

# Chapter 4: Construction Control Measures

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## 1.0 Introduction

Effective management of stormwater runoff during Construction Activities is critical to the protection of water resources, including from potential pollutants sources. Both erosion and sediment controls are necessary for effective prevention from potential impacts caused by exposed dirt on a construction site. Also, site management and material management practices, are useful to prevent the potential pollution from other non-dirt sources.

This Chapter provides information on the City's erosion and sediment control program criteria. Appendices D and E are intended to provide supplemental information related to such criteria, and are referenced throughout this Chapter.

## 2.0 Scope of Applicability

All projects within the City's MS4 permitted area, and those City-owned municipal projects located outside of the City Limits shall always follow the criteria in this Manual. This includes but is not limited to, projects (public or private) seeking excavation permits, stockpile permits, development construction permits, and building permits.

Some lands in Fort Collins do not, however, fall under the City's MS4 Permit area. Federally-owned lands within Fort Collins are required to follow EPA Region 8 Criteria for erosion control and are not generally reviewed by the City unless requested by the federal government or as part of the National Environmental Policy Act process.

State of Colorado-owned lands within the Municipal boundary of the City of Fort Collins and that are accounted as part of another agency's State of Colorado MS4 Permit (e.g., CSU, Poudre School District, or Front Range Community College, CDOT) are also not required to follow the criteria in this Chapter and FCU will only ask for Erosion Control Materials for the areas within the City's MS4 Permit area. Thus, if the State of Colorado-owned land has no MS4 Permit where that entity has a construction project, a Site Plan Advisory Review (SPAR) is required and Erosion Control Materials are required to meet City criteria.

When a project spans past the City's MS4 permitted area, FCU will require a letter by the other MS4 jurisdiction with a clear description of which jurisdiction will be assuming responsibility for review and inspection of the various parts of the project.

Developers shall be responsible to ensure that appropriate and adequate Erosion Control Materials are produced to prevent the potential pollution from the sources associated with Construction Activities.

Developers shall be responsible to ensure that Erosion Control Materials and Manual are followed throughout the buildout to prevent all the potential pollution sources until the final stabilization of the project.

## 2.1 Exemptions to the Scope of Erosion Control Requirements

The requirements of this Chapter apply to all Construction Activities covered by this Manual, except for projects that do not require Erosion Control Materials, as set forth in Section 6.1.1 of Chapter 2 and restated here.

Some projects do not require Erosion Control Materials. Such projects are:

- Emergency work projects, where there is less than 43,560 ft<sup>2</sup> (1 acre) of Disturbed Area; or
- Projects with Construction Activities that:
  - 1) Have less than 10,000 ft<sup>2</sup> of Disturbed Area;
  - 2) Have shallower slopes than (4H:1V);
  - 3) Have no Sensitive Areas and are further than 50 feet away from any Sensitive Area; and
  - 4) Do not qualify for a CDPS General Permit Stormwater Discharges Associated with Construction Activity (typically as a result of a Larger Common Plan of Development or Sale).

With respect to such emergency work where there is less than 43,560 ft<sup>2</sup> (1 acre) of Disturbed Area, all other erosion control requirements must meet compliance, except to the extent that they cannot reasonably comply due to the emergency circumstances necessitating the emergency work. Emergency work will be allowed an accelerated review time.

Although no submittal of Erosion Control Material is required when an exemption to the scope applies, the site, project, or activity still must take preventative actions to keep pollution sources from being discharged into the drainage system in accordance with [City Code, Section 26-498](#), which still requires the area to apply control measures (such as, sweep, scrape, wet, collect, contain, dry, dispose, etc.) in order to prevent potential pollution sources (such as, dirt, saw cuttings, grinding operations, concrete wash water, concrete materials, trash, debris, landscape materials, and various other potential pollutants associated with construction) from entering the storm sewer system at all times. Projects that are exempt and received a complaint will be evaluated to determine if control measures outlined in this Chapter may be required of the project based upon site conditions observed during the complaint-based project inspection.

City policy provides that only those exclusions specifically listed in the MS4 permit may be allowed. Exceptions or variances to the requirements of the MS4 permit cannot and will not be granted.

## 3.0 Erosion and Sediment Control

### 3.1 Erosion

Although soil erosion is a natural process, accelerated soil erosion occurs on construction projects due to activities that disturb the natural soil and vegetation.

