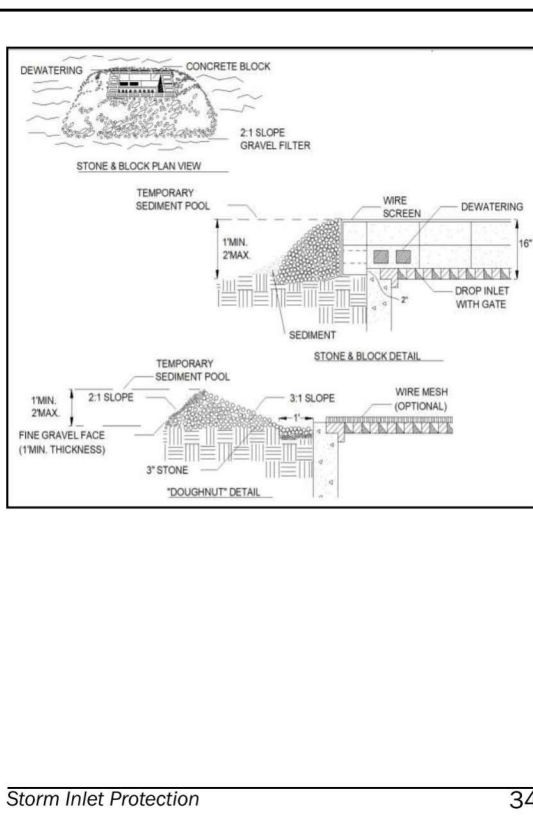
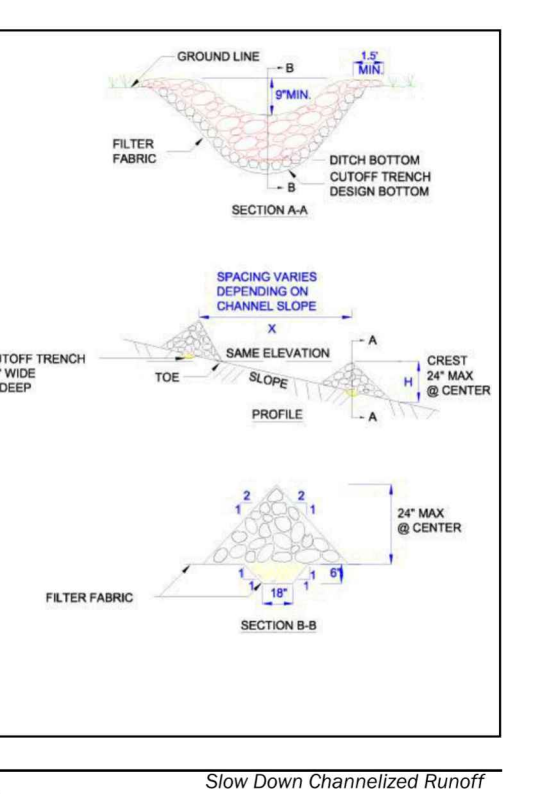


8. Storm Inlet Protection
Purpose:
 Existing or new storm inlets on construction sites constitute a site perimeter and must be protected from sediment laden runoff. The practices below allow stormwater to settle and filter through the practice and not bypass the inlet entirely.
Requirements:
 Stormwater inlets shall be 4 inches above grade or an acceptable inlet control/protection should be installed.
Inlet Protection Installation:
Proprietary Inlet Protection:
 Shall provide for storage and removal of sediment and be sized appropriately for the drainage area, while allowing stormwater to filter through. These may be used if installed and maintained in accordance with the manufacturer's specifications.
Stone and Block Inlet Protection:
 Concrete blocks placed around an inlet with a circle of filtering stone sloped against the blocks.



Storm Inlet Protection 34

Spacing: Space the dams so that the bottom (toe) of the upstream dam is at the elevation of the top (crest) of the downstream dam. This spacing is equal to the height of the check dam divided by the channel slope.
 Spacing (in feet) = Height of check dam (in feet) / Slope in channel (ft/ft)
Check Dam Maintenance:
 • Correct all observed damage immediately after every runoff event.
 • Remove all sediment accumulated behind the check dams and dispose of in an upland location.
 • If significant erosion is observed between check dams, the channel shall be stone lined.



Slow Down Channelized Runoff 40

Rolled Erosion Control Product:
 A preformed protective blanket of straw or other plant residue, formed into a mat, with a supporting mesh framework on one or both sides. This mesh cannot be made of a material with welded joints.

