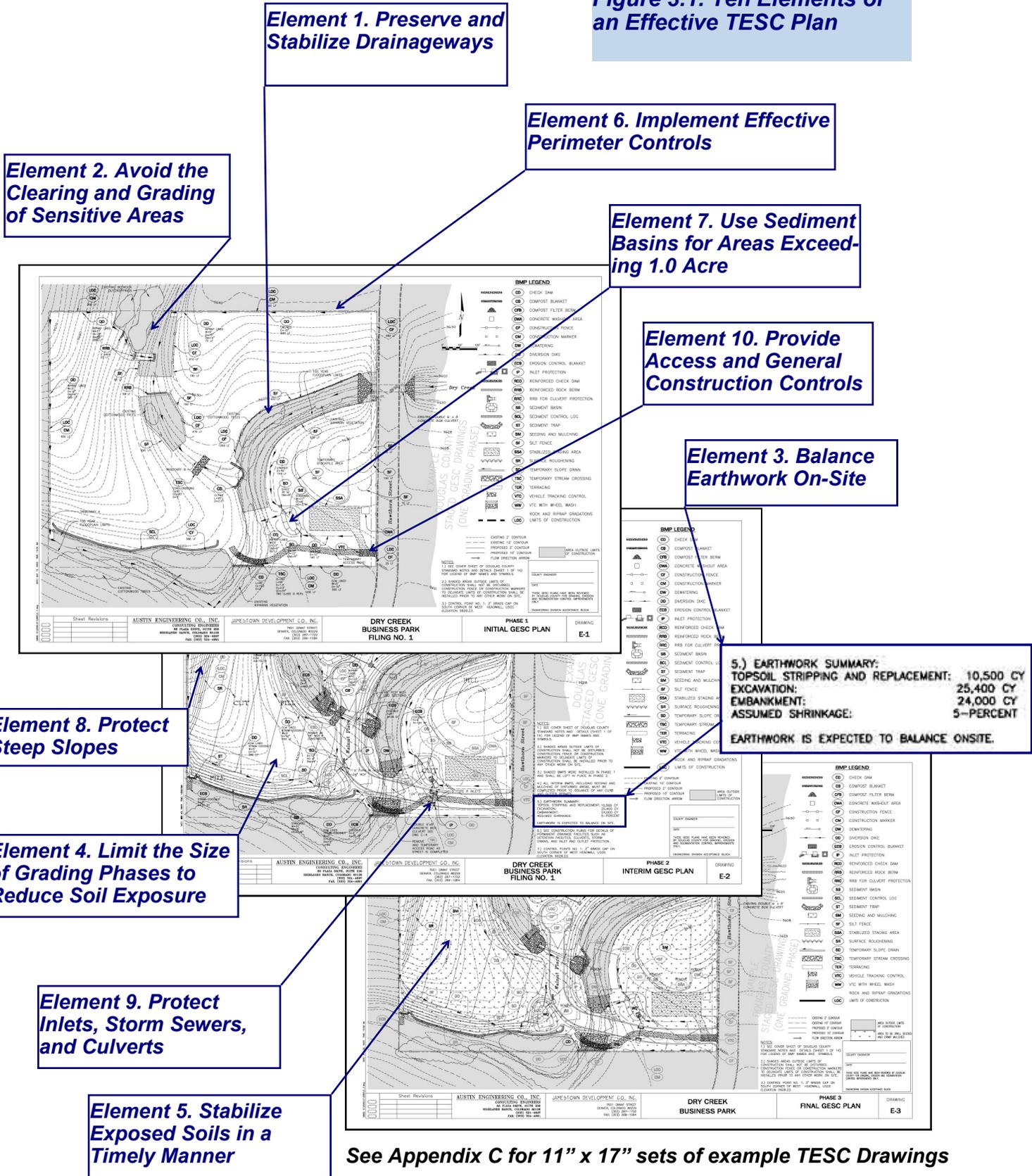
The following information has been included in the TESC Manual to assist the Design Engineer in developing an effective TESC Plan:

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

Section 3. Preparing a TESC Plan

Step 4. Prepare a TESC Plan following the Ten Elements of an Effective TESC Plan and Other Plan Requirements

Figure 3.1. Ten Elements of an Effective TESC Plan



Element 1. Preserve and Stabilize Drainageways

Element 2. Avoid the Clearing and Grading of Sensitive Areas

Element 6. Implement Effective Perimeter Controls

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

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 ONSITE.

See Appendix C for 11" x 17" sets of example TESC 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



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

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).

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.

Section 3. Preparing a TESC Plan

**Element 1.
Preserve and
Stabilize
Drainageways,
continued**

All existing drainageways on the site shall be delineated on TESC Drawings to the limit of their 100-year floodplains (based on future development peak discharges). Limits of construction shall be clearly shown on TESC 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.

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

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.

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

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

amended. **Under no circumstances shall broken up concrete or asphalt be used for bank stabilization.**

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 TESC 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**

Important! *What about straw bales?*

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



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, control measures 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, banks and all slopes equal to and steeper than 4:1. The Design Engineer shall indicate approximate limits of erosion control blanket on the TESC 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.*



**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.



Section 3. Preparing a TESC Plan

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:

- 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



Disturbance to sensitive resource areas shall be avoided or minimized.

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 TESC 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 TESC 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 TESC Drawings. To reduce impacts on Town roadways, development projects are encouraged to balance earthwork onsite.

**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
- TESC 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

TESC Drawings shall be prepared for the import or export site in accordance with the *TESC 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 TESC 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 TESC Drawings for each phase.
10. Ensure that the TESC 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 TESC 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 Stormwater 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 the Stormwater Inspector in writing of the other control measure(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 TESC 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 TESC 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 TESC Drawings. Adequate "footprints" for topsoil stockpiles shall be shown assuming stockpile slopes are no steeper than 3 to 1.

The control measures applicable to stabilizing exposed soils consist of **Surface Roughening (SR)**, **Seeding and Mulching (SM)**, **Erosion Control Blanket (ECB)**, and **Compost Blanket (CB)**.



Erosion control blanket protecting a slope.

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 control measure 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 control measures 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 control measures 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 control measures, a reinforced rock berm, sediment control log, and silt fence function best when installed level, on a contour. However, these control measures 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, control measures are to be configured to control erosion and sediment outside the limits of drainageways so that instream control measures 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 control measures 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.

3.10.1 Temporary Substitutes for Sediment Basins (SB)

Sediment Basins (SB) are required on all sites with disturbed areas larger than 1 acre. The permittee is responsible for installing and maintaining the sediment basin to the extent physically possible in sequencing and phasing of earthmoving operations. The Town understands that circumstances may exist where implementation of temporary sediment basins is unfeasible during certain phases of grading operations based on boundary conditions and other limitations outside the control of the permittee. In the event that implementation of standard sediment basins is anticipated to be physically unfeasible, the following constraints may be considered for the acceptance of substitute controls. Prior to commencing earthwork operations, an action plan (redlined TESC Plan) identifying the selected control measure(s) along with the timing of such controls shall be submitted to the Stormwater Inspector for acceptance. Generally, sites must either provide on-site volumetric treatment prior to discharge, ensure on-site retention to prevent untreated discharge or only in extreme and limited cases reduce discharge to the maximum extent through infiltration techniques as further outlined below:

1. Relocate and/or redistribute temporary sediment basins and diversion ditches as needed to accommodate phased grading operations. The overall volume requirements are to be maintained at designated discharge points as shown on the TESC Plan. This field change shall be documented on the TESC Plan and submitted to the Stormwater Inspector for acceptance prior to implementation.
2. Minimize discharge areas through on-site retention, but in no case allow more than 1 acre of concentrated runoff from the site at any one location without volumetric controls (i.e. direct flows to

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

temporary cut areas with volumes greater than or equal to 2.5 times the required sediment basin volume). Other temporary control measures such as silt fence, check dams, temporary sediment traps are to be implemented as needed for these smaller runoff areas prior to discharge. A redlined TESC Plan showing proposed areas, volumes, acreage and timing of this drainage control measure shall be submitted to the Stormwater Inspector for acceptance prior to implementation.

- 3. In some extreme cases and for limited periods of time during earthmoving operations, sites may encounter areas larger than 1 acre that have the potential to discharge from the site. After all other means have been exhausted, implementation of on-going deep surface roughening (furrows a minimum of 6"-12" deep) to reduce runoff from large disturbed areas may be the only drainage control possible. Deep surface roughening shall be refreshed on active grading areas at the end of each day until the sediment basin(s) are reinstalled. A redlined TESC Plan showing proposed areas, volumes, acreage and timing of this drainage control measure shall be submitted to the Stormwater Inspector for acceptance prior to implementation.

Ultimately, site drainage control is the responsible of the permittee to operate within the constraints of the TESC Permit and the approved TESC Plan. If at any time it is determined by the Stormwater Inspector that the site controls are inadequate, a stop work order may be issued until the necessary controls are implemented.

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).

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



Erosion Control Blanket (ECB) shall be used on slopes equal to or steeper than 4:1.

Element 8.
Protect Steep Slopes,
continued

Stormwater Division for approval. Slopes equal to or steeper than 4 to 1 shall be protected with **Erosion Control Blanket (ECB)**.

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 3.17.20.

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 control measures 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 TESC 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 runoff 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 TESC 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 stockpiles 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 measures 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 TESC 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 TESC 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 TESC Drawing.

3.14

Special Requirements for Vertical Residential Construction. See Section 8 for Vertical Residential Construction requirements.

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 TESC Plan for underground utility work should configure control measures to reduce the contamination of stormwater

**Special
Requirements
for Vertical
Residential
Construction**

**Special
Requirements
for Utility
Construction**

Special Requirements for Utility Construction, continued

runoff from construction erosion and sediment.

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

- Obtain TESC 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 *Transportation Design Criteria Manual*, 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 *TESC 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 TESC Permit (even if the plant is to be located inside the limits of construction of a TESC-permitted project).

TESC 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/TESC Permit renewal application may be considered for a Temporary Batch Plant/TESC Permit extension. The request for renewal shall be made no later than 30 days prior to the expiration of the Temporary Batch Plant/TESC Permit. All extensions are contingent on the applicant reapplying for the Temporary Batch Plant/TESC Permit and

Special Requirements for Temporary Batch Plants, continued

Design and Sizing Criteria for Control Measures

completion of a satisfactory site inspection to ensure that the site is in compliance with the Temporary Batch Plant TESC Plan. The license agreement from the property owner shall be resubmitted with the request for a time extension.



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

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

3.17

All of the design parameters outlined on the Town of Castle Rock accepted details shall be specified for each control measure selected, as indicated on the Town of Castle Rock TESC Plan Standard Notes and Details 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 control measure exists. Design guidance is provided in the following paragraphs for each of the Town of Castle Rock-accepted control measures.

3.17.1 Check Dam (CD) and Reinforced Check Dam (RCD). Design parameters to be specified on the plan-view TESC 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 non-reinforced **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 twenty acres.

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 two-year return period event for development conditions expected during the operation of the check dam.

Design and Sizing Criteria for Control Measures, continued

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

Design parameters to be specified on the plan-view TESC 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 TESC 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 TESC 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 TESC Drawings include the following items:

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

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.

Design and Sizing Criteria for Control Measures, continued

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 TESC 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 TESC Drawing Standard Notes and Details provided in Appendix B. Dimensions shall be specified to ensure that the ditch adequately conveys runoff from a two-year return period event for development conditions expected during the operation of the ditch. Ditches or drainageways conveying a two-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 TESC 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 two years for channel applications and twelve 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 sized for the shear stress from a two-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 equal to or steeper than 4:1, outside of drainageways. Concave slope areas that may concentrate sheet flows as well as all other drainage

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 two years.

Design and Sizing Criteria for Control Measures, continued

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 TESC 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

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.

Design and Sizing Criteria for Control Measures, continued

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 TESC Drawing.

Figure 3.2. Erosion Control Blanket Design Criteria

		Shear Stress, lbs/sf												
		0.25	0.5	0.75	1	1.25	1.5	1.75	2	2.25	>2.25			
Velocity, fps	1	All four types of ECB allowed					All but 100% straw allowed		Excelsior and 100% coconut allowed		100% coconut allowed		Outside allowable range	
	2													
	3													
	4													
	5													
	>5	Outside allowable range												

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.

3.17.8 Inlet Protection (IP). Inlet protection shall be shown on the plan-view TESC Drawings at all street and area inlets. The TESC 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 TESC 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).

Design and Sizing Criteria for Control Measures, continued

3.17.9 Reinforced Rock Berm (RRB). Design parameters to be specified on the plan-view TESC 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 two-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 twenty acres of upstream drainage area).

3.17.10 Sediment Basin (SB). Design parameters shall be specified on the plan-view TESC 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 TESC 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 fifteen acres, a *USDCM 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. As shown on the standard detail sheets, the standard sediment basin 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 forty 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.

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 forty-hours may be used as the sediment basin outlet as long as at least half of the

Design and Sizing Criteria for Control Measures, continued

sediment basin volume is provided below the lowest orifice of the permanent outlet works. The permittee is responsible for the removal and accumulated sediment prior to the completion of the permanent detention or water quality basin.

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

3.17.11 Sediment Control Log (SCL). Design parameters to be specified on the plan-view TESC 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.

3.17.12 Sediment Trap (ST). Design parameters to be specified on the plan-view TESC 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.

Design and Sizing Criteria for Control Measures, continued

3.17.13 Seeding and Mulching (SM). Design parameters to be specified on the plan-view TESC 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 TESC 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 TESC 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 two tons per acre and mechanically crimped into the soil. Revegetation is considered complete when the site is adequately covered with the variety

What about Hydraulic Seeding / Hydraulic Mulching?

Important! 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 TESC permitted projects.



Design and Sizing Criteria for Control Measures, continued

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.

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

3.17.14 Silt Fence (SF). Design parameters to be specified on the plan-view TESC 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 fifteen feet into the drainage “shadow” of the adjacent upslope section to ensure capture of all approaching sheet flow.
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.

Design and Sizing Criteria for Control Measures, continued

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 fifteen feet. In this case, the sections of silt fence will occupy a relatively

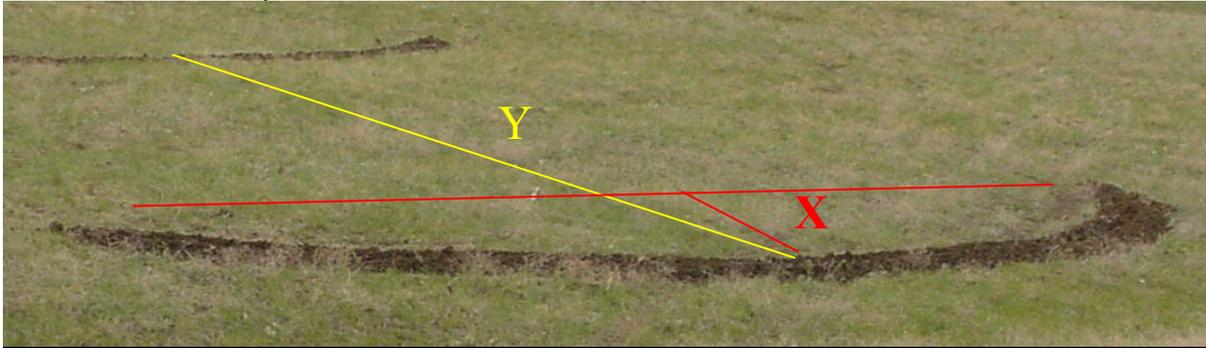


Table 3-4. Silt Fence on Slope

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

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).

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



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

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

Design and Sizing Criteria for Control Measures, continued

3.17.15 Temporary Slope Drain (TSD). Design parameters to be specified on the plan-view TESC 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 two-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 TESC 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 TESC Drawing.

3.17.18 Stream Crossing (SC). Design parameters to be specified on the plan-view TESC 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

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 two-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

Design and Sizing Criteria for Control Measures, continued

structural capacity of the crossing shall be the responsibility of the Design Engineer.

3.17.19 Temporary Road Crossing (TRC) Design parameters to be specified on the plan-view TESC Drawings include the following items:

- Location of road crossing

A location shall be selected that avoids disturbance of trees or desirable vegetation, or installing over inlets, ramps, manholes, valves and other surface utilities.

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

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

Terracing may be used on 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.

3.17.21 Vehicle Tracking Control (VTC). Design parameters to be specified on the plan-view TESC 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 TESC Plans, and are reviewed and approved as part of the TESC 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.

3.17.22 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 Stormwater Inspector, typically, only if vehicle tracking onto public streets becomes a major problem.

Standard TESC Plan Drawing Requirements

3.18

The following TESC Drawing requirements shall be adhered to when preparing a Standard TESC Drawing. Specific requirements vary based on the three types of Standard TESC Drawings described in Section 2. Drawing requirements for a Staged TESC Permit (separate drawings for the Initial, Interim, and Final Stages) are discussed in the following paragraphs. Requirements for Small Site and Utility TESC Drawings and Staged and Phased TESC Drawings are shown in Sections 3.18.9 and 3.18.10, respectively. Submittal requirements for the Temporary Batch

**Standard
TESC Plan
Drawing
Requirements,
continued**

Plant TESC Drawings, Early Grading TESC Drawings, and Temporary Stockpile TESC 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 TESC Drawing to ensure that each of the requirements is addressed.

All TESC 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 one-inch to twenty-feet up to one-inch to 100-feet, as appropriate, to clearly show sufficient detail for review. An example set of TESC Drawings for Staged/Phased permits is provided in Appendix C.

As discussed in Section 2.2, TESC 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 TESC Drawing Cover Sheet. A separate cover sheet is required for all TESC 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 *TEMPORARY 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 TEMPORARY EROSION AND SEDIMENT CONTROL CRITERIA, AS AMENDED. ADDITIONAL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES MAY BE REQUIRED OF THE PERMITTEE(S) DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED TESC PLAN DOES NOT FUNCTION AS INTENDED. THE REQUIREMENTS OF THIS TESC PLAN SHALL RUN WITH THE LAND AND BE THE OBLIGATION OF THE PERMITTEE(S) UNTIL SUCH TIME AS THE TESC PLAN IS PROPERLY COMPLETED, MODIFIED OR VOIDED.

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

THE *TEMPORARY EROSION AND SEDIMENT CONTROL*

**Standard
TESC Plan
Drawing
Requirements,
continued**

PLAN INCLUDED HEREIN HAS BEEN PREPARED UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH THE REQUIREMENTS OF THE *TEMPORARY EROSION, AND SEDIMENT CONTROL (TESC) 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 TESC 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 TESC Drawing. This drawing sheet shall provide temporary erosion and sediment controls for the initial clearing, grubbing and grading of a project. Control measures should generally be sufficient to cover construction activities through the completion of overlot grading. At a minimum, it shall contain:

1. Property Lines.
2. Existing topography at one- or two-foot contour intervals, extending a minimum of 100 feet beyond the property line.
3. Location of any existing structures or hydrologic features within the mapping limits.
4. USGS Benchmark and note that NAVD88-Datum was used for project.
5. 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.
6. Location of stockpiles, including topsoil, imported aggregates, and excess material.
7. Location of storage and staging areas for equipment, fuel, lubricant, chemicals (and other materials) and waste storage.
8. Outlines of cut and fill areas.
9. Summary of cut and fill volumes.

Standard TESC Plan Drawing Requirements, continued

10. Location of temporary roads.
11. Location of borrow or disposal areas.
12. Location, map symbol, and letter callouts of all initial erosion and sediment control measures.
13. Information to be specified for each control measure, such as type and dimensions, as called for in the Standard Notes and Details.
14. The Control Measure Legend from the cover sheet of the Town of Castle Rock Standard Notes and Details.
15. The following notes:
 - REMOVAL OF CONTROL MEASURES SHALL NOT OCCUR WITHOUT THE APPROVAL OF THE STORMWATER INSPECTOR.
 - ALL PAVED SURFACES MUST REMAIN FREE OF ALL SEDIMENT AND MAY REQUIRE STREET SWEEPING AT THE DISCRETION OF THE STORMWATER INSPECTOR.
16. Town of Castle Rock approval block.
17. Design Engineer sign-off block.
18. Other information as may be reasonably required by the Town of Castle Rock.

3.18.4 Interim TESC Drawing. This drawing sheet shows temporary erosion and sediment control measures during site construction. At a minimum, it shall contain the following information:

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 TESC Drawing. **These contours shall be screened.**
2. Location of all existing erosion and sediment control measures on site, as shown on the **Initial** TESC Drawing Sheet. **These control measures shall be screened. Dimension information for initial stage control measures shall not be shown.**
3. Items 1 and 4 through 10 from the Initial TESC Drawing (see Section 3.18.3).

In addition, the Interim TESC 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. Location of all interim erosion and sediment controls, designed in conjunction with the proposed site topography, but also considering the controls designed in the Initial TESC Drawing.
6. Location of all buildings, drainage features and facilities, paved areas, retaining walls, 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.
7. The Control Measure Legend from the cover sheet of the Town of Castle Rock Standard Notes and Details.
8. The following notes:

Standard TESC Plan Drawing Requirements, continued

- SHADED CONTROL MEASURES 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.
- REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL NOT OCCUR WITHOUT THE APPROVAL OF THE STORMWATER INSPECTOR.
- ALL PAVED SURFACES MUST REMAIN FREE OF ALL SEDIMENT AND MAY REQUIRE STREET SWEEPING AT THE DISCRETION OF THE STORMWATER INSPECTOR.

9. Town of Castle Rock acceptance block.

10. Design Engineer sign-off block.

3.18.5 Final TESC Drawing. This drawing sheet shows controls for final completion of the site including final stabilization and temporary sediment controls through revegetation. At a minimum, this drawing sheet shall contain the indicated information:

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

1. Existing topography in areas of proposed contours need not be shown.
2. Existing Initial and Interim control measures 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 control measures that are to be removed and any resulting disturbed area to be stabilized.
5. Location of all Final erosion and sediment control measures, 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 and pavement areas.
8. Show other control measures considered by the Designer Engineer to be appropriate.
9. Show the following control measures to be removed at the end of construction:

Standard TESC Plan Drawing Requirements, continued

- dewatering (DW)
 - temporary stream crossings (SC)
 - stabilized staging area (SSA)
 - vehicle tracking control (VTC)
 - construction fence (CF)
10. The Control Measure Legend from the cover sheet of the Town of Castle Rock Standard Notes and Details.
 11. Include the following notes:
 - SHADED CONTROL MEASURES WERE INSTALLED IN INITIAL OR INTERIM TESC 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
 - REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL NOT OCCUR WITHOUT THE APPROVAL OF THE STORMWATER INSPECTOR.
 - ALL PAVED SURFACES MUST REMAIN FREE OF ALL SEDIMENT AND MAY REQUIRE STREET SWEEPING AT THE DISCRETION OF THE STORMWATER INSPECTOR.
 11. Town of Castle Rock acceptance block.
 12. Design Engineer sign-off block.
 13. Other information as may be reasonably required by the Town of Castle Rock.

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

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

3.18.8 Drawing Requirements for Small Site and Utility TESC Drawings. These Drawing requirements are the same as for TESC 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 TESC Drawings. TESC Drawing requirements for Staged and Phased TESC Drawings are the same as for Staged Plans, except that each phase of construction (less than 40 acres of disturbance, or 70 acres for over-excavation projects) shall be shown separately (with Initial, Interim, and Final stages shown on individual sheets).

Standard TESC Report Requirements

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

3.19

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

3.19.1 TESC Projects that require a CDPHE General Permit. For TESC Projects that are also required to obtain a General Permit from the CDPHE, the State required Stormwater Management Plan (SWMP) can be utilized as the TESC 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 TESC 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 control measures - An opinion of probable costs for erosion and sediment control, including anticipated maintenance during the construction phase, shall be submitted with the TESC Drawing(s). This will be reviewed by Town staff and used as a basis for Fiscal Surety (discussed in Section 4.10 of this TESC 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 TESC projects that do not required a CDPHE General Permit. For TESC Projects that are not required to obtain a General Permit from the CDPHE, the applicant shall submit a TESC Report that contains the below information:

1. Name, address, and telephone number of the applicant – The name, address, and telephone number of the Design Engineer preparing the TESC Plan shall also be included, if different from the applicant.
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, related project reference, and project location.
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

Standard TESC Report Requirements, continued

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

The spreadsheet that shall be used for preparing the opinion of probable costs for erosion and sediment control is included in Appendix H.

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

Standard TESC Report Requirements, continued

14. Other information or data – As may be reasonably required by the Town of Castle Rock.
15. The following note – “THIS *TEMPORARY 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 *TEMPORARY EROSION AND SEDIMENT CONTROL* CRITERIA. ADDITIONAL 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 TESC Plan.

Submittal Requirements for Related Plans

3.20

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

- A TESC Drawing for the site in accordance with the requirements found in this *TESC Manual*. The Batch Plant TESC Drawing shall comprise two plan sheets, an Initial and Final TESC Drawing (example drawings are shown in Appendix D). The Initial Drawing shall utilize at a minimum the following control measures:
 - 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 (3.17.22) 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.

The Final TESC 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 controls and site reclamation.
- A lease agreement from the property owner (if applicable).

Submittal Requirements for Related Plans, continued

- A copy of all associated State and Federal permits.
- All access points to or from a construction site must be shown on the TESC Drawings and reviewed and approved as part of the TESC Permit. No ramps of dirt, gravel, asphalt, wood, or other materials are allowed in the curb section.

3.20.2 Submittal Requirements for Early Grading TESC Permits. As discussed in Section 2.5.1, the Town of Castle Rock generally discourages requests for Early Grading Permits-TESC Drawing reviews, followed by applications for a TESC 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.)

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 TESC 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 TESC 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 TESC Permit applications are considerably ahead of the formal Public Improvement Construction Plans.
- 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 TESC 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 TESC Drawing shall be submitted for review and acceptance. The Early Grading TESC Drawing Submittal shall include, but not be limited to, each of the following items:

- A detailed explanation why special consideration should be given

Submittal Requirements for Related Plans, continued

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

The review schedule for a Early Grading-TESC Drawing is the same as required when a TESC 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 TESC Drawing and applicable review and inspection fees may be required at the time of full submittal.

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 TESC 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.)

If the variance is accepted, TESC Drawings shall be prepared for the export site in accordance with the TESC Manual and applicable Fiscal Surety shall be required.

Submittal Requirements for Related Plans, continued

Submittal Requirements for Vertical Residential Construction

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 TESC Permit. At a minimum, a Phase II Drainage Report shall be approved prior to issuing an Early Grading TESC Permit.

3.20.5 Submittal Requirements for Vertical Residential Construction (for use on residential projects only).

To be submitted separate from the standard TESC Plan and at the time of Construction Drawing approval or prior to issuance of Building Permits. This drawing is to be prepared in a separate, stand-alone set and shall provide temporary erosion and sediment controls for Vertical Residential Construction following completion of subdivision improvements. Control measures should generally be sufficient to cover construction activities, including over-excavation, through the completion of all residential homes. At a minimum, it shall contain:

1. Only existing Final erosion control measures shall be shown, (screened; dimension information shall not be shown) including seeding and mulching, erosion control blanket and perimeter controls.
2. Cover sheet per Section 3.18.1.
3. Topography at one- or two-foot contour intervals.
4. Directional flow arrows on all drainage features.
5. Limits of disturbance required for all vertical construction activities
6. Shade all tracts and lots not owned by the permittee.
7. New control measures behind back of sidewalk and all abutting open tracts and existing sediment controls that will become the responsibility of the permittee shall be shown in bold.
8. Location of Staging Area(s), VTCs, Concrete Washout Area(s) and Stockpile Area(s). If these items are intended to be relocated throughout the construction process, show the initial location on the drawing.
9. Location of other control measures considered by the designer to be appropriate.
10. Label lot numbers, street addresses and lot grading type (A or B) on each lot. Interior lot control measures do not need to be shown as standard details for A and B lots are provided in the Standard Notes and Details.
11. The Control Measure Legend from the cover sheet of the Town of Castle Rock Standard Notes and Details.
12. Include the following notes:
 - CONTROL MEASURES INSTALLED PER FINAL TESC DRAWING TRANSFER TO THE PERMITTEE AND SHALL BE LEFT, OR REPLACED, UNTIL REVEGETATION ESTABLISHMENT IS APPROVED BY THE TOWN OR VERTICAL LOT CONSTRUCTION IS COMPLETE.

Submittal Requirements for Vertical Residential Construction, continued

- IF LOCATION(S) OF VTC(S), STOCKPILE(S), STAGING AREA(S) AND CONCRETE WASHOUT AREA(S) CHANGE DURING CONSTRUCTION, THE PERMITTEE SHALL REVISE THE DRAWING ACCORDINGLY AND MUST SHOW APPROPRIATE CONTROL MEASURES IMPLEMENTED AT ALL TIMES.
 - ALL STRUCTURAL CONTROL MEASURES MUST BE MAINTAINED IN EFFECTIVE OPERATING CONDITION AT ALL TIMES AND ARE SUBJECT TO INSPECTION AND ENFORCEMENT UNDER THE TESC PERMIT.
 - IF SEDIMENT 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 STORMWATER 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 MAY RESULT IN AN IMMEDIATE STOP WORK ORDER.
 - PERMITTEE SHALL ENSURE THAT ALL CONCRETE WASHOUT AREAS ARE PROPERLY INSTALLED, POSTED AND CLEANED SUCH THAT ALL WASTEWATER IS CONTAINED AND DOES NOT ENTER THE STORM DRAIN SYSTEM. FAILURE TO PROPERLY MAINTAIN CONCRETE WASHOUT AREAS SUCH THAT A DISCHARGE OCCURS WILL RESULT IN A STOP WORK ORDER AND/OR AN IMMEDIATE CLEANUP ORDER.
 - PERMITTEE SHALL ENSURE THAT ALL SANITARY FACILITIES ARE PROPERLY SECURED TO THE GROUND TO PREVENT TOPPLING AND DISCHARGE OF LIQUID WASTE. FAILURE TO PROPERLY SECURE SANITARY FACILITIES WILL RESULT IN A VIOLATION.
 - PERMITTEE SHALL ENSURE THAT THE TESC DRAWING REMAINS UPDATED WITH CURRENT FIELD CONDITIONS. FAILURE TO MAINTAIN THE TESC DRAWING MAY RESULT IN A VIOLATION.
 - REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL NOT OCCUR WITHOUT THE APPROVAL OF THE STORMWATER INSPECTOR.
13. FEMA Floodplain limits shall be shown if within planned or adjacent areas.
 14. Town of Castle Rock acceptance block.
 15. Design Engineer's signature block.
 16. Other information as may be reasonably required by the Town of Castle Rock.

**Control Measure
Cost Issues**

3.21

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

1. Installation of the control measures indicated on the Initial, Interim, and Final TESC Drawings according to the number, types, dimensions, and quantities called for.
2. Provision of TESC Manager (see Section 5.1 for a description of the TESC Manager role) to supervise, inspect, and interface with the Town on the project's TESC Drawing.
3. Installation of additional control measures that the permittee(s) think are appropriate or that are called for by the Stormwater Inspector to address actual site conditions. (As stated in Section 1.7, the TESC Permit process is a dynamic, not static, process; the permittee(s) are responsible for adapting the original TESC Drawing as necessary to effectively reduce erosion and sediment, and must comply with any modifications to the plan required by the Stormwater Inspector.)
4. Maintenance costs for control measures. 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 TESC Drawing. Appendix H provides approximate unit cost information that shall be used to generate a cost opinion.

Variances

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

3.22

The Town of Castle Rock may consider modifying criteria that are deemed inappropriate or too restrictive for site conditions. Variances 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 *TESC 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 Water Department and require approval by the Director or designee.

Section 4. Acceptance of TESC Plan and Applying for Permit

Overview of Section 4

4.0

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

Permit Step 5: Submit the TESC 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 TESC Plan**, describes procedures for submitting a TESC Plan.

Section 4.2, **Completeness Check**, states that TESC 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 TESC 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 TESC Plan based on the Town's comments.

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

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

Section 4.7, **Final Acceptance of the TESC Plan**, describes the Town signing process for the TESC Plan.

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

Section 4.8, **Applying for a TESC Permit**, discusses filling out the TESC 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 TESC Permit**, discusses the duration of TESC Permits and the need to renew TESC Permits prior to expiration.

Section 4.13, **Transfer of TESC Permits**, describes procedures for transferring a TESC Permit the permittee(s) change during the life of a TESC Permit..

Permit Step 5: Submit the TESC 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 TESC Plan

4.1

After the TESC 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 pre-submittal meeting with the Development Services Department.

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

Completeness Check

4.2

During the pre-submittal meeting, the Town shall pre-review the TESC 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

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.

returned to the Design Engineer. This process shall be repeated until a complete TESC plan set is submitted to the Town. The review period on a TESC Plan shall not start until a complete TESC plan set is submitted.



TESC Plans will undergo a completeness check.

Detailed Review by Town Staff

4.3

The TESC 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 passing the completeness check, TESC Plans will receive a detailed review by Town staff.

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

Review Schedule

Revisions to Plan Based on Town Comments

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

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.

4.5

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

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

If review comments are not addressed, the TESC 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 TESC Plan. This may help to resolve issues quickly and avoid multiple reviews and resubmittals.

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

Preliminary Acceptance of the TESC Plan

4.6

When all TESC Plan review comments are addressed, the Applicants will be notified by the Town that the TESC Plan is preliminarily accepted (final acceptance occurs when the TESC Plan is submitted to the Town and signed by Castle Rock Water and the Development Services Department).

