

### **Environmental Health and Safety**

# **Stormwater Construction and Post-Construction Guidelines**



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#### Environmental Health and Safety

#### Stormwater Construction and Post-Construction Guidelines

#### I. Purpose

In compliance with Colorado Discharge Permit System – Stormwater COR-09033, the goal of the Construction Site Runoff Control Program is to reduce, to the maximum extent practicable, sediment and other construction related pollutants from entering the municipal separate storm sewer system.

#### **II. Construction Activity**

During the planning stages for projects that may cause sediment and construction pollutants, a plan will need developed to reduce pollutants from discharging into the stormwater system associated from construction activity.

Stormwater construction guidelines are listed below that involve less than one acre or greater than one acre construction projects.

#### Less than One Acre

- UNC Facilities Planning and Construction (P&C), Grounds Department, and/or project contractor is responsible for developing and submitting a specific plan for the construction site.
- Plan will be reviewed by Environmental Health and Safety Department.
- Plan will be submitted to the City of Greeley as information only (see Section IV for details).
- City of Greeley will activate stormwater inspections. See Section V regarding Inspection Reports.

#### Greater than One Acre

- UNC P&C will have the design team include the basic requirements and details for the contractor.
- A qualified stormwater manager will need to be identified, the person with the most knowledge on the project
- The project contractor is responsible for developing and submitting a specific Stormwater Management Plan (SWMP) for the construction site.
- UNC will need to send over the SWMP over to the City of Greeley for a formal review.
- A developed plan and application will be submitted to Colorado Department of Public Health
   & Environment (CDPHE) in order to receive a Construction Stormwater General Permit.
- A copy of the issued permit and plan will be submitted, as information only, to the City of Greeley (see section IV for details).

- Inspection requirements for respective permits (if documented, COR400000 can be used for MS4)
- City of Greeley will activate stormwater inspections. See Section V regarding Inspection Reports.

#### III. Post-Construction

The City of Greeley Stormwater Division will conduct a post construction inspection to ensure Best Management Practices (BMPs) are in place. The University will ensure that BMPs are continually followed and that grounds are maintained appropriately.

#### IV. Submission of Approved Permits

Please send any SWMP or stormwater construction documents to UNC EHS.

City of Greeley – Submission of stormwater construction documents shall be sent to:

City of Greeley Stormwater Management Division Attn: Brian Hathaway 1001 9<sup>th</sup> Avenue Greeley, CO 80631 brian.hathaway@greeleygov.com

#### V. Inspection Reports

The inspection requirements for the respective permits or greater than one acre will be done by a third party (either hired by the contractor or the contractor themselves) and documented and kept for 3 years.

- COR400000 will need to be done every 7 days or 14 days plus post-storm events or 30 days if waiting on final stabilization. (by the third party)
- An inspection by the City of Greeley or UNC EHS

When the City of Greeley or UNC EHS completes an inspection report, a copy will be given to the contractor representative on-site, and a copy provided to the UNC Environmental Health and Safety Department. The address for UNC Environmental Health and Safety is:

University of Northern Colorado Environmental Health & Safety 501-20 Street, Campus Box 57 Greeley, CO 80639

UNC Project Managers or Environmental Health and Safety Department will follow up on any corrective action items and ensure the items are being addressed.

#### VI. Recordkeeping

All Documentation must be kept for at least 3 years.

The erosion control plan/site map is a living document. The site map must be updated to reflect current conditions and the updated site map must be included in the SWMP. All inspection reports shall be kept in the SWMP.

The City of Greeley requires all long-term operations and maintenance of permanent water quality features, must be recorded with Weld County Clerk and Recorders Office.

Please close all permits when the project has reached final stabilization.

### Appendix A. Stormwater Management Site Plan Review for Construction & Post Construction MS4 Requirements Checklist

For projects that impact stormwater, please review the checklist.