 Install blankets and mats vertically on long slopes. Unroll from top of hill and staple as you unroll it. Do not stretch blankets.
Erosion Control Matting:
 Install per manufacturer's instructions.

 Excellent stabilization of large slopes to limit the area of disturbance. Make sure to install erosion control matting within 48 hours of grading to ensure good contact between soil and mat.

IMPORTANT NOTE:
 Rolled Erosion Control Product (RECP) materials have the potential to ensnare animals such as snakes and birds, which can lead to injury or fatality. This has been observed to be most problematic in products with a plastic mesh, whether biodegradable or not.

 Accordingly, only woven and interlinked products are approved for use in RECP applications. (See Tables 4.3 and 4.4 of the Vermont Standards & Specifications for Erosion Prevention and Sediment Control)

Slope Stabilization 48

7. To ensure cover of disturbed soil in advance of a precipitation or melt event, areas of disturbed soil must be stabilized prior to any runoff producing event.
 • Stabilization is not required if the work is occurring in a self-contained excavation (i.e. no outlets) with a depth of 2 feet or greater (e.g. house foundation excavation, utility trenches), provided any dewatering, if necessary, is conducted in accordance with Part 13.
 8. Prior to stabilization, snow or ice must be removed to the extent practicable.
 9. Use stone to stabilize areas such as the perimeter of buildings under construction or where construction vehicle traffic is anticipated. Stone paths should be sufficient width to accommodate vehicle or equipment traffic.
 Winter Stabilization 54

13. Dewatering Activities
Purpose:
 To minimize and prevent discharges of sediment as a result of dewatering activities.
Requirements:
 Stormwater and groundwater from dewatering activities shall be uncontaminated and shall be filtered or passed through a sediment trapping device, or both, and routed in a manner that does not result in visually turbid discharges to waters. Pump intake for dewatering must be at or near the surface of the ponding area to prevent disturbance of the settled material. Visually turbid water must not be pumped directly to storm drains or other conveyance that leads to waters without implementing one or more of the practices described below.
How to comply:
 Implement one or more of the following practices when dewatering:
 • Implement sock filters or sediment filter bags on dewatering pump discharge hoses or pipes.
 • Route dewatering pump into silt fence enclosures or into staked hay bale enclosures lined with fabric.

Dewatering Activities 56

16. Inspection, Maintenance, and Discharge Reporting
 Site inspections are required to ensure that all erosion prevention and sediment control practices are sufficient and functioning properly. Regular inspections and maintenance of practices will help to reduce costly repairs and minimize the risk to water quality from construction stormwater discharges.
Requirements:
 Inspect the site at least once every 7 days and after every rainfall or snowmelt that results in stormwater runoff. Perform maintenance to ensure that practices are functioning according to the specifications outlined in this handbook.
 In the event of a visibly turbid discharge from the construction site, you must take immediate action to inspect and maintain existing erosion prevention and sediment control practices. Additional erosion prevention and sediment control measures must be installed as necessary, including temporary stabilization, to minimize and prevent the discharge of sediment laden stormwater runoff.

If after maintaining and supplementing BMPs, a discharge of visibly discolored stormwater from the construction site to surface waters continues, the permittee is required to notify DEC within 24 hours.
 While documentation of a routine inspection is not required, example inspection forms and forms for required discharge reporting are available at the Stormwater Program website. Permittees shall review Construction General Permit 3-9020 for all discharge reporting requirements.
 • A copy of the Low Risk Site Handbook shall be kept on-site.
 • Daily inspections are required from October 15 through April 15.

Inspection, Maintenance, and Reporting 62

Filter Fabric and Stone Inlet Protection:
 Vertical filter fabric installed around drop inlet with stone around fabric for stormwater filtering and creating ground contact with filter fabric. Alternatively, fabric may be buried below ground.

 Good installation of rock check dams. The check dams should extend up the sides of the banks. Middle section should be lower than the sides. Clean out sediment as it accumulates.
 Hay bales must not be used as check dams due to their high failure rates.

12. Winter Construction Requirements October 15 - April 15
Purpose:
 'Winter construction' as discussed here, describes the period from October 15 through April 15, when erosion prevention and sediment control is significantly more difficult. There are specific requirements for sites that conduct earth disturbance during the defined Winter Construction Period and for sites where disturbed areas have not reached final stabilization by October 15.
 Rains in late fall, thaws throughout the winter, and spring melt and rains can produce significant flows over frozen and saturated ground, greatly increasing the potential for erosion. A construction site can be managed to anticipate these conditions to prevent erosion and thus minimize the risk to water quality during this time period.
Requirements for Winter Shutdown:
 For projects or areas of a site that will have completed earth disturbance activities prior to the winter construction period (October 15 through April 15), the following requirements must be adhered to:

• Route dewatering pump to vegetated area at least 50 feet from surface waters and at a slope no greater than 5%.
 Remove accumulated sediment after the water has dispersed or infiltrated and stabilize the area with seed and mulch as necessary. A sufficient area of vegetation greatly improves the efficacy of filtering/settling of turbid water discharged from a dewatering enclosure.