The TESC Plan shall be signed and stamped by a Professional Engineer registered in the State of Colorado.

Final Acceptance of the TESC Plan

4.7

Signed TESC Plans. The TESC Plan will be considered accepted when signed by Castle Rock Water and the Development Services Departments. Applicants will be notified by the Town when the TESC plans have been signed.

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

Applying for a TESC Permit

4.8

Once the Town has notified the Applicant that the TESC Plan is accepted, the Applicant may apply for a TESC Permit. The information required on the Standard TESC 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 TESC Permit by submitting the TESC Permit Application, Fee and Fiscal Surety. Sections 4.8 through 4.13 discuss Step 7.

The most current Standard TESC Permit Application is available on CRgov.com/TESC.

When the TESC Plan is accepted by the Town , the applicant shall submit the following to obtain a TESC Permit.

1. *An electronic copy of the approved TESC Drawings, signed TESC Report.*
2. *Completed TESC Permit Application (see CRgov.com/TESC).*
3. *Permit fees paid in accordance with Section 4.9.*
4. *Fiscal Surety provided in accordance with Section 4.10.*

Permit Fees

4.9

Permit fees are to be paid to a Technician at the Development Services Department of the Town. Fees may be paid by check, cash or credit card. Fees for a TESC Permit are calculated based on the Development Fee Schedule, as amended and are collected to offset costs of administrating the TESC 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 Standard TESC Permit post Fiscal Surety.

The conditions under which the TESC Fiscal Surety is held is separate from any other surety relating to the project site's Public Improvement

Posting Fiscal Surety, continued

Construction Plans, or any other permits relating to the site and is held and released separately.

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

The probable cost worksheet shall be completely filled out and submitted as part of the TESC Report (see Section 3.19 for TESC 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:

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 TESC Permit. Cash deposits will be held in a non-interest-bearing account. The Town requests that the property owner, and not a contractor, post the Fiscal Surety as they have legal control of the property and contractors often change throughout the duration of the project.

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

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

should allow for completion of all TESC 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 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 may result in the Town drawing upon the Fiscal Surety.

4.11 Section Removed.

4.12

A TESC 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 TESC Permit must be renewed.

Duration of TESC Permits

Duration of TESC Permits, continued

4.12.1 Permit Renewal and Expiration. Permittee(s) shall have a valid TESC Permit until Final Close-out Acceptance (after vegetation is established).

If active construction of the project takes longer than one 1 year and/or revegetation process takes longer than two years, the permittee shall renew the TESC Permit a minimum of fourteen (14) days prior to the expiration date. Failure to extend the permit during active construction may result in a Stop Work Order.

During active construction, the TESC Permit can be extended in monthly increments. During revegetation, the TESC Permit can only be extended in yearly increments.



Transfer of TESC 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 TESC Permit is replaced by a different Contractor, the TESC Permit shall be transferred to the new Owner and/or Contractor. The transfer shall require a new TESC 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 TESC Permit if the Owner or Contractor changes may 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 TESC Permit and Fiscal Surety within thirty (30) days of the sale of the property are subject to Default per Section 6.9.1.



Transfer of Ownership for Vertical Residential Construction. For lots that have been sold to one or more Builders for the purpose of vertical residential construction, the TESC Permit shall be transferred as follows:

- TESC Permit responsibility within buildable lots and the protection of all downstream drainage systems becomes the responsibility of the new property owner(s). For each builder within the permit area, a new TESC Permit is required. Refer to Section 8 for TESC Permit requirements for vertical residential construction. No builder permits will be issued until the requirements of Section 8 have been achieved for each builder.
- TESC 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 Development 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.

Section 5. Field Section

Overview of Section 5

5.0

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

Step 8. Select a TESC Manager; review the TESC Plan, Report and Manual (Chapter 5) and ensure that the permittees and their representatives, including field personnel, understand the TESC Permit requirements.

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

Section 5.2, **Understanding the Requirements of the TESC Plan**, describes the requirements of the permittee(s) prior to the Preconstruction Meeting, including selecting the TESC Manager, thoroughly reviewing the TESC Manual, TESC Plan, TESC 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 TESC Plan throughout construction.

Section Highlight – Implementing the TESC Plan is a Dynamic Process

Implementing the TESC Plan is a dynamic, not static, process. The permittee(s) are responsible for adapting the original TESC 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. Following issuance of the TESC Permit, schedule a Preconstruction Meeting through Development Services and install the initial control measures per accepted TESC plan.

Section 5.3, **Preparation for the Preconstruction Meeting**, summarizes the activities to occur concurrently with the meeting which include: obtaining a Traffic Control Plan approval and the installation of Initial control measures. Other than the installation of the Initial control measures, no other construction shall start prior to the Preconstruction Meeting.

Section 5.7, **Correct Installation and Maintenance of Control Measures**, provides installation and maintenance information for the Town accepted erosion and sediment control measures.

Step 10. Attend the Preconstruction Meeting, designate the TESC Manager, confirm an understanding of the TESC Permit requirements, review the initial control measures, and make any Field Change Order (FCO) revisions as needed.

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

Step 11. Verify that all fees, fiscal surety, plans and permits are in place and schedule the initial TESC inspection. Construction shall not begin until passing the initial TESC inspections.

Section 5.5, This Section provides guidance for passing the initial TESC inspection, the duration that the TESC Permit is valid, and procedures for transferring the TESC 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 control measures are correctly installed, are inspected and maintained in accordance with the required timeframes, and that all of the General Construction Requirements described in the TESC Manual are complied with.

Section 5.7, **Correct Installation and Maintenance of Control Measures**, provides installation and maintenance information and shows photographs of field installations of each of the Town's Standard Erosion and Sediment Control measures. 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 TESC Notes shown on Sheet 1 of the Town of Castle Rock TESC 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 TESC Inspection Process**, discusses Inspection related to the Town TESC 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 TESC 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 TESC Permit reinstated and pay the TESC Permit fee at the Town of Castle Rock Development Services Department.
- ◆ Schedule a site inspection with the Stormwater Inspector through the Water Department.
- ◆ Obtain the reinstated TESC Permit after approval of the corrected work from a Stormwater Inspector.



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

Section 5.11, **Installation of Interim and Final Control Measures**, discusses the general schedule for installing Interim and Final control measures.

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

The TESC Manager

5.1

5.1.1 Responsibilities of the TESC Manager. As the permittee(s)' focus shifts from applying for the TESC Permit to constructing the project, the first task is to select a TESC Manager. The TESC Manager is the permittee(s)' contact person with the Town for all matters pertaining to the TESC Plan and Permit. The TESC 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 TESC Permit; however, the permittee(s) shall remain the legally responsible party. The TESC Manager shall respond to requests made by the Town staff and have any deficiencies in the work corrected.

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

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

5.1.3 Availability of the TESC Manager. The TESC Manager shall be present at the project site a majority of the time and (along with the Alternate TESC Manager) shall provide the Town with a 24-hour emergency contact number. In the event the TESC Manager (or Alternate TESC Manager) is not on site, and cannot be reached

during any level of violation (see Section 5.10.2), a Stop Work Order may be issued.



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



The TESC Manager shall always be available on site or by phone for communications with the Stormwater Inspector.

Understanding the Requirements of the TESC Plan

5.2

5.2.1 Implementing the TESC Plan in the Field. Constructing the project and implementing the TESC Plan in the field is a challenging part of the TESC Permit Process. The TESC 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 TESC 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 reseeded, 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 TESC Permit fee or reinspection fee.*

5.2.3 Review of the TESC Manual, TESC Plan, and Related Plans and Permits. Prior to the Preconstruction Meeting, the TESC Manager shall thoroughly review the TESC Manual, TESC 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 TESC Plan in Section 3 would provide valuable insight. It is the TESC Manager's responsibility to understand all of the requirements of the TESC Permit Process as laid out in these documents. In addition, it is the TESC Manager's responsibility to ensure that other field personnel are aware of the TESC requirements.

The Town of Castle Rock welcomes calls from permittee(s) during this process to answer any questions that the TESC Manager or other permittee staff may have regarding the TESC Permit Process.

Understanding the Requirements of the TESC Plan, continued

5.2.4 Documents that Shall Remain On-Site. TESC Drawings, Report, Standard Notes and Details, and any project permits shall remain on the site at all times.

Permit Step 9: Install the Initial control measures as shown on the approved TESC Drawings and schedule a Preconstruction Meeting with the Town.
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 *Transportation Design Criteria Manual*, as amended. All access points to or from a construction site as approved in the TESC 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 Scheduling the Preconstruction Meeting. The permittee(s) shall contact the Town of Castle Rock Development Services Department (see contact information in Appendix A) to schedule the Preconstruction Meeting. Please allow for at least three business days to schedule a preconstruction meeting.

5.3.4 Construction Shall Not Start. Other than the installation of the initial control measures shown on the approved TESC Plan, no stripping operations, haul road grading, utilities, foundation work or other construction shall occur.

5.3.5 Installation of Initial Control Measures. The Initial control measures shown on the TESC Drawings may be installed prior to the Preconstruction Meeting. The Initial control measures are shown on the Initial TESC Drawing and are indicated as "Initial" when shown on a combined Small Site and Utility TESC Plan.

No formal notification needs to be given to the Town to install the Initial control measures. However, the approved TESC Drawings must be in hand and all of the requirements of the TESC Manual and TESC Plan, including the Standard Notes and Details, shall be complied with. See Section 5.7 for a description of proper installation and maintenance of control measures.



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

Permit Step 10: Attend the Preconstruction Meeting, designate the TESC Manager, confirm an understanding of the TESC Permit requirements, review the Initial control measures, and make any Field Change Order (FCO) revisions as needed.
Section 5.4 discusses Step 10.

Preconstruction Meeting

5.4

5.4.1 Attendees at the Preconstruction Meeting. The Preconstruction Meeting is a critical milestone prior to the start of construction. In addition to the Stormwater 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. **TESC Manager and Alternate TESC 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 TESC Plan are necessary).

Important! *If one of the mandatory attendees does not attend the Preconstruction Meeting, or if the accepted TESC Plans are not in the TESC Manager’s possession, 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.

1. **Introductions.** Introductions of all attendees, including the TESC Manager and Alternate TESC Manager, will take place.
2. **Contact Information.** Attendees will exchange contact information.
3. **Review of TESC Manual.** The Stormwater Inspector will confirm the permittee(s)’ understanding of the TESC Manual.
4. **Review of TESC Drawings and Report.** The TESC Drawings for all stages and phases will be reviewed to confirm the attendees’ understanding of the TESC Plan and to discuss any modifications to the plan. If modifications to the TESC 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. **Coordination with Public Works Inspector and Public Improvement Construction.** Discuss timing, scheduling, and any other coordination issues relating to the TESC and public improvement construction and permits.
6. **TESC Permit.** Verify that all fees, fiscal surety, plans and permit are in place. If any one of these items is missing, the permittee must demonstrate compliance prior to scheduling the Initial TESC inspection.

Preconstruction Meeting, continued

5.4.3 Field Change Orders (FCO). If modification to the TESC Plan is required to provide for a more effective plan, the permittee(s) shall contact the Design Engineer and the Stormwater Inspector to discuss the change. Minor modifications that include relocation or reconfiguration of approved control measures generally will only require a redline markup of the drawings. More substantial engineering modifications will require formal plan submittal through the FCO process.

If a FCO is required, the permittee shall submit a FCO application along with a modified plan, to the Development Services Department (see contact information in Appendix A) to obtain review and acceptance of the proposed modifications prior to installing the proposed control measures. FCOs shall be stamped by the Design Engineer. Modifications in excess of 10% of the surety require a surety adjustment.

Permit Step 11: Schedule the Initial TESC Inspection, make any corrections and once passed, construction may start.
Section 5.5 and Section 5.6 discuss Step 11.

Initial TESC Inspection

5.5

5.5.1 Initial TESC Inspection. Contact the Stormwater Inspector to request inspection once Initial control measures are installed. The initial TESC inspection may occur concurrently with or following the preconstruction meeting. The TESC Permit must be issued prior to inspection. This includes paying the permit fee and providing fiscal surety.

A visual inspection of all of the Initial control measures that have been installed will take place before any construction begins. The Stormwater Inspector will confirm if any corrections are required. If the Initial control measures are accepted by the Stormwater Inspector, as is or with minor corrections, the Stormwater Inspector will inform the permittee(s), **Construction shall not start until the Initial TESC inspection is passed.**



5.4.3 Corrections to the Control Measures. If the Stormwater Inspector determines that significant modifications or corrections to the control measures are necessary, the Stormwater 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 control measures by the Stormwater Inspector shall take place prior to any additional inspections. (Modifications to the TESC Plan will, in most cases, require acceptance of the Design Engineer who signed and stamped the TESC Drawings and require a FCO). The re-inspection requires one-day notice and shall be scheduled through the Stormwater Inspector.

5.5.2 Duration of TESC Permit. A TESC 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 TESC permit must be renewed. A TESC Permit shall be renewed



Start of Construction

prior to its expiration. The permittee(s) shall contact the Town and start the renewal process at least thirty (30) days prior to the original TESC Permit's expiration date.

If the permittee(s) do not extend the permit prior to the expiration date, the permit will be automatically renewed for 1 year per the Development Services Fee Schedule. This fee will need to be paid prior to release of any fiscal surety. Permittee(s) shall have a valid TESC Permit until all areas of a project are transferred to another TESC Permit, or until Final Close-out Acceptance (after vegetation is established).

5.5.3 Transfer of a TESC Permit. If a project or portion of a project is sold to a new Owner, or if the Contractor that is identified on the TESC Permit is replaced by a different Contractor, the TESC Permit shall be transferred to the new Owner and/or Contractor. The transfer shall require a new TESC 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 TESC Permit if the Owner or Contractor changes may result in issuance of a Stop Work Order per Section 5.10.3. Refer to Section 4.13 for more information on transfer of ownership.

5.6

5.6.1 Topsoil Stripping. With the executed TESC Permit on site and completion of the Initial TESC inspection, 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 Stormwater 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 TESC Drawings.

5.6.3 Inadequate Topsoil. 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 or be required to test the soil and amend in accordance with lab recommendations.

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.

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

Correct Installation and Maintenance of Control Measures

5.7

The overall effectiveness of the TESC Plan depends on the correct installation and maintenance of control measures. With this goal in mind, the Town has prepared the TESC Plan Standard Notes and Details, a set of drawings that identifies correct installation and maintenance procedures for all of the Town-accepted control measures. These drawings are provided in Appendix B. They are to be included in all TESC Plans and govern all TESC-Permitted construction work in the Town. The Standard Notes and Details allow Design Engineers and Permittee(s) to become familiar with one set of control measures and consistent installation and maintenance requirements.



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

Following are brief descriptions of the standard erosion and sediment control measures accepted for use in the Town and some of the important installation and maintenance requirements found in the TESC Plan Standard Notes and Details. Example photographs illustrating correctly installed control measures and practices to avoid are included.

Correct Installation and Maintenance of Control Measures, continued

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

Key Installation and Maintenance Requirements:

- Riprap utilized for check dams shall have a median stone size of 12".
- Riprap pad shall be trenched into the ground a minimum of 1'-8".
- The ends of the check dam shall be a minimum of 1'-6" higher than the center of the check dam.
- The TESC 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 1/2 of the height of the crest.



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



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



Properly installed check dam.



Correct Installation and Maintenance of Control Measures, 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 control measure 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 two 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.



DONT 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 Control Measures, 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 5.7.23) 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 Control Measures, 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.



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



This construction fence is in need of repair. Inspections shall be made daily and downed sections repaired immediately.

Correct Installation and Maintenance of Control Measures, 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 TESC 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 Stormwater Inspector.
- Dewatering operations shall use one or more of the dewatering sumps shown in the TESC 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 TESC 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 Control Measures, 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 twelve inches.
- The TESC 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 Control Measures, 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 TESC 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 TESC 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 Control Measures, 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 TESC 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 six-inch centers along all joints and at two-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 TESC 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 TESC 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.



Section 5. Field Section

Step 12. Ensure Control Measures are Correctly Installed and Maintained and that General Construction Requirements are Complied with



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



This inlet protection is overdue for sediment removal.



DO Properly installed area inlet protection.



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



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



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



**Correct Installation
and Maintenance
of Control
Measures,
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 overtopping, that is placed in a major drainageway (upstream watershed area in excess of 100 to 130 acres). Like a check dam, the purpose of the reinforced check dam is to trap sediment in the backwater zone upstream of the check. The reinforcement increases the ability of the rock dam to withstand the larger overtopping flows of major drainageways.

Key Installation and Maintenance Requirements:

- The check dam shall be trenched into the ground a minimum of 1'-6".
- Erosion control blanket shall be placed in the reinforced check dam trench extending a minimum of 1'-6" on both the upstream and downstream sides of the reinforced check dam.
- Gabions shall have galvanized twisted wire netting with a maximum opening dimension of 4 ½" and a minimum wire thickness of 0.10". Wire mesh shall be secured using "Hog Rings" at 4" spacing, or other approved means shall be used at all gabion seams and to secure the gabion to the adjacent gabion.
- Riprap utilized for check dams shall have a D₅₀ median stone size of 12".
- The TESC 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 removed 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 drainageways to resist breaching from overtopping flows.

Correct Installation and Maintenance of Control Measures, 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 TESC 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 TESC Manager shall inspect reinforced rock berm weekly and during and after any storm event and make repairs or 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 Control Measures, 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 TESC 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 TESC Manager shall inspect reinforced rock berm weekly and during and after any storm event and make repairs or 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 Control Measures, 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 TESC Plan Standard Notes and Details.
- A gravel pack of 1-1/2-inch rock around the pipe outlet shall be provided.
- The TESC 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-foot 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 Control Measures, 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 TESC 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 Control Measures, 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 TESC Manager shall inspect the sediment trap weekly and during and after any storm event and make repairs or clean out as necessary.



A properly installed sediment trap.

Correct Installation and Maintenance of Control Measures, 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. Temporary Nurse or Cover Crop (grass species which will establish quickly however are sterile and will therefore not re-germinate) is prohibited in the Town of Castle Rock.

Key Installation and Maintenance Requirements:

- All areas to be seeded and mulched shall have native topsoil spread to a depth of at least 6-inches (loose depth). All disturbed areas shall be loosened to a depth of 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.



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

- Seasonal weather conditions should be taken into consideration when scheduling seed and mulch installation. Coordinate with Castle Rock Water's Conservation Division for guidance. Generally, if a Red Flag Warning and/or local fire restriction has been issued, no seeding shall be commenced until such time that the warnings/restrictions are released.

- 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.



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.*

- Temporary irrigation systems shall require an irrigation permit which can be obtained through Castle Rock Water.
- 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.
- 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.

Correct Installation and Maintenance of Control Measures, continued

5.7.15 Seeding and Mulching (SM), continued.

- Hydraulic seeding and mulching is not an accepted method of seeding and mulching in the Town of Castle Rock. However, drill seed with hydraulic mulching will be considered on a case-by-case basis with prior approval from the Stormwater Inspector.
- Copies of seed tickets shall be provided to the Stormwater 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 *TESC Manual* for a definition of required vegetation coverage.



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



Hydraulic seeding/mulching is not allowed.



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

Correct Installation and Maintenance of Control Measures, 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 TESC 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 control measures 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 Control Measures, 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.
- Stabilized staging area shall be connected to a VTC entrance/exit point.



DO Properly installed stabilized staging area.



DO NOT Parking, staging, and storage are spread out all over this site, increasing disturbance and erosion.

Correct Installation and Maintenance of Control Measures, 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 TESC 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 Control Measures, continued

5.7.19 Temporary Road Crossing (TRC). A temporary road crossing is a location where cut and fill grading operations need to occur on both sides of an existing road.

Key Installation and Maintenance Requirements:

- Avoid installing temporary road crossings over inlets, rams, manholes, valves and other surface utilities.
- Contact Public Works to obtain a street closure permit. Street will be closed to all traffic except emergency vehicles.
- Access over the crossing on the existing road must be maintained at all times for emergency vehicles.



 *Improperly installed temporary road crossing without emergency access ramp.*

Correct Installation and Maintenance of Control Measures, continued

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

Key Installation and Maintenance Requirements:

- A riprap pad shall be placed at the outfall of the slope drain.
- The TESC 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 Control Measures, continued

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

Key Installation and Maintenance Requirements:

- Permittee(s) shall confirm that all related stream permitting is obtained prior to installing temporary stream crossings and that all work will be in compliance with such permitting (see Sections 2.5.6 and 2.7.2).
- The TESC 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 crossing.



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

Correct Installation and Maintenance of Control Measures, continued

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

Key Installation and Maintenance Requirements:

- The TESC 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.*

Section 5. Field Section

Correct Installation and Maintenance of Control Measures, continued

5.7.23 Vehicle Tracking Control (VTC). Vehicle tracking control consists of a 3 to 6 inch crushed rock pad 12 inches thick at all entrance/exit points for a site, that is intended to help strip mud from tires prior to vehicles leaving the construction site. Access to the site may only be taken at a permitted access point, as approved in the TESC 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, boulders or crushed concrete is not 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 TESC Manager shall inspect the VTC daily and during and after any storm event.



DO NOT 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.

DO Properly installed vehicle tracking control.



DO NOT No vehicle tracking control means mud on streets and an immediate Stop Work Order.



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



Correct Installation and Maintenance of Control Measures, continued

5.7.24 Vehicle Tracking Control with Wheel Wash (WW). Wheel wash consists of a gravel and riprap pad at the main entrance/exit point for the site with an adjacent washwater/sediment trap. If the Town of Castle Rock requires a contractor to implement this control measure, 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 TESC 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.

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 of construction is considered a Level I Violation subject to a Stop Work Order. The Permittee(s) shall obtain written approval for use of any adjacent property for stockpiling, etc. from the legal owner and the Town of Castle Rock, and shall provide erosion and sediment control measures for the adjacent area.



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



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



5.8.2 Street Cleaning.

Streets shall be kept clean throughout the life of a project. The Permittee must have adequate equipment on-site, including commercial street sweeper(s) during active hauling operations. 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.

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



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



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

General Construction Practices, continued

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



5.8.4 Stockpiles. Stockpile areas for stripped topsoil, excess excavated material, and other materials shall be located within the limits of construction and at least 100-feet from the banks of a drainageway. Stockpile areas shall be sized to fully contain the material based on maximum allowable stockpile side slopes of 3 (horizontal) to 1 (vertical). Soils that will be stockpiled for more than 30-days shall be seeded and mulched within 14-days of stockpile construction.

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



As stated in Section 5.6, topsoil shall be stripped from all disturbed areas of a site and stockpiled prior to other construction work on the site. Failure to strip and stockpile topsoil may 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 TESC Permit and Authorization for Haul Route will result in the issuance of a Stop Work Order. A TESC 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.

Subgrade areas to receive embankment material shall be prepared by removing vegetation and any organic material,

**General
Construction
Practices,
continued**

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 issued a positive determination, based upon review of an engineering design and operations report prepared and submitted by the owner.

Recycled fill material that contains concrete, asphalt, or other non-earthen material may be 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 base flows 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 stormwater runoff from the installation and maintenance of underground activities.

General Construction Practices, continued

Utility line installation shall comply with the following:

- All utility work within a Town of Castle Rock Right of Way shall be required to obtain a Town of Castle Rock Public Works Permit in accordance with the *Transportation Design Criteria Manual*, 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 TESC Plan Standard Notes and Details in Appendix B).
- All other applicable criteria as outline in the *TESC 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 registered 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

General Construction Practices, continued

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.

Fueling and vehicle maintenance operations shall take place in the stabilized staging areas (SSA).



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 construction workers. Sanitary facilities shall be located in the stabilized staging area (SSA) away from drainageways. Sanitary facilities shall never be placed in the right-of-way or near storm sewer inlets and shall be properly secured to prevent toppling.



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.



This sanitary facility is located too close to a storm inlet.

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. 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 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 TESC Inspection Process

The Owner's signature on the TESC 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 TESC Inspections. During the construction phase, erosion and sediment controls will be inspected regularly by a Stormwater Inspector. Stormwater 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. Stormwater Inspectors will coordinate with the TESC Manager, whose responsibility it is to ensure that the site remains in compliance with all TESC requirements.

Besides observations by Stormwater 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 Stormwater Inspector to schedule the following mandatory inspections:

1. Inspection of Initial control measures.
2. Any time during construction when a new TESC Manager or Alternate TESC Manager is chosen.
3. Prior to issuance of a Construction Permit for construction of any public improvements (curb, gutter, waterlines, sidewalk, sanitary sewers, paving roadways, etc.).
4. Prior to flushing of water lines.
5. 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 transfer of the TESC Permit to a new owner.
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 control measures.
8. Final Close-out Inspection (after vegetation has been accepted and sediment controls have been removed or after the last CO on vertical residential construction projects).
9. For Staged and Phased TESC Plans where more than forty acres needs to be disturbed (seventy acres for soil mitigation) and where work occurs in multiple grading phases, the following inspection process is required:

The Stormwater Inspectors regulate erosion and sediment control requirements for residential projects from the commencement of the overlot grading operations through Final Acceptance and closeout of the TESC Permit once the site meets vegetation requirements in Section 6.4.

Mandatory Inspections for Staged and Phased Projects:

1. A phased project starts in the same manner as any other TESC permitted project, with the installation of the Initial control measures as shown on the Initial TESC Drawing. The difference is that only the Initial control measures for Phase I need to be installed and inspected in order to obtain the TESC Permit.
2. Once the Permittee(s) have obtained the TESC 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 control measures for Phase I shall be installed per the Interim TESC Drawing; in addition, the Initial control measures shall be installed on Phase II as shown on the Initial TESC Drawing.
4. A **mandatory inspection** shall be scheduled, in accordance with this section, to inspect the Initial and Interim control measures on Phase I as well as the Initial control measures for Phase II. If the Stormwater Inspector finds the control measures to be installed and maintained in accordance with the approved TESC Plan and TESC Manual, topsoil stripping/ stockpiling and grading may commence on Phase II.
5. All disturbed areas on Phase I shall be drill seeded and crimp mulched or otherwise stabilized in accordance with the accepted TESC Plan within seven calendar days from the Stormwater 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.
6. This process shall be repeated for each additional phase until all earthwork is complete.



Violations and Enforcement

All inspections shall be coordinated through the Town of Castle Rock Water Department.

5.10

5.10.1 Penalties and Enforcement. Failure to comply with any term, condition, limit, deadline or other provision of the TESC Permit or failure to obtain a TESC Permit, constitutes a violation of Chapter 15.34 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.

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.

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

Violations and Enforcement, continued

In addition to any other legal or equitable remedies that the Town may have for TESC 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 TESC Permit, by the Stormwater 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 III Violations have the least severe impact on people and the environment and Level I Violations have the most severe impact.

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). 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 measures.***
- ***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 TESC Permit and accepted TESC Drawings on-site.***

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:

- ***Implementation of inadequate control measure(s).***
- ***Tracking of material onto roadways and adjacent paved areas.***
- ***Failure to make required plan revisions.***
- ***Failure to perform control measure maintenance as directed by the Town of Castle Rock Stormwater Inspector.***
- ***Failure to properly secure sanitary facilities.***

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

- *Clearing, grubbing or grading without a Town of Castle Rock TESC permit.*
- *Clearing, grubbing or grading without approved control measures installed.*
- *Failure to schedule a Preconstruction Meeting.*
- *Failure to be able to contact the TESC Manager or Alternate TESC 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.*
- *Failure to follow approved phasing plan.*
- *Failure to correct Level II Violations per the directives of the Stormwater Inspector.*
- *Stockpiling of earth and/or landscape materials on streets, sidewalks or gutters without a right-of-way permit.*
- *Discharging concrete wastewater beyond the designated washout area.*



Stop Work Order. Example Level I Violations include the following:
5.10.3 Stop Work Orders. The Director of Castle Rock Water, 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 TESC Permit. **When a Stop Work Order is issued, the TESC 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 Stormwater Inspector of such activities.

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

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 Water Department to schedule a site inspection.
4. Obtain a reinstated TESC Permit after approval of the corrected work from a Stormwater Inspector.

Important! *If a Permittee works without a TESC 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 TESC Permit. The Town will enforce the TESC Permit, TESC Manual, TESC Plan and Stop Work Order through any available*

Section 5. Field Section

- Permittee(s) fail to submit permit fees and/or surety before initial inspection of control measures.
- The required attendees fail to attend the scheduled Preconstruction Meeting.
- Permittee(s) fail to have the TESC Drawings 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 control measures prior to receiving authorization by the Town of Castle Rock.
- Stormwater Inspector finds LII violations of TESC Permit requirements during routine inspections.
- Failure to cancel any 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 TESC Manager scheduled an inspection prior to reaching the required vegetative cover as well as not maintaining the required sediment controls.

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.

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 prior to receiving subsequent inspections and approval of work. Re-inspection fees shall be charged for all projects that are

Permit Step 14: Ensure that the Interim and Final control measures are installed at the appropriate times in accordance with the accepted TESC Drawings and TESC Manual .
Section 5.11 discusses Step 14.

Installation of Interim and Final Control Measures

deficient due to the following:

5.11

It is the responsibility of the TESC Manager to ensure that Interim and Final control measures are installed at the earliest opportunity that grading or construction of new facilities allows. Some control measures have specific time requirements for installation that are identified on the TESC 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 control measures 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 Stormwater Inspector to make the final determination of Interim and Final control measure installation time frames.

Section 6. Project Acceptance and Close-Out

Overview of Section 6

6.0

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

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

Step 15. Prepare the site for the Initial Close-out Inspection, complete TESC transfer(s) as needed 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 (see Figure 8.1 for Vertical Residential TESC requirements).

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 control measures and control weeds as necessary. Make corrective actions as required by the Stormwater Inspector.

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 control measures and schedule the Final Close-Out Inspection.

Section 6.7, **Final Close-Out Inspection**, all on-site control measures shall be removed and the Final Close-Out

Step 20. After receiving written notice from the Town that all TESC requirements have been addressed, the TESC Permit will be closed, the Town will release Fiscal Surety and 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 TESC requirements.

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

Permit Step 15: Prepare the site for the Initial Close-out Inspection, complete TESC transfer(s) as needed 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. (See Figure 8.1 for Vertical Residential TESC requirements.)

Preparation for Initial Close-out Inspection

6.1

6.1.1 Preparing for Inspection. In preparation for the Initial TESC Acceptance Inspection prior to the Permittee(s) leaving the site, the TESC 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 TESC Plan or Stormwater Inspector) and install/maintain erosion and sediment control measures per the Town of Castle Rock-approved Final TESC 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 TESC Manager shall request an Initial TESC 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 TESC Manual prior to the Initial Close-out Inspection. Failure to properly complete these items may result in a TESC hold being placed on the issuance of any Building Permits or Certificates of Occupancy. If all items are completed in accordance with TESC 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 TESC Manager, shall attend the Initial Close-out Inspection along with the Public Works Inspector and Stormwater Inspector.

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

- **Inspection of final control measures.** Installation of all final control measures 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 the Vertical Residential TESC Program.** For residential construction, the transition to the Vertical Residential TESC Program is discussed.
- **Discussion of vegetation requirements.** 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 Stormwater Inspectors and all applicable TESC Permit and surety transfers are to be complete, if applicable, 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 Vertical Residential TESC Program. The intent of the TESC Permit during the residential construction phase is to ensure compliance until all individual lot construction is completed. *(Refer to Section 8 Vertical Residential TESC 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 TESC 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 Stormwater 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 TESC Manager shall prepare the site in accordance with Section 6.1.

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

Partial Acceptance of Phased Single-Family Residential Projects

Acceptance.

6.2.6 Public Improvements Acceptance. Public Improvements



Acceptance shall be in accordance with the *Transportation Design Criteria Manual*.

6.2.7 Permit Extension for Final Stabilization due to Weather

Projects seeking a Temporary Certificate of Occupancy (TCO), 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 TESC 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 requirement of all temporary control measures.

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 TESC 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 TESC 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 TESC 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 requirements shall be complete for each phase for which Initial Close-out Acceptance is applied for, including all drainage improvements

Partial Acceptance of Phased Single-Family Residential Projects, continued



Photo Courtesy of Michelle Delaria

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

necessary to serve that phase. Detention and water quality facilities that serve one or more phases shall be 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 TESC Plan, inspections shall be made by the Public Works Inspector and Stormwater Inspector, per Section 5.9 of the *TESC Manual*. If both the Public Works and Stormwater 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

Permit Step 17: Inspect the site monthly during the revegetation process. Make corrections to the site revegetation and other final control measures 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 Stormwater 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

deficient items, the Permittee(s) shall make the necessary corrections and reschedule an inspection.

6.4

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

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

1. A uniform vegetative cover with an individual plant density of at least 70 percent of pre-disturbance levels and no less than three plants per square foot with a minimum height of three inches. The plants 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

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

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 has been known to cause dermatitis. Seeds are oblong, grayish to 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-foot 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 mid-rib, 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



Hoary Cress

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 1/2- to 3/4-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 1/2- to 3/4-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 1 1/2-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 Castle Rock Water (contact information is shown in Appendix A) to schedule a Vegetation Acceptance Inspection.

6.6.2 Written Acceptance. The Stormwater Inspector will confirm that vegetation has met the required coverage and that noxious weeds have been controlled or all disturbed areas are permanently landscaped. If the required coverage has been met, the Stormwater Inspector will issue written acceptance of the vegetation and give the Permittee(s) instructions to remove remaining on-site control measures. 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 control measures 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 Control Measures. After obtaining written acceptance of the vegetation coverage, the remaining on-site control measures shall be removed and properly disposed. The site shall be cleaned up and any areas disturbed as a result of the control measure removal shall be seeded and mulched. The Final Close-out Inspection shall then be scheduled with the Town.

