



APPENDIX B

CONSTRUCTION STORMWATER MANAGEMENT GUIDANCE DOCUMENT

GUIDANCE DOCUMENT

INTRODUCTION

Any activity that decreases vegetative cover and disturbs the land surface increases vulnerability to wind and rainfall erosion. Therefore, land disturbing activities must provide a plan for addressing potential erosion and discharge of pollutants to waters of the state. The County mandates that an Erosion and Sediment Control Plan (ESCP) be developed for all construction activities for which submittal of a Drainage Letter or Drainage Report is required. This document is intended to provide guidance for the development of the ESCP. In addition, Chapter 7 *Construction BMPs* of Volume 3 of the MHFD Manual provides comprehensive information regarding management of stormwater quality on construction sites and is incorporated herein.

APPLICABILITY

An ESCP must be submitted with all Drainage Letters or Drainage Reports in the County. Other projects, such as those in close proximity to wetlands or waterways, may require an ESCP as deemed appropriate by the County Engineer. Construction activities with a land disturbance of at least one acre, or part of a larger common plan of development disturbing at least one acre, are also required to apply for coverage under the State's Construction Stormwater Discharge permit and implement a Stormwater Management Plan (SWMP). Those sites requiring coverage under the State permit that reside within the County's MS4 must also apply for a Land Disturbance Permit (LDP) from the County and complete all submittal requirements as described in the Land Disturbance Permit Checklist¹. The flowchart in Figure 1 provides guidance regarding the type of erosion control submittal(s) required for various projects within the County, including projects requiring a Development Construction Permit (DCP) or LDP.

It is expected that the ESCP requirements contained herein will also apply to the SWMP; however, additional requirements may be needed for compliance with the State permit, and the applicant is encouraged to consult the State permit directly for the most current SWMP requirements. The County also recognizes the wide diversity of construction projects that occur

¹ Please note the ESCP is referred to as a SWMP in the LDP checklist. The SWMP referenced in the LDP also meets the requirements of the ESCP as described in this document, and only one plan for erosion control is required to be submitted to the County.

within the County, and many of the ESCP items described herein may be waived for smaller projects at the discretion of the County Engineer.