 Water is pumped from the construction site into a silt fence enclosure on a vegetated area or into a sock filter away from waterways.

Dewatering Activities 56

14. Concrete Washout
Purpose:
 Concrete wash water often contains a slurry of heavy metals, can be caustic, and has a high pH. As a result, concrete washwater is not a permitted discharge.
Requirements:
 Concrete washwater and excess washout concrete should go in a lined washout. This washout should be accessible to the cement truck and at least 50 feet away from stormwater inlets and surface water.
Concrete Washout Installation:
 If cement washout is going to occur on site, a lined concrete washout as shown below shall be used onsite. Care should be given to assure that the washout does not overflow during a storm event. Proprietary lined and contained concrete washout basins may also be utilized in accordance with manufacturer's specifications.
Concrete Washout Maintenance:
 Concrete washout shall be pumped to a concrete truck as necessary, for disposal or reuse at a batch plant. Washout may also be allowed to evaporate/harden for disposal in accordance with all applicable local, state, and federal regulations.

Acknowledgements
 Some design details and standards were adopted from those provided by Vermont Electric Power Company (VELCO), TRC Solutions, Connecticut Department of Transportation (CTDOT) and the New York Department of Environmental Conservation (NYDEC).

9. Water Bars
Purpose:
 Some sites may benefit from the use of water bars on the construction site. When installed these may capture and redirect runoff to a stable low gradient location. Water bars limit the erosive velocity of water by diverting surface runoff at pre-designed intervals.
Requirements:
 These can be constructed per the following detail, with side slopes no steeper than 4:1 where vehicles cross with a minimum design height of 12 inches, measured from channel bottom to ridge top.
Water Bar Installation:
 Water bars should have stable outlets, either natural or constructed. The spacing should follow Table 1.
 Table 1. Water Bar Spacing

Slope (%)	Distance between structures (ft)
< 5	125
5 - 10	100
10 - 20	75
20 - 35	50
> 35	25

Rock Outlet Protection:
 • Waterways or outlets with concentrated stormwater runoff shall be stabilized with riprap, proprietary stabilization product or permanent materials. This additional stabilization is applicable in areas where the channel slope and velocity or soil type require additional stabilization.
 • All outlets from concentrated stormwater flows will require a stabilized bed.
 • Stone shall be sized so it is not mobilized during high flows.
 The images on page 44 show the before and after of an eroding channel from a culvert outlet, stabilized with stone, to a small pool for energy dissipation at the bottom of the slope.

1. For areas to be stabilized for the winter through the establishment of vegetation, seeding and mulching shall be completed no later than September 15 to ensure adequate growth and cover before the start of the winter period.

 Stabilization and seeding of slopes before winter will reduce or eliminate erosion in the spring.
 Winter Stabilization 50

Section 3 Additional Resources
 How to calculate slope:

 How to estimate disturbance area:
 1 acre = 43,560 square feet = 4,840 square yards
Area in acres (width in feet x length in feet)

Area (ft)	100	150	200	300	400	500
100	0.23	0.34	0.46	0.70	0.93	1.16
150	0.34	0.51	0.68	1.05	1.40	1.74
200	0.46	0.68	0.91	1.36	1.81	2.28
300	0.68	1.01	1.36	2.04	2.71	3.40
400	0.91	1.36	1.81	2.71	3.57	4.46
500	1.16	1.74	2.28	3.40	4.46	5.57

11. Slope Stabilization
Purpose:
 Surface covering designed to protect and stabilize an area prone to erosion where seeding and mulching may be inadequate, generally slopes 3:1 or greater. The erosion potential may be due solely to slope angle; however, a more gradual slope and poor soil structure can also require additional stabilization.
Requirements for Temporary Stabilization:
 Use of one of the listed slope protection practices below on slopes 3:1 and greater or as needed on flatter slopes based on soil type.
Riprap: A layer of stone designed to protect and stabilize areas subject to erosion.