For Vertical Residential TESC Permits, temporary control measures other than those required on individual lots may be removed. This generally includes inlet protection, concrete washouts and vehicle tracking control. Contact your Stormwater Inspector for direction.

6.7.2 Final Close-out Inspection. The Stormwater Inspector will check the removal of control measures and either accept the work or stipulate the corrections that have to be made. If corrections are substantial, the Stormwater 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 TESC requirements have been addressed, the Town will release Fiscal Surety and , 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 project's Fiscal Surety will be released and the permit will be closed.

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 TESC Permit, TESC Plan and/or *TESC Manual*, remedies will be in accordance with the remedies identified in this *TESC Manual*, remedies set forth in the Transportation Design Criteria Manual, 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:

6.9.2 Notice of Default. If the Castle Rock Water 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 TESC Plan up to the face amount of the Fiscal Surety; (b) sue the Permittee(s) for recovery of any amount necessary

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 TESC Plan and the other requirements of the TESC permit;
- (b) Permittee(s) fails to complete construction of the TESC improvements by the completion date provided in the TESC Plan or Permit as the same may be extended; Permittee(s) fails to cure any noncompliance specified in any written notice of noncompliance within the timeframe specified in the notice of noncompliance; Permittee(s) otherwise breaches or fails to comply with any obligation of the TESC Permit;
- (c) 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;
- (d) Permittee(s) fails to maintain in full force and effect a letter of credit in the amounts specified above or in the TESC Permit. Notice of default as to any phase of the TESC improvements must be given prior to expiration of the warranty period for such phase of the Improvements as hereinafter provided;
- (e) Permittee(s) and/or property owner(s) fail to transfer the TESC Permit and provide new fiscal surety within thirty (30) days of all or a portion of the project being sold to a new owner.

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 TESC Improvements, in substantial accordance with the TESC Plan, the opinion of probable costs, and other requirements of this *TESC 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 TESC Improvements.

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

Operation and Maintenance of Native and Landscaped Areas

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 TESC Improvements substantially in accordance with the TESC Plan and the other requirements of this *TESC 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).

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 critical after the establishment of vegetation under the TESC 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 TESC 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.

Section 7. Low Impact TESC Permit

Overview of Section 7

7.0

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

Step 1. Confirm that a Low Impact TESC 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, receive the Issued Low Impact Permit and Accepted Low Impact TESC Drawing-(see Section 7.4).

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

Step 6. Install initial control measures 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 TESC Permit and Drawing are to be kept on-site at all times during construction (see Section 7.7).

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

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

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

The nine-step process for Low Impact TESC 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 TESC Permit is required.

Section 7.1 discusses Step 1.

Projects that Require a Low Impact TESC 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 TESC Permit is required for the project. This Low Impact TESC 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 TESC 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 TESC Permit requirements and interpret which TESC 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 TESC Permit. A Low Impact TESC Permit does not require TESC 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 Permit Step 2: Prepare Low Impact Permit Application and Drawing.

Section 7.2 discusses Step 2.

Low Impact TESC Permit Application and Drawings

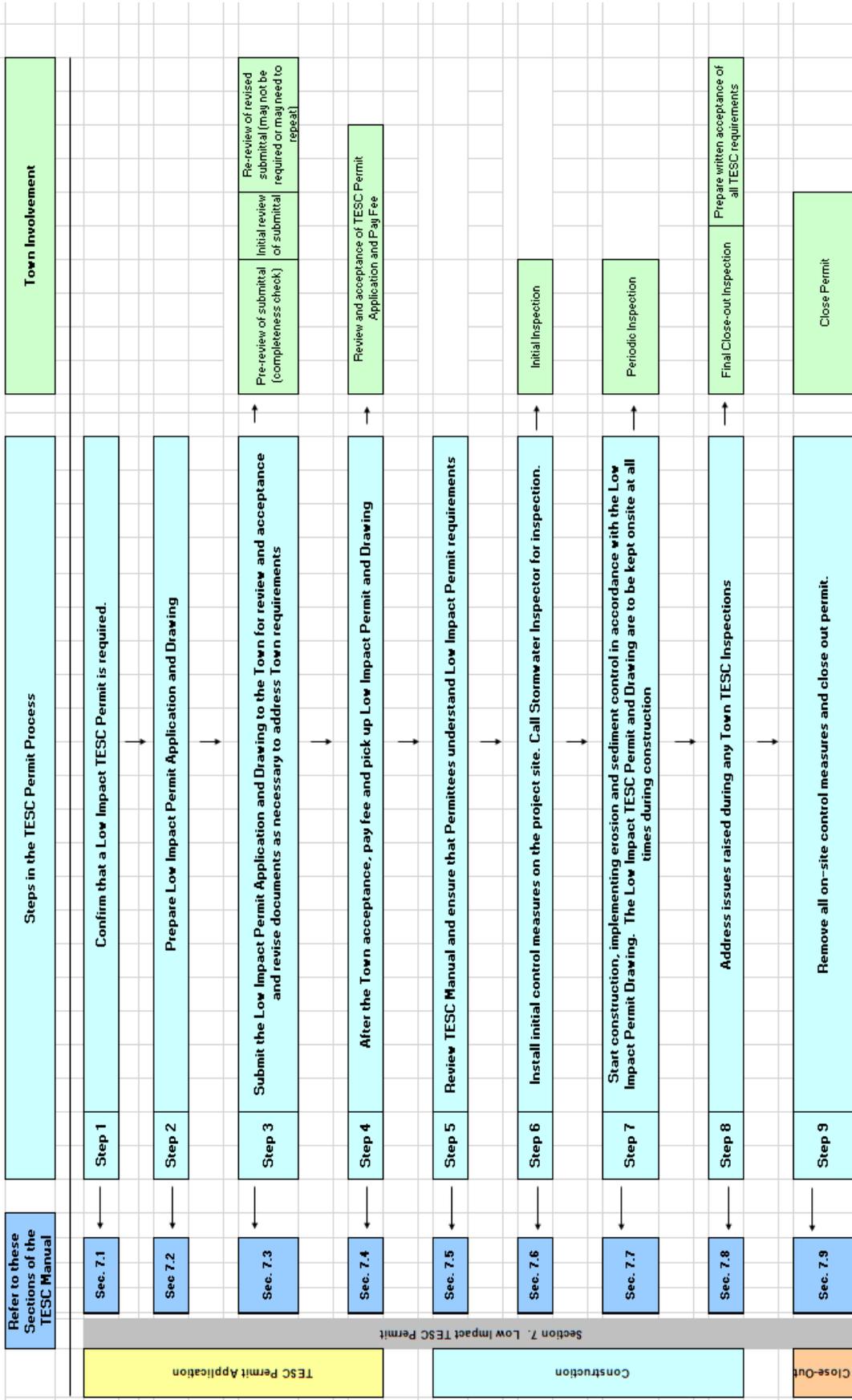
7.2

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

Section 7. Low Impact TESC Permit

Figure 7.1

Town of Castle Rock TESC Permit Process for Low Impact TESC Permits



7.2.2 Low Impact Drawing Requirements. Although a detailed TESC Plan need not be prepared for sites where a TESC 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 measures in accordance with these criteria.

The principles described in Section 3 for preparing a TESC Plan also apply to a Low Impact TESC Drawing. Specifically, Section 3.1 discusses principles of erosion and sedimentation, Section 3.3 describes ten elements of an effective TESC Plan, and Section 3.17 provides design and sizing criteria for control measures. An example TESC Drawing for a Low Impact TESC 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 TESC 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 TESC Plan will be reviewed with an eye toward the effectiveness of the overall Plan. After review, written comments will be provided to the applicant.

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

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

Low Impact Permit Step 4. After Town acceptance, pay fee, receive the issued Low Impact Permit and Accepted Low Impact TESC Drawing. Section 7.4 discusses Step 4.

Pay Permit Fee

7.4

Once the TESC Drawing and Permit have been accepted by the Town of Castle Rock, the Applicant shall pick up the Drawing and Permit. At the same time, the Applicant shall pay permit fees to the Town. Permit fees shall be paid in accordance with Section 4.9

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

Review TESC Manual

7.5

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

Low Impact Permit Step 6: Install initial control measures on the project site. Section 7.6 discusses Step 6.

Install Initial Control Measures

7.6

The initial control measures shown on the approved TESC Low Impact Drawing shall be installed per the TESC Standard Notes and Details.

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

Low Impact Permit Step 7: Start construction, implementing erosion and sediment control in accordance with the Low Impact Permit Drawing. The Low Impact TESC Permit and 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 control measures, construction may begin. The approved TESC Permit and the accepted construction drawings are to be kept on-site in the permittee(s)' possession at all times.

All TESC 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 TESC Permit or any other TESC 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 TESC Permit, per Sections 2 through 6.



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

Address any TESC or Public Works Inspection Comments

7.8

Under a Low Impact TESC Permit, Stormwater Inspectors shall visit a Low Impact site regularly. Permittee(s) shall address any comments or corrections required by the Stormwater 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 control measures, the project is complete. Section 7.9 discusses Step 9.

Project Close Out

7.9

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

Section 8. Vertical Residential Drainage and TESC Requirements

Overview of Section 8

8.0

The modified 6-step process provided in this section applies to Vertical Residential Construction jointly under a Standard TESC Permit and individual Building Permits.

Section 8.1 **Applicability and Authority.**

Step 15a. Apply for a Standard TESC Permit for Vertical Residential Construction by submitting a TESC Drawing and Report, TESC Permit Application, Permit Fee and Fiscal Surety (see Section 8.2).

Step 15b. Submit individual Plot Plans for each lot under respective Building Permits (see Section 8.3 and 8.4)

Step 16a. Complete the TESC Manager assignments, schedule a preconstruction meeting, install temporary control measures and pass initial inspection (see Section 8.5).

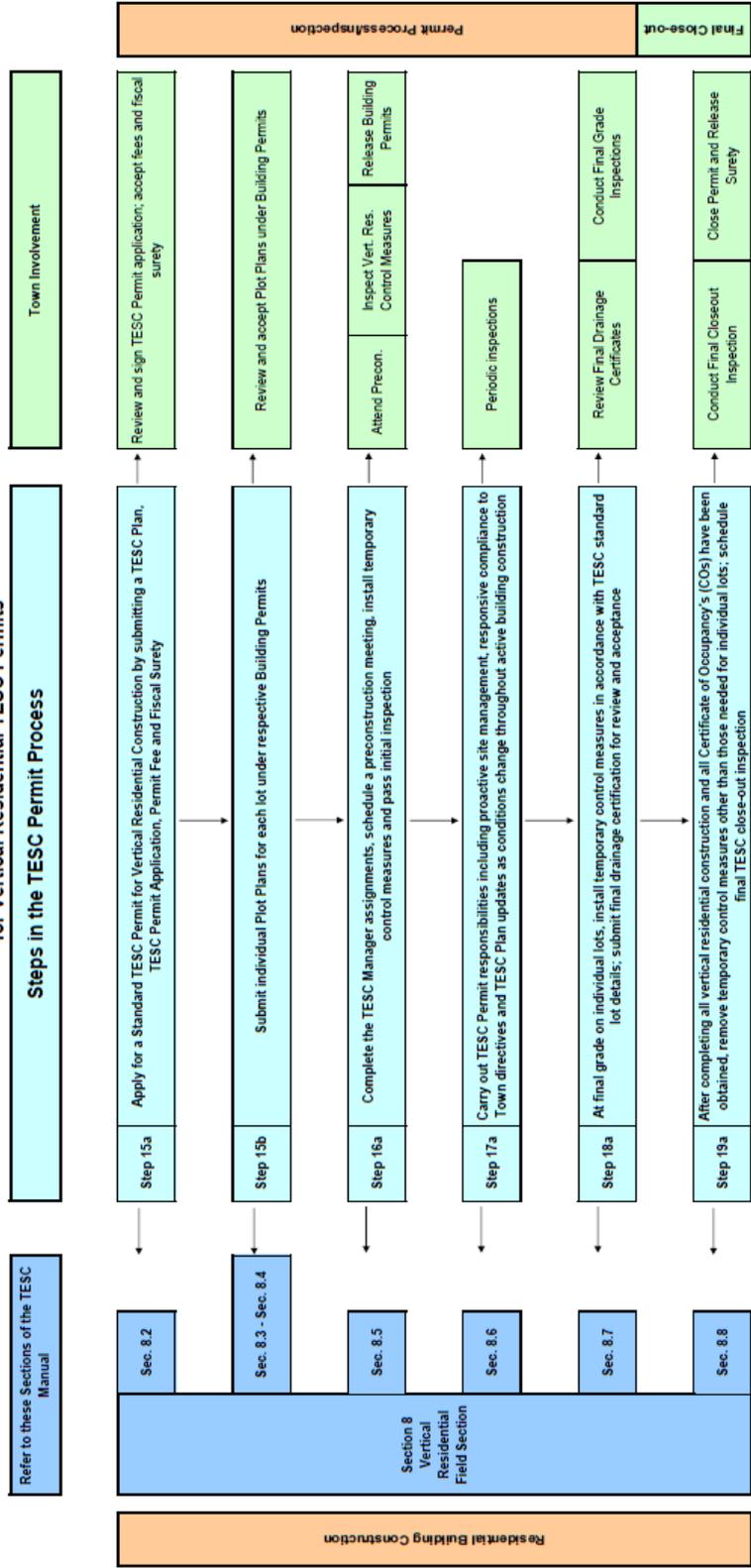
Step 17a. Carry out TESC Permit responsibilities including proactive site management, responsive compliance to Town directives and TESC Plan updates as conditions change throughout active building construction (see Section 8.6).

Step 18a. At final grade on individual lots, install temporary control measures in accordance with TESC standard lot details; submit final drainage certification for review and acceptance (see Section 8.7).

Step 19a. After completing all vertical residential construction and all Certificate of Occupancy's (COs) have been obtained, remove temporary control measures other than those needed for individual lots; schedule final TESC close-out inspection (see Section 8.8).

Section 8. Vertical Residential Drainage and TESC Requirements

Figure 8.1
Town of Castle Rock TESC Permit Process
for Vertical Residential TESC Permits



Section 8. Vertical Residential Drainage and TESC Requirements

Applicability and Authority

8.1

8.1.1 Applicability. The purpose of this section is to establish minimum drainage and temporary erosion and sediment control (TESC) requirements for single-family vertical residential lot construction. This section applies to any new single-family residential construction on vacant lots and new construction on existing lots including, but not limited to, additions and accessory structures requiring a Building Permit and which alter the final grade or drainage on the lot.

8.1.2 Authority. Minimum drainage requirements set forth in this section are enforceable under the Building Permits for individual lots. Temporary erosion and sediment control requirements are enforceable through a Standard TESC Permit for vertical residential construction of multiple lots under a common plan of development and a Low Impact TESC Permit for custom residential lots (refer to Section 7 for Low Impact TESC Permit requirements).

Step 15a. Apply for a Standard TESC Permit for Vertical Residential Construction by submitting a TESC Drawing and Report, TESC Permit Application, Permit Fee and Fiscal Surety

TESC Permit Requirements

8.2

8.2.1 Standard TESC Permit Requirements. A signed Standard TESC Permit application must be submitted to Development Services, along with an approved Vertical Residential TESC Drawing, TESC Report, Permit Fees and Fiscal Surety and the applicant must pass the initial TESC inspection prior to issuance of the first Building Permit within a subdivision.

1. Refer to Section 3.20.5 for Vertical Residential TESC Drawing requirements.
2. Refer to Section 3.19 for TESC Report requirements.
3. Refer to Section 4 for submittal requirements.

8.2.2 TESC Permit Requirements for Custom Home Construction. A signed Low Impact TESC Permit application must be submitted to the Building Department, along with a Low Impact TESC Plan and Permit Fee prior to issuance of a Building Permit. The permittee must pass the initial TESC inspection prior to beginning construction.

Step 15b. Submit individual Plot Plans for each lot under respective Building Permits

Drainage Requirements under the Building Permit

8.3

As a condition of Building Permit approval, permittee shall submit for review a Plot Plan according to the requirements set forth below.

8.3.1 Plot Plan Submittal Requirements. The Plot 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 plot plan shall meet the requirements of this section

Section 8. Vertical Residential Drainage and TESC Requirements

Drainage Requirements under the Building Permit, continued

and will be reviewed for compliance with this section and, when applicable, the approved drainage patterns set forth in the "overlot grading plan" approved by the Town.

A plot plan shall be prepared and submitted for Town approval. One (1) electronic copy (PDF format), for each parcel, shall be submitted with the Building Permit application. The following items shall be clearly illustrated on the plot 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. Demonstrate required 2-foot freeboard has been met for properties in or adjacent to a floodplain. All properties within the floodplain require a floodplain development permit prior to issuance of a building permit. An elevation certificate may also be required.
- Provide a north arrow, the street address, subdivision, filing, lot and block.
- The plan size for lot sizes of one (1) acre or less shall be 8.5" x 11" to 8.5" x 14".
- 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 plot 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).
- 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 retaining walls including elevations for top and bottom of wall. Provide maximum height of retaining wall(s), including footing. Retaining walls taller than four (4) feet (including footing height) require a separate building permit and shall be designed by a registered design professional. Reference permit number for retaining wall on plot plan.

Section 8. Vertical Residential Drainage and TESC Requirements

Drainage Requirements under the Building Permit

- Illustrate where storm water runoff enters the lot and discharges to adjacent rights-of-way, properties and easements.

Include these general notes on the plan:

- ANY ADJUSTMENTS WHICH MUST BE MADE TO UTILITY POLES, STREET LIGHT STANDARDS, FIRE HYDRANTS, CATCH BASINS OR INLETS, TRAFFIC SIGNS AND SIGNALS, OR OTHER PUBLIC IMPROVEMENTS OR INSTALLATIONS WHICH ARE NECESSARY AS THE RESULT OF THE CURB OPENINGS OR DRIVEWAYS SHALL BE ACCOMPLISHED WITHOUT ANY COST TO THE TOWN. DRIVEWAYS SHALL NOT INTERFERE WITH OPERATIONS OR LOCATIONS OF ANY DRAINAGE APPURTENANCES OR ADA RAMPS.
- THIS PLAN IS IN CONFORMANCE WITH THE MINIMUM REQUIREMENTS AS SET FORTH IN THE [LEGAL DESCRIPTION] SUBDIVISION GRADING PLAN AS APPROVED BY THE TOWN OF CASTLE ROCK ON [MM/DD/YEAR] UNDER APPROVAL NO. [CDXX-XXXX].
- THIS LOT IS COVERED UNDER STANDARD TESC PERMIT NO. [TSCXX-XXXX].

Minimum Drainage Requirements for Finished Grade

8.4

8.4.1 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. 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 Chapter 4, as amended, for specific requirements).

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.

8.4.2 Drainage Swales. Drainage swales shall not be located within the foundation backfill zones unless limited by property lines. Drainage 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.

Section 8. Vertical Residential Drainage and TESC Requirements

Minimum Drainage Requirements for Finished Grade, continued

8.4.3 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 instances where means of stabilization other than retaining walls are proposed must be submitted to the Town of Castle Rock Stormwater Manager for approval.

8.4.4 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. Downspouts, sump pump and drainage pipes shall not extend beyond the property line and be a minimum of 10 feet away from the Town sidewalk.

8.4.5 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, buildings and window wells shall be protected against flooding.

Step 16a. Complete the TESC Manager assignments, schedule a preconstruction meeting, install temporary control measures and pass initial inspection.

Preconstruction Meeting and Initial Inspection

8.5
8.5.1 Preparing for the Preconstruction Meeting. Refer to Sections 5.1 through 5.3 for responsibilities the permittee must perform prior to scheduling the preconstruction meeting.

8.5.2 Preconstruction Meeting. Refer to Sections 5.4 for preconstruction meeting requirements.

8.5.3 Initial TESC Inspection. Refer to Section 5.5 for initial TESC inspection requirements prior to start of construction.

Step 17a. Carry out TESC Permit responsibilities including proactive site management, responsive compliance to Town directives and TESC Plan updates as conditions change throughout active building construction.

Important! Verify that all fees, fiscal surety, plans and permits are in place prior to calling for the initial TESC inspection. If any of these items are found to be missing the inspection will fail and a re-inspection fee will be assessed. Building permits will not be issued until the Initial TESC Inspection passes.

8.6
8.6.1 Proactive site management by Permittee. All erosion and sediment control practices must be maintained in effective operating condition at all times. Permittee shall inspect and maintain all control measures as identified on the TESC Drawing at least every fourteen (14) days and after any precipitation, snowmelt or runoff event that causes surface erosion, sediment transport or vehicular tracking. Refer to Section 5.7 and 5.8 for further information on ensuring control measures are correctly installed and maintained and for general requirements during construction.

8.6.2 Inspections, Violations and Enforcement. Town inspections, violations and enforcement shall be in accordance with Sections 5.9 and 5.10. Further guidance is provided below for common violations on active vertical residential construction sites.

TESC Inspections, Violations and Enforcement

Section 8. Vertical Residential Drainage and TESC Requirements

If sediment 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 Stormwater 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 may result in an immediate stop work order.

Permittee shall ensure that all concrete washout areas are properly installed, posted and cleaned such that all wastewater is contained and does not enter the storm drain system. Failure to properly maintain concrete washout areas such that a discharge occurs will result in a stop work order and/or an immediate cleanup order.



Permittee shall ensure that all sanitary facilities are properly secured to the ground to prevent toppling and discharge of liquid waste. Failure to properly secure sanitary facilities will result in a violation.

Permittee shall ensure that the TESC Plan remains updated with current field conditions. Failure to maintain the TESC Plan may result in enforcement action.

8.7

Step 18a. At final grade on individual lots, install temporary control measures in accordance with TESC standard lot details; submit final drainage certificate for review and acceptance.

Field Change Orders and Final Drainage Certification

8.7.1 Field Change Orders for Drainage. Field changes may arise during the construction process for individual lots that alter final grade. Major revisions to lot grading and drainage patterns during construction will require prior Town approval. Builder is to resubmit a new Plot Plan through Development Services for review and acceptance prior to the changes being implemented in the field. Failure to obtain Town acceptance prior to field changes could result in a Stop Work Order and/or withholding of CO.

8.7.2 Preparing Lots for Final Grade. Prior to issuance of a certificate of occupancy, the following items must be completed:

- Final grade on the property is to be established in accordance with the approved Plot Plan and requirements as set forth in Section 8.4.
- A Final Drainage Certificate is to be submitted and accepted by the Town.
- Temporary erosion and sediment controls shall be properly installed per the TESC Standard Details.
- Pass Final Drainage Inspection.

In cases where final grade cannot be established because of weather constraints at the time of the final inspection, the permittee may request

Section 8. Vertical Residential Drainage and TESC Requirements

Final Drainage Certificate

approval to obtain CO by posting a Fiscal Surety until all items are completed and approved by the Town. Temporary sediment controls are required at all times regardless of weather conditions.

8.7.3 Final Drainage Certificate. Individual lots require a Final Drainage Certificate prepared by a registered design professional and reviewed by the Town before a certificate of occupancy can be issued. The Final Drainage Certification is required to demonstrate the minimum drainage requirements per Section 8.4 have been met including proper site drainage and adequate drainage away from the foundation and off the lot. 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 Plot Plan.
- Location of the sump pump discharge, if applicable.
- The plan shall be signed and stamped by a registered design professional.

Step 19a. After completing all vertical residential construction and all Certificate of Occupancy's (COs) have been obtained, remove temporary control measures other than those needed for individual lots; schedule final TESC close-out inspection.

Final Close-out

8.8

8.8.1 Removal of On-site Control Measures. After obtaining the certificate of occupancy for the last lot under the TESC Permit, the remaining on-site control measures not associated with individual lots shall be removed and properly disposed. All streets and storm drains shall be cleaned. Areas of disturbance outside individual lots shall be seeded and mulched in accordance with Section 5. If seeded and mulched areas are substantial, the Town may require that the permit and fiscal surety remain in place until vegetation reaches the coverage requirements in Section 6.4.

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

8.8.3 Release of Fiscal Surety. Once final Close-out Acceptance has been obtained, the project's Fiscal Surety will be released and the permit will be closed.

Section 9. Acronyms and Glossary

Acronyms

Following is a list of acronyms used in this Manual:

APEN	Air Pollutant Emission Notice
ASTM	American Society of Testing Materials
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
DD	Diversion Ditch
DW	Dewatering
ECB	Erosion Control Blanket
FCO	Field Change Order
FEMA	Federal Emergency Management Agency
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
TER	Terracing
TESC	Temporary Erosion and Sediment Control
TRC	Temporary Road Crossing
TSC	Temporary Stream Crossing
TSD	Temporary Slope Drain

Section 9. Acronyms and Glossary

Acronyms, continued

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 Director of Castle Rock Water.

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 Temporary Erosion and Sediment Control (TESC) Permit Application.

Alternate Temporary Erosion and Sediment Control (TESC) Manager refers to an on-site representative who serves, in the absence of the TESC Manager, as the permittee(s) contact person with the Town and who is responsible for ongoing compliance with the TESC Permit.

Backfill zone is the area to be backfilled between the foundation and the excavation wall.

Cell is a group of lots in a tract housing development owned or under construction by one (1) specific builder.

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

Glossary of Terms, continued

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.

Control Measure refers to a physical, structural, or managerial practice or device implemented by a Contractor to prevent or reduce the discharge of pollutants to the storm system or Waters of the State.

Control Measure, inadequate is any control measure that is not designed, implemented or operating in accordance of the requirements of this manual.

Control Measures, non-structural are those control measures that require modified or additional operational or behavioral practices, such as street sweeping or phasing construction activities on a project.

Control Measures, structural are those control measures 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.

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.

Design Engineer refers to the Professional Engineer responsible for the development of the TESC 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

**Glossary of
Terms,
continued**

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.

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:

- 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 twenty acres,
- Alteration 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.

Glossary of Terms, continued

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.

Field Change Order refers to a written document showing the scope and details of any change desired from the approved TESC Plan after the plans have been approved by and filed with the Town. The permittee must execute the written document by submitting to and receiving approval from the Town before it becomes a valid change to the approved plan.

Fill refers to material deposited, placed, pushed, dragged or transported to a place other than from the place from where it was excavated.

Final drainage certificate refers to a record drawing for residential lots depicting vertical and horizontal deviations to grades, spot elevations, slopes and drainage patterns throughout the lot as shown on the approved Plot Plan .

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.

Grading is excavation, fill, in-place ground modification or any combination thereof, including the establishment of a grade following demolition of a structure.

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.

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 entering the inlet.

**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 TESC 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 TESC Permit.

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.

Reinforced Check Dam (RCD) consists of rock placed within wire-reinforced gabions to provide additional resistance to the forces of

**Glossary of
Terms,
continued**

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.

Stage of Construction refers to the Initial, Interim, or the Final Stage of construction; control measures are to be shown on the TESC Plan as being installed at one of these three stages.

Standard Control Measure refers to any one of a number of control

Glossary of Terms, continued

measures 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 the Stormwater Manager.

Stop Work Order refers to a written notice provided by a Stormwater Inspector that suspends a TESC 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 letter is obtained.

Stormwater runoff refers to water originating from rainfall and other precipitation.

Stormwater Inspector refers to the Town representative who visits construction sites to check for compliance with the TESC Permit.

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 Erosion and Sediment Control (TESC) Drawings refers to the illustrative portion of the TESC Plan which show the location and extent of all temporary erosion and sediment control measures, as well as other associated information required by the TESC Manual.

Temporary Erosion and Sediment Control (TESC) 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 TESC Permit.

Temporary Erosion, and Sediment Control (TESC) 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 Temporary Erosion and Sediment Control Manual.

Temporary Erosion and Sediment Control (TESC) 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.

Temporary Erosion and Sediment Control (TESC) Permit Program refers to the program developed and administered by the Town of Castle

Glossary of Terms, continued

Rock to regulate land disturbing activities within the Town of Castle Rock.

Temporary Erosion and Sediment Control (TESC) Plan refers to the complete package of required information submitted to the Town of Castle Rock for review and acceptance which include TESC Drawings, TESC Report, TESC Drawing and Report Checklist, and Opinion of Probable Cost Worksheet.

Temporary Erosion and Sediment Control (TESC) Report refers to the report required to be submitted with the TESC Plan that details all aspects of the TESC plan, such as soils, areas and volumes, etc.

Temporary Road Crossing (TRC) A temporary road crossing is a location where cut and fill grading operations need to occur on both sides of an existing road.

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.

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 control measure, 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.

Section 10. Bibliography

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San Francisco Bay Region, Regional Water Quality Control Board. *Erosion and Sediment Control Field Manual*, Third Edition. July 1999.

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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.