Erodibility of soils is affected by multiple factors including physical soil characteristics, soil qualities, and soil features, and rainfall characteristics.

Physical properties of soils such as particle size, cohesiveness, and density affect erodibility. Loose silt and sand-sized particles typically are more susceptible to erosion than "sticky" clay soils. Rocky soils are less susceptible to wind erosion, but are often found on steep slopes that are subject to water erosion.

Soil qualities are behavior and performance attributes that are not necessarily directly measured, but are inferred from observations of dynamic conditions and from soil properties. (i.e. soil qualities include natural drainage, infiltration, and frost action).

Soil features are attributes that are not directly part of the soil (i.e. soil features include slope steepness, slope lengths, vegetative cover slope and depth to restrictive layer). These features can greatly impact the use and management of the soil.

Soil qualities are most typically split into Hydrologic soil groups.

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

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

- Group A. Soils have a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.
- Group B. Soils have a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.
- Group C. Soils have a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

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

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

Hydraulic soil properties and qualities for Fort Collins are typically based upon Larimer County Soil Survey from 1980 and are easily accessed in information published by the [USDA National Cooperative Soil Survey](#). This can be useful for further information around soil properties and qualities in the Fort Collins Area. Most of the soils in Colorado fall into the Group B and Group C soils and are susceptible to wind or water erosion, or both.

When surface vegetative cover and soil structure are disturbed during construction, the soil is more susceptible to erosion. Vegetation plays a critical role in controlling erosion. Roots bind soil together and the leaves or blades of grass reduce raindrop impact forces on the soil. Grass, tree litter, and other ground cover not only intercept precipitation and allow infiltration, but also reduce runoff velocity and shear stress at the surface. Vegetation reduces wind velocity at the ground surface, and provides a rougher surface that can trap particles moving along the ground. Once vegetation is removed, soils become more susceptible to erosion.

## 3.2 Sedimentation

Sedimentation occurs when eroded soil transported in wind or water is deposited from its suspended state. During a typical rainstorm in Colorado, 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 eventually deposited as runoff decreases. The deposited sediments may be re-suspended when future runoff events occur. In this way, sediments are moved progressively downstream in the waterway system.

## 3.3 Effective Erosion and Sediment Control

It is better to minimize erosion than to rely solely on Sediment Control Measures to remove sedimentation from construction runoff. Erosion Control Measures limit the amount and rate of erosion occurring on disturbed areas. Sediment Control Measures attempt to capture the soil that has been eroded before it leaves the project. Despite the use of both erosion control and sediment control measures, some amount of sediment will remain in runoff leaving a project, but the use of a "treatment train" of practices can help to minimize offsite transport of sediment. The last line of treatment such as inlet protection, and sediment control in basins, should be viewed as a "polishing" control measure, as opposed to the only treatment on the project.

Section 6.0 of this Chapter provides an overview of Erosion and Sediment Control Measures. Appendix E includes detailed Construction Control Measures that provides design details and guidance for effective use of various erosion and sediment control practices. Control measures should be combined and selected to meet these objectives:

- Conduct land-disturbing activities in a manner that effectively reduces accelerated soil erosion and reduces sediment movement and deposition offsite.
- Schedule construction activities to minimize the total amount of soil exposed at any given time.
- Establish temporary or permanent cover on areas that have been disturbed as soon as practical after grading is completed.
- Design and construct temporary or permanent facilities to limit the flow of water to non-erosive velocities for the conveyance of water around, through, or from the disturbed area.
- Remove sediment caused by accelerated soil erosion from surface runoff water before it leaves the project.
- Stabilize disturbed areas with permanent vegetative cover and provide permanent stormwater quality control measures for the post-construction condition.

### **3.4 Fundamental Erosion and Sediment Control Principles**

The intent of erosion and sediment control design is to protect adjacent properties and downstream properties from the detrimental effects of Construction Activity. Water erosion is always directional, i.e., always down-slope. This directional nature of water erosion can be used to design resistance to sediment movement near the downstream edge of the disturbed property. The erosion control design may govern slope placement so that sediment-laden runoff is not directly tributary to an adjacent property. The slope may need to be built to accommodate a temporary diversion channel, which keeps water on the disturbed parcel.