 Stone riprap installed on an unstable slope with a stormwater outlet pipe along the slope.
 Slope Stabilization 46

4. Drainage structures must be kept open and free of snow and ice dams.
 5. Silt fence and other practices requiring earth disturbance must be installed ahead of frozen ground.
 6. Mulch used for temporary stabilization must be applied at a minimum of 2 inches with an 80-90% cover.
 Winter Stabilization 52

15. Permanent Controls
 Permanent stormwater treatment practices are constructed to maintain water quality, preserve existing water table elevations, prevent downstream flooding, and are often required for a project under a Vermont operational stormwater discharge permit applicable to the construction or redevelopment of impervious surfaces.*
 Permanent Stormwater Treatment Practices (STPs) include infiltration and filtering practices as well as detention ponds and treatment wetlands. **It is critical that infiltration practices do not receive runoff until the site area has reached final stabilization.**
 The outlet of permanent controls that are used as temporary storage and sediment basins during construction constitutes a potential discharge point and therefore must be managed to minimize and prevent sediment laden stormwater discharges. These practices will often need to be reshaped to meet the operational design criteria for volumes, grades and geometry once final grading and stabilization has occurred.
 *An impervious surface is a manmade surface, including, but not limited to, paved and unpaved roads, parking areas, roofs, driveways, and walkways, from which precipitation runs off rather than infiltrates.
 Permanent Controls 60

Concrete Washout

 Concrete Washout 58

Vermont Department of Environmental Conservation
 Watershed Management Division
 1 National Life Drive
 Montpelier, VT 05620-3522
 dec.vermont.gov/watershed/stormwater

10. Slow Down Channelized Runoff
Purpose:
 Stone check dams reduce erosion in drainage channels by slowing down the stormwater flow.
Requirements:
 If there is a concentrated flow (e.g. in a ditch or channel) of stormwater on your site, then you are required to install stone check dams. Hay bales and silt fence must not be used as check dams.
Check Dam Installation:
 • Height: No greater than 2 feet. Center of dam should be 9 inches lower than the side elevation
 • Side slopes: 2:1 or flatter (see p.63 for slope calculation)
 • Stone size: Use a mixture of 2 to 9 inch stone; the smaller stone helps to filter the channelized runoff. The small stone should be placed primarily in the interior of the check dam and the large stone should be placed in an armoring layer on the outside.
 • Width: Dams should span the width of the channel and extend up the sides of the banks

3. For areas of disturbance within 100 ft of a waterbody, the following must be installed across the slope, down gradient of the earth disturbance:
 • a combination of one practice from group A placed in front of a practice from group B, or
 • two group B practices, or
 • a single row of Reinforced Silt Fence

 Typical riprap slope protection detail
 Slope Stabilization 46

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 Winter Stabilization 52

Permanent Controls

 Permanent Controls 60

Winter Stabilization

 Winter Stabilization 52

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 Winter Stabilization 52

Permanent Controls

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Winter Stabilization

 Winter Stabilization 52

Revisions

No.	Description	Date	By

Use of These Drawings
 1. Unless otherwise noted, these Drawings are intended for preliminary planning, coordination with other disciplines or utilities, and/or approval from the regulatory authorities. They are not intended as construction drawings unless noted as such or marked approved by a regulatory authority.
 2. By use of these drawings for construction of the Project, the Owner represents that they have reviewed, approved, and accepted the drawings, obtained all necessary permits, and have met with all applicable parties/disciplines, including but not limited to, the Engineer and the Architect, to insure these plans are properly coordinated including, but not limited to, contract documents, specifications, owner/contractor agreements, building and mechanical plans, private and public utilities, and other pertinent permits for construction.
 3. Owner and Architect are responsible for final design and location of buildings shown, including an area measured a minimum five (5) feet around any building and coordinating final utility connections shown on these plans.
 4. Prior to using these plans for construction layout, the user shall contact TCE to ensure the plan contains the most current revisions.
 5. These Drawings are specific to the Project and are not transferable. As instruments of service, these drawings, and copies thereof, furnished by TCE are its exclusive property. Changes to the drawings may only be made by TCE. If errors or omissions are discovered, they shall be brought to the attention of TCE immediately.
 6. It is the User's responsibility to ensure this copy contains the most current revisions.

Joel & Jennifer Desautels
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 PROFESSIONAL ENGINEER
For Permitting Only
 Project Title

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 1333 Bullock Road
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EPSC Low Risk Handbook Sheet 2

Date: 10/03/2021
 Scale:
 Project Number: 15-212
 Drawn By: CMJ
 Project Engineer: JAD
 Approved By: JAD
 Field Book: