

# Construction Stormwater Pollution Prevention Plan

## St Charles Borromeo Parish Office Addition

Prepared for:

Prepared for:  
St Charles Borromeo  
7112 South 12<sup>th</sup> Street  
Tacoma, WA 98465

Contact: Father Michael McDermott  
Phone: (253) 564-5785

Prepared by:  
Sitts & Hill Engineers, Inc.  
4815 Center Street  
Tacoma, Washington 98409

Contact: Rick Hand, P.E.  
Phone: (253) 474-9449

March 2024

Job Number 20,126



City of Tacoma  
Reviewed for Code Compliance

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## Project Engineers Certification

I hereby state that this **Construction Stormwater Pollution Prevention Plan** for the **St Charles Borromeo Parish Office Addition** has been prepared by me or under my supervision and meets the standard of care and expertise which is usual and customary in this community for professional engineers. I understand that the City of Tacoma does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities prepared by me.



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## 1 Project Information and Overview

The project proposes construction of a two story building to the existing St Charles Borromeo Site and accompanying site and utility improvements. Permits sought for the proposed project include a building permit and site development permit.

This report is prepared in accordance with the 2021 City of Tacoma Stormwater Management Manual (herein known as the Manual).

On Sunday October 24, 2021, St Charles Borromeo’s parish administration building caught fire, causing a total loss to the structure. This project proposes the replacement of the lost office space as well as additional meeting spaces in a two story building. Specific proposed improvements include the building, concrete and asphalt pavement, stormwater utilities, and relocation of power, water, and sewer utilities.

## 2 Existing Project Site Conditions

The site address is 7112 South 12<sup>th</sup> Street Tacoma, WA 98465, please see the vicinity map included as Figure 1. The site is situated on tax parcel numbers 022003-4054 (0.637 acres) and 022003-4002 (13.45 acres). The site is currently developed with the church and school buildings, gymnasium, old convent building, and two portable buildings. The site is zoned R2 One Family Dwelling. Abutting the site to the west is South Meyers Street and to the north is South 12<sup>th</sup> Street. The adjacent property to the east is developed with multi-family housing and is zoned RCX Residential Commercial Mixed Use, and all other adjacent properties are developed with single family residences.

Stormwater runoff on the site generally sheet flows to the nearest catch basin to be collected into the existing conveyance system. Once collected, stormwater runoff is then conveyed to one of the two discharge locations: to a catch basin in the intersection of South 12<sup>th</sup> Street East and Oxford Street at the northeast corner of the site or to a catch basin in the intersection of South 12<sup>th</sup> Street East and Meyers Street at the northwest corner of the site. From there, stormwater enters the public system and travels north, up Oxford Street to the east and up Meyers Street to the west. There is no stormwater run-on from offsite.

According to the Tacoma Dart Map the site contains several small steep slope areas and approximately 100 feet to the west of the site is an aquifer recharge area. The steep slopes recognized on the Dart Map either are miscellaneously labelled (roof areas and portions of parking lot that are less than 5% slope) or do not present a substantial risk. The site’s underlying native glacial till soils make infiltration infeasible. According to the FEMA Flood Map the site lies within Zone X; an area of minimal flood hazard. There are no other known sensitive or critical areas like Flood Hazards or a Superfund area and we are unaware of any historical drainage problems such as flooding. We are unaware of any fuel tanks above or below ground on the site or know of any active wells within 100 feet of the site. The site is on the City’s sewer system and does not have a septic field.

A Geotechnical Engineering Report has been prepared for the site by GeoEngineers, dated September 1, 2023, and is included in Appendix E. The soils underlying the project are consolidated glacial till with little permeability. Infiltration BMPs are considered infeasible.

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Figure 1 - Vicinity Map



Google Maps, 2023

7112 South 12<sup>th</sup> Street Tacoma, WA 98465



NOT TO SCALE

### 3 13 Elements of Construction Stormwater Pollution Prevention

The project site is currently developed with asphalt and concrete surfacing. During construction, exposed soils will collect some of the stormwater, and all other runoff will continue to sheet flow to the nearest catch basin to be collected and conveyed to the site's two discharge locations in the public stormwater conveyance system. Erosion and sediment control for this project will consist of cleaning construction vehicle tires prior to exiting the site and providing sediment control at the existing catch basins inlets.

Below is a discussion of each of the thirteen Construction Stormwater Pollution Prevention Elements and a summary of applicable BMPs. Design, installation, and maintenance of any specific BMP should be carried out in accordance with the 2021 City of Tacoma Stormwater Management Manual and any further instructions detailed in the construction plans. Included

in Appendix A are the requirements for each BMP identified in this report, and Appendix B contains the proposed Demolition and TESC Plans.

### 3.1 Element #1: Preserve Vegetation and Mark Clearing Limits

Work limits will be identified in the field from the construction plans. Buffer zones, high visibility fencing, spray paint, and/or stakes will be provided to delineate the limits of construction and maintain a buffer zone between construction and the existing site features.

Applicable BMPs: BMP C103: High Visibility Fencing

### 3.2 Element #2: Establish Construction Access

Construction vehicles will access the site from the established driveways from the north off of South 12<sup>th</sup> Street. Any debris generated as a result of construction activity will be swept clean to prevent tracking onto paved areas.

Applicable BMPs: N/A

### 3.3 Element #3: Control Flow Rates

Stormwater runoff will continue to sheet flow to the nearest catch basin inlet on the site for collection and conveyance. There will be no stormwater discharge from the site on the surface.

Applicable BMPs: N/A

### 3.4 Element #4: Install Sediment Controls

Catch basin inlet protection will be installed on all existing catch basins adjacent or downstream of the project area until site surfaces are fully stabilized.

Applicable BMPs: BMP C220: Stormwater System Inlet Protection

### 3.5 Element #5: Stabilize Soils

Any exposed soil requiring stabilization due to poor weather conditions, or left unworked for more than 2 days from October 1 to April 30 (7 days from May 1 to September 30), will be covered at the end of each work shift. Covering material will be anchored to ensure adequate protection. Use of mulching, seeding, sodding, and topsoiling to be coordinated with landscape plans. Erosion control measures will remain in place until soil stabilization can be achieved by the installation of permanent surfacing. There will be no soil stockpiles after construction. Dust control will be utilized as necessary at the Contractor's discretion by keeping the work area adequately moisture conditioned.

Applicable BMPs: BMP C120: Temporary and Permanent Seeding  
BMP C121: Mulching  
BMP C123: Plastic Covering  
BMP C124: Sodding  
BMP C140: Dust Control

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### 3.6 Element #6: Protect Slopes

The project site does not include existing or proposed slopes.

Applicable BMPs: N/A

### 3.7 Element #7: Protect Stormwater System Inlets

All catch basins near the site are to be protected as necessary during construction. This will be accomplished through the use of catch basin inserts and pavement sweeping. The construction drawings detail the location and protection measure required for each proposed catch basin to be protected. Inlet protection filters are required on all proposed catch basins near the area of work. Filters will be inspected frequently during construction (especially after storm events) and pavement will be checked and swept as necessary. If inlet protection filters become one-third full, they will be cleaned in such a manner as to prevent sediment from entering the stormwater drainage system. Inlet protection material will also be kept on hand in case additional protection becomes necessary.

Applicable BMPs: BMP C220: Stormwater System Inlet Protection

### 3.8 Element #8: Stabilize Channels and Outlets

There are no existing or proposed open conveyance channels or outlets on the project site.