Control measures are necessary for each phase of development and it is understood that initial grading and construction will require certain control measures, which will change or be replaced as development progresses. Temporary control measures such as silt fences or diversion structures may be used during the initial grading and other applicable construction sequences, and later either removed completely, or replaced with grass, water quality structure, LID, or other permanent erosion or sediment control.

Control measures can be arranged to perform in series or a “treatment train” so that sediment reduction caused by one measure releases less sediment to the next. In this manner, series resistances to

sediment movement are built into a project so that stormwater release to adjacent properties or streams are carrying minimal Sediment. The “treatment train” can be designed to minimize costs, and to minimize interference with onsite Construction Activities.

The construction and maintenance of Erosion Control Measures is critical to ensure proper performance. Erosion Control Plans must include construction details and maintenance guidelines.

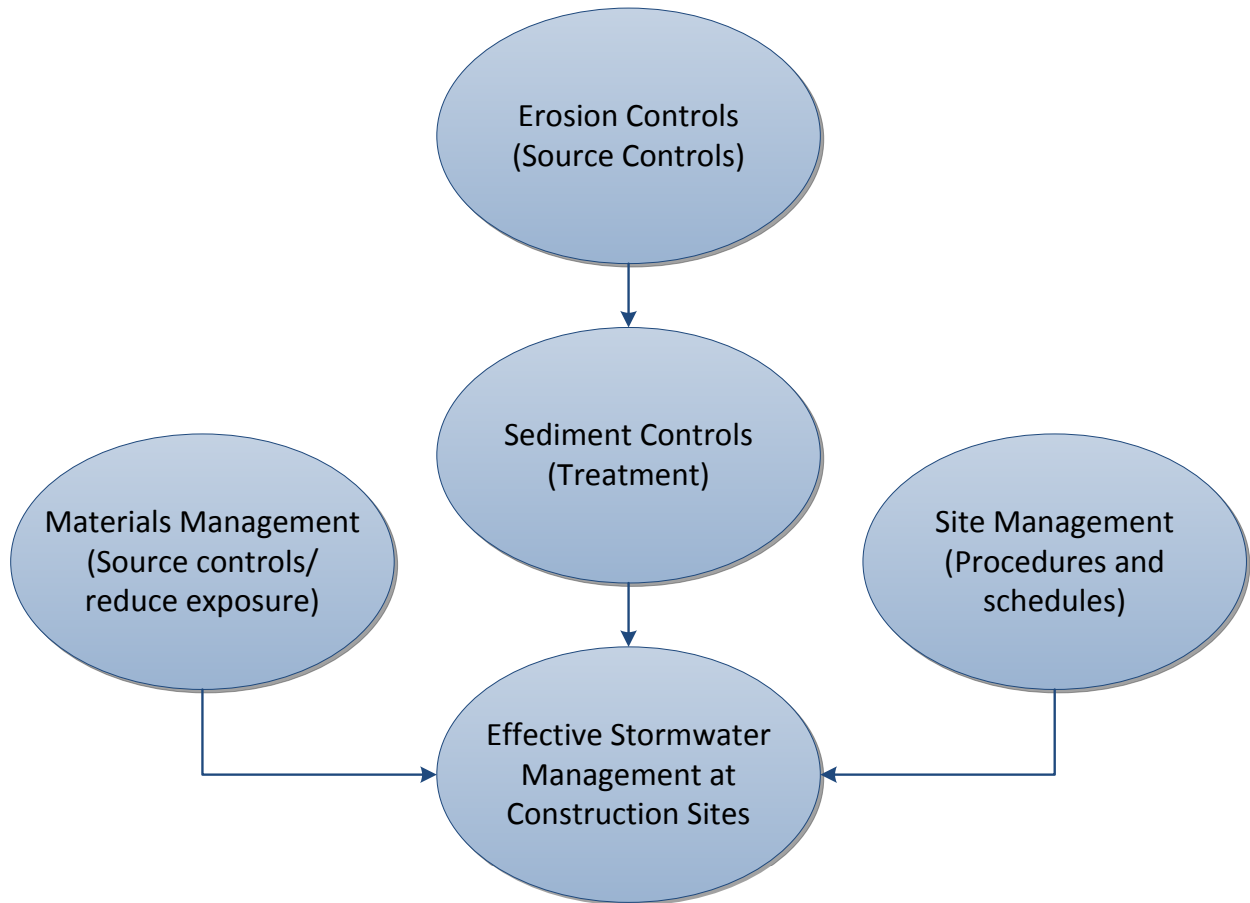
## 4.0 Overview of Construction Control Measures

The use of control measures can be structural and non-structural in how they are applied, as well as, temporary (primary focus of this Chapter) and permanent measures (other permanent design structures water quality devices and LIDs covered in other Chapters of this Manual) with regards to how long they are designed to function as a control measure. All control measures should be effective in preventing or reducing sediment, or other potential pollutants, transportation from the project to the maximum extent practicable.

Construction Control Measures include not only Erosion and Sediment Control Measures, but also material management and site management control measures. Each control measure varies with regard to the functions they provide and where they are best applied. **Table 4.0** provides a qualitative characterization of the roles that various BMPs provide with regard to serving erosion control functions, sediment control functions, or site/materials management roles. In particular, it is important to understand whether the primary role of the control measure is to control erosion, sediment, material management or site management.



**Figure 4.0. Components of Effective Stormwater Management on Projects**



A key to effective stormwater management at a construction site is to understand how construction stormwater management requirements change over the course of a construction project and how to install and remove the right control measures as the project progresses in a way that reduces and eliminates potential pollutant transportation from the construction site to the maximum extent practicable.

The control measures identified in the subsequent four sections (Section 4.1 through section 4.4 of this Chapter) are provided in an in-depth fact sheet in Appendix E. These control measure detail sheets give local City requirements and guidance on applicability, design, installation, maintenance, and final disposition.

**Table 4.0. Overview of Construction BMPs**

<b>Construction Control Measures</b>			
<b>Functions</b>	<b>Erosion Control</b>	<b>Sediment Control</b>	<b>Site/Material Management</b>
Brush Barrier	Moderate	Moderate	No
Check Dams	Yes	Moderate	No
Chemical Treatment	Moderate	Yes	No
Compost Blankets and Filter Berms	Yes	Moderate	No
Concrete Washout Area	No	No	Yes
Construction Fence	No	No	Yes
Construction Phasing	Moderate	Moderate	Yes
Dewatering Operations	Moderate	Yes	Yes
Earth Dikes/Drainage Swales	Yes	Moderate	No
Good Housekeeping (Multiple Practices)	No	No	Yes
Inlet Protection (Various Forms)	No	Yes	No
Mulching	Yes	Moderate	No
Paving and Grinding Operations	No	No	Yes
Protection of Existing Vegetation	Yes	Moderate	Yes
Rock Sock (Perimeter Control)	No	Yes	No
Rolled Erosion Control Products	Yes	No	No
Rough Cut Street Control	Yes	Moderate	No
Sediment Basin	No	Yes	No
Sediment Control Log	Moderate	Yes	No
Sediment Traps	No	Yes	No
Silt Fence	No	Yes	No
Soil Binders	Yes	No	Moderate
Stabilized Construction Roadway	Yes	Moderate	Yes
Stabilized Staging Area	Yes	Moderate	Yes
Stockpile Management	Yes	Yes	Yes
Streambank Stabilization	Yes	No	No
Street Sweeping / Vacuuming	No	Yes	Yes
Surface Roughening	Yes	No	No
Temporary Batch Plant	No	No	Yes
Temporary Diversion Channel	Yes	No	No
Temporary Outlet Protection	Yes	Moderate	No
Temporary Slope Drains	Yes	No	No
Temporary Stream Crossing	Yes	Yes	No
Temporary/Permanent Seeding	Yes	No	No
Terracing	Yes	Moderate	No
Vegetative Buffers	Moderate	Yes	Yes
Vehicle Tracking Control	Moderate	Yes	Yes
Wind Erosion /Dust Control	Yes	No	Moderate

## 4.1 Erosion Control Measures

Erosion Control Measures are source controls used to limit erosion of soil. These are typically surface treatments that stabilize soil that has been exposed by excavation or grading, although some limit Erosion by redirecting flows or reducing velocities of concentrated flow.

[Reference:](#) Fact sheets for erosion control practices are provided in Section 6.1 of this Chapter.