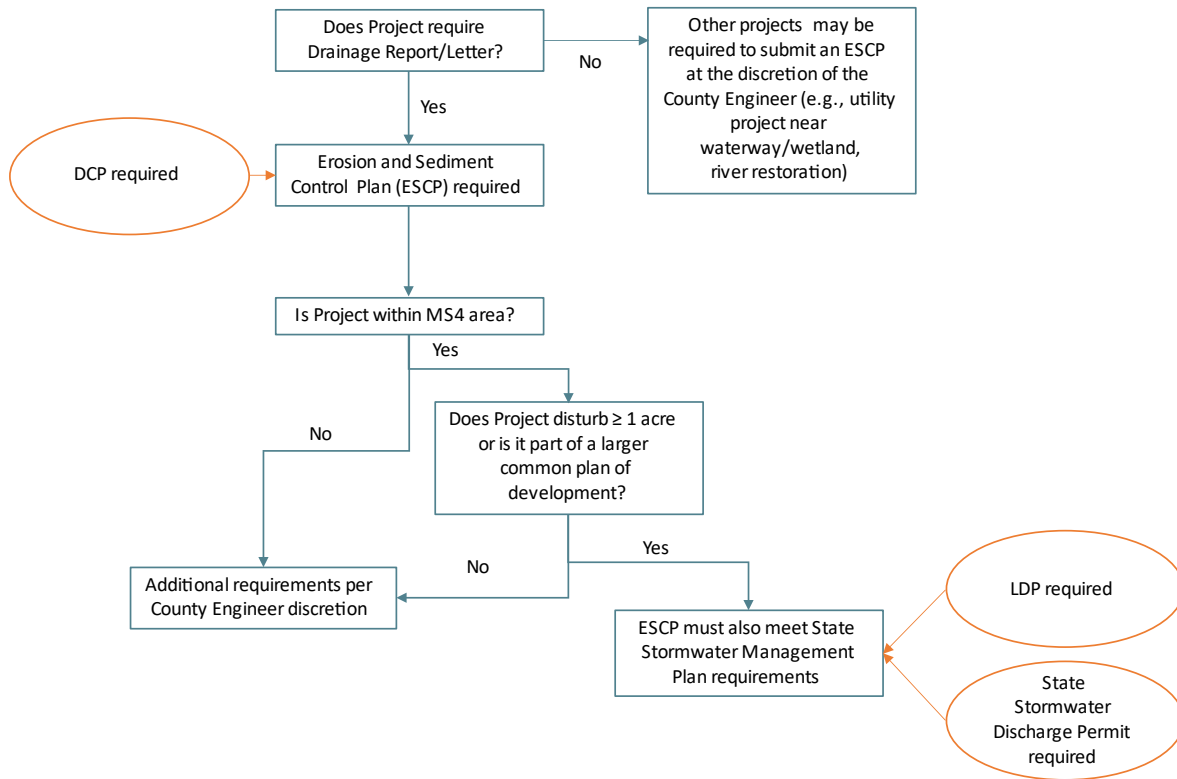


Figure 1. Type of Erosion Control Submittal(s) Required by Project within County

EROSION AND SEDIMENT CONTROL PLAN

As described in Chapter 7 *Construction BMPs* of Volume 3 of the MHFD Manual, there are four components to effective management of stormwater discharges from construction sites: erosion control, sediment control, materials management, and site management. The Erosion and Sediment Control Plan shall encompass all four aspects and include a narrative portion describing the construction activities to occur on the site, as well as a site map/drawing with all elements of drainage and erosion and sediment control indicated. A completed Erosion and Sediment Control Plan Checklist (Appendix C) shall be submitted with each ESCP submittal.

General Information and Site Description

Construction best management practices (BMPs) must be designed and implemented in response to the specific character of the site and the construction activity taking place on it. The erosion control narrative shall include a description of the nature and type of construction activity that will take place on the site as well as the proposed schedule and sequencing. Control measures shall be chosen to address potential pollutant discharges at each phase. This information should be provided in a table format, a template for which is provided in Appendix D of the Standards.

Describe characteristics influencing the erodibility of the site, including soil types, slope, and ground cover. The Revised Universal Soil Loss Equation is a tool that may be helpful in assessing the potential for erosion on a site, and more detail regarding the method and its application can be found in the *Construction BMPs* chapter of the MHFD Manual. Include any stream crossings located within the construction boundary. Measure the distance between construction activity and sensitive areas. Describe areas that may receive discharge from the site as well as areas that might receive discharge onto the site. Include a table with calculations that includes an estimate of the total acreage, the acreage that is expected to be disturbed, and percent of existing vegetation ground cover relative to the entire site. Include the method used to determine vegetative cover. Measure the *maximum unsheltered distance* for the project. An example table with possible details and calculations is included in Appendix D.

Types of Development in the County Requiring Drainage Planning*

New Development: Any construction activity or site alteration on a site that has not been previously developed.

Minor Expansion: Any development activity that includes the following: 1) Expansion of a mixed use-building by more than 2,000 square feet of non-residential space or the lesser of more than 10 dwelling units or 10% of the number of dwelling units; or 2) Expansion of a non-residential building by the greater of either 2,000 square feet or more than 20% of the total square footage of the building.

Change of Use: Any change of use that involves or requires on-site or off-site improvements, including but not limited to parking; landscaping, screening, or buffering; drainage facilities; outdoor uses on the lot, including sales, display, and storage.

Major Redevelopment: Any development activity on a mixed-use or non-residential site that involves change to 75 percent or more of the square footage of a primary structure. Major redevelopment shall be measured cumulatively over a rolling five-year period in the same ownership, starting with the applicant's most recent development application.