Applicable BMPs: N/A

### 3.9 Element #9: Control Pollutants

All material to be removed/demolished will be disposed of at an approved off-site location. Fueling and lubrication of construction vehicles and other motorized equipment will occur only at approved off-site facilities. Construction equipment will be inspected daily as part of regular maintenance activities. Any leaks or other sources of contamination will be repaired immediately. Spillage or other discharges of pollutants will be reported within 24 hours. Also, the contractor will maintain any materials necessary for rapid cleanup of spills.

Applicable BMPs: BMP C151: Concrete Handling  
BMP C152: Sawcutting and Surfacing Pollution Prevention  
BMP C153: Material Delivery, Storage, and Containment  
BMP C154: Concrete Washout Area

### 3.10 Element #10: Dewatering

The contractor is responsible for selecting excavation and dewatering methods, if necessary. A Special Approved Discharge (SAD) Permit may be required. A high groundwater mark was not encountered during geotechnical boring investigations, extending twenty feet below existing

Applicable BMPs: BMP C251: Construction Stormwater Filtration

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### 3.11 Element #11: Maintain BMPs

All erosion and sediment control BMPs will be maintained and repaired as needed during construction. Installed BMPs will be inspected weekly (unless otherwise specified) or after any large storm event for stability and functionality. Deficiencies will be corrected in such a way as to prevent sediment from entering the stormwater drainage system. Refer to the TESC Plans located in Appendix B.

Applicable BMPs:     BMP C150:     Materials On Hand  
                          BMP C160:     Certified Erosion and Sediment Control Lead

### 3.12 Element #12: Manage the Project

The Erosion Control Specialist shall be identified prior to the start of construction will be on-call at all times. This Construction Stormwater Pollution Prevention Plan will be retained on-site during construction. A County inspector will be notified if changes are made to this plan. Changes may occur if there are significant modifications to the design, construction, operation, or maintenance of the proposed drainage system or installed BMPs. The contractor will designate at least one person as a responsible representative in charge of TESC and water quality protection. The designated person shall be the CESCL who is responsible for ensuring compliance with all local, state, and federal ESC and water quality requirements.

Applicable BMPs:     BMP C150:     Materials On Hand  
                          BMP C160:     Certified Erosion and Sediment Control Lead (CESCL)  
                          BMP C162:     Scheduling

- *Phasing of Construction* – Phase development projects in order to prevent soil erosion and the transport of sediment from the project site during construction, unless the Erosion and Sediment Control Lead can demonstrate that construction phasing is infeasible. Revegetation of exposed areas and maintenance of that vegetation shall be an integral part of the clearing activities for any phase.
- *Seasonal Work Limitations* – From October 1 through April 30, clearing, grading, and other soil disturbing activities shall only be permitted if shown to the satisfaction of the City that silt-laden stormwater will be prevented from leaving the site through a combination of the following:
  - Site conditions including existing vegetative coverage, slope, soil type, and proximity to receiving waters;
  - Limitations on activities and the extent of disturbed areas; and
  - Proposed erosion and sediment control measures.

Based on the information provided and local weather conditions, the City may expand or restrict the seasonal limitation onsite disturbance. The following activities are exempt from the seasonal clearing and grading limitations:

- Routine maintenance and necessary repair of erosion and sediment control BMPs
  - Routine maintenance of public facilities or existing utility structures that do not expose the soil or result in the removal of the vegetative cover to soil
  - Activities where there is one hundred percent infiltration of stormwater within the site in approved and installed erosion and sediment control facilities
- *Inspection and Monitoring*



- a. Inspect, maintain, and repair all BMPs as needed to assure continued performance of their intended function. Projects regulated under the Construction Stormwater General Permit (CSWGP) must conduct site inspections and monitoring in accordance with Special Condition S4 of the CSWGP.
- b. Projects that disturb one or more acres must have site inspections conducted by a Certified Erosion and Sediment Control Lead (CESCL) or Certified Professional in Erosion and Sediment Control (CPESC).
- c. Projects disturbing less than one acre must have an Erosion Sediment Control Lead (ESC) conduct inspections. The ESC Lead does not have to have CESCL or CPESC certification.
- d. The CESCL, CPESC, or ESC Lead shall be identified in the SWPPP and shall be onsite or on-call at all times.
- e. The CESCL, CPESC, or ESC Lead must examine stormwater visually for the presence of suspended sediment, turbidity, discoloration, and oil sheen and evaluate the effectiveness of BMPs to determine if it is necessary to install, maintain, or repair BMPs.
- f. The CESCL, CPESC, or ESC Lead must inspect all areas disturbed by construction activities, all BMPs, and all locations where stormwater leaves the site at least once every calendar week and within 24 hours of any discharge from the site. (Individual discharge events that last more than one day do not require daily inspections). The CESCL, CPESC, or ESC Lead may reduce the inspection frequency for temporary stabilized, inactive sites to once every calendar month.
- g. Construction site operators must correct any problems identified by the CESCL, CPESC, or ESC Lead by:
  - Reviewing the SWPPP for compliance with the 13 construction SWPPP elements and making appropriate revisions within 7 days of the inspection.
  - Fully implementing and maintaining appropriate source control and/or treatment BMPs as soon as possible but correcting the problem within 10 days.
  - Documenting BMP implementation and maintenance in the site log book. (Required for sites larger than 1 acre but recommended for all sites).

Sampling and analysis of the stormwater discharges from a construction site may be necessary on a case-by-case basis to ensure compliance with standards. Ecology or the City will establish these monitoring and associated reporting requirements.

- *Responsible Party* – For all projects, a 24-hour responsible party shall be listed in the SWPPP, along with that person’s telephone number and email address.
- *Maintenance of the Construction SWPPP* – Keep the Construction SWPPP onsite or within reasonable access to the site. Modify the SWPPP whenever there is a change in the design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the state. Modify the SWPPP if, during inspections or investigations conducted by the owner/operator, City staff, or by local or state officials, it is determined that the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. Modify the SWPPP as necessary to include additional or modified BMPs designed to correct problems identified. Complete revisions to the SWPPP within seven (7) days following the inspection. City of Tacoma Environment Services (review staff or inspector) may require that a modification to the SWPPP go through additional City review.



### 3.13 Element #13: Protect Permanent Stormwater BMPs

Existing and proposed stormwater management facilities include catch basins, underground conveyance piping, and a Stormfilter. These will be protected from construction activities and sediment runoff until site surfaces are stabilized.

Applicable BMPs:   BMP C220:   Storm Drain Inlet Protection

- Protect all permanent stormwater BMPs from sedimentation through installation and maintenance of erosion and sediment control BMPs on portions of the site that drain into the BMPs. Restore all BMPs to their fully functioning condition if they accumulate sediment during construction. Sediment impacting Best Management Practices shall be removed before system start-up. Restoring the BMP shall include removal of all sediment and full replacement of treatment media.
- Prevent compacting infiltration facilities by excluding construction equipment and foot traffic.
- Keep all heavy equipment off native soils under infiltration BMPs that have been excavated to final grade to retain the infiltration rate of the soils.
- Protect lawn and landscaped areas from compaction due to construction equipment and material stockpiles.
- Do not allow muddy construction equipment on the base material of permeable pavement or on the permeable pavement section.
- Do not allow sediment laden runoff onto permeable pavements or base materials of permeable pavements.
- Permeable pavements fouled with sediment or that can no longer pass an initial infiltration test must be cleaned prior to final acceptance.

## 4 Construction Schedule

Construction is anticipated to begin in the fall of 2023 and be completed in the fall of 2024. The building will later have tenant improvements to build out the second floor of the proposed addition, however; the site development portion of the project will all be completed in this initial phase.