Appendices

List of Appendices

- Appendix A Contact Information
- Appendix B Standard Notes and Details
- Appendix C Example Drawings
 - ◆ Small Site TESC Drawings
 - ◆ Utility TESC Drawings
 - ◆ Staged TESC Drawings
 - ◆ Staged and Phased TESC Drawings
 - ◆ Vertical Residential TESC Drawing
 - ◆ Temporary Batch Plant TESC Drawings
 - ◆ Low Impact TESC Drawing

- Appendix D Checklist for Developing a TESC Plan
- Appendix E Seed Mix Information
- Appendix F Town of Castle Rock TESC Acceptance Block
- Appendix G TESC Drawing and Report Checklist
- Appendix H Opinion of Probable Cost Example Spreadsheet
- Appendix I Standard TESC Permit Application
- Appendix J Low Impact TESC Permit Application
- Appendix K Hold Harmless Letter Example

Appendix A

Contact List

Contact Information

(Information is subject to change)

Town of Castle Rock
Stormwater Hotline
Phone: 720-733-2235
Email: Stormwater@crgov.com

Town of Castle Rock
Castle Rock Water, Stormwater Division
(Contact the project Stormwater Inspector listed on your TESC permit for TESC technical questions and scheduling TESC inspections)
175 Kellogg Court
Castle Rock, CO 80109
Phone: 720-733-2235
Email: Stormwater@crgov.com

Town of Castle Rock
Castle Rock Water, Stormwater Division
Stormwater Manager/Floodplain Manager
175 Kellogg Court
Castle Rock, CO 80109
Phone: 720-733-2235
Email: Stormwater@crgov.com

Town of Castle Rock
Development Services Department
(for process, plan review, permit, and fiscal surety questions)
100 N. Wilcox Street
Castle Rock, CO 80104
Phone: 720-733-2202
Email: DevReview@crgov.com

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
Castle Rock Water
Water Conservation Technician
175 Kellogg Court
Castle Rock, CO 80109
Phone: 720-733-6017
Email: WaterConservation@crgov.com

Colorado Department of Public Health and Environment (CDPHE)
Water Quality Control Division (WQCD)
4300 Cherry Creek Drive South
WQCD-B2
Denver, CO 80246-1530
Phone: 303-692-3500
Email: cdphe.commentswqcd@state.co.us
Website: <https://www.colorado.gov/cdphe/wqcd>

Colorado Department of Public Health and Environment (CDPHE)
24-Hour Environmental Emergency Spill Reporting Line
1-877-518-5608

National Response Center (24-Hour National Spill Response)
1-800-424-8802

U.S. Army Corps of Engineers, Omaha District
Denver Regulatory Office
9307 S. Wadsworth Blvd.
Littleton, CO 80128-6901
Phone: 303-979-4120

United States Department of the Interior
Fish and Wildlife Service
134 Union Boulevard, Suite 675
Lakewood, Colorado 80228-1807
Phone: 303 236-4216
Website: <https://www.fws.gov/coloradofishandwildlife/>

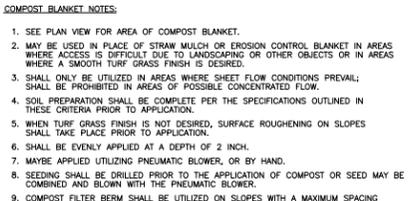
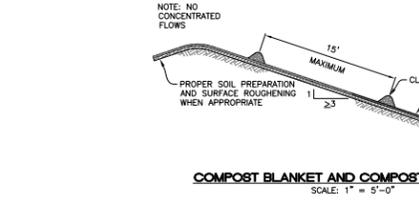
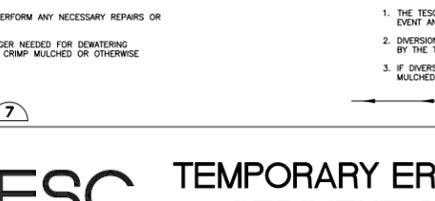
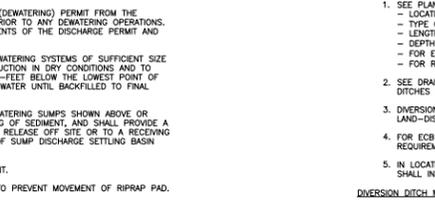
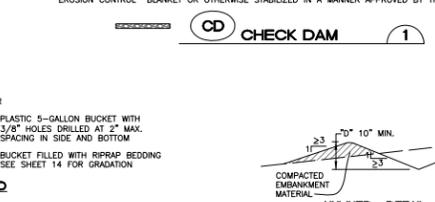
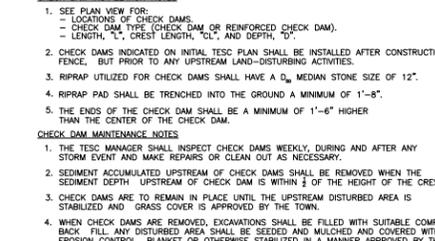
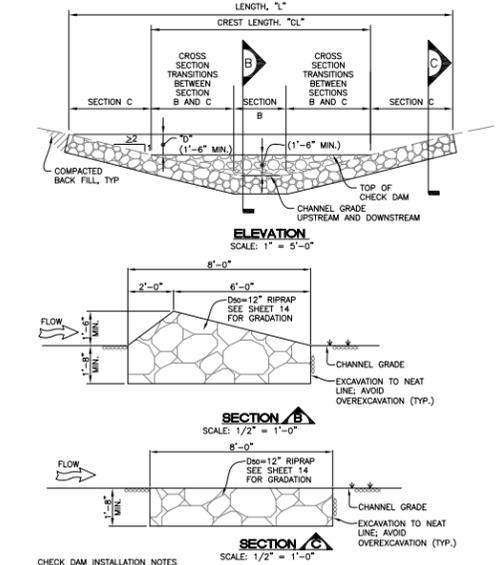
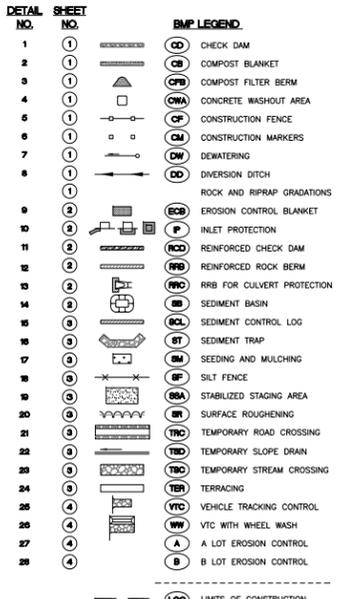
Federal Emergency Management Agency (FEMA)
Region VIII
Denver Federal Center
Building 710, Box 25267
Denver, CO 80225-0267
Phone: 303-235-4800

Appendix B

Standard Notes and Details

TEMPORARY EROSION AND SEDIMENT CONTROL (TESC) GENERAL NOTES

- THE DIRECTOR OF CASTLE ROCK WATER AND DEVELOPMENT SERVICES DEPARTMENT SIGNATURES AFFIXED TO THIS DOCUMENT INDICATE THE STORMWATER ENGINEERING DIVISION AND THE DEVELOPMENT SERVICES DEPARTMENT HAVE REVIEWED THE DOCUMENT AND FOUND IT IN GENERAL COMPLIANCE WITH THE TOWN OF CASTLE ROCK TEMPORARY EROSION AND SEDIMENT CONTROL (TESC) MANUAL. THE DIRECTOR OF CASTLE ROCK WATER 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.
- THE ADEQUACY OF THIS TESC PLAN LIES WITH THE ORIGINAL DESIGN ENGINEER.
- THE TESC 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.
- OVERLAP GRADING REQUIRES A CONSTRUCTION PERMIT THROUGH THE PUBLIC WORKS DEPARTMENT IN ADDITION TO THE TESC PERMIT. ALL EXCAVATIONS 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 PREVAIL.
- 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 TESC MANUAL, TESC PLAN OR TESC PERMIT.
- SEE CONSTRUCTION PLANS FOR ALL GEOTECHNICAL SAMPLING, TESTING AND INSPECTION REQUIREMENTS.
- THE PLACEMENT OF EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE TOWN OF CASTLE ROCK ACCEPTED TESC PLAN AND THE TOWN OF CASTLE ROCK TESC MANUAL.
- ANY VARIATION IN MATERIAL, TYPE OR LOCATION OF EROSION AND SEDIMENT CONTROL MEASURES FROM THE TOWN OF CASTLE ROCK ACCEPTED TESC PLAN WILL REQUIRE APPROVAL FROM AN ACCOUNTABLE REPRESENTATIVE OF THE TOWN.
- AFTER THE TESC PLAN HAS BEEN ACCEPTED, THE TESC PERMIT APPLIED FOR FEES AND FISCAL SECURITY SUBMITTED TO THE TOWN. THE CONTRACTOR MAY INSTALL THE INITIAL-STAGE EROSION AND SEDIMENT CONTROL MEASURES INDICATED ON THE ACCEPTED TESC PLAN AND CONTACT DEVELOPMENT SERVICES TO SCHEDULE A PRECONSTRUCTION MEETING. THE REQUEST SHALL BE MADE A MINIMUM OF THREE (3) BUSINESS DAYS PRIOR TO THE REQUESTED MEETING TIME.
- THE FIRST CONTROL MEASURES 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.
- THE OWNER OR OWNER'S REPRESENTATIVE, THE TESC 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 APPROVED TESC PLANS ARE NOT AVAILABLE, THE MEETING WILL BE CANCELLED AND THE APPLICANT WILL HAVE TO RECONSTRUCT 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.
- AFTER INSTALLATION OF THE INITIAL-STAGE EROSION AND SEDIMENT CONTROL MEASURES, THE PERMITTEE SHALL CALL THE TOWN OF CASTLE ROCK STORMWATER INSPECTOR TO SCHEDULE AN INITIAL INSPECTION AT THE PROJECT SITE. NO CONSTRUCTION ACTIVITIES SHALL BE PLANNED WITHIN 24 HOURS AFTER PASSING INITIAL INSPECTION.
- CONSTRUCTION SHALL NOT BEGIN UNTIL THE STORMWATER INSPECTOR APPROVES THE INSTALLATION OF THE INITIAL CONTROL MEASURES AND THE TESC PERMIT HAS BEEN APPROVED. FAILURE TO HAVE THE REQUIRED PERMIT FEES, FISCAL SURETY AND PERMIT COMPLETE AT THE TIME OF INITIAL INSPECTION WILL RESULT IN A FAILED INSPECTION. NO CONSTRUCTION MAY BEGIN UNTIL ALL ITEMS ARE RECEIVED AND SITE PASSES INITIAL INSPECTION.
- THE TESC 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.
- 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 TESC PLAN. CONTROL MEASURE INSTALLATION AND APPROVAL BY THE TOWN AT THE START AND COMPLETION OF EACH PHASE SHALL BE COMPLETED IN ACCORDANCE WITH THE REQUIREMENTS OUTLINED IN THE TESC MANUAL.
- 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.
- 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.
- THE TESC 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 TESC PERMIT MUST BE EXTENDED.
- A COPY OF THE TESC PERMIT AND ACCEPTED TESC PLAN SHALL BE ON SITE AT ALL TIMES.
- THE TESC MANAGER SHALL BE RESPONSIBLE FOR ENSURING THAT THE SITE REMAINS IN COMPLIANCE WITH THE TESC PERMIT AND BE THE PERMITTEE'S CONTACT PERSON WITH THE TOWN FOR ALL MATTERS PERTAINING TO THE TESC PERMIT. THE TESC 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 TESC MANAGER IS NOT ON SITE AND CANNOT BE REACHED DURING A VIOLATION, THE ALTERNATE TESC MANAGER SHALL BE CONTACTED. IF NEITHER THE TESC MANAGER NOR ALTERNATE TESC MANAGER CAN BE CONTACTED DURING ANY VIOLATION, A STOP WORK ORDER SHALL BE ISSUED.
- 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.



PARAMETERS	CLASS 1 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 RATIO	< 4
MATURITY INDICATOR EXPRESSED AS CARBON TO NITROGEN RATIO	20:1
TESTED FOR CLOP/RAID	YES/NEGATIVE RESULT
MOISTURE CONTENT	30-60 %
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 RATIO	< 4
MATURITY INDICATOR EXPRESSED AS CARBON TO NITROGEN RATIO	20:1
TESTED FOR CLOP/RAID	YES/NEGATIVE RESULT
MOISTURE CONTENT	30-60 %
PARTICLE SIZE DISTRIBUTION	3\"/>

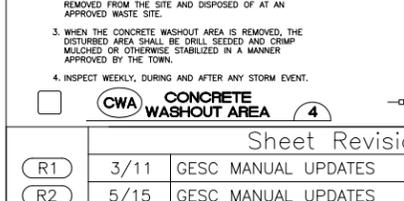
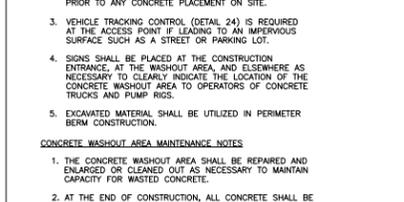
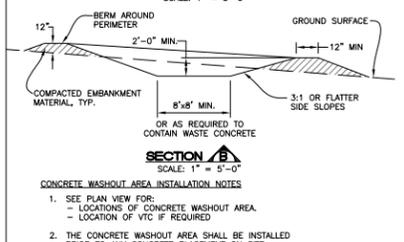
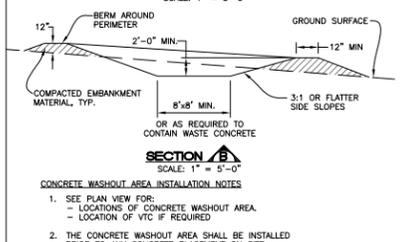
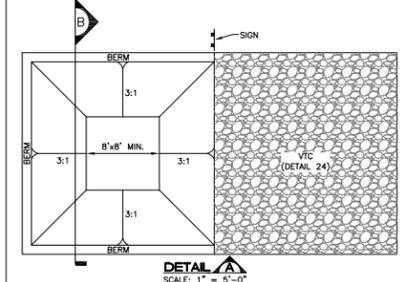
PARAMETERS	CLASS 1 COMPOST FOR COMPOST FILTER BEAM
MINIMUM STABILITY INDICATOR	STABLE TO VERY STABLE
SOLUBLE SALTS	MAXIMUM 5mmhos/cm
PH	6.0 - 8.0
AG INDEX	> 10
MATURITY INDICATOR EXPRESSED AS PERCENTAGE OF GERMINATION/VIGOR	80+/80+
MATURITY INDICATOR EXPRESSED AS AMMONIA N/ NITRATE RATIO	< 4
MATURITY INDICATOR EXPRESSED AS CARBON TO NITROGEN RATIO	20:1
TESTED FOR CLOP/RAID	YES/NEGATIVE RESULT
MOISTURE CONTENT	30-60 %
PARTICLE SIZE DISTRIBUTION	3\"/>

DESIGN MEDIUM STONE SIZE (INCHES)	% OF MATERIAL SMALLER THAN TYPICAL STONE	TYPICAL STONE EQUIVALENT DIAMETER (INCHES)	TYPICAL STONE WEIGHT (POUNDS) FOR GRADATIONS
6	70 - 100 90 - 70 35 - 50	12 9 8	85 35 10 0.4
9	70 - 100 90 - 70 35 - 50	15 12 9	160 85 1.3
12	70 - 100 90 - 70 35 - 50 2 - 10	21 18 12 8	440 275 85 3
18	50 - 100 70 - 50 2 - 10	30 25 18 6	1280 850 275 10
24	50 - 100 70 - 50 2 - 10	42 35 24 9	3500 1750 650 35

SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
3"	100
1 1/2"	20 - 90
NO. 4	0 - 20
NO. 200	0 - 3

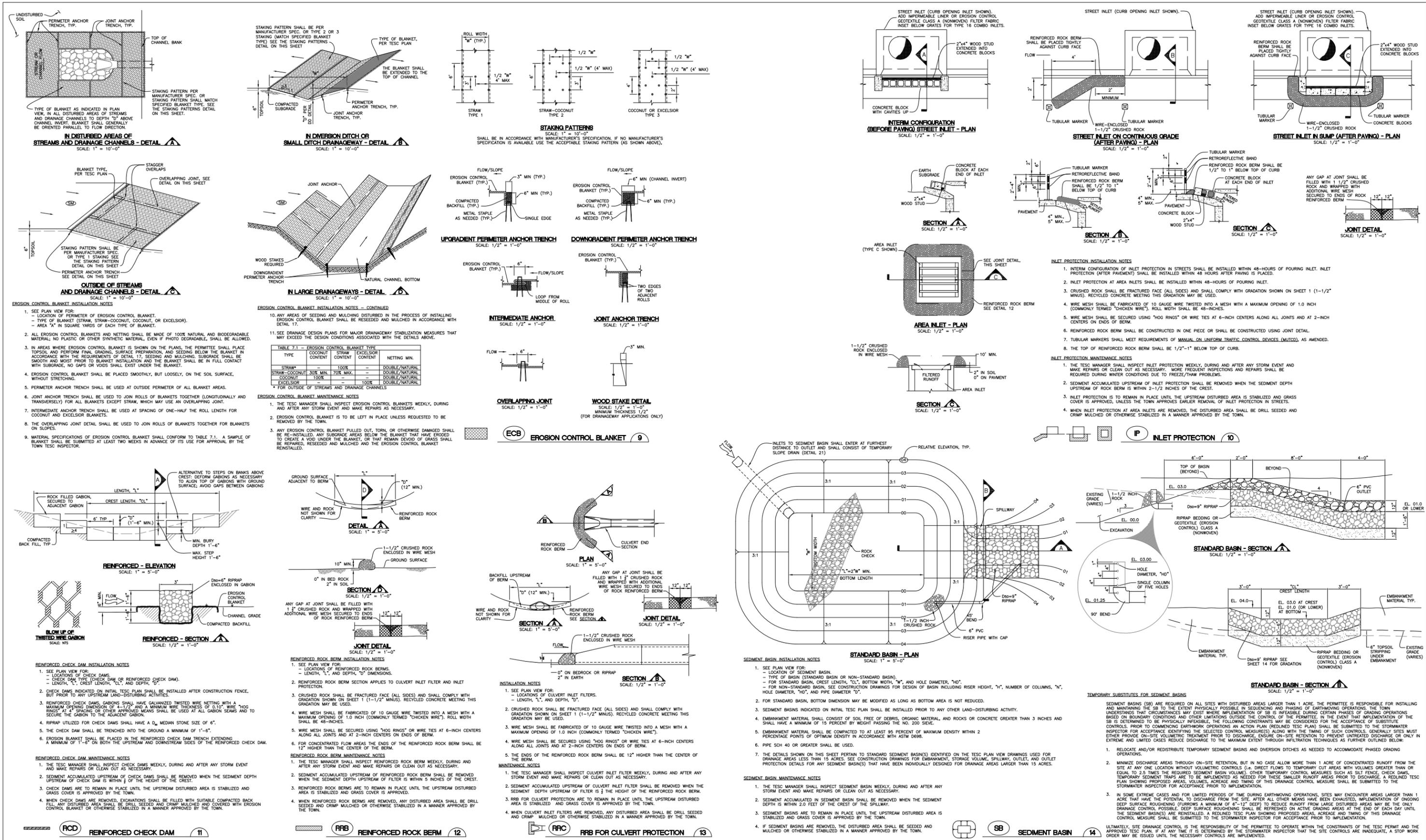
SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
NO. 4	100
2"	90 - 100
1 1/2"	20 - 55
1"	0 - 15
3/4"	0 - 5
3/8"	0 - 5

SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
NO. 4	100
2"	90 - 100
1 1/2"	20 - 55
1"	0 - 15
3/4"	0 - 5
3/8"	0 - 5



NO.	DATE	DESCRIPTION	BY
R1	3/11	GESC MANUAL UPDATES	DV
R2	5/15	GESC MANUAL UPDATES	DV
R3	6/19	GESC MANUAL UPDATES	DV

NOTE: SCALES SHOWN ARE FOR 22"x34" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.



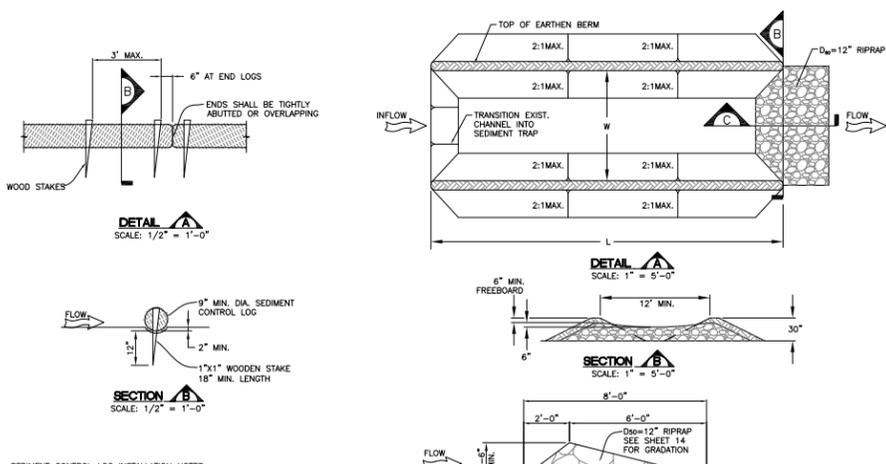
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NOTE: SCALES SHOWN ARE FOR 22"x34" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.

CASTLE ROCK WATER
Stormwater Engineering Division

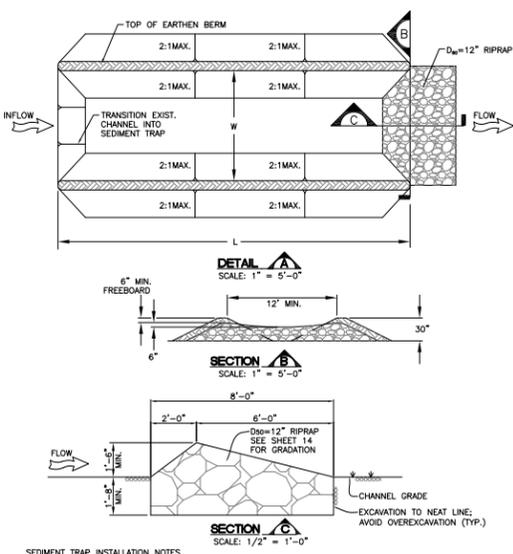
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TESC PLAN
STANDARD NOTES AND DETAILS
SHEET 2 OF 4



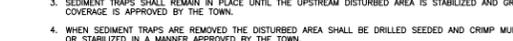
- SEDIMENT CONTROL LOG INSTALLATION NOTES**
- SEE PLAN VIEW FOR:
 - LOCATION AND LENGTH OF SEDIMENT CONTROL LOG.
 - SEDIMENT CONTROL LOGS INDICATED ON INITIAL TESC PLAN SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.
 - SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELLOOR, OR COCONUT FIBER.
 - NOT FOR USE IN CONCENTRATED FLOW AREAS.
 - THE SEDIMENT CONTROL LOG SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 2\"/>

- SEDIMENT CONTROL LOG MAINTENANCE NOTES**
- THE TESC MANAGER SHALL INSPECT SEDIMENT CONTROL LOGS DAILY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
 - SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOGS SHALL BE REMOVED WHEN THE UPSTREAM SEDIMENT DEPTH IS WITHIN 1/2 THE HEIGHT OF THE CREST OF LOG.
 - 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.



- SEDIMENT TRAP INSTALLATION NOTES**
- SEE PLAN VIEW FOR:
 - LOCATION, LENGTH AND WIDTH OF SEDIMENT TRAP.
 - SEDIMENT TRAPS INDICATED ON INITIAL TESC PLAN SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.
 - SEDIMENT TRAP BERM SHALL BE CONSTRUCTED FROM MATERIAL FROM EXCAVATION. THE BERM SHALL BE COMPACTED TO DENSE OF THE MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D698.
 - RIPRAP OUTLET SHALL BE CONSTRUCTED WITH D=12\"/>

- SEDIMENT TRAP MAINTENANCE NOTES**
- THE TESC MANAGER SHALL INSPECT SEDIMENT TRAPS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
 - SEDIMENT ACCUMULATED UPSTREAM OF RIPRAP SHALL BE REMOVED WHEN THE UPSTREAM SEDIMENT DEPTH IS WITHIN 1/2 THE HEIGHT OF THE RIPRAP OUTLET STRUCTURE.
 - SEDIMENT TRAPS SHALL REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVERAGE IS APPROVED BY THE TOWN.
 - WHEN SEDIMENT TRAPS ARE REMOVED THE DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR STABILIZED IN A MANNER APPROVED BY THE TOWN.



- SEEDING AND MULCHING INSTALLATION NOTES**
- SEE PLAN VIEW FOR:
 - AREA OF SEEDING AND MULCHING.
 - TYPE OF SEED MIX (PERMANENT, TEMPORARY, OR LOW-GROWTH).
 - ALL BRANDS FURNISHED SHALL BE FREE FROM SUCH NOXIOUS WEEDS AS RUSSIAN OR CANADIAN THISTLE, COARSE FESCUE, EUROPEAN BINDWEED, JOHNSON GRASS, KNAW WEED AND LEAFY SPURGE.
 - 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, MOLLY, 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.
 - DRILL SEEDING MIX SHALL CONFORM TO THE TABLE ON THE RIGHT.
 - 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 TESC INSPECTOR.
 - 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).
 - PERMANENT SEED MIX SHALL BE USED UNLESS OTHERWISE APPROVED BY THE TOWN. THE USE OF TEMPORARY NURSERY DROP IN PERMANENT AND LOW GROW MIXES IS PROHIBITED.
 - 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.
 - FOR PERMANENTLY 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.
 - SOIL IS TO BE THOROUGHLY LOOSENED (TILLED) TO A DEPTH OF AT LEAST 6 INCHES AND 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.
 - 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 8 INCHES. MATERIAL USED FOR MULCH SHALL CONSIST OF NEED-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.
 - 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.
 - 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.
 - ALL SEEDED AREAS SHALL BE MULCHED, CRIMPED AND TACKIFIED WITHIN 24-HOURS AFTER SEEDING.
 - 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 PLANT GUM OF PLANTAGO INSULARIS, (DESERT INDIANWART), APPLIED TO 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 11 SOLUTION = 6.4 AND 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**
- 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 TESC 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 MULCH AND DAMAGE PLANTS, WILL NOT BE PERMITTED.
 - 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 TESC INSPECTOR FOR ANY AREAS FAILING TO MEET THE REQUIRED COVERAGE.
 - RILL AND GULLY EROSION SHALL BE FILLED WITH TOPSOIL PRIOR TO RESEEDING. THE RESEEDING METHOD SHALL BE APPROVED BY THE TOWN.
 - NOXIOUS WEEDS SHALL BE CONTROLLED IN A MANNER ACCEPTABLE TO THE TOWN.
 - REQUIRED COVERAGE FOR STANDARD, OPEN SPACE AND LOW GROWTH SEED MIXES SHALL BE DEFINED AS FOLLOWS:
 - A UNIFORM VEGETATIVE COVER WITH AN INDIVIDUAL PLANT DENSITY OF AT LEAST 70 PERCENT OR PRE-DISTURBANCE LEVELS AND NO LESS THAN THREE (3) PLANTS PER SQUARE FOOT WITH A MINIMUM HEIGHT OF ROCK-APPROVED MIX.
 - NO BARE AREAS LARGER THAN 4 SQUARE FEET (TWO-FEET BY TWO-FEET OR EQUIVALENT).
 - FREE OF ERODED AREAS.
 - FREE FROM INFESTATION OF NOXIOUS WEEDS IN ACCORDANCE WITH SECTION 6.4 OF THE TESC 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
SIDEOTS GRAMA	VAUGHN	PNWB	10	0.9
WESTERN WHEATGRASS	ARRIBA	PNCS	10	1.6
BLUE GRAMA	HACHITA	PNWB	10	0.3
THICKSPINE WHEATGRASS	CRITANA	PNCS	10	1
PRAIRIE SANDREED	GOSHEN	PNWS	10	0.7
GREEN NEEDLEGRASS	LOORM	PNCB	10	1
SLENDER WHEATGRASS	PRYOR	PNCB	5	0.6
STREAMBANK WHEATGRASS	SODAR	PNCS	5	0.6
TOTAL				9.2

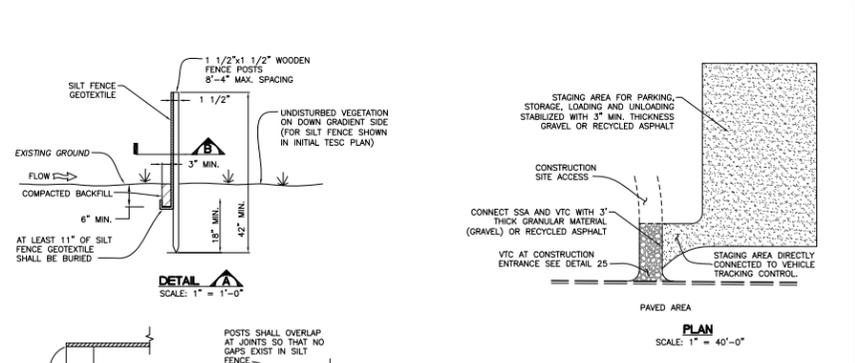
DOUGLAS COUNTY AND CASTLE ROCK TEMPORARY DRILL SEEDING MIX

SPECIES	VARIETY	NOTES	% IN MIX	POUNDS OF PLS PER ACRE
SMOOTH BROMEGRASS	LINCOLN	PICS	30	3.9
INTERMEDIATE WHEATGRASS	OMIE	PICS	30	4.5
FLUORESCENT WHEATGRASS	LUNA	PICS	30	4.2
ANNUAL RYEGRASS	N/A	ACB	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	TOKKA	PNWS	20	3.2
BLUE GRAMA	HACHITA	PNWB	20	0.6
WESTERN WHEATGRASS	ARRIBA	PNCS	20	3.2
SIDEOTS GRAMA	VAUGHN	PNWB	20	1.8
THICKSPINE WHEATGRASS	CRITANA	PNCS	10	1
STREAMBANK WHEATGRASS	SODAR	PNCS	10	1.2
TOTAL				11.0

- REQUIRED COVERAGE FOR TURF GRASS AREAS SHALL BE DEFINED AS FOLLOWS:
 - AT LEAST 80% VEGETATIVE COVER OF GRASS SPECIES PLANTED.
 - NO BARE AREAS LARGER THAN 4 SQUARE FEET (TWO-FEET BY TWO-FEET OR EQUIVALENT).
 - FREE OF ERODED AREAS.
 - FREE FROM INFESTATION OF NOXIOUS WEEDS IN ACCORDANCE WITH SECTION 6.4 OF THE TESC CRITERIA MANUAL.



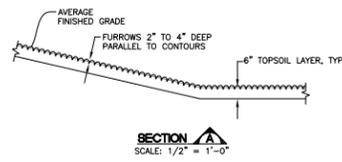
- DOUGLAS COUNTY AND CASTLE ROCK TEMPORARY DRILL SEEDING MIX**

SPECIES	VARIETY	NOTES	% IN MIX	POUNDS OF PLS PER ACRE
SMOOTH BROMEGRASS	LINCOLN	PICS	30	3.9
INTERMEDIATE WHEATGRASS	OMIE	PICS	30	4.5
FLUORESCENT WHEATGRASS	LUNA	PICS	30	4.2
ANNUAL RYEGRASS	N/A	ACB	10	0.8
TOTAL				13.4

DOUGLAS COUNTY AND CASTLE ROCK LOW-GROWTH DRILL SEEDING MIX

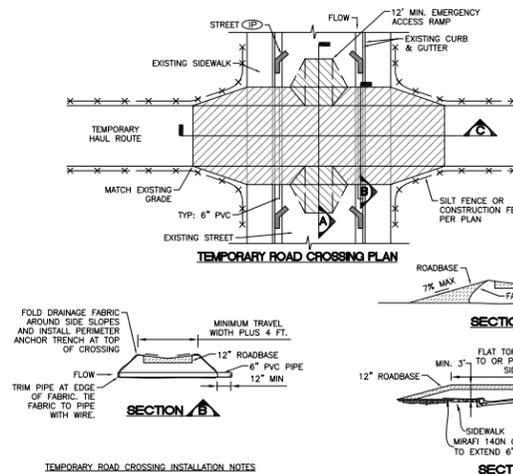
SPECIES	VARIETY	NOTES	% IN MIX	POUNDS OF PLS PER ACRE
BUFFALOGRASS	TOKKA	PNWS	20	3.2
BLUE GRAMA	HACHITA	PNWB	20	0.6
WESTERN WHEATGRASS	ARRIBA	PNCS	20	3.2
SIDEOTS GRAMA	VAUGHN	PNWB	20	1.8
THICKSPINE WHEATGRASS	CRITANA	PNCS	10	1
STREAMBANK WHEATGRASS	SODAR	PNCS	10	1.2
TOTAL				11.0

- REQUIRED COVERAGE FOR TURF GRASS AREAS SHALL BE DEFINED AS FOLLOWS:
 - AT LEAST 80% VEGETATIVE COVER OF GRASS SPECIES PLANTED.
 - NO BARE AREAS LARGER THAN 4 SQUARE FEET (TWO-FEET BY TWO-FEET OR EQUIVALENT).
 - FREE OF ERODED AREAS.
 - FREE FROM INFESTATION OF NOXIOUS WEEDS IN ACCORDANCE WITH SECTION 6.4 OF THE TESC CRITERIA MANUAL.



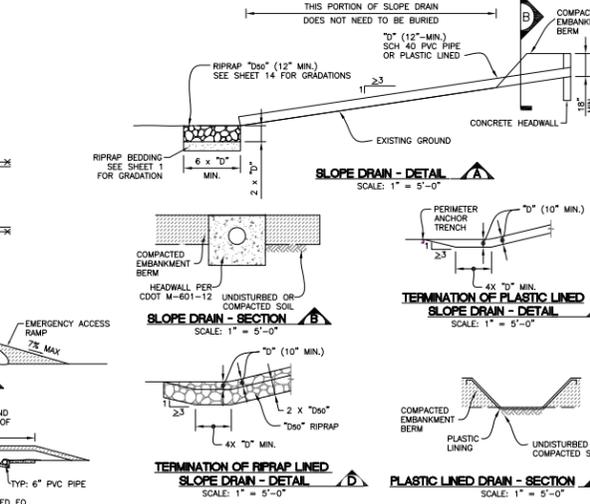
- SURFACE ROUGHENING INSTALLATION NOTES**
- SURFACE ROUGHENING SHALL BE PROVIDED ON ALL FINISHED GRADES (SLOPES AND "FLAT" AREAS) WITHIN 2 DAYS OF COMPLETION OF FINISHED GRADE (FOR AREAS NOT RECEIVING TOPSOIL) OR WITHIN 2 DAYS OF TOPSOIL PLACEMENT.
 - AREAS WHERE BUILDING FOUNDATIONS, PAVEMENT, OR SOD IS TO BE PLACED WITHIN 7-DAYS OF FINISHED GRADING DO NOT NEED TO BE SURFACE ROUGHENED.
 - DISTURBED SURFACES SHALL BE ROUGHENED USING RIPRAP OR TILLING EQUIPMENT ON THE CONTOUR OR TRACKING UP AND DOWN A SLOPE USING EQUIPMENT TRACKS.

- SURFACE ROUGHENING MAINTENANCE NOTES**
- THE TESC MANAGER SHALL INSPECT THE SURFACE ROUGHENING WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS AS NECESSARY.
 - VEHICLES AND EQUIPMENT SHALL GENERALLY BE CONFINED TO ACCESS DRIVES AND SHALL NOT BE DRIVEN OVER AREAS THAT HAVE BEEN SURFACE ROUGHENED.
 - IN NON-TURF GRASS FINISHED AREAS, SEEDING AND MULCHING SHALL TAKE PLACE DIRECTLY OVER SURFACE ROUGHENED AREAS WITHOUT FIRST SMOOTHING OUT THE SURFACE.
 - IN AREAS NOT SEEDED AND MULCHED AFTER SURFACE ROUGHENING, SURFACES SHALL BE RE-ROUGHENED AS NECESSARY TO MAINTAIN GROOVE DEPTH AND SMOOTH OVER ANY RILL EROSION.



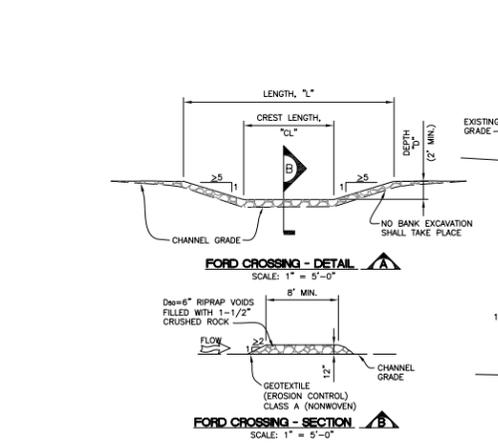
- TEMPORARY ROAD CROSSING INSTALLATION NOTES**
- SEE PLAN VIEW FOR LOCATION OF TEMPORARY ROAD CROSSING.
 - AVOID INSTALLING TEMPORARY ROAD CROSSINGS OVER INLETS, RAMPS, MANHOLES, VALVES AND OTHER SURFACE UTILITIES.
 - CONTACT PUBLIC WORKS TO OBTAIN A STREET CLOSURE PERMIT. ALL TRAFFIC CONTROL REQUIREMENTS SHALL BE FOLLOWED.
 - CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO THE PUBLIC RIGHT-OF-WAY.
 - SCHEDULE 40 OR GREATER PVC PIPE SHALL BE USED.
 - ONLY EMERGENCY ACCESS ALLOWED OVER CROSSING DURING CONSTRUCTION.

- TEMPORARY ROAD CROSSING MAINTENANCE NOTES**
- THE TESC MANAGER SHALL INSPECT ROAD CROSSINGS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY TO ENSURE FULL ACCESS BY EMERGENCY VEHICLES AT ALL TIMES.
 - CONTACT THE TESC AND CONSTRUCTION INSPECTOR FOR INSPECTION UPON REMOVAL OF THE TEMPORARY ROAD CROSSING.
 - WHEN ROAD CROSSINGS ARE REMOVED, THE EXISTING PAVEMENT, CURB, GUTTER, AND SIDEWALK SHALL BE SWEEP CLEAN IN A MANNER APPROVED BY THE TOWN.
 - ANY DISTURBED UNPAVED AREAS SHALL BE DRILL SEEDED AND CRIMP MULCHED AND COVERED WITH EROSION CONTROL BLANKET OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE TOWN.