## 4.2 Sediment Control Measures

Sediment Control Measures limit transport of sediment offsite to downstream properties and receiving waters. Sediment controls are the second line of defense, capturing soil that has been eroded. Sediment controls generally rely on treatment processes that either provide filtration through a permeable media or that slow runoff to allow the settling of suspended particles. A third treatment process that is used in some parts of the country includes advanced treatment systems employing chemical addition (flocculent) to promote coagulation and settling of sediment particles.

The City does not permit the use of chemical treatment with Construction Activities.

[Reference:](#) Fact sheets for sediment control practices are provided in Section 6.2 of this Chapter.

## 4.3 Site Management

Site management is often ultimately the deciding factor in how effective control measures are on a project. Control measures implemented at the project must not only be properly selected and installed, but also must be inspected, maintained, and properly repaired for the duration of the construction project. In addition to general site management, there are a number of specific site management practices that affect construction site management. For example, effective construction scheduling (phasing and sequencing) helps minimize the duration of exposed soils. Protection of existing vegetation also minimizes exposed areas and can reduce the cost of final project stabilization. Stabilized construction entrances (vehicle tracking controls) and street sweeping are critical source control measures to minimize the amount of sediment that leaves a project. Additionally, there are several miscellaneous activities that must be carefully conducted to protect water quality such as dewatering operations, temporary batch plants, temporary stream crossings and other practices.

As part of the construction kick-off meeting for the project (or for major sequences of construction), an effective strategy is to include a training component related to construction site stormwater management. Such training should provide basic education to site personnel regarding the requirements of the state and local construction stormwater permits and programs and bring awareness to the serious

finest and penalties that can result from failure to comply with permit requirements. The individual or individuals responsible for inspection and maintenance of construction control measures should have a practical understanding of how to maintain construction control measures proactively in effective operating condition and how to identify conditions where failure is eminent or has already occurred. In addition to project-specific training, several training courses are available across the state regarding construction site stormwater management.

[Reference:](#) Fact sheets for site management practices are provided in Section 6.3 of this Chapter.

#### **4.4 Materials Management**

Materials management control measures are source control practices intended to limit contact of runoff with potential pollutant sources commonly found at construction sites such as construction materials and equipment-related fluids. By intentionally controlling and managing areas where chemicals are handled, the likelihood of these materials being transported to waterways is reduced.

[Reference:](#) Fact sheets for materials management practices are provided in Section 6.4 of this Chapter.

#### **4.5 Proprietary Control Measures**

Many proprietary control measures are available for construction site stormwater management. This Manual does not provide a list of approved products; however, the City requires that a proprietary product have a control measure fact sheet/detail sheet that must be provided to the City. The fact sheet must address all items that the City may require before accepting a proprietary control measure.

[Reference:](#) All written submissions shall adhere to the requirements of Section 5.1 of this Chapter, as well as follow the variance procedure provided in Section 8.0 of Chapter 2.

### **5.0 Control Measure Selection and Planning**

All projects that are required to supply Erosion Control Materials shall plan and select the materials before the installation of control measures to minimize potential pollutant sources from initial disturbance of a project, until final stabilization and throughout every phase of construction to the maximum extent practicable.

Construction Control Measures shall be selected, designed, installed, maintained, and removed based upon project-specific conditions and in accordance with good engineering, hydrologic, and potential pollutant source control practices.

Control measures shall be selected based on the physical layout and project conditions that will exist during each phase and during each phase (sequence) of construction, because project conditions change through the various stages of construction so too shall the control measures need to change. This is to include individual lot protection on residential developments along with entire block protection on apartment complex once the pavement has been installed.

The Erosion Control Material shall be consistent with other plans (grading, plat, landscaping, etc.) as those plans may change with various updates, comments, and revisions. The Erosion Control Materials should be reevaluated with every set of plan revisions to make sure all plans are compatible.

Effective construction stormwater management may also require contractual mechanisms to ensure that any sub-contractors will be taking the correct steps to prevent erosion, sediment and non-dirt related pollutant source discharges from the project.

Projects that include construction work in waterways, along linear projects, with underground trenching, with native seed and in areas with habitat, all have some unique cases that shall be evaluated based upon their unique conditions and the nature of their Construction Activities.