The following typical construction sequence will be used:

1. Obtain site development permit from the City of Tacoma. Schedule pre-construction meetings with the city inspector, owner, contractor and design team. Submit all submittals to architect.
2. Provide TESC measures (erosion control plans and details sheets). Coordinate with project work time periods and project milestone completion dates.
3. Provide temporary utilities and services necessary for construction activities.
4. Commence construction activities.
  - a. Start building construction
  - b. Install storm drainage facilities
  - c. Install concrete curbs and sidewalks

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- d. Install asphalt and concrete paving
  - e. Complete surface restoration
5. Clean sediment from storm drainage structures and piping if affected. Provide documentation cleaning was performed by a licensed/bonded company.
  6. Final site inspections. See contract plans for milestone inspections required by owner and permitting agency.
  7. Certificate of occupancy issued.

## 5 Modeling Report

No calculations or models have been prepared for this CSWPPP.

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## Appendix A Temporary Erosion and Sediment Control BMPs

The following BMPs were copied out of the 2021 City of Tacoma Stormwater Management Manual. These may be used for reference purposes; however, design and installation specifications should be followed from the construction plans.

- BMP C103: High Visibility Fence.
- BMP C120: Temporary and Permanent Seeding
- BMP C121: Mulching
- BMP C123: Plastic Covering
- BMP C124: Sodding
- BMP C140: Dust Control
- BMP C150: Materials On Hand
- BMP C151: Concrete Handling
- BMP C152: Sawcutting and Surfacing Pollution Prevention
- BMP C153: Material Delivery, Storage, and Containment
- BMP C154: Concrete Washout
- BMP C160: Certified Erosion and Sediment Control Lead
- BMP C162: Scheduling
- BMP C220: Storm Drain Inlet Protection
- BMP C251: Construction Stormwater Filtration

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### **1.3 BMP C103: High Visibility Fence**

#### **1.3.1 Purpose**

Fencing is intended to:

- Restrict clearing to approved limits.
- Prevent disturbance of sensitive areas, their buffers, and other areas required to be left undisturbed.
- Limit construction traffic to designated construction entrances or roads.
- Protect areas where marking with survey tape or flagging may not provide adequate protection.

#### **1.3.2 Conditions of Use**

To establish clearing limits, plastic, fabric, or metal fence may be used:

- At the boundary of sensitive areas, their buffers, and other areas required to be left uncleared.
- As necessary to control vehicle access to and on the site.

#### **1.3.3 Design and Installation Specifications**

- High visibility plastic fence shall be composed of a high-density polyethylene material and shall be at least four feet in height. Posts for the fencing shall be steel or wood and placed every 6 feet on center (maximum) or as needed to ensure rigidity. The fencing shall be fastened to the post every six inches with a polyethylene tie. On long continuous lengths of fencing, a tension wire or rope shall be used as a top stringer to prevent sagging between posts. The fence color shall be high visibility orange. The fence tensile strength shall be 360 lbs./ft. using the ASTM D4595 testing method.
- If appropriate, install fabric silt fence in accordance with BMP C233: Silt Fence to act as high visibility fence. Silt fence shall be at least 3 feet high and must be highly visible to meet the requirement of this BMP.
- Design and install metal fences according to the manufacturer's specifications.
- Metal fences shall be at least 3 feet high and must be highly visible.
- Do not wire or staple fences to trees.

#### **1.3.4 Maintenance Standards**

- If the fence has been damaged or its visibility reduced, it shall be repaired or replaced immediately and visibility restored.

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## 1.7 BMP C120: Temporary and Permanent Seeding

### 1.7.1 Purpose

Seeding reduces erosion by stabilizing exposed soils. A well-established vegetative cover is one of the most effective methods of reducing erosion.

### 1.7.2 Conditions of Use

- Seeding may be used throughout the project on disturbed areas that have reached final grade or that will remain unworked.
- Channels that will be vegetated should be installed before major earthwork and hydroseeded with a Bonded Fiber Matrix. The vegetation should be well established (i.e., 75 percent cover) before water is allowed to flow in the ditch. With channels that will have high flows, install erosion control blankets over the hydroseed. If vegetation cannot be established from seed before water is allowed in the ditch, sod should be installed in the bottom of the ditch over hydromulch and blankets.
- Seed detention ponds as required.
- Mulch is required at all times because it protects seeds from heat, moisture loss, and transport due to runoff.  
Mulch can be applied on top of the seed or simultaneously by hydroseeding. See BMP C121: Mulching for specifications.
- All disturbed areas shall be reviewed in late August to early September and all seeding shall be completed by the end of September. Otherwise, vegetation will not establish itself enough to provide more than average protection.
- At final site stabilization, seed and mulch all disturbed areas not otherwise vegetated or stabilized.

### 1.7.3 Design and Installation Specifications

- Seed during seasons most conducive to plant growth.
  - The optimum seeding windows for western Washington are April 1 through June 30 and September 1 through October 1.
  - Seeding that occurs between July 1 and August 30 will require irrigation until 75 percent grass cover is established.
  - Seeding that occurs between October 1 and March 30 will require a mulch or an erosion control blanket until 75 percent grass cover is established.
- To prevent seed from being washed away, confirm that all required surface water control measures have been installed.
- The seedbed should be firm and rough. All soil should be roughened no matter what the slope. If compaction is required for engineering purposes, track walk slopes before seeding. Backblading or smoothing of slopes greater than 4:1 is not allowed if they are to be seeded.
- New and more effective restoration-based landscape practices rely on deeper incorporation than that provided by a simple single-pass rototilling treatment. Wherever practical, the subgrade should be initially ripped to improve long-term permeability, infiltration, and water inflow qualities. At a minimum for permanent areas, use soil



amendments to achieve organic matter and permeability performance defined in engineered soil/landscape systems. For systems that are deeper than 8 inches, complete the rototilling process in multiple lifts, or prepare the soil system properly and then place it to achieve the specified depth.

- The use of fertilizers is discouraged. Fertilizers should only be used where necessary to ensure growth. Amending soils per BMP L613: Post-Construction Soil Quality and Depth should be considered (and may be required for permanent lawn and landscaped areas) as the first measure for ensuring vegetation growth. If fertilization is necessary, naturally-derived fertilizers should be chosen over chemically-derived fertilizers. Apply fertilizers per manufacturer's direction. Always use slow-release fertilizers.
- Hydroseed applications shall include a minimum of 1,500 pounds per acre of mulch with 3 percent tackifier. See BMP C121: Mulching for specifications.
- On steep slopes, Bonded Fiber Matrix (BFM) or Mechanically Bonded Fiber Matrix (MBFM) products should be used. BFM/MBFM products are applied at a minimum rate of 3,000 pounds per acre of mulch with approximately 10 percent tackifier. Application is made so that a minimum of 95 percent soil coverage is achieved. Numerous products are available commercially and should be installed per manufacturer's instructions. Most products require 24-36 hours to cure before a rainfall and cannot be installed on wet or saturated soils. Generally, these products come in 40-50 pound bags and include all necessary ingredients except for seed and fertilizer.
- BFMs and MBFMs have some advantages over blankets:
  - No surface preparation required;
  - Can be installed via helicopter in remote areas;
  - On slopes steeper than 2.5:1, blanket installers may need to be roped and harnessed for safety;
- In most cases, the shear strength of blankets is not a factor when used on slopes, only when used in channels. BFMs and MBFMs are good alternatives to blankets in most situations where vegetation establishment is the goal.
- When installing seed via hydroseeding operations, only about 1/3 of the seed actually ends up in contact with the soil surface. This reduces the ability to establish a good stand of grass quickly. One way to overcome this is to increase seed quantities by up to 50 percent.
- Vegetation establishment can also be enhanced by dividing the hydromulch operation into two phases:
  - Phase 1- Install all seed and fertilizer with 25-30 percent mulch and tackifier onto soil in the first lift;
  - Phase 2- Install the rest of the mulch and tackifier over the first lift.
- An alternative is to install the mulch, seed, fertilizer, and tackifier in one lift. Then, spread or blow straw over the top of the hydromulch at a rate of about 800-1000 pounds per acre. Hold straw in place with a standard tackifier. Both of these approaches will increase cost moderately but will greatly improve and enhance vegetative establishment. The increased cost may be offset by the reduced need for:
  - Irrigation
  - Reapplication of mulch
  - Repair of failed slope surfaces