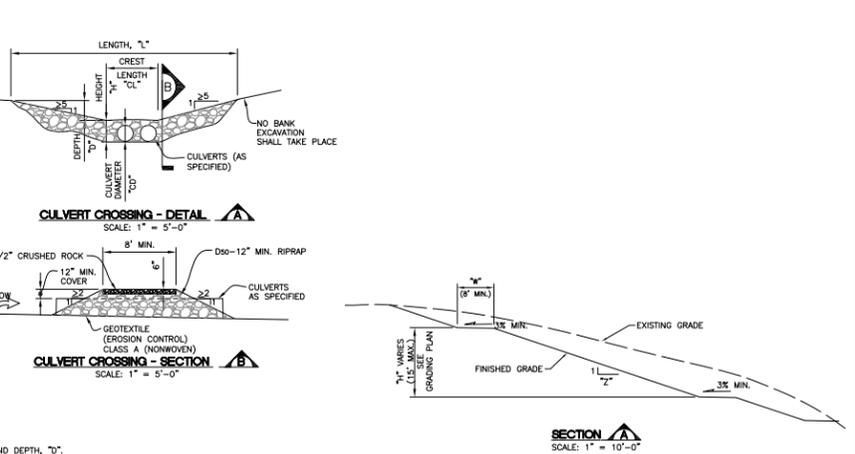
- SLOPE DRAIN INSTALLATION NOTES**
- SEE PLAN VIEW FOR:
 - LOCATION AND LENGTH OF SLOPE DRAIN.
 - TYPE OF SLOPE DRAIN (PIPE, RIPRAP LINED, PLASTIC LINED OR ENGINEERED).
 - PIPE DIAMETER, "D", AND RIPRAP SIZE, "Dm".
 - SLOPE DRAIN DIMENSIONS SHALL BE CONSIDERED MINIMUM DIMENSIONS; CONTRACTOR MAY ELECT TO INSTALL LARGER FACILITIES, ANY DAMAGE TO SOLE OF SLOPE DRAIN DURING RUNOFF EVENTS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
 - SLOPE DRAINS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY UPSTREAM LAND-DISTURBING ACTIVITIES.
 - FOR TEMPORARY SLOPE DRAINS, PIPE MAY BE INSTALLED ON TOP OF SLOPE; HOWEVER, 12" MIN. COVER AT TOP OF SLOPE SHALL BE PROVIDED.
 - A RIPRAP PAD SHALL BE PLACED AT THE OUTFALL OF THE SLOPE DRAIN.

- SLOPE DRAIN MAINTENANCE NOTES**
- THE GESC MANAGER SHALL INSPECT SLOPE DRAINS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS AS NECESSARY.
 - 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.



- TEMPORARY STREAM CROSSING INSTALLATION NOTES**
- 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.
 - TEMPORARY STREAM CROSSING DIMENSIONS, DSD, 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.
 - SEE SHEET 14 FOR RIPRAP AND 1-1/2" CRUSHED ROCK GRADATIONS.
 - 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**
- THE TESC MANAGER SHALL INSPECT STREAM CROSSINGS WEEKLY, 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 (FOR FORD CROSSING) OR GREATER THAN AN AVERAGE DEPTH OF 12-INCHES (CULVERT CROSSING).
 - STREAM CROSSINGS ARE TO REMAIN IN PLACE UNTIL NO LONGER NEEDED, BUT SHALL BE REMOVED PRIOR TO THE END OF CONSTRUCTION.
 - 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.



- TERACING INSTALLATION NOTES**
- SEE PLAN VIEW FOR:
 - WIDTH, "W", HEIGHT, "H", AND SLOPE, "S".
 - TERACING IS NOT REQUIRED FOR SLOPES OF 4 TO 1 OR FLATTER.
 - EARTH (VEGETATED) SLOPES STEEPER THAN 3 TO 1 ARE NOT ALLOWED ON THE SITE.

- TERACING MAINTENANCE NOTES**
- THE TESC MANAGER SHALL INSPECT THE SURFACE ROUGHENING WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
 - ANY RILL EROSION OCCURRING ON SLOPES SHALL BE REPAIRED AND RESEEDED AND MULCHED IN ACCORDANCE WITH DETAIL 17.



Sheet Revisions

REV	DATE	DESCRIPTION	BY
R1	3/11	GESC MANUAL UPDATES	DV
R2	5/15	GESC MANUAL UPDATES	DV
R3	6/19	GESC MANUAL UPDATES	DV

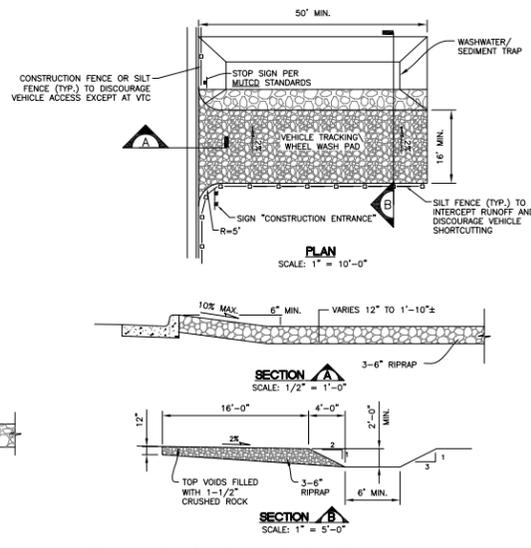
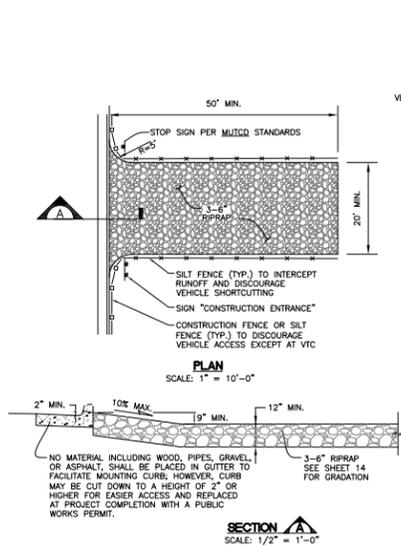
NOTE: SCALES SHOWN ARE FOR 22"x34" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.



CASTLE ROCK WATER
Stormwater Engineering Division

TESC
TEMPORARY EROSION, AND SEDIMENT CONTROL

TESC PLAN
STANDARD NOTES AND DETAILS
SHEET 3 OF 4



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 TESC PERMIT AND BE SHOWN ON THE TESC PLANS.
5. A STOP SIGN INSTALLED IN ACCORDANCE WITH THE MANUAL ON UNEIFORM TRAFFIC CONTROL DEVICES (MUTCD), AS AMENDED, SHALL BE INSTALLED FOR EXITING TRAFFIC AT THE VTC.

VEHICLE TRACKING CONTROL MAINTENANCE NOTES

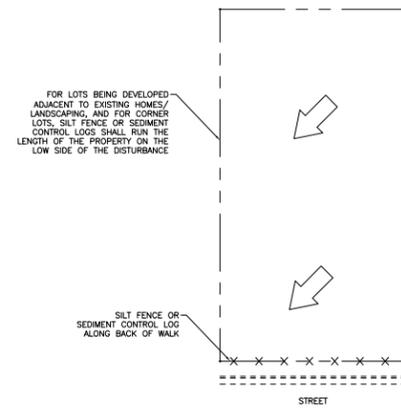
1. STORMWATER MANAGER SHALL INSPECT VEHICLE TRACKING CONTROL DAILY. STONE SURFACE SHALL BE CLEAN AND LOOSE ENOUGH TO RUT SLIGHTLY UNDER WHEEL LOADS AND CAUSE LOOSE STONE TO DISLODGE MUD FROM TIRES. WHEN STONE BECOMES COMPACTED OR FILLED WITH SEDIMENT SO THAT THE EFFECTIVENESS OF THE PAD IS DIMINISHED, 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.

VEHICLE TRACKING CONTROL WITH WHEEL WASH INSTALLATION NOTES

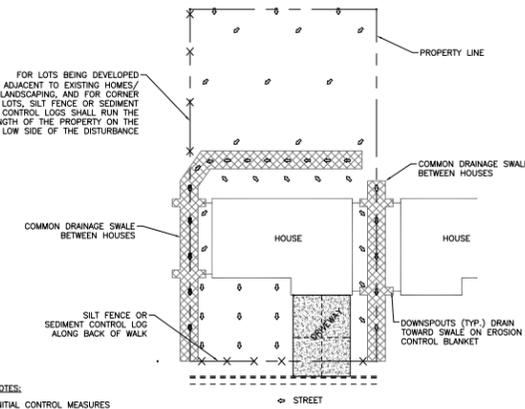
1. ALTHOUGH NOT NORMALLY USED, THE TOWN RESERVES THE RIGHT TO REQUIRE VEHICLE TRACKING CONTROL WITH WHEEL WASH FACILITIES AT SITES WHERE TRACKING ONTO PAVED AREAS BECOMES A SIGNIFICANT PROBLEM.
2. IF VEHICLE TRACKING CONTROL WITH WHEEL WASH FACILITIES ARE REQUIRED, ALL WHEELS ON EVERY VEHICLE LEAVING 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 UNEIFORM TRAFFIC CONTROL DEVICES (MUTCD), AS AMENDED, SHALL BE INSTALLED FOR EXITING TRAFFIC AT THE VTC.

VEHICLE TRACKING CONTROL WITH WHEEL WASH MAINTENANCE NOTES

1. TESC 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.



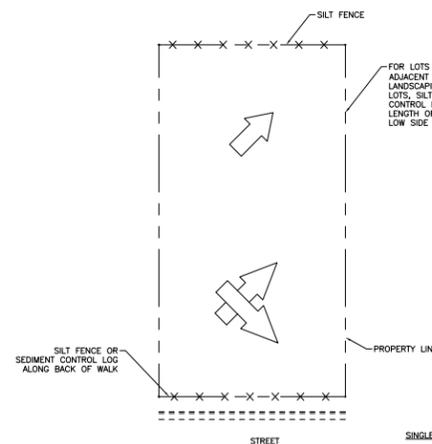
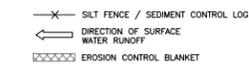
INITIAL TESC REQUIREMENTS



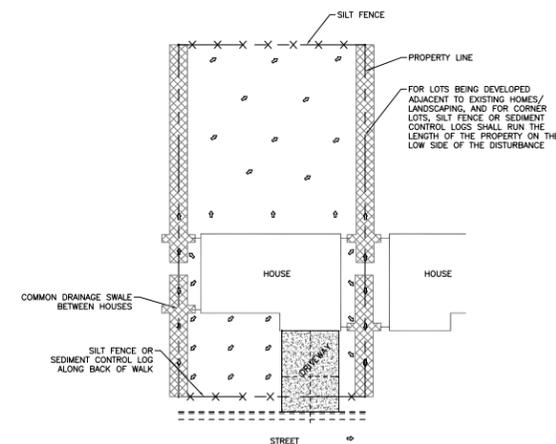
FINAL TESC REQUIREMENTS

SINGLE-FAMILY RESIDENTIAL NOTES:

1. FAILURE TO INSTALL INITIAL CONTROL MEASURES PRIOR TO CONSTRUCTION WILL RESULT IN AN IMMEDIATE STOP WORK ORDER. CONTROL MEASURES MUST BE ADEQUATELY SIZED FOR THE FLOW RATE CONDITIONS.
2. ECB SHALL BE INSTALLED IN ALL DRAINAGE SWALES AND BELOW DOWNSPOUTS AND SUMP PUMP DISCHARGES AT FINAL GRADE.
3. FAILURE TO EXPOSE CURB STOP WILL RESULT IN A FAILED FINAL INSPECTION.
4. AN EQUIVALENT CONTROL MEASURE MAY BE USED FOR SILT FENCE OR SEDIMENT CONTROL LOGS IF APPROVED BY THE STORMWATER INSPECTOR.
5. CONTROL MEASURES ARE TO REMAIN INSTALLED UNTIL PERMANENT EROSION CONTROLS ARE COMPLETED.



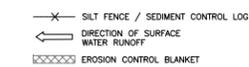
INITIAL TESC REQUIREMENTS



FINAL TESC REQUIREMENTS

SINGLE-FAMILY RESIDENTIAL NOTES:

1. FAILURE TO INSTALL INITIAL CONTROL MEASURES PRIOR TO CONSTRUCTION WILL RESULT IN AN IMMEDIATE STOP WORK ORDER. CONTROL MEASURES MUST BE ADEQUATELY SIZED FOR THE FLOW RATE CONDITIONS.
2. ECB SHALL BE INSTALLED IN ALL DRAINAGE SWALES AND BELOW DOWNSPOUTS AND SUMP PUMP DISCHARGES AT FINAL GRADE.
3. FAILURE TO EXPOSE CURB STOP WILL RESULT IN A FAILED FINAL INSPECTION.
4. AN EQUIVALENT CONTROL MEASURE MAY BE USED FOR SILT FENCE OR SEDIMENT CONTROL LOGS IF APPROVED BY THE STORMWATER INSPECTOR.
5. CONTROL MEASURES ARE TO REMAIN INSTALLED UNTIL PERMANENT EROSION CONTROLS ARE COMPLETED.



Sheet Revisions			
R1	3/11	GESC MANUAL UPDATES	DV
R2	5/15	GESC MANUAL UPDATES	DV
R3	6/19	GESC MANUAL UPDATES	DV

NOTE: SCALES SHOWN ARE FOR 22"x34" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.



CASTLE ROCK WATER
Stormwater Engineering Division

TESC TEMPORARY EROSION, AND SEDIMENT CONTROL

TESC PLAN
STANDARD NOTES AND DETAILS

SHEET
4 OF 4

Appendix C

Example TESC Drawings

- ◆ Small Site TESC Drawings
- ◆ Utility TESC Drawings
- ◆ Staged TESC Drawings
- ◆ Staged and Phased TESC Drawings
- ◆ Vertical Residential TESC Drawing
- ◆ Temporary Batch Plant/TESC Drawings
- ◆ Low Impact TESC Drawing

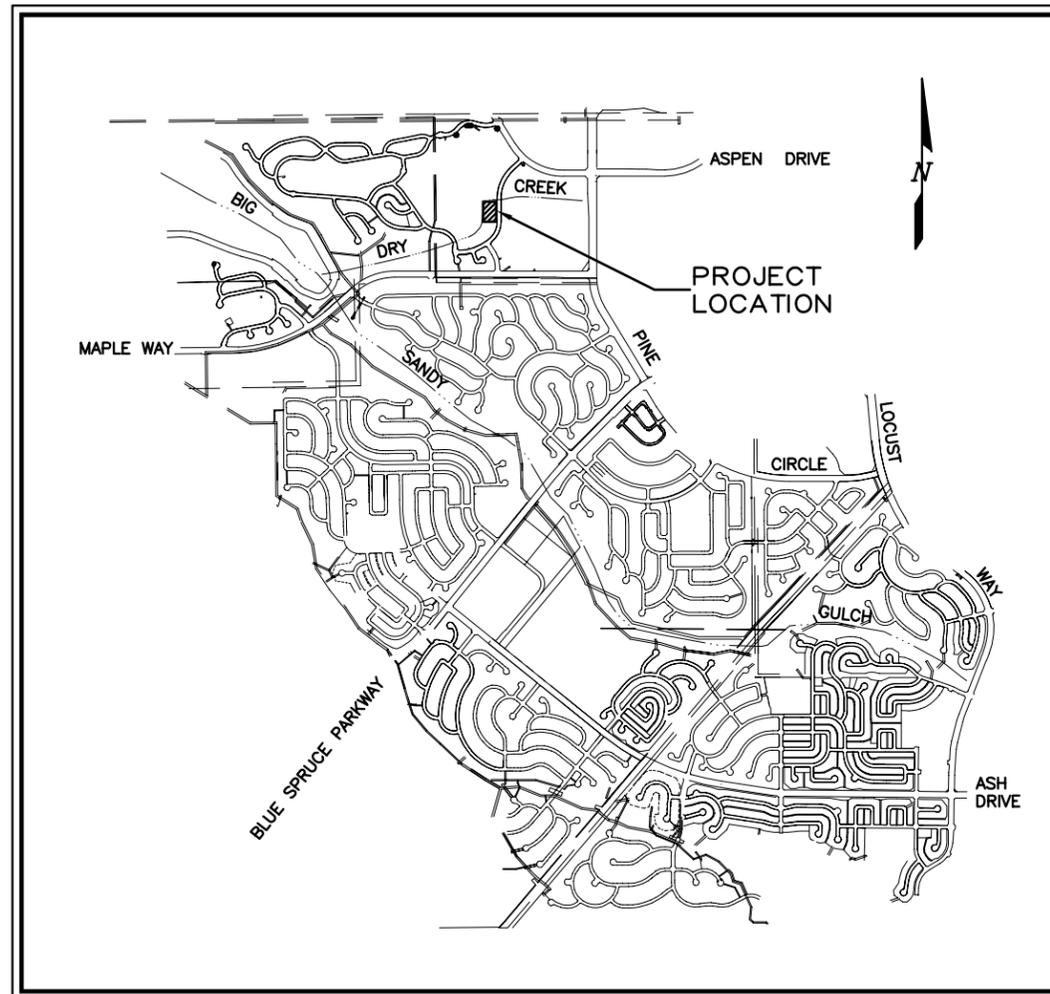
Appendix C

*Example TESC
Drawings*

Small Site TESC 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'

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.

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:

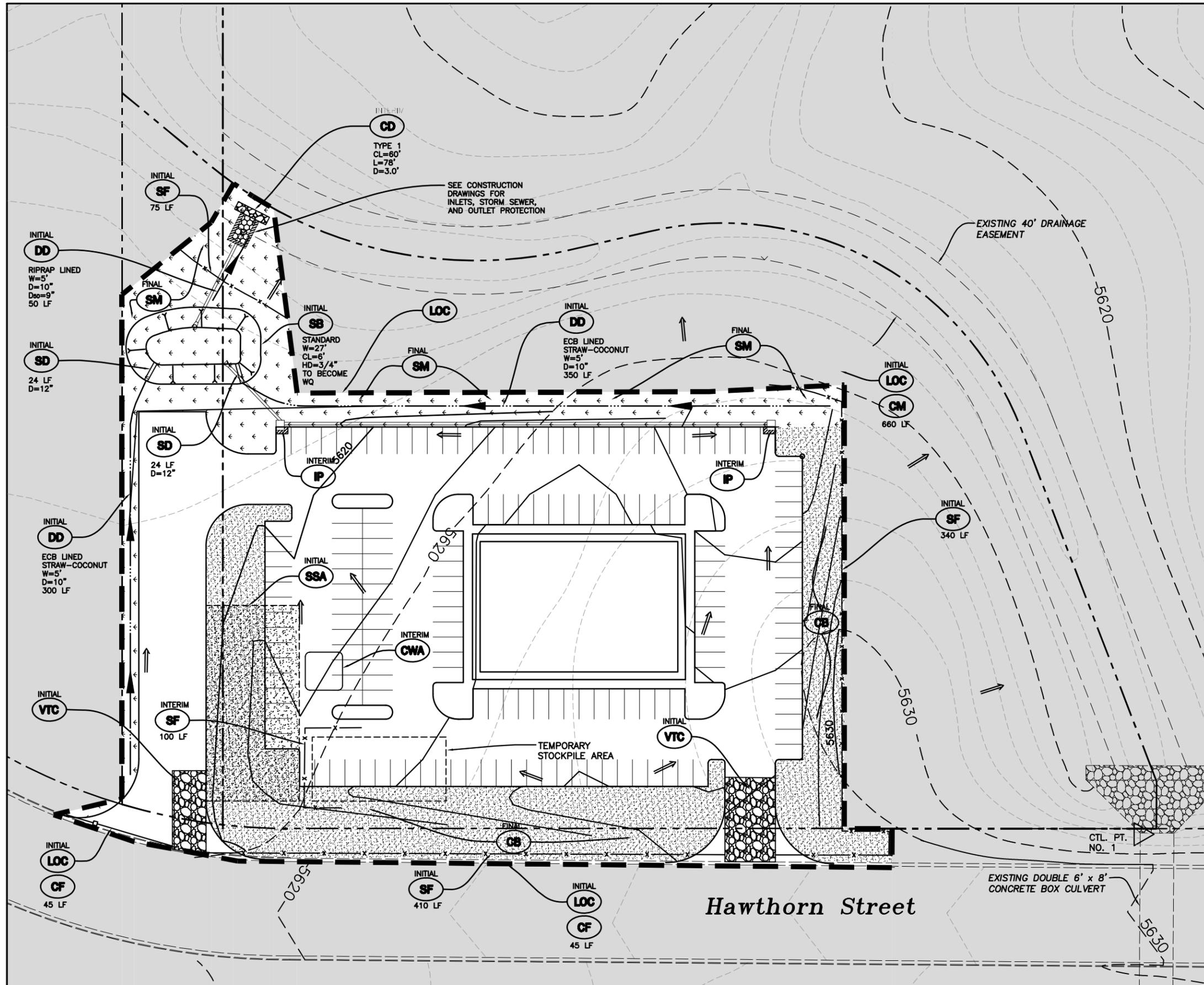
 AUSTIN ENGINEERING COMPANY INC. DATE _____ PE NUMBER _____

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 _____

	Sheet Revisions	AUSTIN ENGINEERING CO., INC. CONSULTING ENGINEERS 88 PLAZA DRIVE, SUITE 200 HIGHLANDS RANCH, COLORADO 80126 (303) 324-4897 FAX: (303) 324-4991	JAMESTOWN DEVELOPMENT CO., INC. 7901 GRANT STREET DENVER, COLORADO 80229 (303) 287-1722 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 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		AREA OUTSIDE LIMITS OF CONSTRUCTION
	EXISTING 10' CONTOUR		AREA TO BE DRILL SEEDED AND CRIMP MULCHED.
	PROPOSED 2' CONTOUR		
	PROPOSED 10' CONTOUR		
	FLOW DIRECTION ARROW		

NOTES:

- SEE COVER SHEET OF THE TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS (SHEET 1 OF 14) FOR LEGEND OF BMP NAMES AND SYMBOLS.
- CONTROL POINT NO. 1: 3" BRASS CAP ON SOUTH CORNER OF WEST HEADWALL, USGS ELEVATION 5628.23.
- 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

Sheet Revisions	

AUSTIN ENGINEERING CO., INC.
 CONSULTING ENGINEERS
 88 PLAZA DRIVE, SUITE 200
 HIGHLANDS RANCH, COLORADO 80126
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 FAX: (303) 324-4991

JAMESTOWN DEVELOPMENT CO., INC.
 7901 GRANT STREET
 DENVER, COLORADO 80229
 (303) 287-1722
 FAX: (303) 289-1084

BUSINESS SITE A

SMALL SITE GESC PLAN

DRAWING
E-1

TOWN OF CASTLE ROCK STANDARD GESC NOTES AND DETAILS TO GO HERE

0000	Sheet Revisions		NOTE: SCALES SHOWN ARE FOR 22"x34" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.		UTILITIES DEPARTMENT Stormwater Engineering Division	GESC GRADING, EROSION, AND SEDIMENT CONTROL	GESC PLAN STANDARD NOTES AND DETAILS	SHEET 1 OF 14

Appendix C

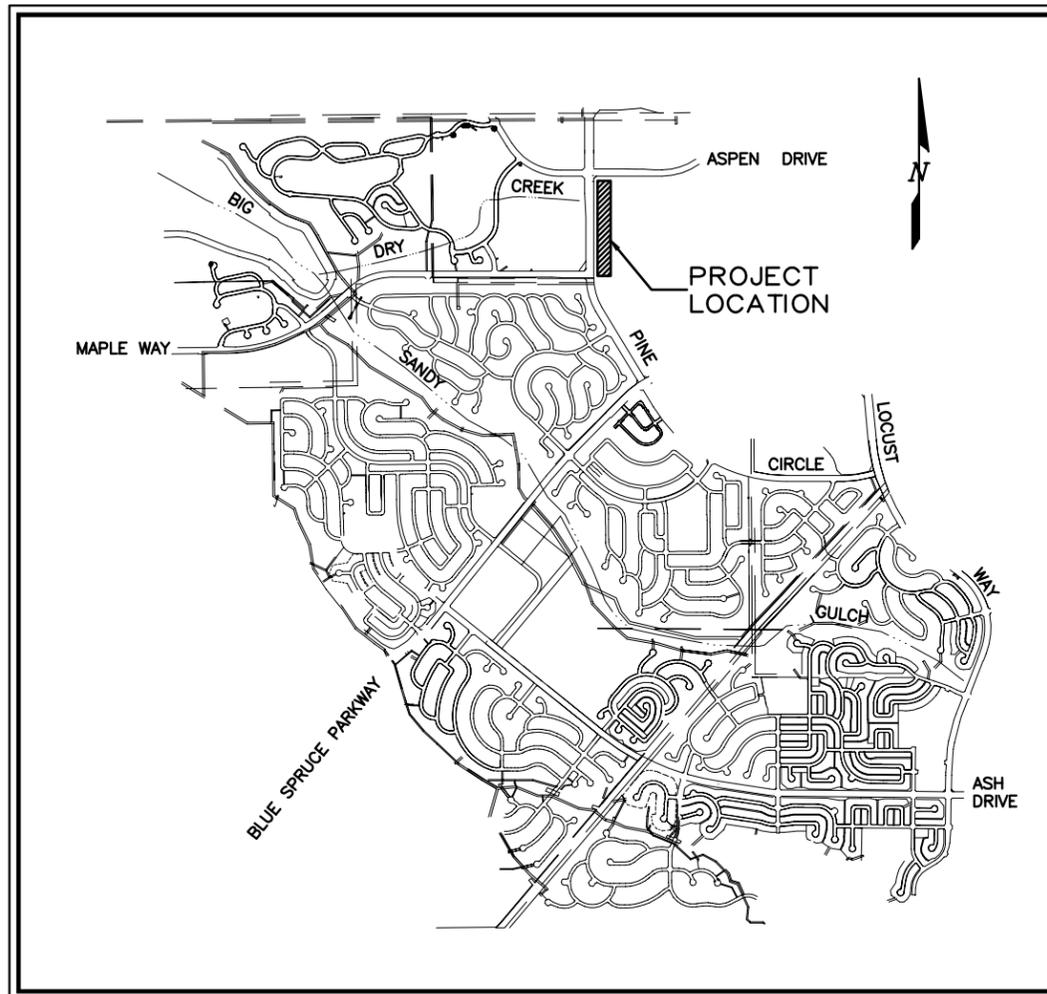
*Example TESC
Drawings*

Utility TESC 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'

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.

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

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.

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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 _____

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	

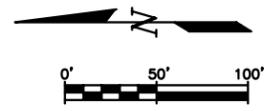
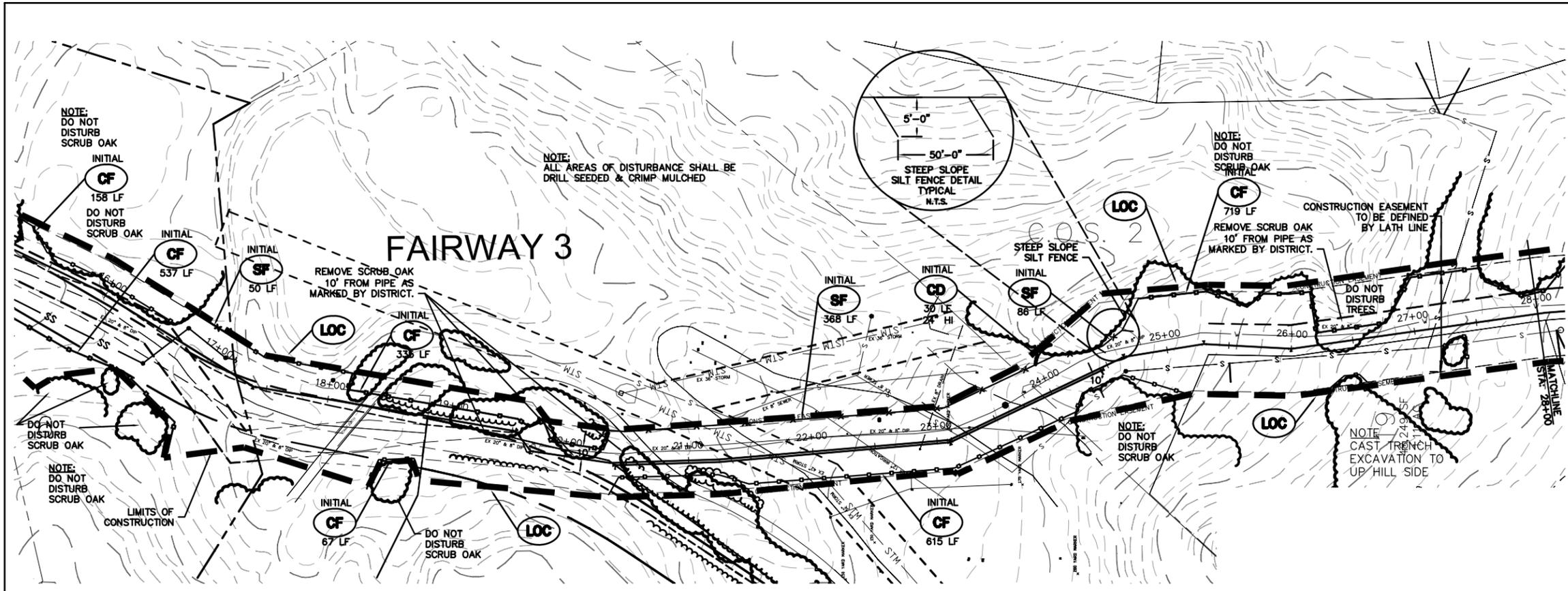
AUSTIN ENGINEERING CO., INC.
CONSULTING ENGINEERS
88 PLAZA DRIVE, SUITE 200
HIGHLANDS RANCH, COLORADO 80126
(303) 324-4897
FAX: (303) 324-4991

JAMESTOWN DEVELOPMENT CO., INC.
7901 GRANT STREET
DENVER, COLORADO 80229
(303) 287-1722
FAX: (303) 289-1084

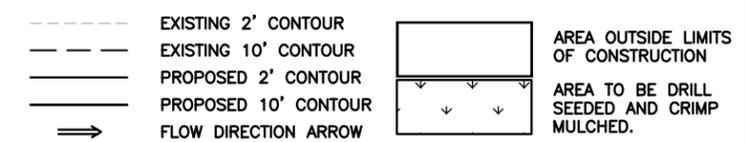
**UTILITY
GESC PLAN**

COVER SHEET

DRAWING
G-1



EXAMPLE OF CASTLE ROCK
 UTILITY GESC DRAWINGS



- NOTES:**
- SEE COVER SHEET OF THE TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS (SHEET 1 OF 14) FOR LEGEND OF BMP NAMES AND SYMBOLS.
 - CONTROL POINT NO. 1: 3" BRASS CAP ON SOUTH CORNER OF WEST HEADWALL, USGS ELEVATION 5628.23.
 - 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
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	

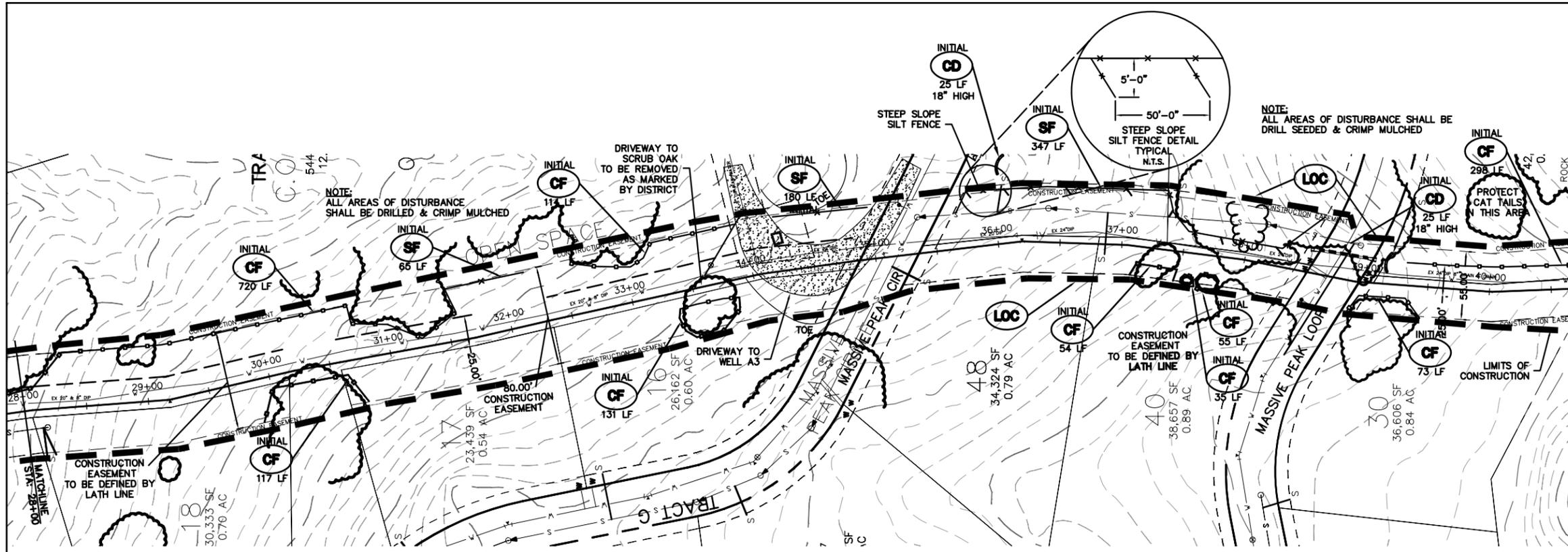
AUSTIN ENGINEERING CO., INC.
 CONSULTING ENGINEERS
 88 PLAZA DRIVE, SUITE 200
 HIGHLANDS RANCH, COLORADO 80128
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 7901 GRANT STREET
 DENVER, COLORADO 80229
 (303) 287-1722
 FAX: (303) 289-1084

**UTILITY
 GESC PLAN**

**WATERLINE
 PLAN**

DRAWING
U-1



NOTE:
ALL AREAS OF DISTURBANCE SHALL BE
DRILL SEEDED & CRIMP MULCHED

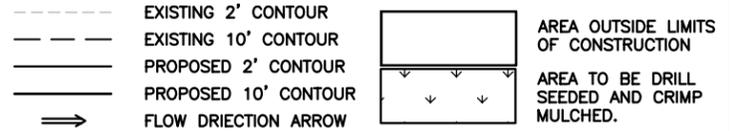
NOTE:
ALL AREAS OF DISTURBANCE
SHALL BE DRILLED & CRIMP MULCHED

NOTE
CAST TRENCH
EXCAVATION TO
UP HILL SIDE

NOTE
CAST TRENCH
EXCAVATION TO
UP HILL SIDE



EXAMPLE
 TOWN OF CASTLE ROCK
 UTILITY GESC DRAWINGS



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.