Project Name: Project Address: Date on project plan:

S&E control practices needed

## STORMWATER MANAGEMENT SITE PLAN REVIEW FOR CONSTRUCTION & POST-CONSTRUCTION MS4 REQUIREMENTS

□Site is less than 1 acre, no state construction permit required, grading permit may be required, basic

□Site greater than one (1) acre: State Permit Required, Phased Site Control (is required at 5 acres), a Grading permit may be required  PART 1. SEDIMENT & EROSION CONTROL PLAN SET: BMPS for Erosion & Sediment Controls (Reference Chapter 12 and Chapter 13 of City of Greeley Design Criteria Manual Volume II) Will need some sort of erosion control					
	EROSION CONTROL BMP's	Requirement Satisfied	More information is required as detailed below		
EC-1	Surface Roughening	□YES □NO □N/A			
EC-2	Vegetative Buffer	□YES □NO □N/A			
EC-3	Drainage Swales	□YES □NO □N/A			
EC-4	Wind Erosion Control Measures	□YES □NO □N/A			
EC-5	Slope protection	□YES □NO □N/A			
EC-6	Outlet Protection	□YES □NO □N/A			
EC-7	Temporary Seeding – properly shown on plan on plan set	□YES □NO □N/A			
EC-8	Permanent Seeding – properly shown on plan set	□YES □NO □N/A			
EC-9	Seeding dates are specified to cover the planting season for both temporary and permanent seeding	□YES □NO □N/A			
EC-10	Other:	□YES □NO □N/A			
	SEDIMENT CONTROL BMP				
SC-1	Silt Fence	□YES □NO □N/A			

SC-2	Sediment Control Logs (Wattles)	□YES □NO □N/A	
SC-3	Rock Socks	□YES □NO □N/A	
SC-4	Inlet Protection (required)	□YES □NO □N/A	
SC-5	Sediment Basins & Traps	□YES □NO □N/A	
SC-6	Check Dams	□YES □NO □N/A	
SC-7	Earth Berm	□YES □NO □N/A	
SC-8	Vehicle Tracking Control (required)	□YES □NO □N/A	
SC-9	Other:	□YES □NO □N/A	
	MATERIAL MANAGEMENT BMPS		
MM-1	Stockpile locations with appropriate controls (12.5.2.A)	□YES □NO □N/A	
MM-2	Material Management Procedures (12.5.2.B)	□YES □NO □N/A	
MM-3	Material Use (12.5.2.C)	□YES □NO □N/A	
MM-4	Spill Control and Prevention (12.5.2.D)	□YES □NO □N/A	
	WASTE MANAGEMENT(SPCC)		
WM-1	Concrete Waste Management (12.5.3.A)	□YES □NO □N/A	
WM-2	Solid Waste Management (12.5.3.B)	□YES □NO □N/A	
WM-3	Sanitary and Septic Waste Management (12.5.3.C)	□YES □NO □N/A	
WM-4	Liquid Waste Management (12.5.3.D)	□YES □NO □N/A	
WM-5	Hazardous Waste Management (12.5.3.E)	□YES □NO □N/A	
WM-6	Contaminated Waste Management (12.5.3.F)	□YES □NO □N/A	
	GENERAL POLLUTION PREVENTION		
GP-1	Dewatering Operations (12.5.4.A)	□YES □NO □N/A	
GP-2	Non-stormwater Discharge Management (12.5.4.B)	□YES □NO □N/A	
GP-3	Wind Erosion Control (12.5.4.C)	□YES □NO □N/A	
	` /		
GP-4	Paving Operations (12.5.4.D)	□YES □NO □N/A	
GP-4 GP-5	Paving Operations	□YES □NO □N/A □YES □NO □N/A	

	(12.5.4.F)		
	SITE MANAGEMENT		
SM-1	Limits of clearing & grading shown, including all stockpiles and access areas	□YES □NO □N/A	
SM-2	Wetland/Waterway Delineation: Temporary signage every 50 ft adjacent to site	□YES □NO □N/A	
SM-3	Phasing plan (Location of Erosion & Sediment control practices as phased with construction) (5 acres)	□YES □NO □N/A	
SM-4	Provisions described initiate and complete temporary or permanent stabilization within 14 days final grade in inactive areas	□YES □NO □N/A	
SM-5	Slopes of 4:1 or greater must have fabric or erosion matting stabilization	□YES □NO □N/A	
SM-6	Final stabilization measures outlined (should be in SWMP)	□YES □NO □N/A	
SM-7	BMP removal schedule (should be in SWMP).	□YES □NO □N/A	

### **Construction Notes and Details (Good suggestions)**

Are the following items shown on	Requirement Sa	tisfied		More information is required as
construction drawings				detailed below
a) Specific Soil and erosion control	$\Box$ YES	$\square$ NO	$\square N/A$	
sequence given for each phase				
b) Inspection of all erosion and sediment	$\Box$ YES	$\square$ NO	$\square N/A$	
control BMPs shall be required at the end				
of each (active) day's work, with necessary				
maintenance and repairs provided				
immediately				
c) All disturbed areas shall be adequately	$\Box$ YES	$\square$ NO	$\square N/A$	
stabilized within 7 days after final grade is				
reached, if the area will not be in an active				
construction area.				
d) Construction work in or directly	$\Box$ YES	$\square$ NO	$\square N/A$	
adjacent to a watercourse shall require				
adequate bed and bank stabilization as				
defined in the USDCM, Vol. 3				
e) Refer to the approved Stormwater	$\Box$ YES	$\square$ NO	$\square$ N/A	
Management Plan for additional				
requirements				
f) "The inspector may at any time require	$\Box$ YES	$\square$ NO	$\square N/A$	
h) If stockpiles are not brought to final	$\Box$ YES	$\square$ NO	$\square N/A$	
grade within 30 days following initial				
disturbance, or re-disturbance, temporary				
stabilization measures shall be required and				

the stockpiles shall remain less than 10 ft in		
height		
i) temporary erosion and sediment control	□YES □NO □N/A	
measures shall be removed as soon as their		
function has been fulfilled (when final		
stabilization is achieved)		
j) Construction of underground utilities	□YES □NO □N/A	
shall be included as a land disturbing		
activity.		
k) All Erosion Control Details (Final)	□YES □NO □N/A	
13.4.2.B		

### PART 2: CIVIL PLAN SET SHEETS: Permanent Long-Term Water Quality Control Structure

	PERMANENT BMP: POST CONSTRUCTION LONG TERM STRUCTURE	(Reference Chapter of City of Greeley Design Criteria Manual Volume II)	
PS-1	Extended Detention Basin with Water Quality Capture Volume Structure	□YES □NO □N/A	
PS-2	Underground Detention – Water Quality Vaults, i.e. Stormceptors	□YES □NO □N/A	
PS-3	Other:	□YES □NO □N/A	

The control measure being installed for permanent long-term water quality control meets one of the following base design standards:

\*Document all exclusions

Base Design Standard		Yes	No	NA
WQCV (exemptions)	100% of site is captured*			
Pollutant Removal Standard	Designed to treat at a minimum the 80 <sup>th</sup> percentile storm event and reduce the event mean concentration of Total Suspended Solids (TSS) to a median value of 30mg/l or less.			
Runoff Reduction Standard	Control measure is designed to infiltrate into the ground, evaporate or evapotranspire a quantity of water equal to 60% of calculated WQCV would be if all imperious area for site discharged without infiltration.			
Development Project Draining to a Regional WQCV Control Measure	The regional WQCV control measure must be designed to accept the drainage from the applicable development site, must not discharge to waters of the state before being discharged to regional WQCV control measure			
Development Project Draining to a Regional WQCV Facility	Must be designed to accept drainage from the applicable development site. May be discharged to waters of the state**. Regional WQCV facility must be implemented with flood control or water quality as the primary use.***			
Constrained Redevelopment Site Standard****	Must meet one of the following:  (a) provide treatment of the WQCV for the captured area (50% or more of the impervious area)  (b) provide treatment for the 80 <sup>th</sup> percentile storm event. Minimum 50% of the applicable development area, including 50% or more of the impervious area, shall drain to the control measure. 100% does not			

need to be directed to the control measure, as long as the overall removal goal is met or exceeded (c) Infiltrate, evaporate, through practices such as green infrastructure, quantity of water equal to 30% of what the calculated WQCV would be if all		
impervious area for the applicable redevelopment site		
discharged without infiltration		

- \*100% of applicable development site is captured, except that up to 20%, but not exceeding 1 acre, of the applicable development site area may be excluded when the permittee has determined that it is not practicable to capture runoff from portions of the site that will not drain towards control measures. In addition, permittee must determine that the implementation of a separate control measure for that portion of the site is not practicable.
- \*\*Before discharging to a water of the state, at least 20% of the upstream imperviousness of the applicable development site must be disconnected from the storm drainage system and drain through a receiving pervious area control measure compromising a footprint of at least 10% of the upstream disconnected impervious area of the applicable development site. Control measure must be designed in accordance with a City approved design manual. Stream channel between the discharge point of the development site and regional WQCV facility must be stabilized.
- \*\*\* Recreational ponds and reservoirs, or water bodies listed by name in surface water quality classifications and standard regulations (5CCR 1002-32 through 5 CCR 1002-38) and standards may not be considered regional facilities.
- \*\*\*\*Standard applies to redevelopment sites that:
  - a) The applicable redevelopment site is for a site that has greater than 75% impervious area and
  - b) The City has determined that it is not practicable to meet any of the standards for on-site treatment (100% WQCV, pollutant removal standard, or runoff reduction standard)

#### PART 3: PERMANENT BMP LONG TERM OPERATION & MAINTEANCE

	Permanent Structure Checklist	Requirements Satisfied	More Information is required as detailed below
PCS-1	Does the design allow for inspection and maintenance access? For example can equipment get to the bottom of the basin?	□YES □NO □N/A	
PCS-4	Does the basin contain trickle channel?	□YES □NO □N/A	
PCS-5	Will the trickle channel be handling underdrains and groundwater? If yes, pan must to have curb sides on it.	□YES □NO □N/A	
PCS-6	Slopes: 4:1 max –exceptions must be approved by Stormwater Engineering.	□YES □NO □N/A	
PCS-7	Basin is designed to be:		
	• Dry Wet	$\square$ YES $\square$ NO $\square$ N/A $\square$ YES $\square$ NO $\square$ N/A	
PCS-8	Vegetation:  • Native Bluegrass	□YES □NO □N/A □YES □NO □N/A	

PCS-9	Irrigation:		
	<ul> <li>Temporary</li> </ul>	$\square$ YES $\square$ NO $\square$ N/A	
	• Permanent	□YES □NO □N/A	

#### Appendix B. SWMP Checklist

# PART 4: STORMWATER MANAGEMENT PLAN (SWMP): SEPARATE WRITTEN DOCUMENT TO MEET REQUIREMENTS OF STATE-ISSUED "STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY" PERMIT

A copy must be sent to the EHS and to the City of Greeley

SWMP Contents	Requirement Satisfied	More info is required as detailed below
Site Description		
Nature of the construction activity at the site	□YES □NO □N/A	
<ul> <li>Proposed schedule for the sequence of major construction activities and the planned implementation of control measures for each phase</li> </ul>	□YES □NO □N/A	
<ul> <li>Estimates of the total acres and acreage expected to be disturbed for clearing, excavation, grading, access roads, stockpiles, borrow sites (including off-site areas), and volume (cubic yards) of excavation and fill</li> </ul>	□YES □NO □N/A	
<ul> <li>Summary of existing data used in the development of construction site plans or SWMP that describe the soil or potential for soil erosion</li> </ul>	□YES □NO □N/A	
<ul> <li>Description of Non-Stormwater Discharges*. These can include the following:         <ol> <li>Uncontaminated springs</li> <li>Concrete washout water</li> <li>Landscape irrigations return flow</li> <li>Emergency fire fighting</li> </ol> </li> <li>*Discharges covered under the division's Low Risk Discharge Policy</li> </ul>	□YES □NO □N/A	
are not authorized.		
<ul> <li>Description of areas receiving discharge from the site, including a description of the immediate source receiving the discharge (if storm sewer, the entity owning the system and the ultimate receiving water)</li> </ul>	□YES □NO □N/A	
<ul> <li>Description of all stream crossings located within the construction site boundaries, including         <ol> <li>Relative location on the site</li> <li>Stream name</li> <li>Any on-site disturbed upland areas that may flow into the stream</li> <li>Control measures implemented to protect the stream in the upland areas</li> </ol> </li> </ul>	□YES □NO □N/A	
<ul> <li>Description of vegetative density and type of vegetation (and the method for determining relative density)</li> </ul>	□YES □NO □N/A	
Site Map:		
Construction site boundaries	□YES □NO □N/A	
<ul> <li>Flow arrows that depict flow direction on-site and runoff</li> </ul>	□YES □NO □N/A	
All areas of ground disturbance (including borrow and fill)	□YES □NO □N/A	
<ul> <li>Areas used for storage of soil</li> </ul>	□YES □NO □N/A	

• Locations of waste accumulation areas (asphalt, liquid, concrete, masonry)	□YES □NO □N/A	
Locations of asphalt, concrete batch plants, and masonry	□YES □NO □N/A	
mixing stations		
Locations of all structural control measures	□YES □NO □N/A	
Locations of all non-structural control measures	□YES □NO □N/A	
Locations of all stream crossings located within the construction site boundary	□YES □NO □N/A	
Stormwater Management Controls:		
Qualified Stormwater Manager and qualifications on SWMP	□YES □NO □N/A	
Identification of Potential Pollutant Sources		
1) Disturbed and stored soils	□YES □NO □N/A	
2) Vehicle tracking of sediments	□YES □NO □N/A	
3) Management of contaminated soils	□YES □NO □N/A	
4) Loading and unloading operations	□YES □NO □N/A	
5) Outdoor storage activities	□YES □NO □N/A	
6) Vehicle and Equipment maintenance and fueling	□YES □NO □N/A	
7) Significant dust or particulate generating processes	□YES □NO □N/A	
8) Routine Maintenance activities involving fertilizers, pesticides, herbicides, detergents, fuels, solvents, oils, etc	□YES □NO □N/A	
9) On-site waste management practices (waste piles, liquid wastes,	□YES □NO □N/A	
dumpsters)		
10) Concrete truck/equipment washing, including washing of concrete truck chute and associated fixtures, and disposal of excess concrete after pouring	□YES □NO □N/A	
11) Dedicated asphalt, concrete batch plants, and masonry mixing stations	□YES □NO □N/A	
12) Non-industrial waste sources, including worker trash and portable	□YES □NO □N/A	
<ul> <li>toilets</li> <li>BMPs for Stormwater Pollution Prevention</li> </ul>		
BMPs for Stormwater Pollution Prevention		
Structural practices for Erosion & Sediment Control	□YES □NO □N/A	
2) Non-structural practices for Erosion & Sediment Control	□YES □NO □N/A	
3) Phased BMP Implementation	□YES □NO □N/A	
4) Materials Handling (pg 7 Guidance Doc)	□YES □NO □N/A	
5) Spill Prevention and Response Plan (pg 7 Guidance Doc)	□YES □NO □N/A	
6) Dedicated Concrete or Asphalt Batch Plants	□YES □NO □N/A	
7) Vehicle Tracking Control	□YES □NO □N/A	
8) Waste Management & Disposal, including concrete	□YES □NO □N/A	
washout		
9) Groundwater, Surface water, and comingled stormwater dewatering	□YES □NO □N/A	
Documented use agreement between permittee and	□YES □NO □N/A	
owner/operator of any control measures outside permitted		
area that are used as a BMP		
Final Stabilization & Long-Term Stormwater Management		
<ul> <li>Describe practices to achieve final stabilization</li> </ul>	□YES □NO □N/A	