- This technique works with standard hydromulch (1,500 pounds per acre minimum) and BFM/MBFMs (3,000 pounds per acre minimum).
- Provide a healthy topsoil to areas to be permanently landscaped. This will reduce the need for fertilizers, improve overall topsoil quality, provide for better vegetal health and vitality, improve hydrologic characteristics, and reduce the need for irrigation. See the Post-Construction Soil Quality and Depth BMP in Volume 4 for more information. Compost shall meet specification in A900: Compost. City of Tacoma Tagro Potting Soil can be used as an alternative to the compost component. Areas that will be seeded only and not landscaped may need compost or meal-based mulch included in the hydroseed in order to establish vegetation. Replace native topsoil on the disturbed soil surface before application.
- Seed that is installed as a temporary measure may be installed by hand if it will be covered by straw, mulch, or topsoil. Seed that is installed as a permanent measure may be installed by hand on small areas (usually less than 1 acre) that will be covered with mulch, topsoil, or erosion blankets.
- Unless otherwise stated, seed mixes shall be applied at a rate of 120 pounds per acre. This rate may be reduced is soil amendments of slow-release fertilizers are used.
- See Table 3 - 2: Standard Temporary Erosion Control Seed Mix to Table 3 - 8: Native Wet Biofiltration Swale Seed Mix for recommended seed mixes. Seed mixes are also shown in A1000: Vegetation. Seed mix should be chosen based upon location, exposure, soil type, slope, and expected foot traffic. Alternative seed mixes may be used provided justification is provided for their use.
  - Table 3 - 2: Standard Temporary Erosion Control Seed Mix is a standard mix where only temporary vegetative cover is required.

**Table 3 - 2: Standard Temporary Erosion Control Seed Mix**

Scientific Name	Common Name	Percent By Weight
<i>Festuca rubra var. commutata</i>	Chewings fescue	40
<i>Lolium perenne</i>	perennial rye	40
<i>Agrostis capillaris</i>	colonial bentgrass	10
<i>Trifolium repens</i>	white Dutch clover	10

- Table 3 - 3: Native Temporary Erosion Control Seed Mix is a mix made from native species that can be used where only temporary vegetative cover is required.

**Table 3 - 3: Native Temporary Erosion Control Seed Mix**

Scientific Name	Common Name	Percent By Weight
<i>Bromus carinatus</i>	California brome	25
<i>Deschampsia caespitosa</i>	Tufted hairgrass	15
<i>Festuca rubra</i>	native red fescue	20
<i>Hordeum brachyantherum</i>	meadow barley	40

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- Table 3 - 4: Landscaping Seed Mix is a mix appropriate as a final vegetative cover for lawn areas.

**Table 3 - 4: Landscaping Seed Mix**

Scientific Name	Common Name	Percent By Weight
<i>Lolium perenne</i>	perennial rye	70
<i>Festuca rubra var. commutata</i>	Chewings fescue	30

- Table 3 - 5: Low Growing Turf Seed Mix is a mix appropriate for dry situations and requires little maintenance once established.

**Table 3 - 5: Low Growing Turf Seed Mix**

Scientific Name	Common Name	Percent By Weight
<i>Festuca arundinaceae</i>	dwarf tall fescue	45
<i>Lolium perenne var. barclay</i>	dwarf perennial rye	30
<i>Festuca rubra</i>	red fescue	20
<i>Agrostis capillaris</i>	colonial bentgrass	5

- Table 3 - 6: Native Meadow Seed Mix is a mix recommended for areas that will be maintained infrequently or not at all and where native plant colonization is desirable.

**Table 3 - 6: Native Meadow Seed Mix**

Scientific Name	Common Name	Percent By Weight
<b>grasses</b>		
<i>Bromus carinatus</i>	California brome	30
<i>Deschampsia caespitosa</i>	tufted hairgrass	10
<i>Elymus glaucus</i>	blue wildrye	10
<i>Festuca roemerii</i>	Roemer's fescue	20
<b>perennials</b>		
<i>Achillea millefolium</i>	yarrow	5
<i>Eriophyllum lanatum</i>	Oregon sunshine	5
<i>Eschscholzia californica</i>	California poppy	3

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Scientific Name	Common Name	Percent By Weight
<i>Lupinus bicolor</i>	bicolor lupine	6
<i>Solidago canadensis</i>	Canada goldenrod	3
<b>annuals</b>		
<i>Clarkia amoena</i>	farewell to spring	5
<i>Gilia capitata</i>	globe gilia	3

- Table 3 - 7: Native Basic Biofiltration Swale Seed Mix represents a mix appropriate for intermittently wet areas.

**Table 3 - 7: Native Basic Biofiltration Swale Seed Mix**

Scientific Name	Common Name	Percent by Weight
<i>Beckmannia syzigachne</i>	American slough grass	5
<i>Danthonia californica</i>	California oat grass	5
<i>Deschampsia caespitosa</i>	tufted hairgrass	15
<i>Elymus glaucus</i>	blue wildrye	30
<i>Glyceria occidentalis</i>	western mannagrass	15
<i>Hordeum brachyantherum</i>	meadow barley	30

- Table 3 - 8: Native Wet Biofiltration Swale Seed Mix represents a mix appropriate for wet areas that are not regulated wetlands.
  - Apply this mix at a rate of 60 pounds per acre.

**Table 3 - 8: Native Wet Biofiltration Swale Seed Mix**

Scientific Name	Common Name	Percent by Weight
<i>Beckmannia syzigachne</i>	American slough grass	10
<i>Carex obnupta</i>	lough sledge	40
<i>Carex stipata</i>	beaked sedge	5
<i>Eleocharis palustris</i>	common spikerush	5
<i>Glyceria occidentalis</i>	western mannagrass	20
<i>Juncus patens</i>	spreading rush	15
<i>Scirpus microcarpus</i>	small-fruited bullrush	5

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**1.7.4 Maintenance Standards**

- Reseed any seeded areas that fail to establish at least 75 percent cover within 6 weeks from the initial seeding (100 percent cover for areas that receive sheet or concentrated flows). If reseeding is ineffective, use an alternate method, such as sodding, mulching, or nets/blankets. If winter weather prevents adequate grass growth, this time limit may be relaxed at the discretion of the City.
- After adequate cover is achieved, reseed and protect with mulch any areas that experience erosion. If the erosion problem is stormwater and surface water related, the problem shall be fixed and the eroded area reseeded and protected by mulch.
- Water seeded areas if necessary. Watering shall not cause runoff.

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## 1.8 BMP C121: Mulching

### 1.8.1 Purpose

The purpose of mulching soils is to provide immediate temporary protection from erosion. Mulch also enhances plant establishment by conserving moisture, holding fertilizer, seed, and topsoil in place, and moderating soil temperatures. Only the most common types are discussed in this section.

### 1.8.2 Conditions of Use

As a temporary cover measure, mulch should be used:

- On disturbed areas that require cover measures for less than 30 days.
- As a cover for seed.
- During the wet season on slopes steeper than 3H:1V with more than 10 feet of vertical relief.
- Mulch may be applied at any time of the year and must be refreshed periodically.
- Tackifiers shall be plant-based, such as guar or alpha plantago, or chemical-based such as poly-acrylamide or polymers.
- Install mulch or tackifier products per manufacturer's recommendations.

### 1.8.3 Design and Installation Specifications

- Mulch shall be compost, chipped site vegetation, hydro-mulch, wood-based mulch or wood straw, wood strand mulch, or straw. See Table 3 - 9: Mulch Standards and Guidelines for specifications, application rates, and additional information.
- A minimum of 2" of mulch is required. Increase the mulch thickness until the ground is 95% covered (not visible under the mulch). Thickness may need to increase for disturbed areas in or near sensitive or other areas susceptible to erosion.
- Mulch used within the ordinary high-water mark of surface waters should be selected to minimize potential flotation of organic matter. Compost has a higher specific gravities (densities) than straw, wood, or chipped material.

### 1.8.4 Maintenance Standards

- The thickness of the cover must be maintained.
- Remulch and/or protect with a net or blanket any areas that experience erosion. If the erosion problem is stormwater and surface water related, then fix the problem and remulch the eroded area.

**Table 3 - 9: Mulch Standards and Guidelines**

Compost	
<ul style="list-style-type: none"> <li>• Compost shall:                             <ul style="list-style-type: none"> <li>◦ Meet the definition for “composted material” per WAC 173-350-100 and comply with standards in WAC 173-350-220, except the feedstock may contain biosolids or manure feedstocks.</li> <li>◦ Be coarse compost meeting the following size gradations (by dry weight) when tested in accordance with the U.S. Composting Council “Test Methods for the Examination of Compost and Composting” (TMECC) Test Method 02.02-B.</li> </ul> </li> </ul>	
Sieve Size	Minimum Percent Passing
3”	100
1”	90
3/4”	70
1/4”	40
<ul style="list-style-type: none"> <li>◦ Have no visible water or dust during handling.</li> <li>◦ Have soil organic matter content of 40% to 65%.</li> <li>◦ Have a carbon to nitrogen ratio below 25:1. Carbon to nitrogen ratio may be as high as 35:1 for plantings composed entirely of plants native to the Puget Sound Lowlands region.</li> <li>◦ Be applied a minimum of 2” thick (~100 tons/acre) though thicker application rates may provide more effective control.</li> </ul>	
<ul style="list-style-type: none"> <li>• Do not use near wetlands or phosphorus impaired waterbodies.</li> <li>• Compost can be later tilled into soils to help meet the requirements of BMP L613: Post-Construction Soil Quality and Depth as required per Minimum Requirement #5.</li> </ul>	
<p>Compost specifications are also contained in A900: Compost.</p>	
Chipped Site Vegetation	
<ul style="list-style-type: none"> <li>• Chipped site vegetation shall:                             <ul style="list-style-type: none"> <li>◦ Have an average size of 2-4” with gradations from fine to 6” in length for texture, variation, and interlocking properties.</li> <li>◦ Be applied a minimum of 2” thick.</li> </ul> </li> <li>• Do not apply on slopes greater than 10%.</li> <li>• Do not use within 200 feet of surface waterbodies.</li> </ul>	
<p>Using chipped site vegetation is a cost-effective way to dispose of debris associated with clearing and grubbing material. The decomposition of the chipped vegetation may help impart nutrients for grass establishment.</p>	

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**Table 3 - 9: Mulch Standards and Guidelines**

Hydro-mulch
<ul style="list-style-type: none"> <li>• Hydro-mulch shall:                             <ul style="list-style-type: none"> <li>◦ Be applied with seed and tackifier.                                     <ul style="list-style-type: none"> <li>• May be applied without seed and tackifier if application rate is doubled.</li> </ul> </li> <li>◦ Have no growth inhibiting factors.</li> <li>◦ Have fibers less than ¾" in length to ensure machinery does not clog.</li> </ul> </li> </ul> <p>Be applied at 35-45 pounds per 1,000 sf or 1500-2000 pounds per acre with a hydromulcher.</p>
Wood-based Mulch or Wood Straw
<ul style="list-style-type: none"> <li>• Wood-based mulch or straw mulch shall:                             <ul style="list-style-type: none"> <li>◦ Have no visible water or dust during handling.</li> <li>◦ Be purchased from a supplier with a Solid Waste Handling Permit or a supplier that is exempt from solid waste regulations.</li> <li>◦ Be applied 2" thick (~100 tons/acre)</li> </ul> </li> <li>• Wood-based mulch or wood straw is often called "hog" or "hogged fuel".</li> </ul> <p>The preparation of wood-based mulch typically does not account for weed seed control so the inclusion of weed plants or seeds should be monitored and minimized or prevented during application.</p>
Wood Strand Mulch
<ul style="list-style-type: none"> <li>• Wood strand mulch shall be:                             <ul style="list-style-type: none"> <li>◦ A blend of loose long, thin wood pieces derived from native conifers or deciduous trees with high length-width ratio.</li> <li>◦ A minimum of 95% of the wood strand shall have lengths between 2" and 10" with a width and thickness between 1/16" and 3/8".</li> <li>◦ Free of resin, tannin, or other compounds that are detrimental to plant establishment and growth.</li> <li>◦ Applied 2" thick.</li> </ul> </li> </ul> <p>Do not use sawdust or wood shavings.</p>
Straw
<ul style="list-style-type: none"> <li>• Straw shall be:                             <ul style="list-style-type: none"> <li>◦ Air-dried.</li> <li>◦ Free from undesirable seed and coarse material.</li> <li>◦ Applied 2"-3" thick (5 bales per 1000 ft<sup>2</sup> or 2-3 tons per acre)                                     <ul style="list-style-type: none"> <li>• Thickness may be reduced by half when used with seeding.</li> <li>• Hand-application requires a greater thickness than blown straw to ensure required coverage.</li> </ul> </li> <li>◦ Held in place by crimping, using a tackifier, or covering with netting. Blown straw shall be held in place using a tackifier.</li> </ul> </li> <li>• Although straw can be cost-effect, straw can introduce and/or encourage weed species and has no long-term benefits so should only be used when other materials are unavailable.</li> </ul> <p>Do not used within the ordinary high-water elevation of surface waters (due to flotation).</p>

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## 1.10 BMP C123: Plastic Covering

### 1.10.1 Purpose

Plastic covering provides immediate, short-term erosion protection to slopes and disturbed areas.

### 1.10.2 Conditions of Use

- Plastic covering may be used on disturbed areas that require cover measures for less than 30 days, except as stated below.
- Plastic is particularly useful for protecting cut and fill slopes and stockpiles.
- The relatively rapid breakdown of most polyethylene sheeting makes it unsuitable for long-term (greater than six months) applications.
- Due to rapid runoff caused by plastic covering, this method shall not be used upslope of areas that might be adversely impacted by concentrated runoff. Such areas include steep and/or unstable slopes.
- Whenever plastic is used to protect slopes, water collection measures must be installed at the base of the slope. These measures include plastic-covered berms, channels, and pipes used to convey clean rainwater away from bare soil and disturbed areas. At no time is clean runoff from a plastic covered slope to be mixed with dirty runoff from a project.
- Other uses for plastic include:
  - Temporary ditch liner;
  - Pond liner in temporary sediment pond;
  - Liner for bermed temporary fuel storage area if plastic is not reactive to the type of fuel being stored;
  - Emergency slope protection during heavy rains; and
  - Temporary conveyance used to direct stormwater and surface water.