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

CALL UTILITY NOTIFICATION
CENTER OF COLORADO

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CALL 2-BUSINESS DAYS IN ADVANCE
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FOR THE MARKING OF UNDERGROUND
MEMBER UTILITIES.

Sheet Revisions	

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JAMESTOWN DEVELOPMENT CO., INC.
 7901 GRANT STREET
 DENVER, COLORADO 80229
 (303) 287-1722
 FAX: (303) 289-1084

**UTILITY
GESC PLAN**

**WATERLINE
PLAN**

DRAWING
U-2

TOWN OF CASTLE ROCK STANDARD GESC NOTES AND DETAILS TO GO HERE

0000	Sheet Revisions		NOTE: SCALES SHOWN ARE FOR 22"x34" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.		UTILITIES DEPARTMENT Stormwater Engineering Division	GESC GRADING, EROSION, AND SEDIMENT CONTROL	GESC PLAN STANDARD NOTES AND DETAILS	SHEET 1 OF 14

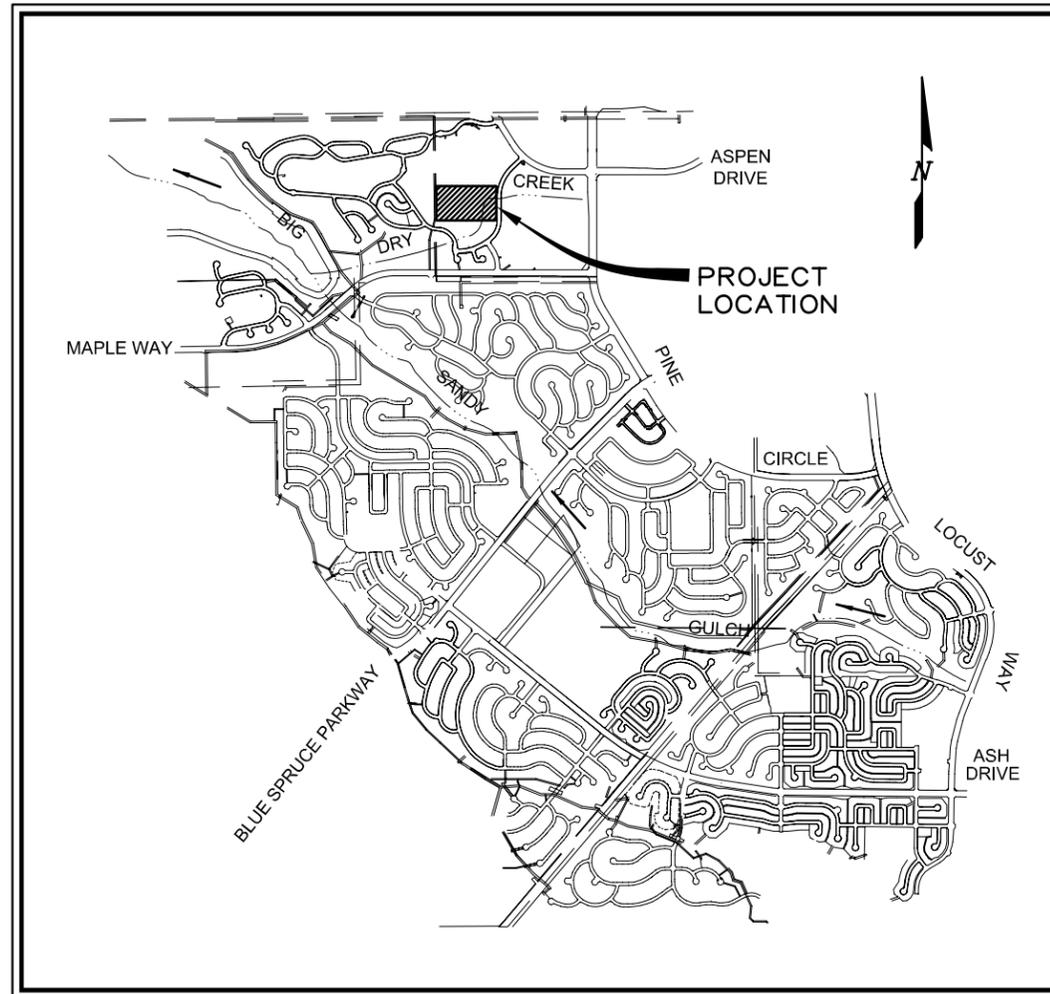
Appendix C

*Example TESC
Drawings*

Staged TESC 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'

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.

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.

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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 _____

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	

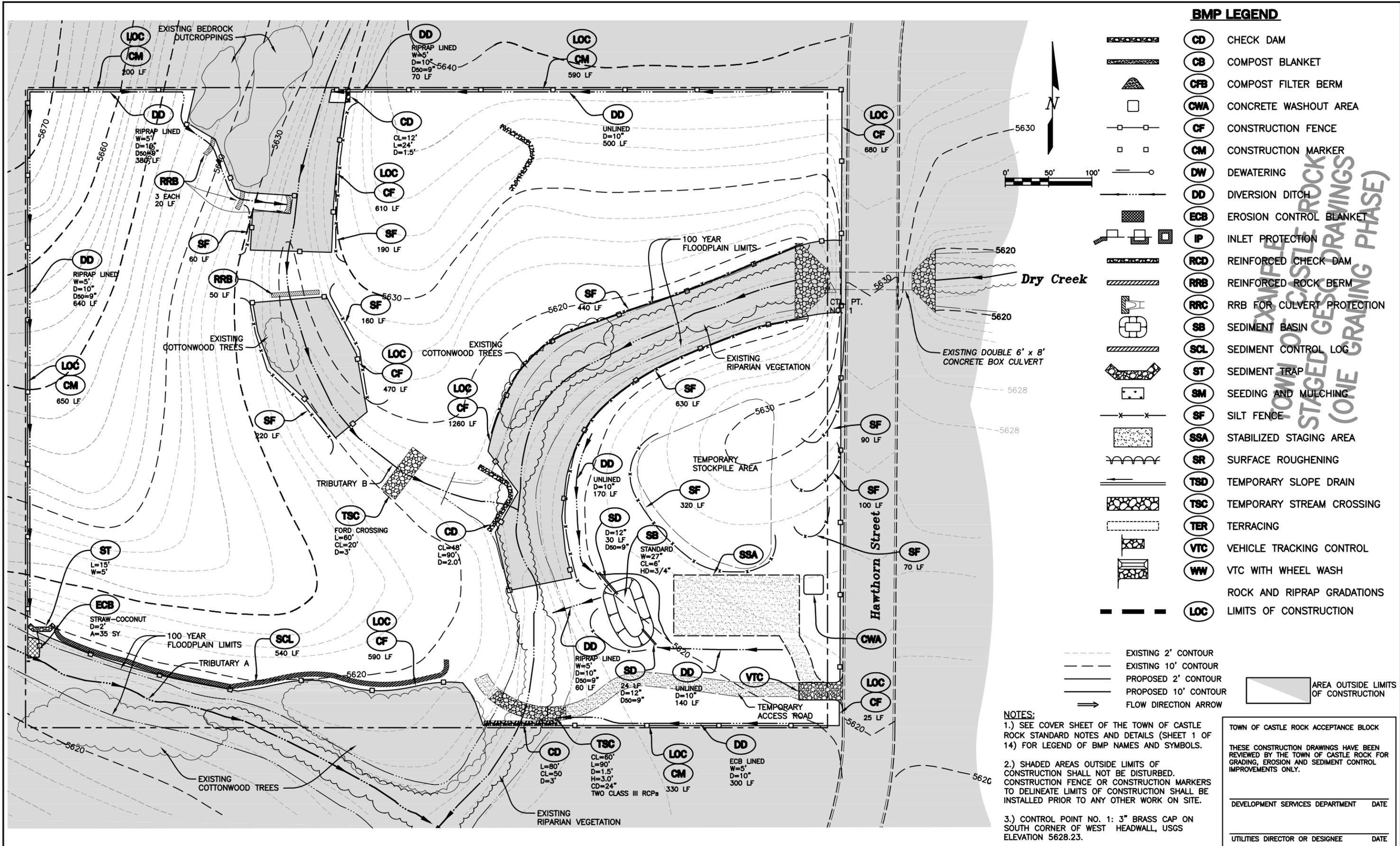
AUSTIN ENGINEERING CO., INC.
CONSULTING ENGINEERS
88 PLAZA DRIVE, SUITE 200
HIGHLANDS RANCH, COLORADO 80126
(303) 324-4897
FAX: (303) 324-4991

JAMESTOWN DEVELOPMENT CO., INC.
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



Sheet Revisions	

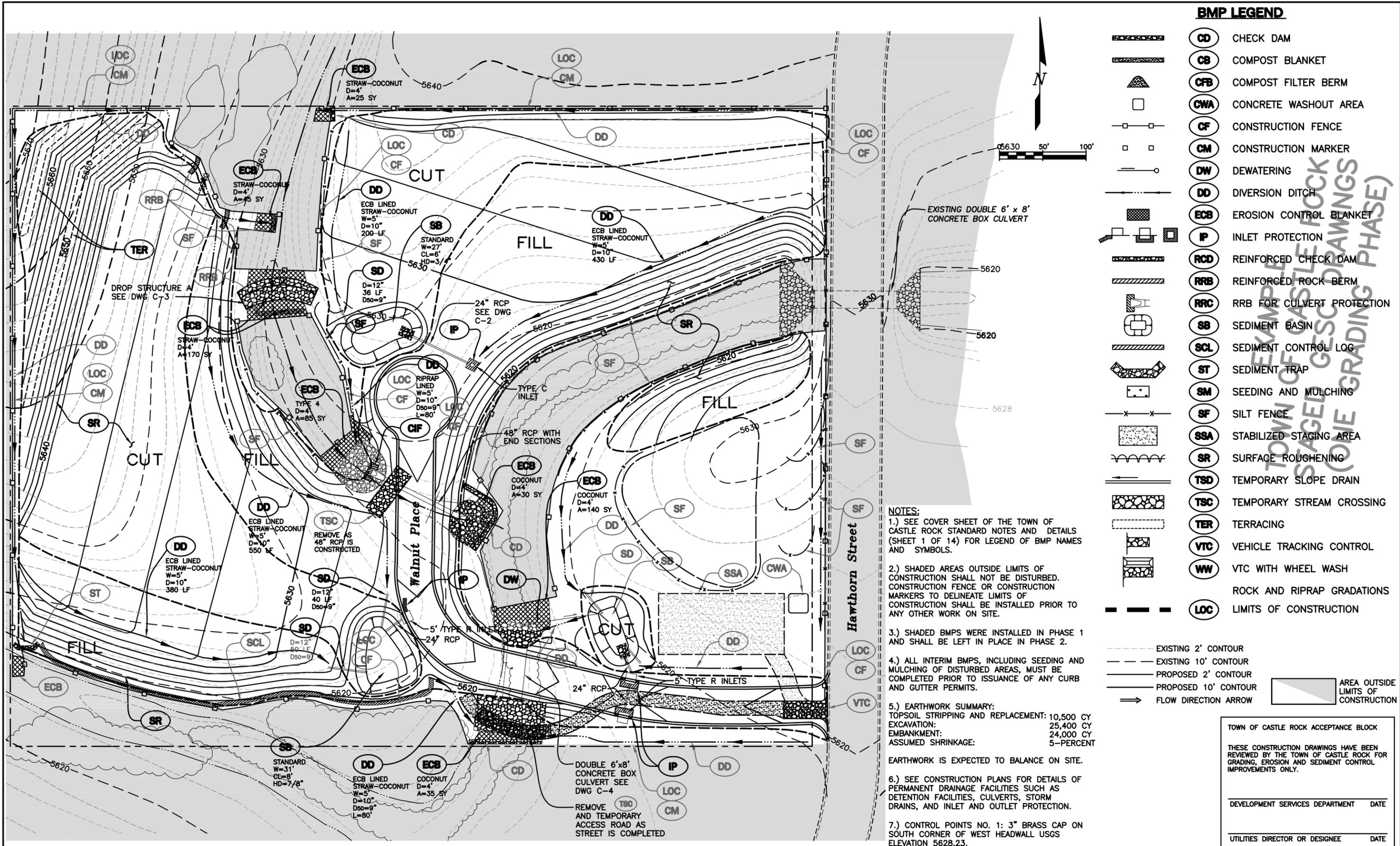
AUSTIN ENGINEERING CO., INC.
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 DENVER, COLORADO 80229
 (303) 287-1722
 FAX: (303) 289-1084

**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
- VW** VTC WITH WHEEL WASH
- LOC** ROCK AND RIPRAP GRADATIONS
- LOC** 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.

- 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

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DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

Sheet Revisions	

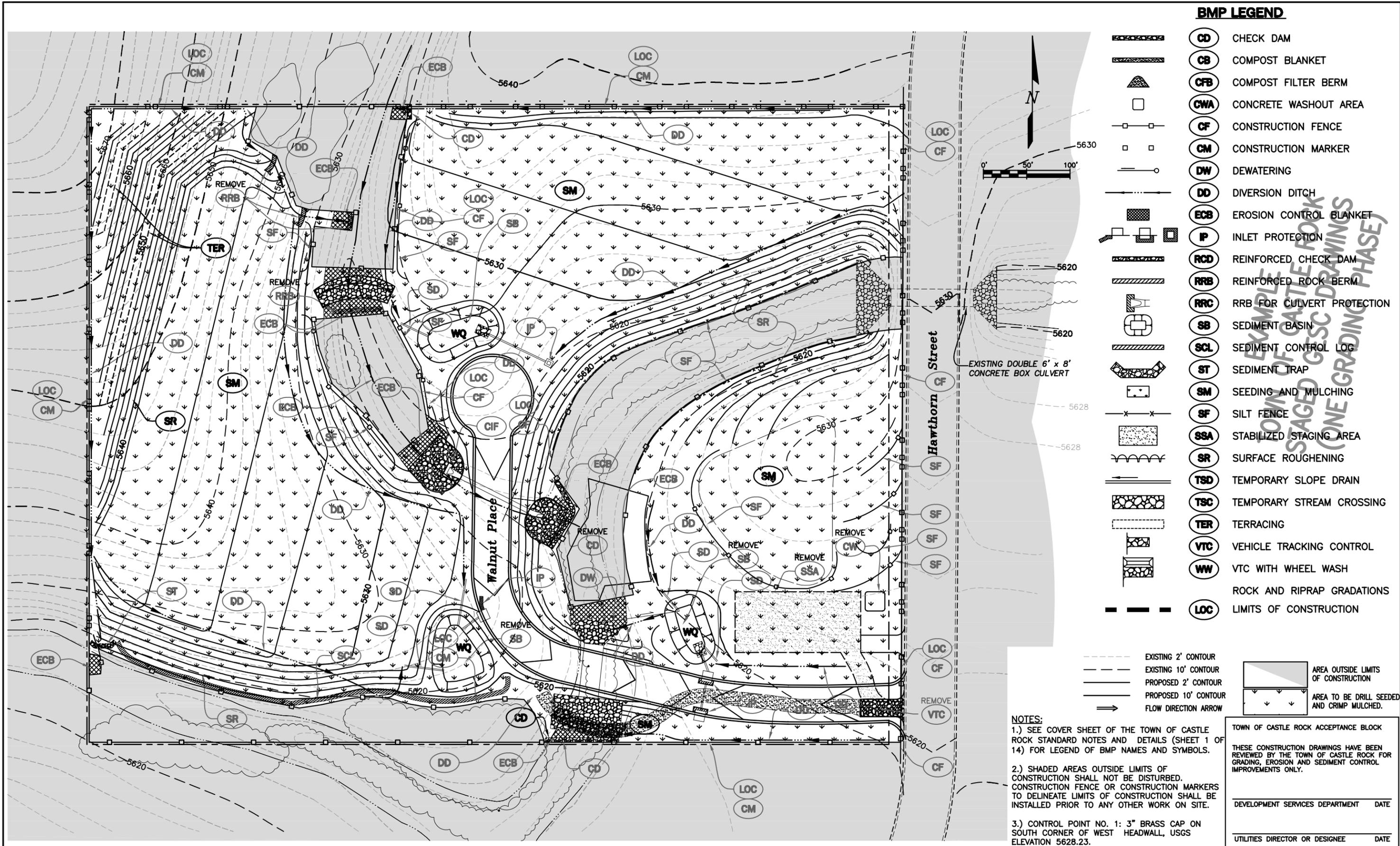
AUSTIN ENGINEERING CO., INC.
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 88 PLAZA DRIVE, SUITE 200
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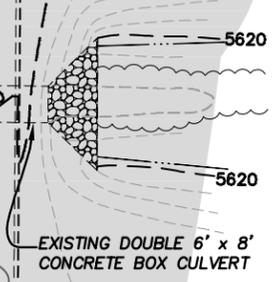
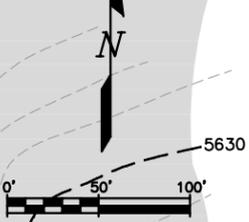
DRY CREEK BUSINESS PARK FILING NO. 1

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:

- SEE COVER SHEET OF THE TOWN OF CASTLE ROCK STANDARD NOTES AND DETAILS (SHEET 1 OF 14) FOR LEGEND OF BMP NAMES AND SYMBOLS.
- 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.
- CONTROL POINT NO. 1: 3" BRASS CAP ON SOUTH CORNER OF WEST HEADWALL, USGS ELEVATION 5628.23.

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

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DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNER DATE

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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

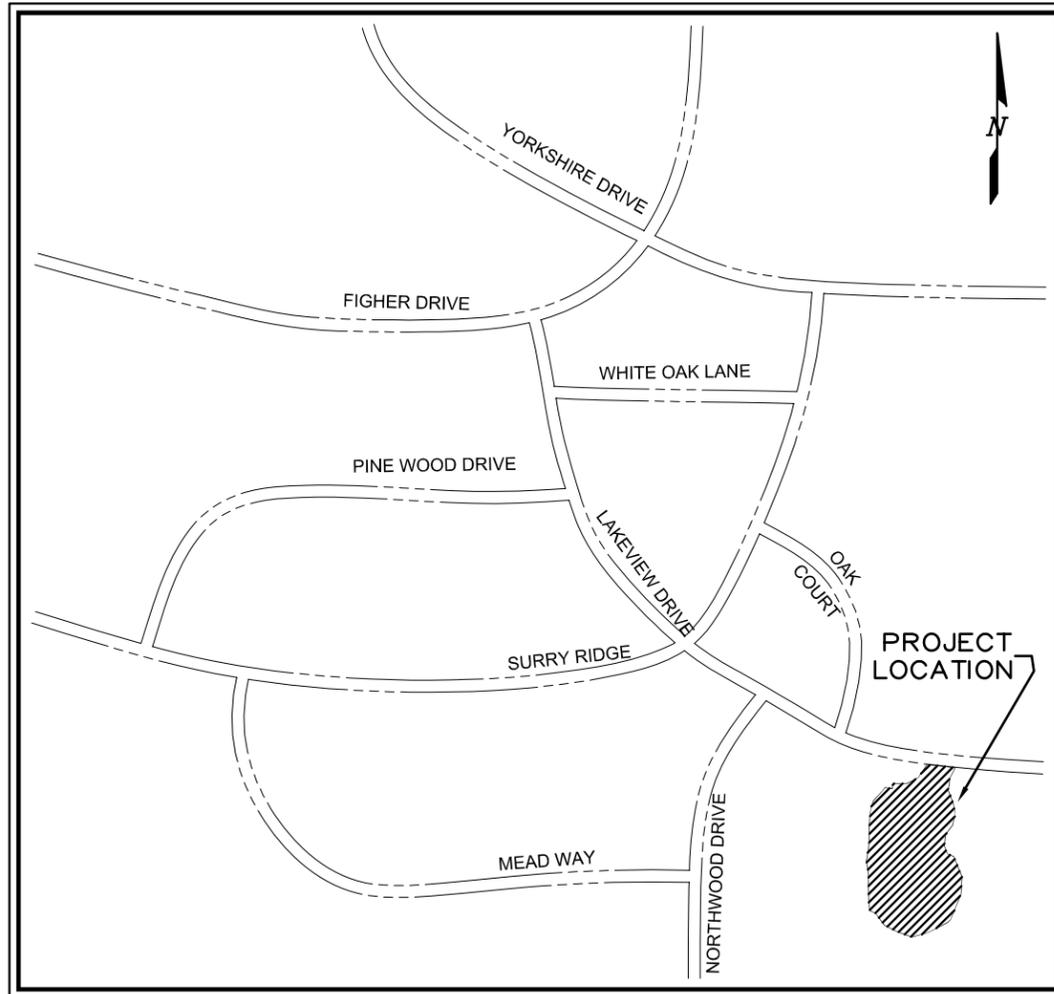
0000	Sheet Revisions		NOTE: SCALES SHOWN ARE FOR 22"x34" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.		UTILITIES DEPARTMENT Stormwater Engineering Division	GESC GRADING, EROSION, AND SEDIMENT CONTROL	GESC PLAN STANDARD NOTES AND DETAILS	SHEET 1 OF 14

Appendix C

*Example TESC
Drawings*

**Staged and Phased TESC
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'

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.

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

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 _____

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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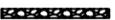
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RESIDENTIAL SITE A

COVER SHEET

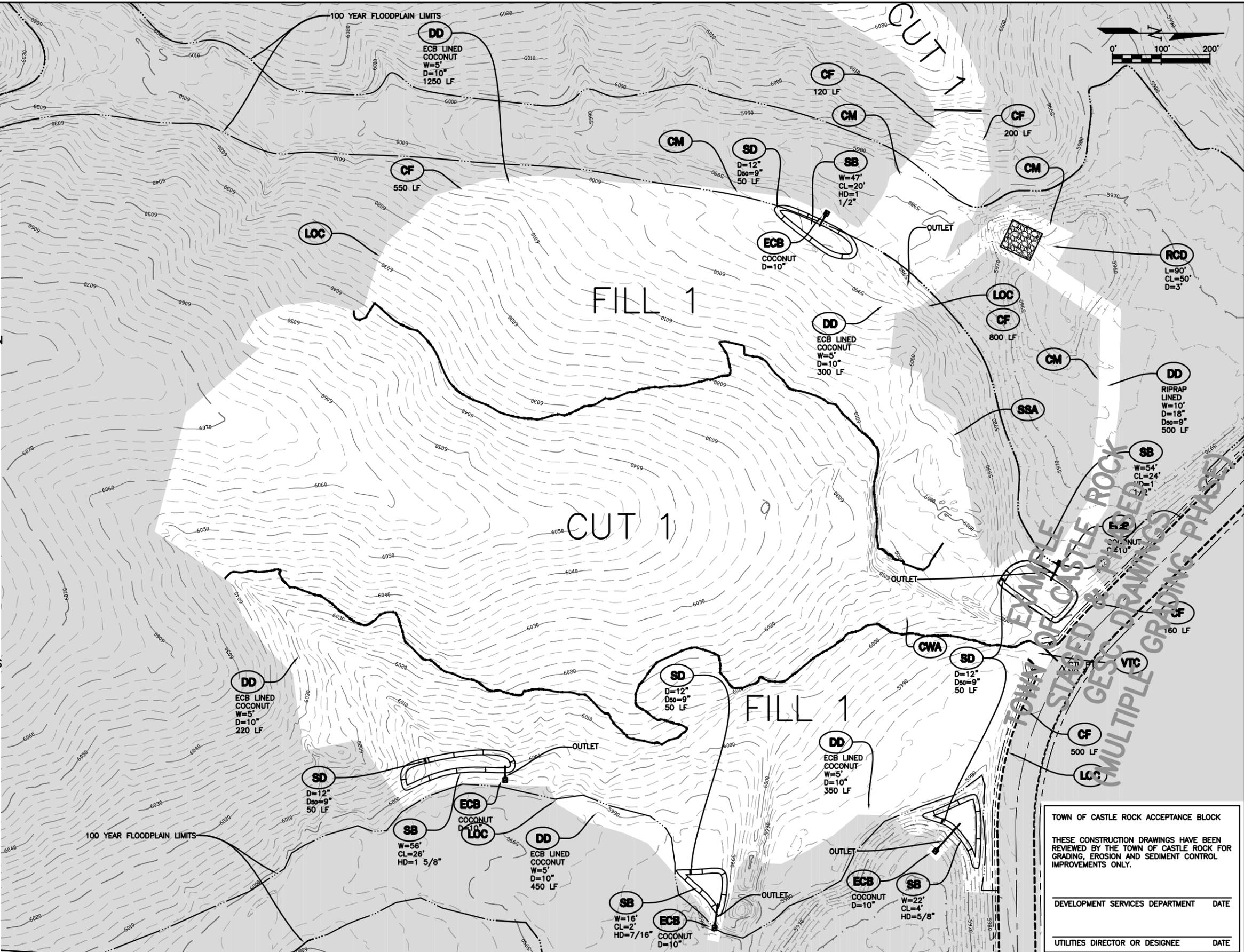
DRAWING
G-1

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

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DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

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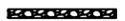
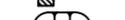
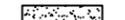
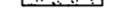
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PHASE I INITIAL GESC PLAN

DRAWING
E-1

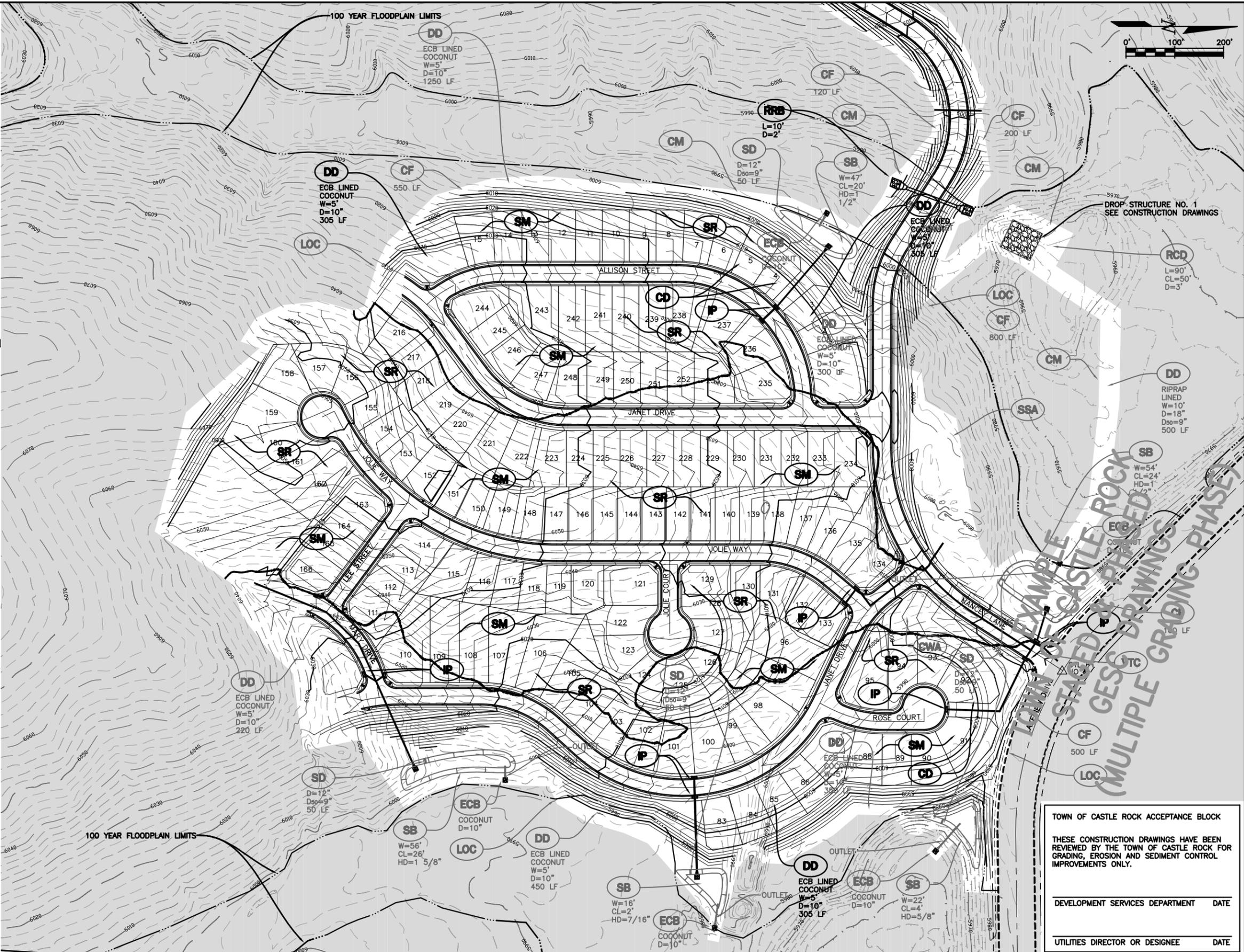
BMP LEGEND

-  **CD** CHECK DAM
-  **CB** COMPOST BLANKET
-  **CFB** COMPOST FILTER BERM
-  **CWA** CONCRETE WASHOUT AREA
-  **CF** CONSTRUCTION FENCE
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-  **TER** TERRACING
-  **VTC** VEHICLE TRACKING CONTROL
-  **VW** VTC WITH WHEEL WASH
-  **LOC** 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.
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RESIDENTIAL SITE A

**PHASE I INTERIM
 GESC PLAN**

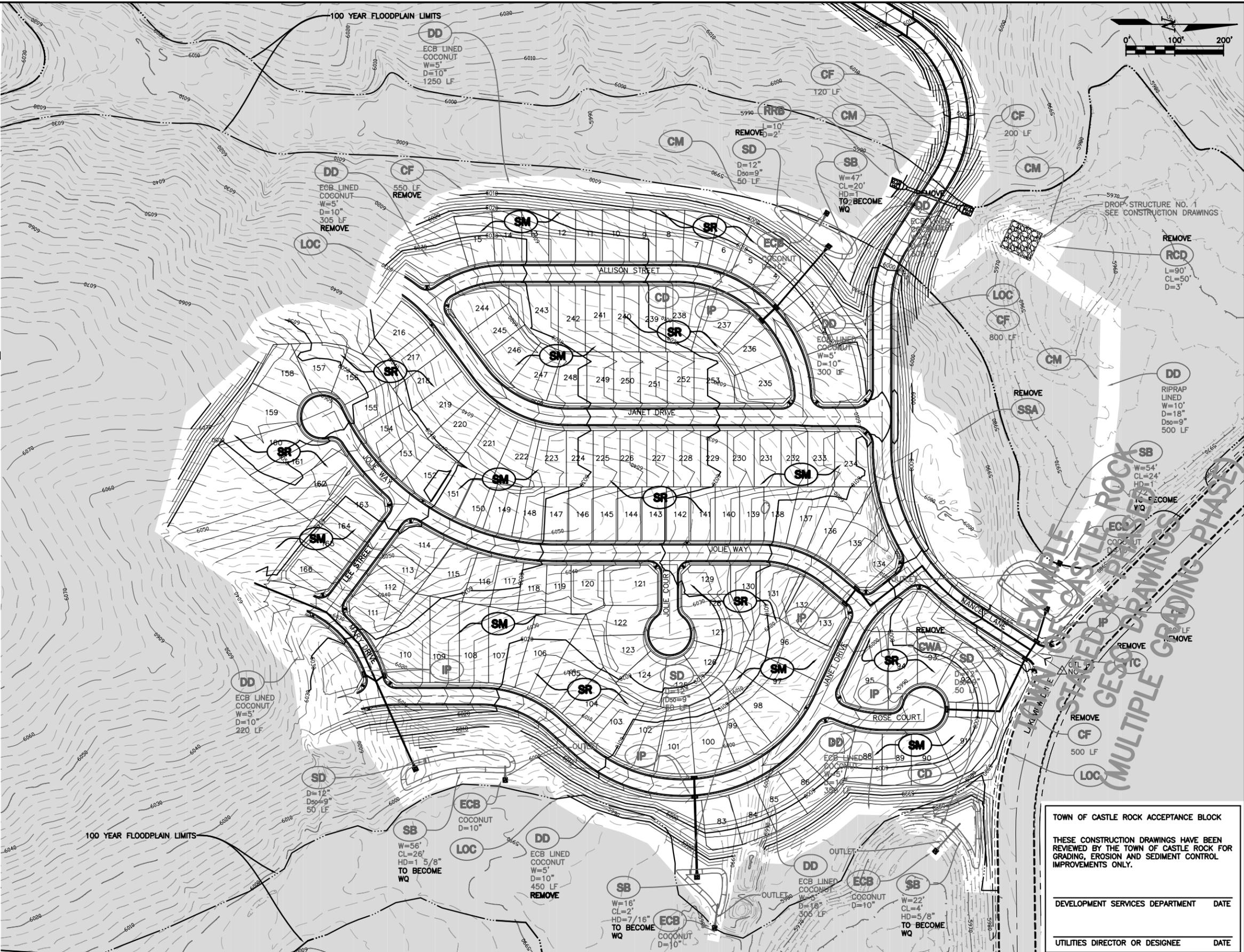
DRAWING
E-2

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
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	LOC LIMITS OF CONSTRUCTION