Final stabilization practices for obtaining vegetative cover	□YES □NO □N/A
should include seed mix and application rates; soil	
preparations and amendments; soil stabilization practices	
(e.g. crimped straw, hydro mulch or rolled erosion control	
products) and appropriate sediment control BMPs as needed	
until final stabilization is achieved.	
<ul> <li>Final stabilization is reached when all ground surface</li> </ul>	□YES □NO □N/A
disturbing activities at the site have been completed, and	
uniform vegetative cover has been established with an	
individual plant density of at least 70% of pre-disturbance	
levels, or equivalent permanent, physical erosion reduction	
methods have been employed.	
<ul> <li>Describes any planned practices to control pollutants in</li> </ul>	□YES □NO □N/A
stormwater discharges that will occur after construction	
operations are completed (such as rain gardens, detention	
ponds, stormwater vaults)	
Inspections:	
• Inspections will be completed per frequency in part I.D.6 of	□YES □NO □N/A
the current CDPHE permit	
1. At least once every 7 calendar days or	
2. Once every 14 calendar days, plus post-storm	
inspections within 24 hours after the end of the event	
<ul> <li>Inspections will be conducted by a qualified stormwater</li> </ul>	□YES □NO □N/A
trained person	
<ul> <li>Inspection report template includes at a minimum the areas</li> </ul>	□YES □NO □N/A
required in the CDPHE permit (*see sample template)	
Installation and Maintenance of BMPs:	
Technical Appendix should include all design calculations	□YES □NO □N/A
for determining rainfall and runoff, sizing any basins,	
diversions or other conveyance or retention/detention	
facilities (13.4.2.A.5)	
Design specifications that contain information on the	□YES □NO □N/A
implementation of the control measure	
Specification on how often each BMP will be maintained	□YES □NO □N/A
Specification at what capacity routine maintenance will be	□YES □NO □N/A
scheduled (no more than 50%)	
A plan for how emergency repairs will be conducted	□YES □NO □N/A

#### Appendix C. COR400000 Inspection report

At minimum, the inspection must include:

- Inspection Date
- Name and titles of personnel conducting the inspection
- Weather conditions at the time of inspection
- Phase of construction at the time of inspection
- Location(s) of discharges of sediment or other pollutants from the site
- Locations(s) of control measures needing routine maintenance
- Locations(s) and identification of inadequate control measures
- Locations(s) and identification of additional control measures are needed that were not in place at the time of inspection
- Description of corrective action(s) for any of the 3 previous items if identified, dates those corrective action(s) were completed, including requisite changes to the SWMP, as necessary
- Description of the minimum inspection frequency and any deviations from the minimum inspection schedule
- After adequate corrective action(s) have been taken, or where a report does not identify
  any incidents requiring corrective action, the report shall contain the following statement:
- "I verify that, to the best of my knowledge and belief, that if any corrective action items, were identified during the inspection, those corrective actions are complete, and the site is currently in compliance with the Permit."

For an example, please go to <a href="https://cdphe.colorado.gov/wq-construction-compliance-assistance-and-guidance">https://cdphe.colorado.gov/wq-construction-compliance-assistance-and-guidance</a>, then scroll down to COR400000- stormwater management plan guidance.