### 1.10.3 Design and Installation Specifications

Plastic slope cover must be installed as follows:

- Run plastic up and down slope, not across slope.
- Plastic may be installed perpendicular to a slope if the slope length is less than 10 feet.
- Minimum of 8-inch overlap at seams.
- On long or wide slopes, or slopes subject to wind, all seams should be taped.
- Place plastic into a small (12-inch wide by 6-inch deep) slot trench at the top of the slope and backfill with soil to keep water from flowing underneath.
- Place sand filled burlap or geotextile bags every 3 to 6 feet along seams and pound a wooden stake through each to hold them in place. Alternative options for holding plastic in place exist and may be considered with COT approval.
- Inspect plastic for rips, tears, and open seams regularly and repair immediately. This prevents high velocity runoff from contacting bare soil, which causes extreme erosion;
- Plastic sheeting shall have a minimum thickness of 6 mil.

- If erosion at the toe of a slope is likely, a gravel berm, riprap, or other suitable protection shall be installed at the toe of the slope in order to reduce the velocity of runoff.

**1.10.4 Maintenance Standards**

- Torn sheets must be replaced and open seams repaired.
- If the plastic begins to deteriorate due to ultraviolet radiation, it must be completely removed and replaced.
- When the plastic is no longer needed, it shall be completely removed.
- Properly dispose of products used to weigh down covering.

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## 1.11 BMP C124: Sodding

### 1.11.1 Purpose

The purpose of sodding is to establish turf for immediate erosion protection and to stabilize conveyance systems where concentrated overland flow will occur.

### 1.11.2 Conditions of Use

Sodding may be used in the following areas:

- Disturbed areas that require short-term or long-term cover.
- Disturbed areas that require immediate vegetative cover.
- All waterways that require vegetative lining. Waterways may also be seeded rather than sodded, and protected with a net or blanket.

### 1.11.3 Design and Installation Specifications

Sod shall be free of weeds, of uniform thickness (approximately 1-inch thick), and shall have a dense root mat for mechanical strength.

The following steps are recommended for sod installation:

- Shape and smooth the surface to final grade in accordance with the approved grading plan. Overexcavate areas as needed to allow room for placing soil amendment and sod.
- Amend 4 inches (minimum) of compost into the top 8 inches of the soil if the organic content of the soil is less than ten percent or the infiltration rate is less than 0.6 inches per hour. Compost used shall:
  - Meet the definition for “composted material” per WAC 173-350-100 and comply with standards in WAC 173-350-220, except the feedstock may contain biosolids or manure feedstocks.
  - Have no visible water or dust during handling.
  - Have soil organic matter content of 40% to 65%.
  - Have a carbon to nitrogen ratio below 25:1. Carbon to nitrogen ratio may be as high as 35:1 for plantings composed entirely of plants native to the Puget Sound Lowlands region.  
City of Tacoma Tagro Potting Soil can be used as an alternative to the compost component in BMP C124: Sodding.
- Fertilize according to the supplier's recommendations.
- Work lime and fertilizer 1 to 2 inches into the soil, and smooth the surface.
- Lay strips of sod beginning at the lowest area to be sodded and perpendicular to the direction of water flow. Wedge strips securely into place. Square the ends of each strip to provide for a close, tight fit. Stagger joints at least 12 inches. Staple on slopes steeper than 3H:1V. Staple the upstream edge of each sod strip.
- Roll the sodded area and irrigate.
- When sodding is carried out in alternating strips or other patterns, seed the areas between the sod immediately after sodding.



**1.11.4 Maintenance Standards**

If the grass is unhealthy, the cause shall be determined and appropriate action taken to reestablish a healthy groundcover. If it is impossible to establish a healthy groundcover due to frequent saturation, instability, or some other cause, the sod shall be removed, the area seeded with an appropriate mix, and protected with a net or blanket.

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## 1.17 BMP C140: Dust Control

### 1.17.1 Purpose

Dust control prevents wind transport of dust from disturbed soil surfaces.

### 1.17.2 Conditions of Use

Use dust control practices in areas (including roadways) subject to surface and air movement of dust where onsite and offsite impacts to streets, the stormwater system, or receiving waterbodies are likely.

### 1.17.3 Design and Installation Specifications

- Vegetate or mulch areas that will not receive vehicle traffic. In areas where planting, mulching, or paving is impractical, apply gravel or landscaping rock.
- Limit dust generation by clearing only to those areas where immediate activity will take place, leaving the remaining area(s) in the original condition, if stable. Maintain the original ground cover as long as practical.
- Construct natural or artificial windbreaks or windscreens. These may be designed as enclosures for small dust sources.
- Sprinkle the site with water until surface is wet. Repeat as needed. To prevent carryout of mud onto street, refer to Stabilized Construction Entrance (BMP C105: Stabilized Construction Entrance/Exit).
- Irrigation water can be used for dust control. Install irrigation systems as a first step on sites where dust control is a concern.
- Spray exposed soil areas with a dust palliative, following the manufacturer's instructions and cautions regarding handling and application. Used oil is prohibited from use as a dust suppressant.
- PAM (BMP C127: Polyacrylamide for Soil Erosion Protection) added to water at a rate of 2/3 pounds per 1,000 gallons of water per acre and applied from a water truck is more effective than water alone. This is due to the increased infiltration of water into the soil and reduced evaporation. In addition, small soil particles are bonded together and are not as easily transported by wind. Adding PAM may actually reduce the quantity of water needed for dust control. There are concerns with the proper use of PAM, refer to BMP C127: Polyacrylamide for Soil Erosion Protection for more information on PAM application. PAM use requires COT approval.
- Lower speed limits. High vehicle speed increases the amount of dust stirred up from unpaved roads and lots.
- Upgrade the road surface strength by improving particle size, shape, and mineral types that make up the surface and base materials.
- Add surface gravel to reduce the source of dust emission. Limit the amount of fine particles to 10 to 20 percent.
- Use geotextile fabrics to increase the strength of new roads or roads undergoing reconstruction.
- Encourage the use of alternate, paved routes, if available.
- Restrict use of paved roadways by tracked vehicles and heavy trucks to prevent damage to road surfaces and bases.

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- Apply chemical dust suppressants using the admix method, blending the product with the top few inches of surface material. Suppressants may also be applied as surface treatments.
- Pave unpaved permanent roads and other trafficked areas.
- Use vacuum street sweepers.
- Remove mud and other dirt promptly so it does not dry and then turn into dust.
- Limit dust-causing work on windy days.
- Contact the Puget Sound Clean Air Agency for guidance and training on other dust control measures. Compliance with the Puget Sound Clean Air Agency's recommendations/requirements constitutes compliance with this BMP.

#### **1.17.4 Maintenance Standards**

Evaluate the potential for dust generation frequently during dry periods. Complete the actions outlined above as needed to limit the dust.

Any dust which leaves the site must be cleaned immediately.

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## 1.18 BMP C150: Materials On Hand

### 1.18.1 Purpose

Quantities of erosion prevention and sediment control materials should be kept on the project site at all times to be used for regular maintenance and emergency situations such as unexpected heavy summer rains. Having these materials onsite reduces the time needed to implement BMPs when inspections indicate that existing BMPs are not meeting the Construction SWPPP requirements.

### 1.18.2 Conditions of Use

Construction projects of any size or type can benefit from having materials on hand. A small commercial development project could have a roll of plastic and some gravel available for immediate protection of bare soil and temporary berm construction. A large earthwork project, such as highway construction, might have several tons of straw, several rolls of plastic, flexible pipe, sandbags, geotextile fabric, and steel “T” posts.

- Materials are stockpiled and readily available before any site clearing, grubbing, or earthwork begins. A large contractor or developer could keep a stockpile of materials that are available to be used on several projects.
- If storage space at the project site is at a premium, the contractor could maintain the materials at a location less than one hour from the project site.

### 1.18.3 Design and Installation Specifications

Depending on project type, size, complexity, and length, materials and quantities will vary. Table 3 - 10: Materials on Hand, provides a good minimum that will cover numerous situations.

**Table 3 - 10: Materials on Hand**

Material	Measure	Quantity
Clear Plastic, 6 mil	100 foot roll	1-2
Drain Pipe, 6 or 8 inch diameter	25 foot section	4-6
Sandbags, filled	each	25-50
Quarry Spalls	ton	2-4
Washed Gravel	cubic yard	2-4
Geotextile Fabric	100 foot roll	1-2
Catch Basin Inserts	each	2-4
Steel “T” Posts	each	12-24

### 1.18.4 Maintenance Standards

- All materials with the exception of the quarry spalls, steel “T” posts, and gravel should be kept covered and out of both sun and rain.
- Re-stock materials used as needed.

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## 1.19 BMP C151: Concrete Handling

### 1.19.1 Purpose

Concrete work can generate process water and slurry that contain fine particles and high pH, both of which can violate water quality standards in the receiving water. Concrete spillage or concrete discharge to waters of the State is prohibited. Use this BMP to minimize and eliminate concrete, concrete process water, and concrete slurry from entering waters of the State.

### 1.19.2 Conditions of Use

Utilize these management practices any time concrete is used.

Concrete construction projects include, but are not limited to, the following:

- Curbs
- Sidewalks
- Roads
- Bridges
- Foundations
- Floors
- Runways

Disposal options for concrete, in order of preference are:

1. Offsite disposal
2. Concrete washout areas
3. De minimus washout to formed areas awaiting concrete

### 1.19.3 Design and Installation Specifications

- Wash concrete truck drums at an approved offsite location or in designated concrete washout areas only.
  - Return unused concrete remaining in the truck and pump to the originating batch plant for recycling. Do not dump excess concrete onsite, except in designated concrete washout areas as allowed in BMP C154: Concrete Washout Area.
- Do not wash out concrete trucks onto the ground (including formed areas awaiting concrete), or into the stormwater conveyance system, open ditches, streets, or streams.
- Wash small concrete handling equipment (e.g. hand tools, screeds, shovels, rakes, floats, trowels, and wheelbarrows) into designated concrete washout areas or into formed areas awaiting concrete pour.
- At no time shall concrete be washed off into the footprint of an area where an infiltration feature will be installed.
- Wash equipment difficult to move, such as concrete paving machines, in areas that do not directly drain to natural or constructed stormwater conveyance or potential infiltration areas.

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- Do not allow washwater from areas, such as concrete aggregate driveways, to discharge directly (without detention or treatment) to natural or constructed stormwater conveyances.
- Contain washwater and leftover product in a lined container when no designated concrete washout areas (or formed areas, allowed as described above) are available. Dispose of contained concrete and concrete washwater (process water) properly. Always use forms or solid barriers for concrete pours within 15-feet of surface waters.
- Refer to BMP C252: Treating and Disposing of High pH Water and BMP C253: Portable Sediment Tank for pH adjustment requirements.
- Refer to the Construction Stormwater General Permit for pH monitoring requirements if the project involves one of the following activities:
  - Significant concrete work (as defined in the Construction Stormwater General Permit).
  - The use of engineered soils amended with (but not limited to) Portland cement-treated base, cement kiln dust or fly ash.
  - Discharging stormwater to segments of water bodies on the 303(d) list (Category 5) for high pH.

#### **1.19.4 Maintenance Standards**

Containers shall be checked for holes in the liner daily during concrete pours and repaired the same day.

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## **1.20 BMP C152: Sawcutting and Surfacing Pollution Prevention**

### **1.20.1 Purpose**

Sawcutting and surfacing operations generate slurry and process water that contains fine particles and high pH (concrete cutting), both of which can violate water quality standards in the receiving water. This BMP is intended to minimize and eliminate process water and slurry from entering waters of the State

### **1.20.2 Conditions of Use**

Anytime sawcutting or surfacing operations take place, use these management practices. Sawcutting and surfacing operations include, but are not limited to, the following:

- Sawing
- Coring
- Grinding
- Roughening
- Hydro-demolition
- Bridge and road surfacing

### **1.20.3 Design and Installation Specifications**

- Vacuum slurry and cuttings during cutting and surfacing operations.
- Do not leave slurry and cuttings on permanent concrete or asphalt pavement overnight.
- Do not allow slurry and cuttings to enter any natural or constructed conveyance system.
- Dispose of collected slurry and cuttings in a manner that does not violate groundwater or surface water quality standards.
- Do not allow process water that is generated during hydro-demolition, surface roughening, or similar operations to enter any natural or constructed conveyance system. Dispose of process water in a manner that does not violate groundwater or surface water quality standards.
- Handle and dispose of cleaning waste material and demolition debris in a manner that does not cause contamination of water. If the area is swept with a pick-up sweeper, haul the material out of the area to an appropriate disposal site.

### **1.20.4 Maintenance Standards**

Continually monitor operations to determine whether slurry, cuttings, or process water could enter waters of the state. If inspections show that a violation of water quality standards could occur, stop operations and immediately implement preventive measures such as berms, barriers, secondary containment, and vacuum trucks.



## 1.21 BMP C153: Material Delivery, Storage and Containment

### 1.21.1 Purpose

Prevent, reduce, or eliminate the discharge of pollutants from material delivery and storage to the stormwater system or watercourses by minimizing the storage of hazardous materials onsite, storing materials in a designated area, and installing secondary containment.

### 1.21.2 Conditions of Use

These procedures are suitable for use at all construction sites with delivery and storage of the following materials:

- Petroleum products such as fuel, oil, and grease
- Soil stabilizers and binders (e.g. Polyacrylamide)
- Fertilizers, pesticides, and herbicides
- Detergents
- Asphalt and concrete compounds
- Hazardous chemicals such as acids, lime, adhesives, paints, solvents, and curing compounds
- Any other material that may be detrimental if released to the environment

### 1.21.3 Design and Installation Specifications

The following steps should be taken to minimize risk:

- Locate temporary storage area away from vehicular traffic, near the construction entrance(s), and away from conveyance systems and receiving waterbodies.
- Supply Material Safety Data Sheets (MSDS) for all materials stored. Keep chemicals in their original labeled containers.
- Surrounding materials with earth berms is an option for temporary secondary containment.
- Minimize hazardous material storage onsite.
- Handle hazardous materials as infrequently as possible.
- During the wet weather season (October 1 through April 30), consider storing materials in a covered area.
- Store materials in secondary containment, such as an earthen dike, a horse trough, or a children's wading pool for non-reactive materials such as detergents, oil, grease, and paints. "Bus boy" trays or concrete mixing trays may be used as secondary containment for small amounts of material.
- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items on a pallet and, when possible, in secondary containment.
- If drums cannot be stored under a roof, domed plastic covers are inexpensive and snap to the top of drums, preventing water from collecting.