Detailed Construction Control Measure fact sheets are provided in Appendix E and contain information on each control measures applicability, installation, maintenance and design details.

The fact sheets are intended to be stand-alone documents that can be used for reference or inserted directly into submitted Erosion Control Materials.

[Reference:](#) For further clarification, refer to Section 7.0 of Appendix D.

## 5.1 Documenting Alternative Methods of Control

Any non-standard control, or alternative control measure shall be submitted for review together with a detail of the proposed measure. Non-standard control measure proposals will be required to be processed through the Variance Request Process (as outlined in Section 8.0 of Chapter 2) before the measure will be allowed to be used on the project. In addition, non-standard or alternative control measures must adhere to the Erosion Control Criteria based upon the functionality and effectiveness in accordance with sound engineering and hydrological practices. Likewise, during construction, any substitution of a standard control measure for a non-standard or job-specific control measure shall also require it to be submitted and accepted prior to use in the field. The determination of whether a control measure is standard or not shall be made by FCU in its sole discretion.

In addition to the requirements provided in Section 8.0 of Chapter 2, all written submissions for a variance of control measures shall address all applicable questions that follow:

**General**

- Does the product provide equivalent or better function than the design details specified in this Manual?
- What are the installation procedures?
- What are the maintenance requirements? Is special equipment required for maintenance?
- What are the consequences of failure of the product?
- Has the product been successfully implemented on other projects in the metropolitan Denver or northern Colorado area? If so, where and who was the inspecting authority?

**Inlet Protection**

- Does the inlet protection enable runoff to enter the inlet without excessive ponding in traffic areas?
- How does the control measure provide for overflow due to large storm events or blockages?
- How is the control measure secured to the street or curb? Will it result in damage to concrete or pavement? Is it secured in a manner that prevents short-circuiting or collapsing into the inlet?
- Does the control measure appear to be sturdy enough to withstand typical activities conducted at construction sites or traffic on public roadways?
- Is there potential for pollutant leaching from the BMP?
- For inlet inserts, is special equipment required to remove the insert? Is the insert material strong enough to withstand tearing and/or collapse into the inlet, even when maintenance is less than ideal?

**Perimeter Controls**

- How is the perimeter control installed (e.g., trenching, staking)? Perimeter controls that are not adequately secured may be subject to undercutting and washout.
- Is the material used in the perimeter control adequately durable for the life of the construction project?

- How are vehicle tracking and project access controlled where flexible perimeter controls allow vehicles to drive over the control measure?

#### **Hydraulically Applied Products**

- Does the product contain chemicals, pollutants, nutrients, or other materials that could adversely impact receiving waters or groundwater?
- Has the product been adequately field tested under local conditions to ensure that the service life is consistent with the manufacturer's representation?
- Does use of the product require special permits?

All submissions shall be evaluated internally by staff to interpret the engineering principles and if the proposed Construction Control Measure adheres to water quality regulations required by the City, State, and Federal governing bodies.

The review and determination of the variance request under this Section 5.1 by the Utilities Executive Director under Section 8.0 of Chapter 2 may consider, among other things, whether the proposed Construction Control Measure is realistic, reasonable, in accordance with good engineering and hydrological practices, and not a potential impact on discharging to the river.

Any acceptance of the use of a control measure does not hold the City liable for any damages associated with this proprietary protect and will be a “use at own risk” by the Developer.

## **6.0 Detailed Construction Control Measures**

All control measures when selected to be used on a project shall be installed, implemented, and maintained, in accordance with the following control measure details in this section.

All the following details shall, per the City MS4 Permit requirements, prevent potential pollution sources from impacting state waters. Control measures shall also be appropriate for the specific Construction Activity, the applicable potential pollutant sources, and phase of construction. See Appendix D, Section 7.0 for help in the selection of control measures.

## 6.1 Erosion Control Detail/Fact Sheets

The details provided in the UDFCD Manual, dated 2010, are to be utilized in the preparation of the Erosion Control Materials. A copy of all control measure fact sheets can be found in Appendix E.