	EXISTING 2' CONTOUR
	EXISTING 10' CONTOUR
	PROPOSED 2' CONTOUR
	PROPOSED 10' CONTOUR
	FLOW DIRECTION ARROW
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RESIDENTIAL SITE A

**PHASE I FINAL
 GESC PLAN**

DRAWING
E-3

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

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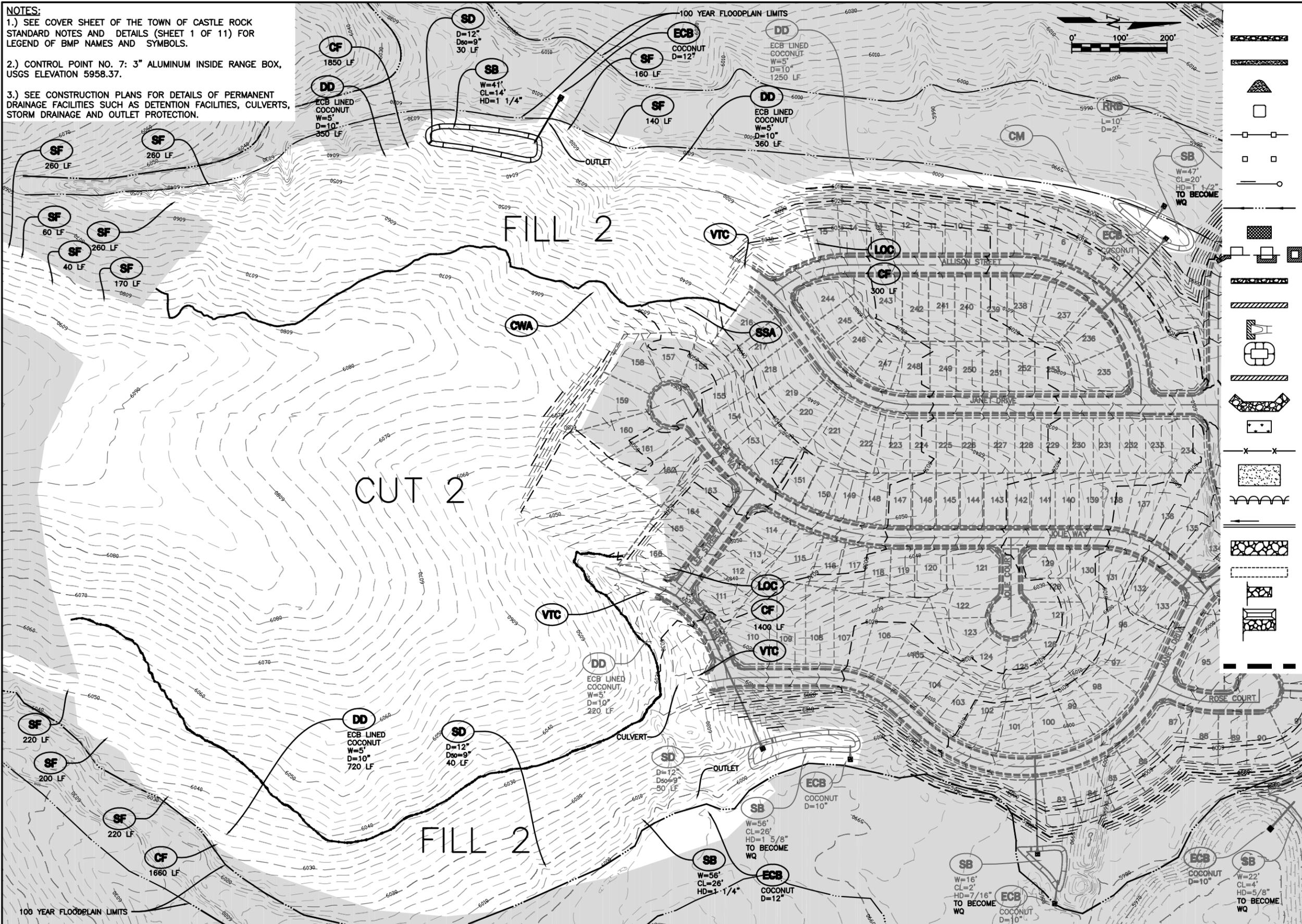
DEVELOPMENT SERVICES DEPARTMENT	DATE
UTILITIES DIRECTOR OR DESIGNEE	DATE

NOTES:

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	CD CHECK DAM
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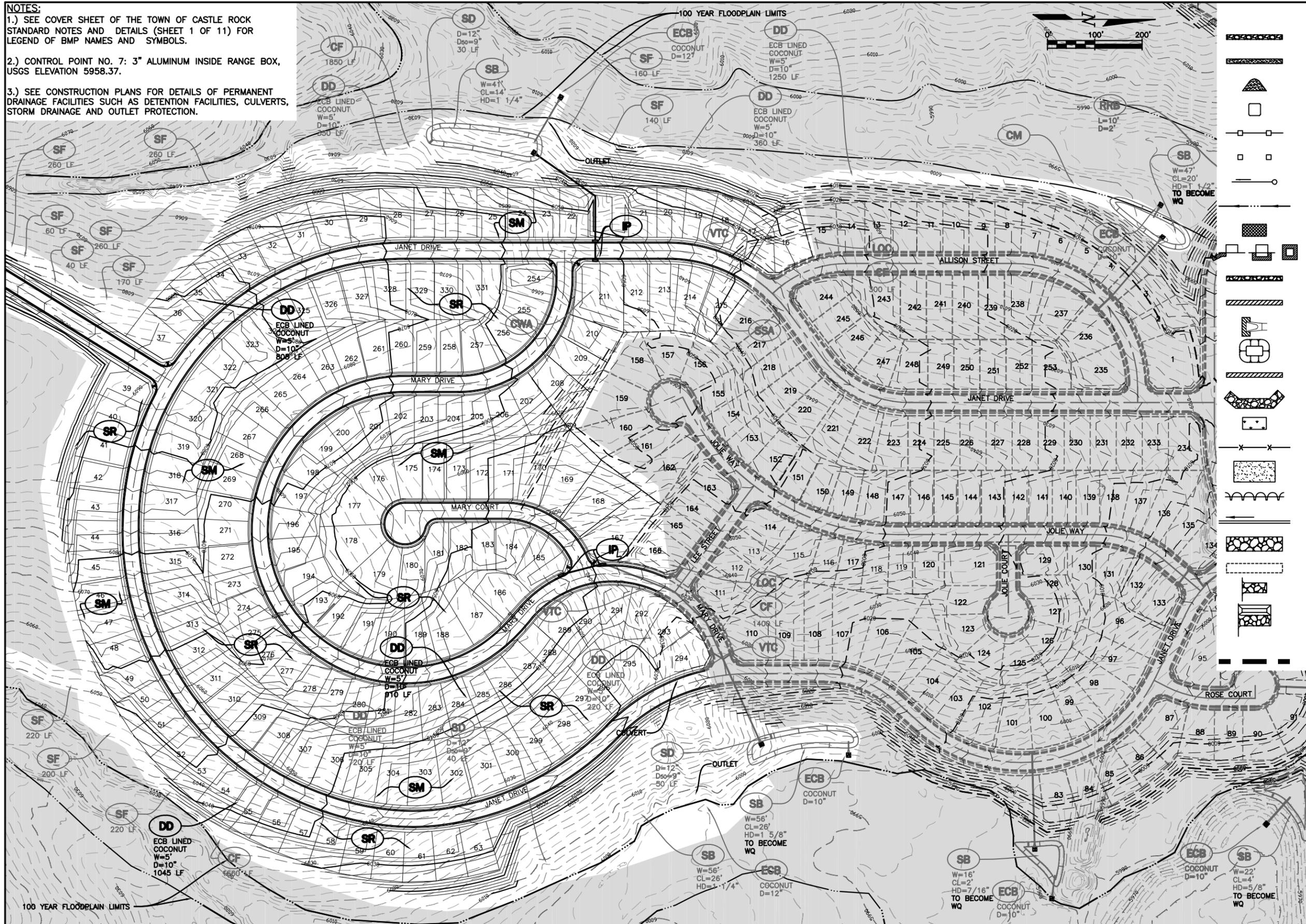
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RESIDENTIAL SITE A

**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.
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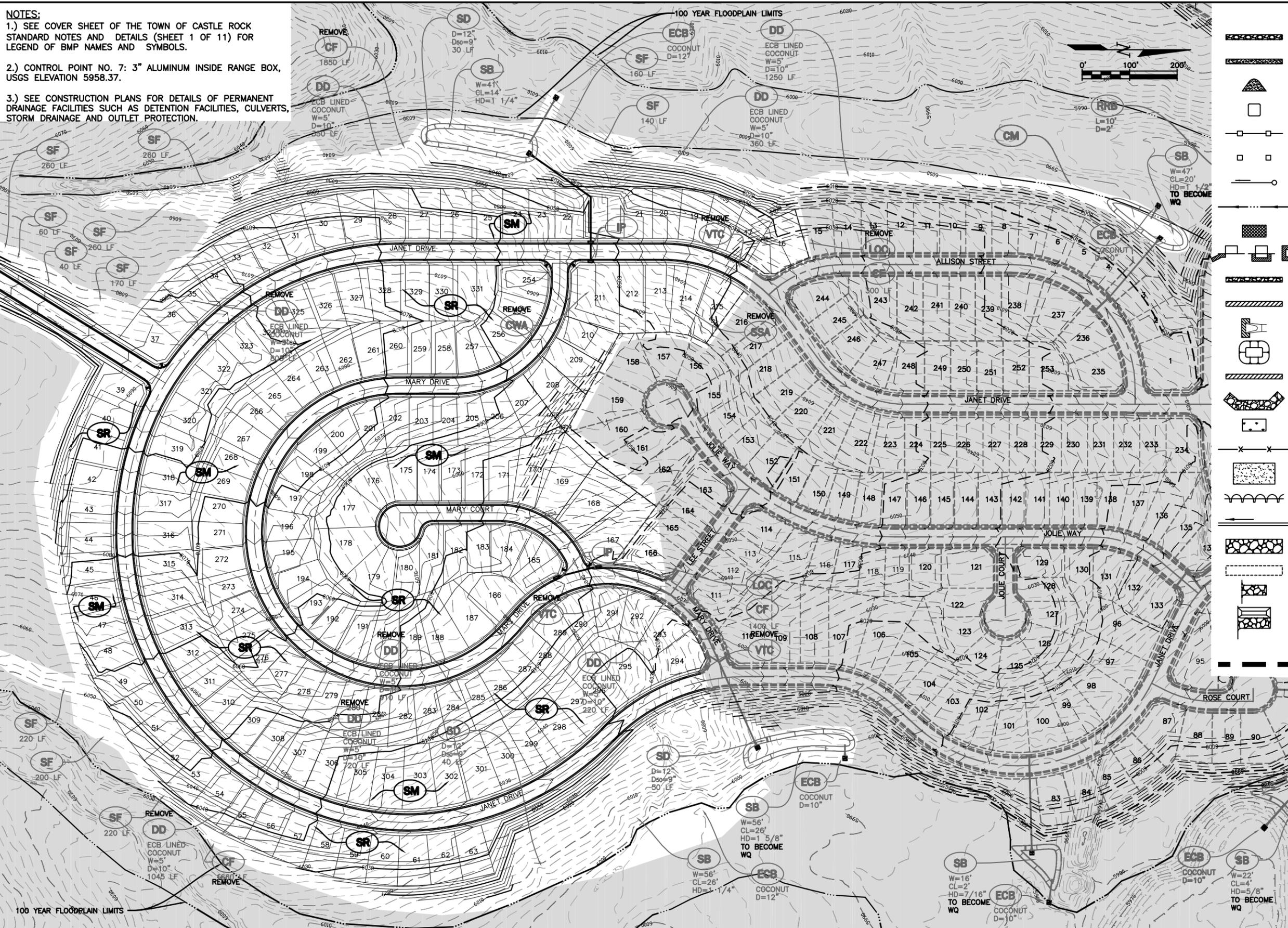
RESIDENTIAL SITE A

**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.
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	VTC VEHICLE TRACKING CONTROL
	VWC VTC WITH WHEEL WASH
	RRG 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 _____

Sheet Revisions	

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 FAX: (303) 289-1084

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
 STAGED & PHASED
 GESC DRAWINGS
 (MULTIPLE GRADING PHASE)

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

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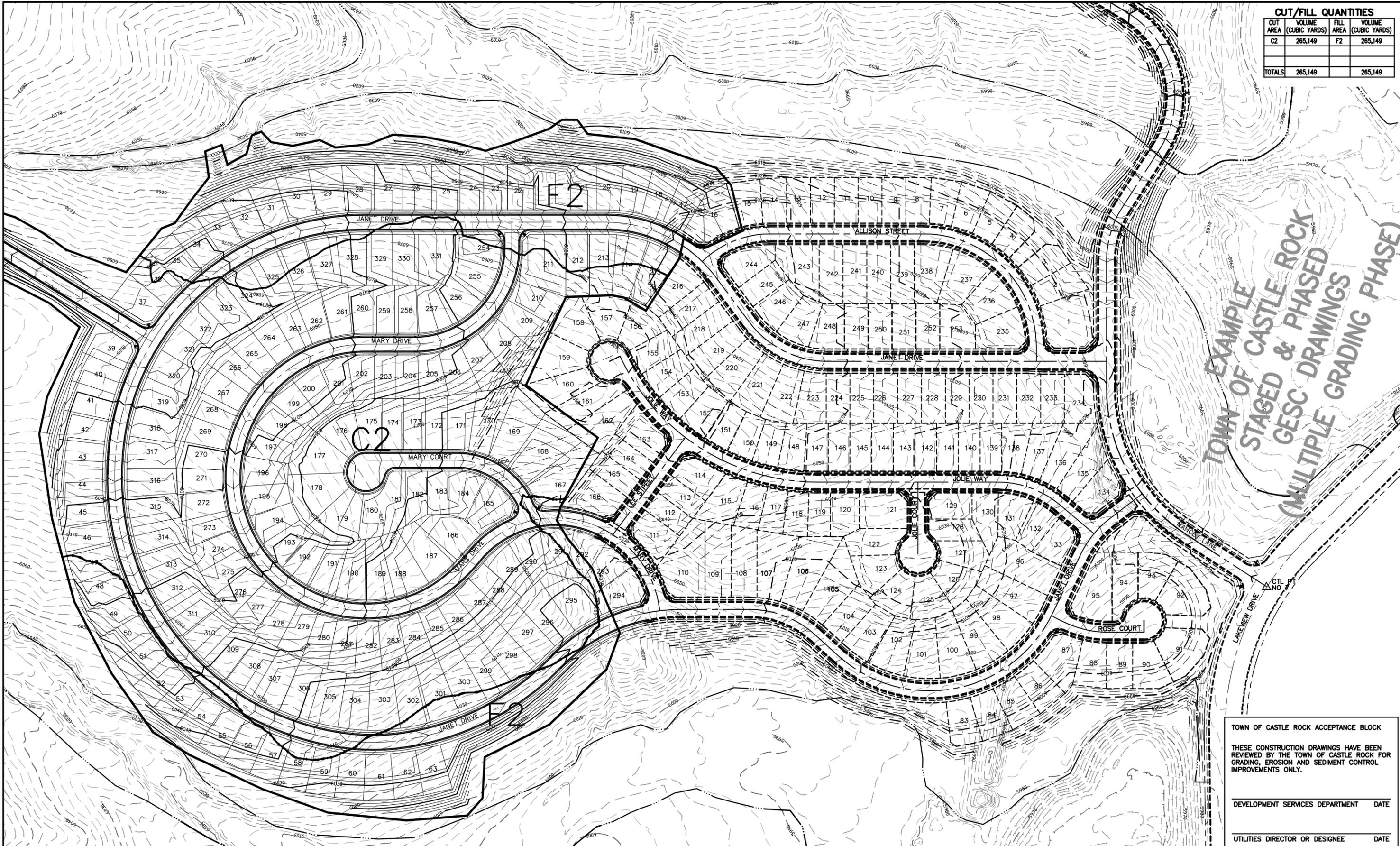
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RESIDENTIAL SITE A

**PHASE I EARTHWORK
 BALANCE PLAN**

DRAWING
E-7

CUT/FILL QUANTITIES			
CUT AREA (CUBIC YARDS)	VOLUME (CUBIC YARDS)	FILL AREA (CUBIC YARDS)	VOLUME (CUBIC YARDS)
C2	265,149	F2	265,149
TOTALS	265,149		265,149



TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

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DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE

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RESIDENTIAL SITE A

**PHASE II EARTHWORK
 BALANCE PLAN**

DRAWING
E-8

TOWN OF CASTLE ROCK STANDARD GESC NOTES AND DETAILS TO GO HERE

0000	Sheet Revisions		NOTE: SCALES SHOWN ARE FOR 22"x34" SHEETS; ADJUST ACCORDINGLY FOR 11"x17" SHEETS.		UTILITIES DEPARTMENT Stormwater Engineering Division	GESC GRADING, EROSION, AND SEDIMENT CONTROL	GESC PLAN STANDARD NOTES AND DETAILS	SHEET 1 OF 14

Appendix C

*Example TESC
Drawings*

Vertical Residential TESC
Drawing

NOTES:

1. CONTROL MEASURES INSTALLED PER FINAL TESC DRAWING TRANSFER TO THE PERMITEE AND SHALL BE LEFT, OR REPLACED, UNTIL REVEGETATION ESTABLISHMENT IS APPROVED BY THE TOWN OR VERTICAL LOT CONSTRUCTION IS COMPLETE.
2. IF LOCATION(S) OF VTC(S), STOCKPILE(S), STAGING AREA(S) AND CONCRETE WASHOUT AREA(S) CHANGE DURING CONSTRUCTION, THE PERMITEE SHALL REVISE THE PLAN ACCORDINGLY AND MUST SHOW APPROPRIATE CONTROL MEASURES IMPLEMENTED AT ALL TIMES.
3. ALL STRUCTURAL CONTROL MEASURES MUST BE MAINTAINED IN EFFECTIVE OPERATING CONDITION AT ALL TIMES AND ARE SUBJECT TO INSPECTION AND ENFORCEMENT UNDER THE TESC PERMIT.
4. IF SEDIMENT OR OTHER POLLUTANTS ARE TRACKED, SPILLED, OR WASHED ONTO STREETS, PERMITEE SHALL CLEAN THE STREETS IN ACCORDANCE WITH TOWN APPROVED METHODS, OR AS DIRECTED BY THE STORMWATER INSPECTOR. FAILURE TO CLEAN UP TRACKING OF MATERIAL ONTO STREETS WILL RESULT IN AN IMMEDIATE STOP WORK ORDER.
5. PERMITEE 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 MAY RESULT IN AN IMMEDIATE STOP WORK ORDER.
6. PERMITEE SHALL ENSURE THAT ALL CONCRETE WASHOUT AREAS ARE PROPERLY INSTALLED, POSTED AND CLEANED SUCH THAT ALL WASTEWATER IS CONTAINED AND DOES NOT ENTER THE STORM DRAIN SYSTEM. FAILURE TO PROPERLY MAINTAIN CONCRETE WASHOUT AREAS SUCH THAT A DISCHARGE OCCURS WILL RESULT IN A STOP WORK ORDER AND/OR AN IMMEDIATE CLEANUP ORDER.
7. PERMITEE SHALL ENSURE THAT ALL SANITARY FACILITIES ARE PROPERLY SECURED TO THE GROUND TO PREVENT TOPPLING AND DISCHARGE OF LIQUID WASTE. FAILURE TO PROPERLY SECURE SANITARY FACILITIES WILL RESULT IN A VIOLATION.
8. PERMITEE SHALL ENSURE THAT THE TESC PLAN REMAINS UPDATED WITH CURRENT FIELD CONDITIONS. FAILURE TO MAINTAIN THE TESC PLAN WILL RESULT IN A VIOLATION.
9. REMOVAL OF CONTROL MEASURES SHALL NOT OCCUR WITHOUT THE APPROVAL OF THE STORMWATER INSPECTOR.



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 |
| | (A) A LOT TESC |
| | (B) B LOT TESC |
| | EXISTING 2' CONTOUR |
| | EXISTING 10' CONTOUR |
| | FLOW DIRECTION ARROW |
| | AREA OUTSIDE LIMITS OF CONSTRUCTION |

TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

THESE DRAWINGS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR TEMPORARY EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

DEVELOPMENT SERVICES DEPARTMENT DATE

Sheet Revisions	

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EXAMPLE SITE A

VERTICAL RESIDENTIAL
 TESC PLAN

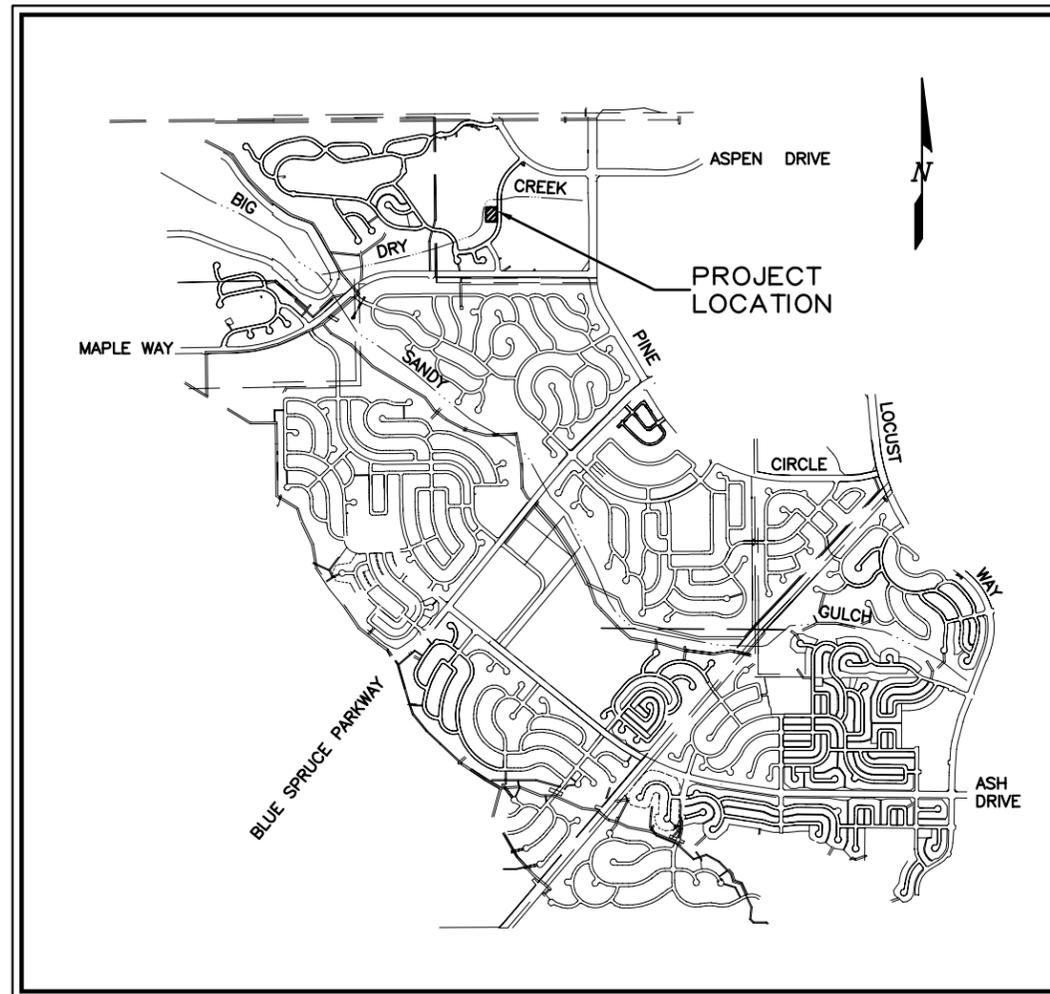
DRAWING
 VR-1

Appendix C

*Example TESC
Drawings*

**Temporary Batch Plant
TESC 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'

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.

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

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

EXAMPLE
 TOWN OF CASTLE ROCK
 TEMPORARY BATCH PLANT
 GESC DRAWINGS

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

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TEMPORARY BATCH PLANT

COVER SHEET

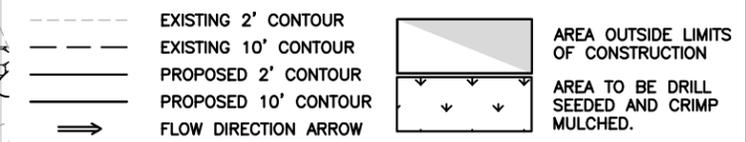
DRAWING
B-1

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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.



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

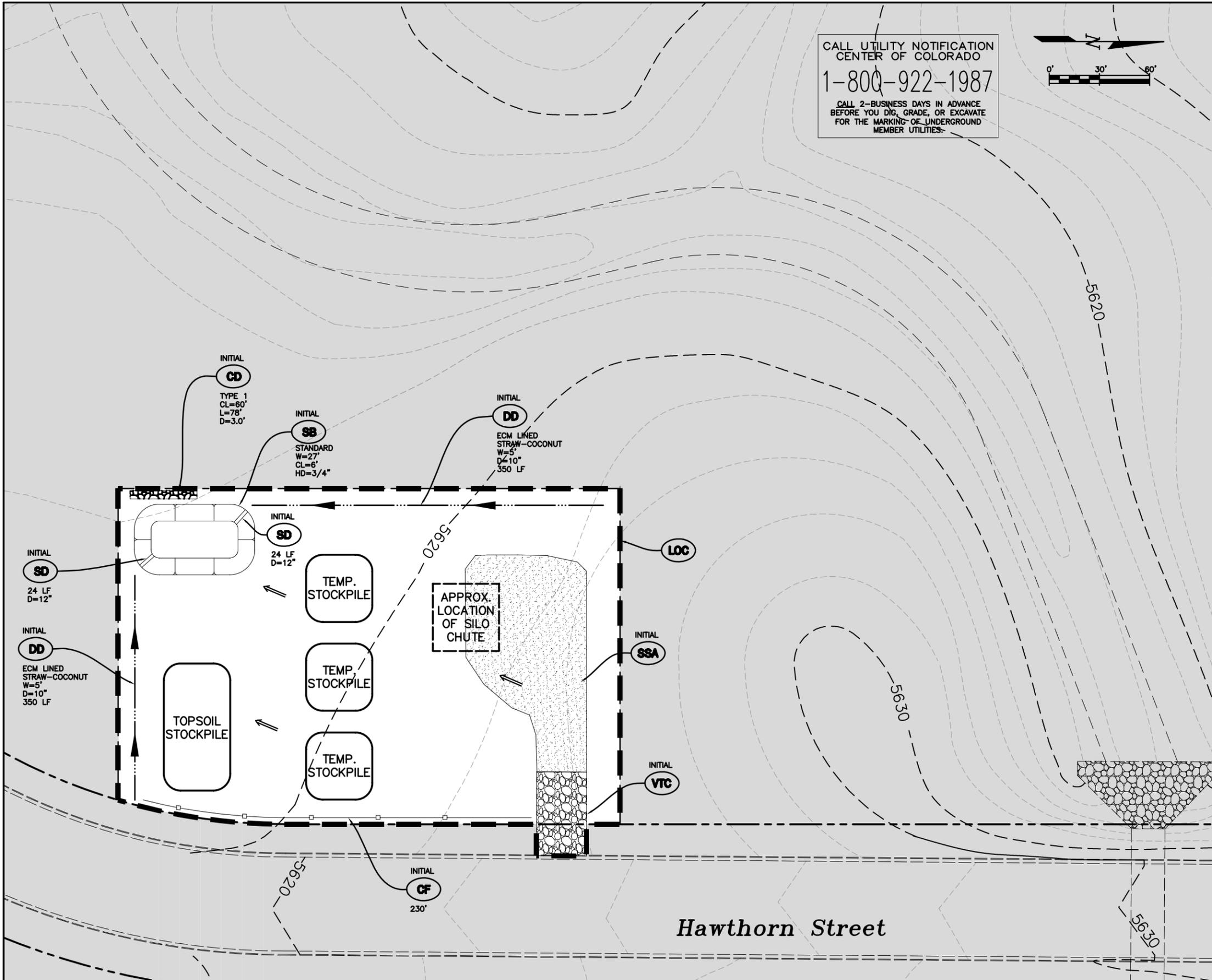


TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

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DEVELOPMENT SERVICES DEPARTMENT DATE

UTILITIES DIRECTOR OR DESIGNEE DATE



TOWN OF CASTLE ROCK
TEMPORARY BATCH PLANT
GESC DRAWINGS

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TEMPORARY BATCH PLANT

**BATCH PLANT
SITE PLAN**

DRAWING
B-2

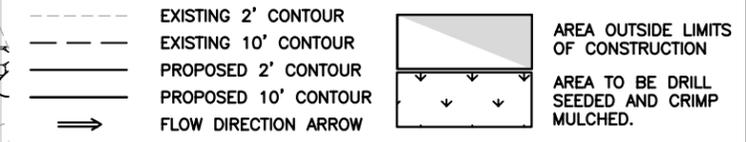
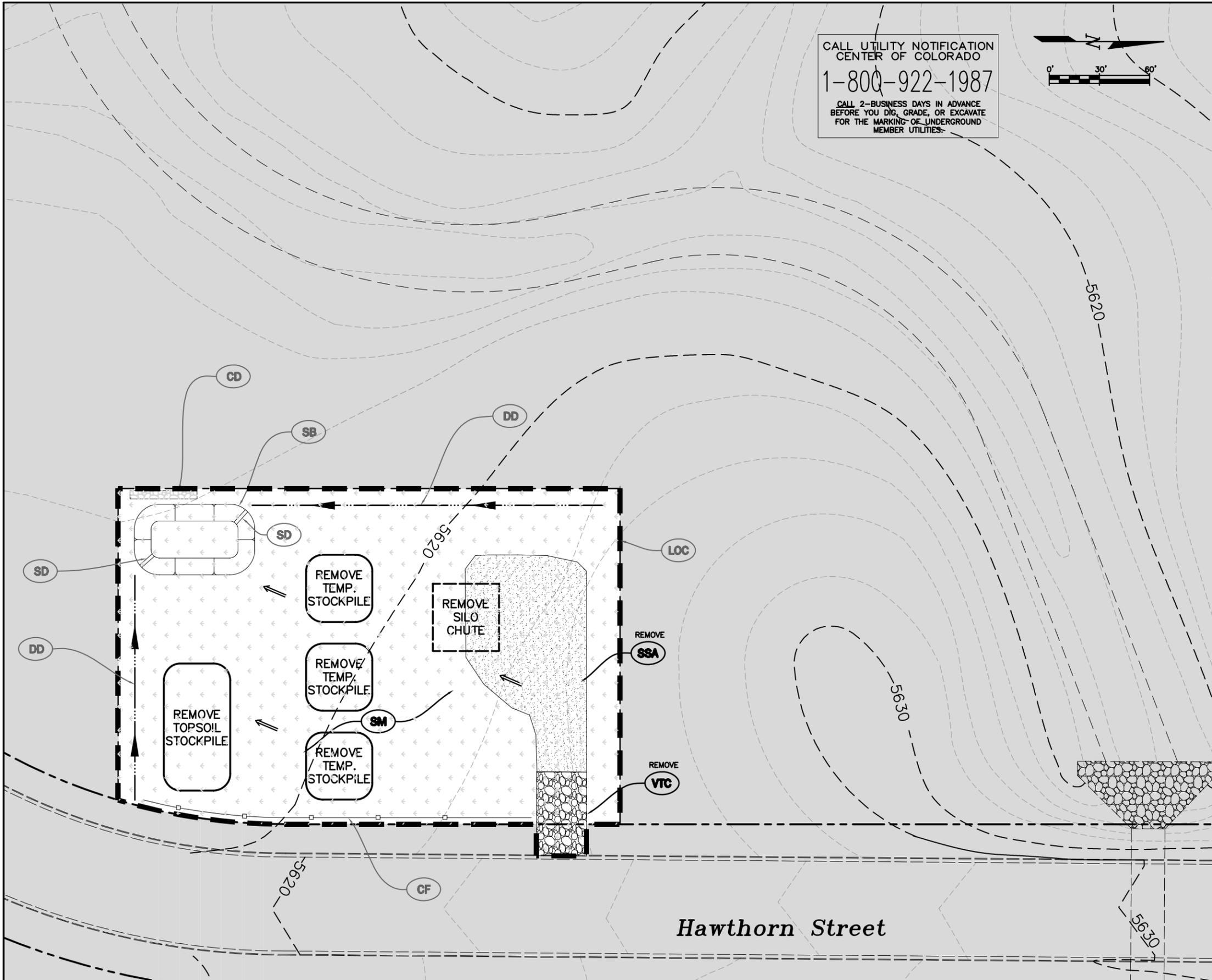
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1-800-922-1987
CALL 2-BUSINESS DAYS IN ADVANCE
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BMP LEGEND