*All of these types of developments are collectively referred to as "**Projects**" throughout these Standards

Construction Stormwater Management Controls for Potential Pollutant Sources

To adequately address construction water quality, all potential sources of pollutants resulting from the construction activities must be identified and control measures carefully chosen to address each. Effective management of construction stormwater encompasses practices aimed at controlling erosion, capturing sediment, managing materials, and implementing construction site procedures designed to prevent pollutant discharges from leaving the site. Table 1, taken from the MHFD Manual, provides an overview of control measures and the component of

construction stormwater management to which each applies. The MS4 General Permit requires that, at a minimum, any discharges associated with the following activities must be addressed:

1. Land disturbance and storage of soils
2. Vehicle tracking
3. Loading and unloading operations
4. Outdoor storage of construction site materials, building materials, fertilizers, and chemicals
5. Bulk storage of materials
6. Vehicle and equipment maintenance and fueling
7. Significant dust or particulate generating processes
8. Routine maintenance activities involving fertilizers, pesticides, detergents, fuels, solvents, and oils
9. Concrete truck/equipment washing, including the concrete truck chute and associated fixtures and equipment
10. Dedicated asphalt and concrete batch plants
11. Other areas or operations where spills can occur
12. Other non-stormwater discharges including construction dewatering not covered under the Construction Dewatering Discharges general permit and wash water that may contribute pollutants to the MS4.

The above information should be presented in a table of potential pollutant sources that indicates whether each is present on the site and the control measure used to address each source. An example table is included in Appendix D – Standard Forms.

For each control measure identified, the ESCP shall include any specifications for its design, implementation, and maintenance. Fact sheets corresponding to standard construction BMPs are provided in Chapter 7 *Construction BMPs* in Volume 3 of the MHFD manual. Copies of the fact sheets have been included in Appendices G – J of the Standards, and the relevant sheet(s) may be included with the ESCP submittal.

Table 1. Overview of Construction BMPs (from MHFD Manual, Volume 3)

Functions	Erosion Control	Sediment Control	Site/Material Management
Erosion Control BMPs			
Surface Roughening	Yes	No	No
Temporary/Permanent Seeding	Yes	No	No
Soil Binders	Yes	No	Moderate
Mulching	Yes	Moderate	No
Compost Blankets and Filter Berms	Yes	Moderate	No
Rolled Erosion Control Products	Yes	No	No
Temporary Slope Drains	Yes	No	No
Temporary Outlet Protection	Yes	Moderate	No
Rough Cut Street Control	Yes	Moderate	No
Earth Dikes / Drainage Swales	Yes	Moderate	No
Terracing	Yes	Moderate	No
Check Dams	Yes	Moderate	No
Streambank Stabilization	Yes	No	No
Wind Erosion / Dust Control	Yes	No	Moderate
Sediment Control BMPs			
Silt Fence	No	Yes	No
Sediment Control Log	Moderate	Yes	No
Straw Bale Barrier	No	Moderate	No
Brush Barrier	Moderate	Moderate	No
Rock Sock (perimeter control)	No	Yes	No
Inlet Protection (various forms)	No	Yes	No
Sediment Basins	No	Yes	No
Sediment Traps	No	Yes	No
Vegetative Buffers	Moderate	Yes	Yes
Chemical Treatment	Moderate	Yes	No
Materials Management			
Concrete Washout Area	No	No	Yes
Stockpile Management	Yes	Yes	Yes
Good Housekeeping (multiple practices)	No	No	Yes
Site Management and Other Specific Practices			
Construction Phasing	Moderate	Moderate	Yes
Protection of Existing Vegetation	Yes	Moderate	Yes
Construction Fence	No	No	Yes
Vehicle Tracking Control	Moderate	Yes	Yes
Stabilized Construction Roadway	Yes	Moderate	Yes
Stabilized Staging Area	Yes	Moderate	Yes
Street Sweeping / Vacuuming	No	Yes	Yes
Temporary Diversion Channel	Yes	No	No
Dewatering Operations	Moderate	Yes	Yes
Temporary Stream Crossing	Yes	Yes	No
Temporary Batch Plants	No	No	Yes
Paving and Grinding Operations	No	No	Yes

Inspection and Maintenance

The County requires that routine site inspections be conducted by the permittee every 7 days or every 14 days when inspections also occur within 24 hours of storm or snowmelt events that cause surface erosion, per the State Construction Stormwater permit requirements. Inspections shall confirm that all control measures are functioning as designed and make note of any maintenance requirements. The County shall inspect all sites within the MS4 every 45 days. For other projects, the County shall inspect the site with a frequency appropriate for the type of project and potential for erosion.

The County also requires an inspection and maintenance plan that includes the following:

1. Designated person responsible for performing inspections of the site and all control measures
2. Inspection frequency
3. Maintenance activities required and frequency

Final Stabilization and Long-term Stormwater Management

Describe all practices used to achieve final stabilization of the Project location. A site will not be considered to have achieved final stabilization until the vegetation density of all disturbed areas reaches at least 70% of pre-construction density. Please refer to the State's "Guidance for Achieving Final Stabilization" document prepared to assist applicants in meeting the final stabilization requirements of the Construction Stormwater permit. This document may be found on the CDPHE website under "WQ construction compliance assistance and guidance". Include a description of structural post-construction or permanent control measure practices to manage stormwater runoff once construction activities have been completed.

Seeding and Vegetation

Re-establishing vegetation communities is a critical step in the final stabilization of a site. Chapter 17.0 of the Standards, *Revegetation*, provides guidance for site preparation, plant selection and installation, and maintenance of replanted areas following a disturbance and should be consulted for revegetation of construction sites in the County. A revegetation plan must be submitted as part of the ESCP.

Plan Map/Drawings

The Erosion and Sediment Control Plan shall include a map/drawing of the construction site with all the following components included. Standard symbols shall be used on each plan sheet and are included in Appendix E. The following list has been adapted from the State Construction Stormwater permit SWMP Site Map requirements.

1. Construction site boundaries
2. All areas of ground surface disturbance shown, including areas of borrow and fill
3. Flow arrows depicting stormwater flow directions on-site and runoff direction

4. Areas used for soil storage indicated
5. Locations of all waste accumulation areas, including areas for liquid, concrete, masonry, and asphalt
6. Locations of dedicated asphalt, concrete batch plants, and masonry mixing stations
7. Locations of all structural controls, sediment basins, and vehicle tracking controls
8. Location of all non-structural control measures
9. Locations of all springs, streams, wetlands, and other state waters
10. Locations of all stream crossings located within the construction site boundary

Standard Notes

Appendix F includes standard notes that shall be included in every ESCP submittal.

Erosion Control Escrow

The County requires an erosion control escrow be provided before construction will be approved. Construction of the erosion control measures shown on the approved ESCP shall not begin without the developer submitting proof of deposit of security to ensure control measures are constructed as planned and any disturbed land is rehabilitated. An irrevocable letter of credit, or cash escrow, acceptable to the County, and naming the County as the protected party, is required. The developer is encouraged to contact the County early in the planning process for escrow amounts and calculation methods.

A table showing the escrow calculation shall be submitted with the ESCP. The table should include the control measures to be used, the units of measure, the number of units, and the planned cost per unit. For the approved revegetation plan, the number of acres to be reseeded should be indicated, as well as per acre costs for implementing the revegetation plan (i.e., costs for seed, mulch, amendments, etc.). The erosion control escrow may be applied in phases where appropriate, with release of funds granted as each phase is completed and the County has determined that the required control measures have been implemented and maintained as described in the ESCP. In such cases, a map showing the planned phasing must be included.

Should the provisions of the approved ESCP not be complied with, the County may call the security. In these cases, the County may administer the construction of the measures shown on the erosion control plans. The County reserves the right to enter upon the land to have the measures constructed and make repairs as necessary.

Such bond, cash escrow, or irrevocable letter of credit shall further guarantee the continued maintenance and replacement of the measures for a period of one year after installation of structural measures and two years after installation of vegetative measures. Any cash escrow or irrevocable letter of credit shall be released upon certification by the County that the required measures have been completed and maintained in accordance with the ESCP.

ENFORCEMENT

Enforcement of the ESCP shall follow the procedures outlined in Section 1.9 of LCLUC.

REFERENCES

City of Fort Collins, 2018. *Fort Collins Stormwater Criteria Manual*.

Larimer County, 2021. *Larimer County Land Disturbance Permit Checklist*.

Larimer County, 2021. *Larimer County Urban Area Street Standards*.

Mile High Flood District, 2010. *Urban Storm Drainage Criteria Manual, Volume 3: Stormwater Best Management Practices*.