- EC- 1 Surface Roughening (SR)
- EC-2 Temporary and Permanent Seeding (TS/PS)
- EC-3 Soil Binders (SB)
- EC-4 Mulching (MU)
- EC-5 Compost Blanket and Filter Berm (CB)
- EC-6 Rolled Erosion Control Products (RECP)  
(Includes Erosion Control blankets [ECBs] and turf reinforcement mats [TRMs])
- EC-7 Temporary Slope Drains (TSD)
- EC-8 Temporary Outlet Protection (TOP)
- EC-9 Rough Cut Street Control (RCS)
- EC-10 Earth Dikes and Drainage Swales (ED/DS)
- EC-11 Terracing (TER)
- EC-12 Check Dams (CD) (also includes Reinforced Check Dams [RCD])
- EC-13 Streambank Stabilization (SS)
- EC-14 Wind Erosion / Dust Control (DC)



## 6.2 Sediment Control Detail/Fact Sheets

The details provided in the UDFCD Manual, dated 2010, are to be utilized in the preparation of the Erosion Control Materials. A copy of all control measure fact sheets can be found in Appendix E.

- SC-1 Silt Fence (SF)
- SC-2 Sediment Control Log (SCL)
- SC-3 is not a part of this Manual\*
- SC-4 Brush Barrier (BB)
- SC-5 Rock Sock (RS)
- SC-6 Inlet Protection (IP) (multiple types)
- SC-7 Sediment Basin (SB)
- SC-8 Sediment Trap (ST)
- SC-9 Vegetated Buffers (VB) \*\*
- SC-10 Chemical Treatment (CT) (also known as Advanced Treatment Systems [ATS])

\*The SC-3 Straw Bale Barriers fact sheet for is not included as these are prohibited from use as a sediment control measure in the City.

\*\*Buffer strips of natural vegetation may be utilized as a control measure with one additional supportive control measure in alignment with state guidance documents that have been published for the use of vegetative buffers.

## 6.3 Site Management Control Detail/ Fact Sheets

The details provided in the UDFCD Manual, dated 2010, are to be utilized in the preparation of the Erosion Control Materials. A copy of all control measure fact sheets can be found in Appendix E.

- SM-1 Construction Phasing/Sequencing (CP)
- SM-2 Protection of Existing Vegetation (PV)
- SM-3 Construction Fence (CF)\*

- SM-4 Vehicle Tracking Control (VTC) (multiple types)
- SM-5 Stabilized Construction Roadway (SCR)
- SM-6 Stabilized Staging Area (SSA)
- SM-7 Street Sweeping and Vacuuming (SS)
- SM-8 Temporary Diversion Channel (TDC)
- SM-9 Dewatering Operations (DW)
- SM-10 Temporary Stream Crossing (TSC) (multiple types)
- SM-11 Temporary Batch Plant (TBP)
- SM-12 Paving and Grinding Operations (PGO)

\*Adequate protection of both tree limbs and root systems is important when specifying limits of Construction Activity. Use construction fence or other barriers to protect areas that should not be compacted or disturbed.

#### **6.4 Materials Management Control Detail/Fact Sheets**

The details provided in the UDFCD Manual, dated 2010, are to be utilized in the preparation of the Erosion Control Materials. A copy of all control measure fact sheets can be found in Appendix E.

- MM-1 Concrete Washout Area (CWA)
- MM-2 Stockpile Management (SP)
- MM-3 Good Housekeeping Practices (GH) (including Spill Prevention and Control, Material Use, Material Delivery and Storage, Solid Waste Management, Hazardous Waste Management, Sanitary/Septic Waste Management, and Vehicle & Equipment Fueling, Maintenance and Cleaning)

## 7.0 Variances to Erosion Control Criteria

Questions related to the criteria set forth in this Chapter may be made to FCU staff, who will work with the requesting party to address any questions and concerns. Developers may also request a variance from the erosion control requirements set forth in this Manual pursuant to Section 5.1 of this Chapter and Section 8.0 of Chapter 2.

[Reference: Variance Request Process can be found in Section 8.0 of Chapter 2: Development Submittal Requirements.](#)

## 8.0 Standard Erosion Control Notes

The “Standard Erosion Control Notes” shall be included in each Erosion Control Plan. These notes shall not be amended as to ensure the consistent application of the standard.

[Reference: The standard Erosion Control Notes can be found in Appendix F of this Manual.](#)

A copy of the Standard Notes are also available on the City’s Erosion Control webpage [www.fcgov.com/erosion](http://www.fcgov.com/erosion).