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- 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
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- TER** TERRACING
- VTC** VEHICLE TRACKING CONTROL
- WW** VTC WITH WHEEL WASH
- ROCK AND RIPRAP GRADATIONS
- LOC** LIMITS OF CONSTRUCTION

TOWN OF CASTLE ROCK
TEMPORARY BATCH PLANT
GESC DRAWINGS



TOWN OF CASTLE ROCK ACCEPTANCE BLOCK

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TEMPORARY BATCH PLANT

BATCH PLANT RECLAMATION PLAN

DRAWING
B-3

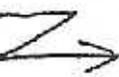
TOWN OF CASTLE ROCK STANDARD GESC NOTES AND DETAILS TO GO HERE

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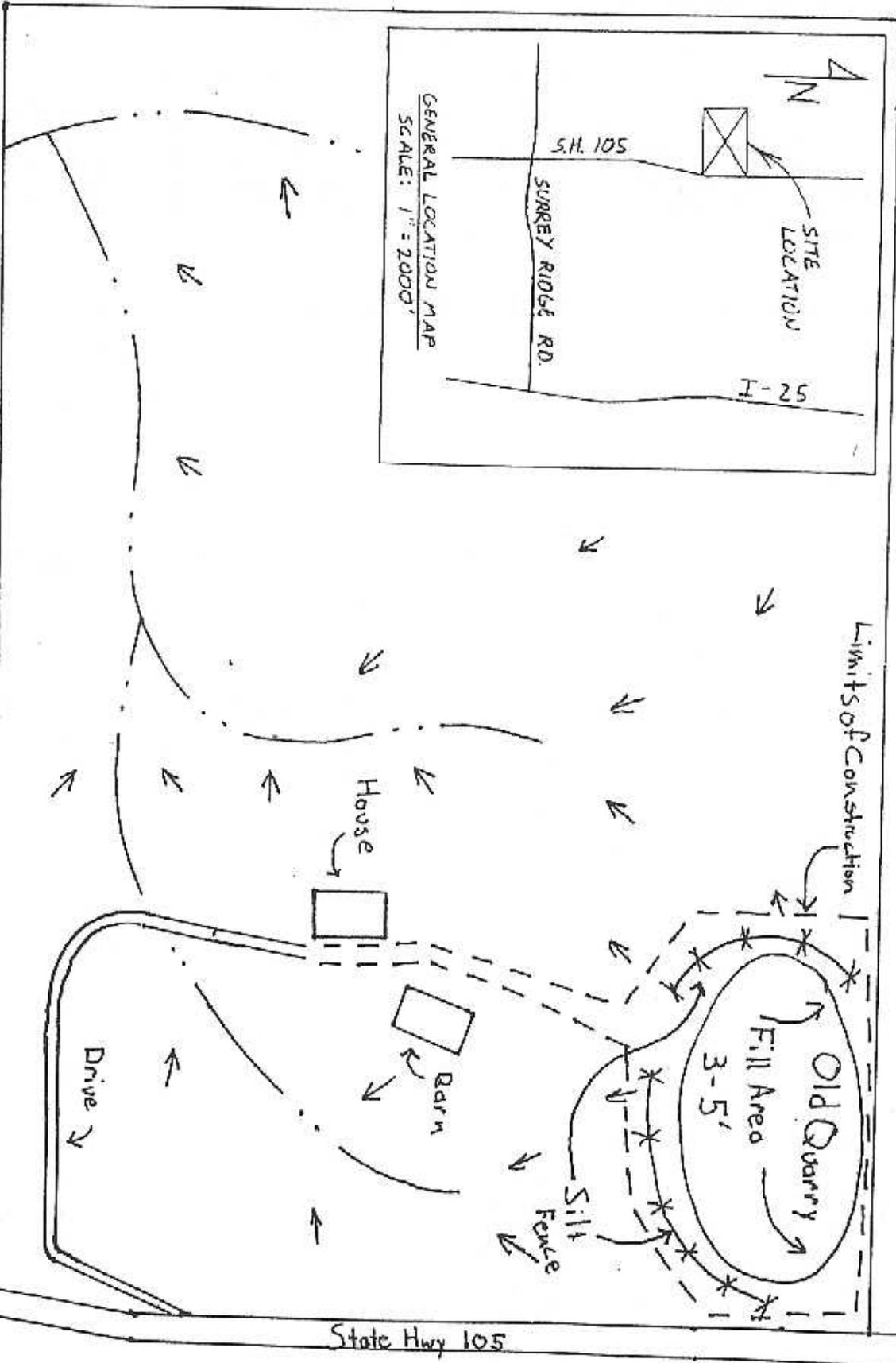
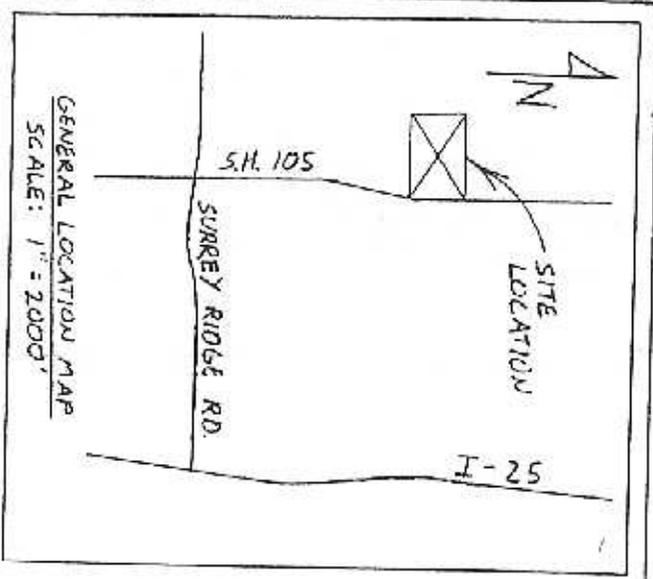
Appendix C

Example TESC Drawings

Low Impact TESC Drawing



13506 State Highway 105



DETAILED PLAN
1" = 100'

Appendix D

**Checklist for Developing a
TESC Plan**

CHECKLIST FOR DEVELOPING A TESC PLAN

Selecting Control Measures Based On Ten Elements of an Effective TESC 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).
2. Delineate floodplain limits for all drainageways.
3. Show limits of fill adjacent to drainageways and channel area to be preserved (shade undisturbed areas on drawings).
4. Show **Construction Fence (CF)** or, if approved, **Construction Markers (CM)** around all stream preservation areas.

Yes ___ No ___

Yes ___ No ___

Yes ___ No ___

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.
2. Design bank stabilization improvements, as necessary.
3. Emulate natural systems in the design of Items C.1. and C.2., above.

Yes ___ No ___

Yes ___ No ___

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:
 - a. Grade control structures
 - b. Bank stabilization
 - c. Road crossings (bridges or culverts)
 - d. Storm sewer outfalls
 - e. Utility crossings
 - f. Temporary stream crossings for construction access
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.
3. Show **Construction Fence (CF)** or, if approved, **Construction Markers (CM)** to delineate the limits of construction determined in Item D.2. above.
4. Identify coordinates or other means of locating **Construction Fence (CF)** or **Construction Markers (CM)** for contractor.
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 TESC Manual.
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.
2. Determine design discharges and size the drainageways.
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.

Yes ___ No ___

Yes ___ No ___

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:
 - a. Town of Castle Rock Floodplain Development Permit
 - b. US Army Corps of Engineers Section 404 Permit
 - c. US Fish and Wildlife Service Threatened and Endangered Species approvals.
 - d. Conditional Letter of Map Revision

Yes ___ No ___

Yes ___ No ___

Yes ___ No ___

Yes ___ No ___

Element 2. Avoid the Clearing and Grading of Sensitive Areas

Yes ___ No ___

1. Conduct a resource inventory on the site and identify on the TESC Plan the type and areal extent of features such as the following:
 - a. Protected habitat for endangered species
 - b. Wetlands
 - c. Nesting bird habitat
 - d. Riparian buffer zones
 - e. Forested areas
 - f. Mature cottonwood stands
 - g. Bedrock outcroppings
 - h. Steep slopes
 - i. Potential stormwater infiltration areas
 - j. Historic, cultural, or archeological resources
 - k. Areas of unique or pristine vegetation or habitat
2. Endeavor to avoid, or minimize, disturbance to the sensitive areas identified in 1. a-k.

Yes ___ No ___

Element 3. Balance Earthwork Onsite

Yes ___ No ___

1. Endeavor to balance earthwork quantities on site through the following tasks:
 - a. Develop initial grading plan
 - b. Check earthwork quantities for balance (consider shrink/swell)
 - c. Raise or lower portions of the site as necessary to try to balance earthwork
 - d. Repeat Steps b and c until balance is achieved
2. If it is impossible to balance earthwork quantities on site, an Authorization for Haul Route application shall be included with the review submittal for the import or export of material.

Yes ___ No ___

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, if possible, 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 equal to or 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 TESC 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 TESC 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 **Diversion 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 control measures are to be used on the contour. Check Section 3.17 of the TESC 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 embankment, spillway, and outlet are required. Refer to the Town of Castle Rock Drainage 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 equal to or 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 incidental 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

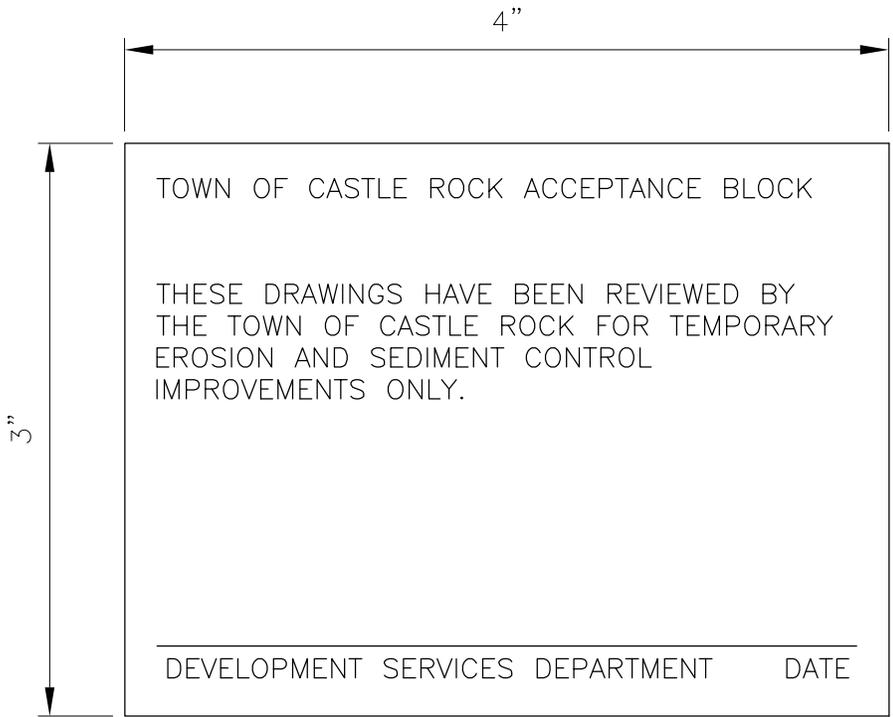
Common Name	Botanical Name	Variety	Notes	%in Mix	Pounds of PLS Per Acres
Smooth Bromegrass	Bromus inermis	Lincoln	PICS	30	3.9
Intermediate Wheatgrass	Elytrigia intermedia ssp. Intermedia	Oahe	PICS	30	4.5
Pubescent Wheatgrass	Elytrigia intermedia ssp. Trichophorum	Luna	PICS	30	4.2
Annual Ryegrass	Lolium 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 TESC
Acceptance Block**



	0000	Sheet Revisions	TESC DRAWINGS ACCEPTANCE BLOCK	
		TEMPORARY EROSION AND SEDIMENT CONTROL		

Appendix G

**TESC Drawing and
Report Checklist**



Temporary Erosion and Sediment Control (TESC) Drawing and Report Checklist

A complete Temporary Erosion and Sediment Control (TESC) submittal will contain the following information. Please check off the items to ensure that your application is complete. Please submit one (1) electronic copy of each document required. Drawing sets should be 24" x 36". Recommended scales include 20', 50' and 10'. PDF format is preferred.

Pre-Application Meeting Date: _____ Project Manager: _____
 Email: _____ Phone: _____

Req'd	Cmpl'd	Subm'd	Submittal Checklist
			LAND USE APPLICATION (completed/ signed)
			SUBMITTAL CHECKLIST (completed)
			DEVELOPMENT REVIEW FEE (Amt. Req'd \$ _____ Amt. Rec'd \$ _____)
			PROPERTY OWNER APPROVAL If any work is proposed on land not owned by the applicant, a letter of approval from the landowner is required.
			TESC DRAWINGS containing the initial, interim and final TESC drawings for the site, including Town Standard TESC detail sheets. Cut and fill quantities need to be indicated as well. Please prepare in accordance with the Town's TESC Manual, found online at http://www.CRgov.com/TESC
			TESC REPORT containing all items listed in the following TESC Report checklist.
			ENGINEER'S TESC COST ESTIMATE using Town standard template, stamped by a Professional Engineer. http://www.CRgov.com/TESC
			HAUL ROUTE MAP If any material is going to be exported or imported to the site, a Haul Route map must be submitted for Town review and approval. Any import or export sites located within the Town of Castle Rock jurisdiction will require a TESC permit as well, unless the site already has an active permit.
			TECHNICAL CRITERIA VARIANCE Complete a Technical Criteria Variance form with appropriate supporting information describing any proposed deviations from the Technical Design Criteria in the TESC Manual.
			CHECKLISTS Submit any checklist used for Drawing preparation and all reports

A complete set of Temporary Erosion and Sediment Control (TESC) Plans should contain the following information. The specific drawing sheets are listed below in the order they should appear in the Plan set. All TESC plans submitted to the Town of Castle Rock (TCR) for review, comment, and approval shall be prepared by, or under the direct supervision of a Professional Engineer, licensed in the State of Colorado. TESC Plans shall be in accordance with the requirements of the Town of Castle Rock TESC Manual, as amended.

TESC DRAWING AND REPORT CHECKLIST. A copy of this TESC Drawing and Report Checklist must be completely filled out, signed by the designer, and submitted with the TESC Plan.

SIGNATURE _____
 Registered Professional Engineer

Req'd	Cmpl'd	Subm'd	
COVER SHEET			
			1. Project name.
			2. Project address (if applicable).
			3. Owner address.
			4. Design firm's name and address.
			5. Drawing sheet index.
			6. Designer's Signature Block.
			7. The following note: THE TEMPORARY 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 TEMPORARY EROSION AND SEDIMENT CONTROL CRITERIA, AS AMENDED. ADDITIONAL TEMPORARY 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.
			8. TESC Plan Designer's signature block with name, date, and Professional Engineer registration number. Signature block shall include the following note: THE TEMPORARY EROSION AND SEDIMENT CONTROL PLAN INCLUDED HEREIN HAS BEEN PREPARED UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH THE REQUIREMENTS OF THE TEMPORARY EROSION, AND SEDIMENT CONTROL (TESC) MANUAL OF THE TOWN OF CASTLE ROCK AS AMENDED.
			9. Town of Castle Rock acceptance block.
			10. General Location Map Show at a scale of 1-inch to 1000-feet to 8000-feet indicating: <ul style="list-style-type: none"> • General vicinity of site location. • Major roadway names. • North arrow and scale.
TESC 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.
INITIAL TESC DRAWING			
This Drawing sheet shall provide temporary erosion and sediment controls for the initial clearing, grubbing and grading of a project. Control measures should generally be sufficient to cover construction activities through the completion of overlot grading. At a minimum, it shall contain:			
			1. Property Lines.
			2. Existing topography at one-or two-foot contour intervals, extending a minimum of 100 feet beyond the property line.
			3. Location of any existing structures or hydraulic features within the mapping limits.
			4. USGS Benchmark used for project and note that NAVD88 Datum was used.
			5. 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.
			6. Location of stockpiles, including topsoil, imported aggregates, and excess material.
			7. Location of storage and staging areas for equipment, fuel, lubricant, chemical (and other materials) and waste storage.
			8. Outlines of cut and fill areas.
			9. Summary of cut and fill volumes.

Req'd	Cmpl'd	Subm'd	
INITIAL TESC DRAWING CONTINUED			
			10. Location of temporary roads.
			11. Location of borrow or disposal areas.
			12. Location, map symbol, and letter callouts of all initial erosion and sediment control measures.
			13. Information to be specified for each control measure, such as type and dimensions, as called for in the Standard Notes and Details.
			14. Control Measure Legend from the cover sheet of the Standard Notes and Details.
			15. The following notes: <ul style="list-style-type: none"> • REMOVAL OF CONTROL MEASURES SHALL NOT OCCUR WITHOUT THE APPROVAL OF THE STORMWATER INSPECTOR. • ALL PAVED SURFACES MUST REMAIN FREE OF SEDIMENT AND REQUIRE CLEANING, INCLUDING STREET SWEEPING, AS NEEDED.
			16. Town of Castle Rock acceptance block.
			17. Design Engineer's signature block.
			18. Other information as may be reasonably required by the Town of Castle Rock
INTERIM TESC DRAWING			
This drawing sheet shows erosion and sediment control measures during site construction. At a minimum, it shall contain the following information:			
			1. Existing topography at one-or two-foot contour intervals, extending a minimum of 100 feet beyond the property line, as shown on the Initial TESC Drawing. These contours shall be screened.
			2. Location of all existing erosion control measures on site, as shown on the Initial TESC Drawing. These control measures shall be screened. Dimension information for initial stage control measures shall not be shown.
			3. Items 1,2, and 4 through 10 from the Initial TESC Drawing.
<i>In addition, the Interim TESC Drawing shall include the following:</i>			
			4. Proposed Topography at one-or two-foot contour intervals, showing elevations, dimensions, locations and slope of all proposed grading.
			5. 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.
			6. 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 part of, the proposed work, per approved plat, SDP, or other improvement plan.
			7. The Control Measure Legend from the cover sheet of the Town of Castle Rock Standard Notes and Details.
			8. The following notes: <ul style="list-style-type: none"> • SHADED CONTROL MEASURES 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. • REMOVAL OF CONTROL MEASURES SHALL NOT OCCUR WITHOUT THE APPROVAL OF THE STORMWATER INSPECTOR. • ALL PAVED SURFACES MUST REMAIN FREE OF SEDIMENT AND REQUIRE CLEANING, INCLUDING STREET SWEEPING, AS NEEDED.
			9. Town of Castle Rock acceptance block.
			10. Design Engineer's signature block.

Req'd	Cmpl'd	Subm'd	
FINAL TESC DRAWING			
This drawing sheet shows controls for final completion of the site including final stabilization and temporary sediment controls through revegetation. At a minimum, this drawing sheet shall contain the indicated information.			
<i>The Final TESC Drawing shall include all information shown on the Initial and Interim Drawings, as noted below:</i>			
			1. Existing Topography in areas of proposed contours need not be shown.
			2. Existing Initial and Interim control measures shall be shown, (screened). Dimension information shall not be shown.
<i>In addition, the following information shall be shown:</i>			
			3. Directional flow arrows on all drainage features.
			4. Any Initial or Interim control measures that are to be removed and any resulting disturbed area to be stabilized.
			5. Location of all Final erosion and sediment control measures (including seeding and mulching of any areas not stabilized in the Interim Plan), permanent landscaping, and measures necessary to minimize erosion and 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 accepted plat, SDP, SIA, or other improvement plan or agreement.
			7. Show seeding and mulching (SM) everywhere except buildings and pavement areas.
			8. Show other control measures considered by the designer to be appropriate.
			9. Show the following control measures to be removed prior to the end of construction: <ul style="list-style-type: none"> • 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.
			10. The Control Measure Legend from the cover sheet of the Town of Castle Rock Standard Notes and Details.
			11. Include the following notes: <ul style="list-style-type: none"> • SHADED CONTROL MEASURES WERE INSTALLED IN INITIAL OR INTERIM TESC 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. • REMOVAL OF CONTROL MEASURES SHALL NOT OCCUR WITHOUT THE APPROVAL OF THE STORMWATER INSPECTOR. • ALL PAVED SURFACES MUST REMAIN FREE OF SEDIMENT AND REQUIRE CLEANING, INCLUDING STREET SWEEPING, AS NEEDED.
			11. Town of Castle Rock acceptance block.
			12. Design Engineer's signature block.
			13. Other information as may be reasonably required by the Town of Castle Rock.

Req'd	Cmpl'd	Subm'd
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VERTICAL RESIDENTIAL TESC DRAWING

This drawing is to be prepared in a separate, stand-alone set and shall provide temporary erosion and sediment controls for Vertical Residential Construction following completion of subdivision improvements. Control measures should generally be sufficient to cover construction activities , including over excavation, through the completion of all residential homes. At a minimum, it shall contain:

The Vertical Residential TESC Drawing shall include all information shown on the Final TESC Drawing, as noted below:

			1. Only existing Final erosion control measures shall be shown, (screened ; dimension information shall not be shown) including seeding and mulching, erosion control blanket and perimeter controls.
<i>In addition, the following information shall be shown:</i>			
			2. Cover sheet per Section 3.18.1 (or Page 2 of this checklist).
			3. Topography at one- or two-foot contour intervals.
			4. Directional flow arrows on all drainage features.
			5. Limits of disturbance required for all vertical construction activities
			6. Shade all tracts and lots not owned by the permittee.
			7. New control measures behind back of sidewalk and all abutting open tracts and existing sediment controls that will become the responsibility of the permittee shall be shown in bold.
			8. Location of Staging Area(s), VTCs, Concrete Washout Area(s) and Stockpile Area(s). If these items are intended to be relocated throughout the construction process, show the initial location on the drawing.
			9. Location of other control measures considered by the designer to be appropriate.
			10. Label lot numbers, street addresses and lot grading type (A or B) on each lot. Interior lot control measures do not need to be shown as standard details for A and B lots are provided in the Standard Notes and Details.
			11. The Control Measure Legend from the cover sheet of the Town of Castle Rock Standard Notes and Details.
			12. Include the following notes: <ul style="list-style-type: none"> 1. CONTROL MEASURES INSTALLED PER FINAL TESC DRAWING TRANSFER TO THE PERMITTEE AND SHALL BE LEFT, OR REPLACED, UNTIL REVEGETATION ESTABLISHMENT IS APPROVED BY THE TOWN OR VERTICAL LOT CONSTRUCTION IS COMPLETE. 2. IF LOCATION(S) OF VTC(S), STOCKPILE(S), STAGING AREA(S) AND CONCRETE WASHOUT AREA(S) CHANGE DURING CONSTRUCTION, THE PERMITTEE SHALL REVISE THE DRAWING ACCORDINGLY AND MUST SHOW APPROPRIATE CONTROL MEASURES IMPLEMENTED AT ALL TIMES. 3. ALL STRUCTURAL CONTROL MEASURES MUST BE MAINTAINED IN EFFECTIVE OPERATING CONDITION AT ALL TIMES AND ARE SUBJECT TO INSPECTION AND ENFORCEMENT UNDER THE TESC PERMIT. 4. IF SEDIMENT 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 STORMWATER INSPECTOR. FAILURE TO CLEAN UP TRACKING OF MATERIAL ONTO STREETS WILL RESULT IN AN IMMEDIATE STOP WORK ORDER. 5. 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 MAY RESULT IN AN IMMEDIATE STOP WORK ORDER. 6. PERMITTEE SHALL ENSURE THAT ALL CONCRETE WASHOUT AREAS ARE PROPERLY INSTALLED, POSTED AND CLEANED SUCH THAT ALL WASTEWATER IS CONTAINED AND DOES NOT ENTER THE STORM DRAIN SYSTEM. FAILURE TO PROPERLY MAINTAIN CONCRETE WASHOUT AREAS SUCH THAT A DISCHARGE OCCURS WILL RESULT IN A STOP WORK ORDER AND/OR AN IMMEDIATE CLEANUP ORDER. 7. PERMITTEE SHALL ENSURE THAT ALL SANITARY FACILITIES ARE PROPERLY SECURED TO THE GROUND TO PREVENT TOPPLING AND DISCHARGE OF LIQUID WASTE. FAILURE TO PROPERLY SECURE SANITARY FACILITIES WILL RESULT IN A VIOLATION.

Req'd	Cmpl'd	Subm'd
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VERTICAL RESIDENTIAL TESC DRAWING CONTINUED		
		12. Include the following notes, continued: 8. PERMITTEE SHALL ENSURE THAT THE TESC DRAWING REMAINS UPDATED WITH CURRENT FIELD CONDITIONS. FAILURE TO MAINTAIN THE TESC DRAWING MAY RESULT IN A VIOLATION. 9. REMOVAL OF CONTROL MEASURES SHALL NOT OCCUR WITHOUT THE APPROVAL OF THE STORMWATER INSPECTOR.
		13. FEMA Floodplain limits shall be shown if within planned or adjacent areas.
		14. Town of Castle Rock acceptance block.
		15. Design Engineer's signature block.
		16. Other information as may be reasonably required by the Town of Castle Rock.

Req'd	Cmpl'd	Subm'd
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TESC REPORT

A complete Temporary Erosion and Sediment Control (TESC) Report should contain the following information. TESC Reports shall be in accordance with the requirements of the Town of Castle Rock TESC Manual, as amended.

			1. <u>Name, Address, and Telephone Number of the Applicants</u> —The name, address, and telephone number of the Professional Engineer preparing (or supervising the preparation of) the TESC Plan shall also be included if different from the Applicants.
			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, and the project location or the latitude and longitude of the approximate center of the project.
			3. <u>Existing Site Conditions</u> — 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. <u>Adjacent Areas</u> —A description of neighboring areas such as streams, lakes, residential areas, roads, etc., which might be affected by the land disturbance.
			5. <u>Soils</u> —A brief description of the soils on the site including information on soil type and names, mapping unit, erodibility, permeability, hydraulic 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).
			6. <u>Areas and Volumes</u> —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.
			7. <u>Erosion and Sediment Control Measures</u> —A description of the methods presented in the TESC Manual that will be used to control erosion and sediment on the site.
			8. <u>Timing/Phasing Schedule</u> —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 measures. Indicate the anticipated starting and completed time periods of individual project phases.
			9. <u>Permanent Stabilization</u> —A brief description, including applicable specifications, of how the site will be stabilized after construction is completed.
			10. <u>Stormwater Management Considerations</u> —Explain how stormwater runoff from and through the site will be handled during construction.
			11. <u>Maintenance</u> —Any special maintenance requirements over and above what is identified in the standard notes and details.
			12. <u>Opinion of Probable Cost for Installation and Maintenance of Controls</u> —An opinion of probable costs for erosion and sediment control, including anticipated maintenance during the construction phase, shall be submitted with the TESC Plan. This will be reviewed by Town staff and used as a basis for fiscal surety. A copy of a spreadsheet to be used for preparing the opinion of probable costs for erosion and sediment control is included in Appendix H of the TESC Manual. An electronic copy of the spreadsheet is available from the Plan Review Engineer. Unit Costs used to develop probable erosion and sediment control costs shall be those shown in the spreadsheet.
			13. <u>Calculations</u> —Any calculations made for the design of such items as sediment basins or erosion control blanket selection.
			14. <u>Other Information</u> —Any other information as reasonably required by the Town of Castle Rock.
			15. <u>The Following Note</u> : "This Temporary Erosion and Sediment Control Plan is on file at the Town of Castle Rock and appears to fulfill the applicable Town of Castle Rock Temporary 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."
			16. <u>Signature Page</u> — For Permittees acknowledging the review and acceptance of responsibility, and a statement by the Professional Engineer acknowledging responsibility for the preparation of the TESC Plan.
			17. <u>Town of Castle Rock Acceptance Block</u> .

Appendix H

**Opinion of Probable Cost
Example Worksheet**

Town of Castle Rock
 TESC Permit - Cost Opinion Spreadsheet
 Project # _____
 [Type Project Name / Description Here]

NO.	Control Measure	ID	Unit	Installation Unit Cost	Quantity	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 Road Crossing	TRC	EA	\$ 3,000.00		\$ -
22	Temporary Slope Drain	TSD	LF	\$ 30.00		\$ -
23	Temporary Stream Crossing	TSC	EA	\$ 1,000.00		\$ -
24	Terracing	TER		N/A		\$ -
25	Vehicle Tracking Control	VTC	EA	\$ 1,000.00		\$ -
26	VTC with Wheel Wash	WW		N/A		\$ -
27	Temporary Batch Plant Restoration		AC	\$ 5,000.00		\$ -
28	A Lot Controls	A	EA	\$ 1,500.00		\$ -
29	B Lot Controls	B	EA	\$ 2,000.00		\$ -

Total Costs	\$ -
10% Contingency	\$ -
Grand Total	\$ -
Total Surety Amount (Grand Total x 1.15)	\$ -

Appendix I

**Standard TESC
Permit Application**



TEMPORARY EROSION AND SEDIMENT CONTROL (TESC) PERMIT APPLICATION

TSC _____ (Assigned by Town Staff)

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 <u>Active</u> Construction:	months
---------------	---	--------

Location:

Total Disturbed Area:	acres	Estimated Material Volume:	cubic yards
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Does this property currently have an active TESC Permit (by others)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
--	------------------------------	-----------------------------	----------------------------------

A Standard TESC Permit is valid for one year of active construction and two additional years of revegetation.

By signing below, both applicants hereby apply for a Town of Castle Rock TESC Permit for the aforementioned property and certify as follows:

- To the best of my/our knowledge, the information provided herein is correct;
- A TESC Plan for the disturbed area on this site was prepared and submitted in accordance with the TESC Manual, as amended; and
- I certify I am legally authorized to sign on behalf of and bind the above-listed entity. The TESC 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 TESC Manual, accepted TESC Plan, and TESC 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 TESC Permit, TESC Plan and/or TESC 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 TESC 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)

<u>FEES</u> Inspection Fee: \$ _____ Transfer Fee \$ _____ (if applicable)	<u>FEES – PERMIT RENEWAL ONLY</u> Active mos. x \$110 \$ _____ Inactive mos. x \$55 \$ _____ Total Fee: \$ _____	Paid Date: _____ Amount: _____ Check <input type="checkbox"/> Cash <input type="checkbox"/> Check # _____

FISCAL SURETY

SEE COST ESTIMATE: Total Control Measure Costs + 10% Contingency = Grand Total x 1.15 = \$ _____
 TOTAL SURETY REQUIRED

Paid By: _____ Surety Type: _____ Surety # _____

Drainage Report Approved: <input type="checkbox"/> Yes <input type="checkbox"/> No Phase: I II III	Development Services Approval Stamp	<u>STORMWATER INSPECTOR</u> Name: _____ Phone: _____
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Appendix J

**Low Impact TESC
Permit Application**



TEMPORARY EROSION AND SEDIMENT CONTROL (TESC) LOW IMPACT PERMIT APPLICATION

TSC _____ (Assigned by Town Staff)

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 three (3) months.

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 <small>(Must be < 3 mos.)</small>
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 TESC 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 TESC Plan for the disturbed area on this site was prepared and submitted in accordance with the TESC Manual, as amended; and
3. I certify I am legally authorized to sign on behalf of and bind the above-listed entity. The TESC 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 TESC Manual, accepted TESC Plan, and TESC 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 TESC Permit, TESC Plan and/or TESC 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 TESC 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)	
TESC Fee: \$ _____	Paid Date: _____ Amount: _____ Check <input type="checkbox"/> Cash <input type="checkbox"/> Check # _____

STAFF APPROVALS	
Development Services Approval Stamp	<p style="text-align: center;"><u>PLEASE CALL FOR REQUIRED PRECON MEETING</u></p> Stormwater Inspector: _____ Phone: _____

Appendix K

**Example Hold Harmless
Letter**

HOLD HARMLESS LETTER

Town of Castle Rock
Development Services Department
100 Wilcox St.
Castle Rock, CO 80104

Project Name: _____

Location: _____

Owner/Developer: _____

Project No.: _____

We are requesting approval of a Temporary Erosion and Sediment Control (TESC) Permit for Early Grading for the above project. We understand that we will be proceeding at our own risk, since we do not have final site improvement plan/final plat approval. We also understand that, prior to approval of the site construction plan, there may be changes required by the Town of Castle Rock. We acknowledge that the Town of Castle Rock will not be held responsible for those changes to the site improvement plan/final plat. We shall be responsible for all the costs associated with any changes that may be required by the Town. The Town shall not be responsible for any costs.

[Provide 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.]

Prior to the issuance of a TESC Permit, we will submit the required surety for the revegetation of the site and all the erosion and sediment control measures that are required per the TESC Plan.

Sincerely,

Owner's Signature

Owner's Printed Name and Title

Date

Attachments: Engineers Opinion of Probable Cost Worksheet