**1.21.4 Material Storage Areas and Secondary Containment Practices:**

- Store liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, or 302 in approved containers and drums and do not overfill the containers or drums. Store containers and drums in temporary secondary containment facilities.
- Temporary secondary containment facilities shall provide for a spill containment volume able to contain precipitation from a 25 year, 24 hour storm event plus 10% of the total enclosed container volume of all containers, or 110% of the capacity of the largest container within its boundary, whichever is greater.
- Secondary containment facilities shall be impervious to the materials stored therein for a minimum contact time of 72 hours.
- Secondary containment facilities shall be maintained free of accumulated rainwater and spills. In the event of spills or leaks, collect accumulated rainwater and spills and place into drums. Handle these liquids as hazardous waste unless testing determines them to be non-hazardous. Dispose of all wastes properly.
- Provide sufficient separation between stored containers to allow for spill cleanup and emergency response access.
- During the wet weather season (October 1 through April 30), cover each secondary containment facility during non-working days, prior to and during rain events.
- Keep material storage areas clean, organized, and equipped with an ample supply of appropriate spill clean-up material.
- The spill kit should include, at a minimum:
  - 1 water resistant nylon bag
  - 3 oil absorbent socks (3-inches by 4-feet)
  - 2 oil absorbent socks (3-inches by 10-feet)
  - 12 oil absorbent pads (17-inches by 19-inches)
  - 1 pair splash resistant goggles
  - 3 pairs nitrile gloves
  - 10 disposable bags with ties
  - Instructions

**1.21.5 Maintenance Standards**

Any stormwater within the material storage area shall be pumped or otherwise discharged after each rain event. Before pumping, the stormwater must be evaluated to determine if it must go to treatment or can be discharged without treatment. If stormwater is contaminated, direct the discharge to appropriate treatment.

Restock spill kit materials as needed.

## 1.22 BMP C154: Concrete Washout Area

### 1.22.1 Purpose

Prevent or reduce the discharge of pollutants to stormwater from concrete waste by conducting washout offsite, or performing onsite washout in a designated area to prevent pollutants from entering surface waters or groundwater.

### 1.22.2 Conditions of Use

Use concrete washout best management practices on construction projects where:

- It is not possible to dispose of all concrete wastewater and washout offsite (ready mix plant, etc.)
- Concrete truck drums are washed onsite.
- Concrete is used as a construction material.

At no time shall concrete be washed off into the footprint of an area where an infiltration feature will be installed.

Note: Auxiliary concrete truck components (e.g. chutes and hoses) and small concrete handling equipment (e.g. hand tools, screeds, shovels, rakes, floats, trowels, and wheelbarrows) may be washed into formed areas awaiting concrete pour.

### 1.22.3 Design and Installation Specifications

#### Implementation

- Perform washout of concrete truck drums at an approved offsite location or in designated concrete washout areas only.
- Do not wash out concrete trucks onto the ground, or into the stormwater conveyance system, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped onsite, except in designated concrete washout areas.
- Wash equipment difficult to move, such as concrete paving machines, in areas that do not directly discharge to natural or constructed stormwater conveyance or potential infiltration areas.
- Concrete washout areas may be prefabricated concrete washout containers, or self-installed structures (above-grade or below-grade).
- Prefabricated containers are most resistant to damage and protect against spills and leaks. Companies may offer delivery service and provide regular maintenance and disposal of solid and liquid waste.
- If self-installed concrete washout areas are used, below-grade structures are preferred over above-grade structures because they are less prone to spills and leaks.
- Self-installed above-grade structures should only be used if excavation is not practical.
- Identify concrete washout area on the TESC plan.

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- Concrete washout areas shall be constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.

**Education**

- Discuss the concrete management techniques described in this BMP with the ready-mix concrete supplier before any deliveries are made.
- Educate employees and subcontractors on the concrete waste management techniques described in this BMP.
- Arrange for the contractor's superintendent or Erosion and Sediment Control Lead (BMP C160: Erosion and Sediment Control Lead) to oversee and enforce concrete waste management procedures.
- Install a sign adjacent to each temporary concrete washout facility to inform concrete equipment operators to utilize the proper facilities.

**Contracts**

Incorporate requirements for concrete waste management into concrete supplier and subcontractor agreements.

**Location and Placement Considerations:**

- Locate washout area or temporary concrete washout facilities at least 50 feet from sensitive areas such as stormwater system inlets, open conveyance ditches, or waterbodies, including wetlands.
- Allow convenient access for concrete trucks, preferably near the area where the concrete is being poured.
- If trucks need to leave a paved area to access washout, prevent track-out with a pad of rock or quarry spalls (BMP C105: Stabilized Construction Entrance/Exit). These areas should be far enough away from other construction traffic to reduce the likelihood of accidental damage and spills.
- The washout area volume installed should depend on the expected demand for storage capacity.
- On large sites with extensive concrete work, washouts may be placed in multiple locations for ease of use by concrete truck drivers.

**Concrete Truck Washout Procedures**

- Washout concrete truck drums in designated concrete washout areas only.
- Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated concrete washout areas or properly disposed of offsite.

**Concrete Washout Area Installation**

- Install concrete washout areas prior to starting concrete work.
- Construct concrete washout areas of sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations. It is recommended that the minimum length and width be 10 feet.

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- Plastic lining should be a minimum of 10-mil polyethylene sheeting and free of holes, tears, or other defects that compromise impermeability.
- Lath and flagging should be commercial grade.
- Install liner seams per manufacturer's recommendations.
- Prepare soil base free of rocks or other debris that may cause tears of holes in plastic lining.

#### **1.22.4 Inspection and Maintenance**

- Inspect and verify that concrete washout BMPs are in place prior to the commencement of concrete work.
- Once concrete wastes are washed into designated washout areas and allowed to harden, the concrete should be broken up, removed, and disposed of per applicable solid waste regulations. Dispose of hardened concrete on a regular basis.
- During periods of concrete work, inspect daily to verify continued performance.
  - Check overall condition and performance.
  - Check remaining capacity (% full).
  - If using self-installed washout facilities, verify plastic liners are intact and sidewalls are not damaged.
  - If using prefabricated containers, check for leaks.
- Maintain washout facilities to provide adequate holding capacity with a minimum freeboard of 12 inches.
- Washout facilities must be cleaned, or new facilities must be constructed and ready for use once the washout is 75% full.
- If the washout is nearing capacity, vacuum and dispose of the waste material in an approved manner.
  - Do not discharge liquid or slurry to streets, the stormwater system, receiving waterbodies, or the ground..
  - Do not use wastewater system without obtaining a City of Tacoma Special Approved Discharge permit. Call Source Control at 253.591.5588 for more information.
  - Place a secure, non-collapsing, non-water collecting cover over the concrete washout facility prior to predicted wet weather to prevent accumulation and overflow of precipitation.
  - Remove and dispose of hardened concrete and return the structure to a functional condition. Concrete may be reused onsite or hauled away for disposal or recycling.
- When you remove materials from the self-installed concrete washout, build a new structure; or, if the previous structure is still intact, inspect for signs of weakening or damage, and make any necessary repairs. Re-line the structure with new plastic after each cleaning.

#### **1.22.5 Removal of Temporary Concrete Washout Facilities**

- When temporary concrete washout facilities are no longer required for the work, remove and properly dispose of the hardened concrete, slurries and liquids.



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- Remove materials used to construct temporary concrete washout facilities from the site of the work and dispose of or recycle it.
- Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities shall be backfilled, repaired, and stabilized to prevent erosion.

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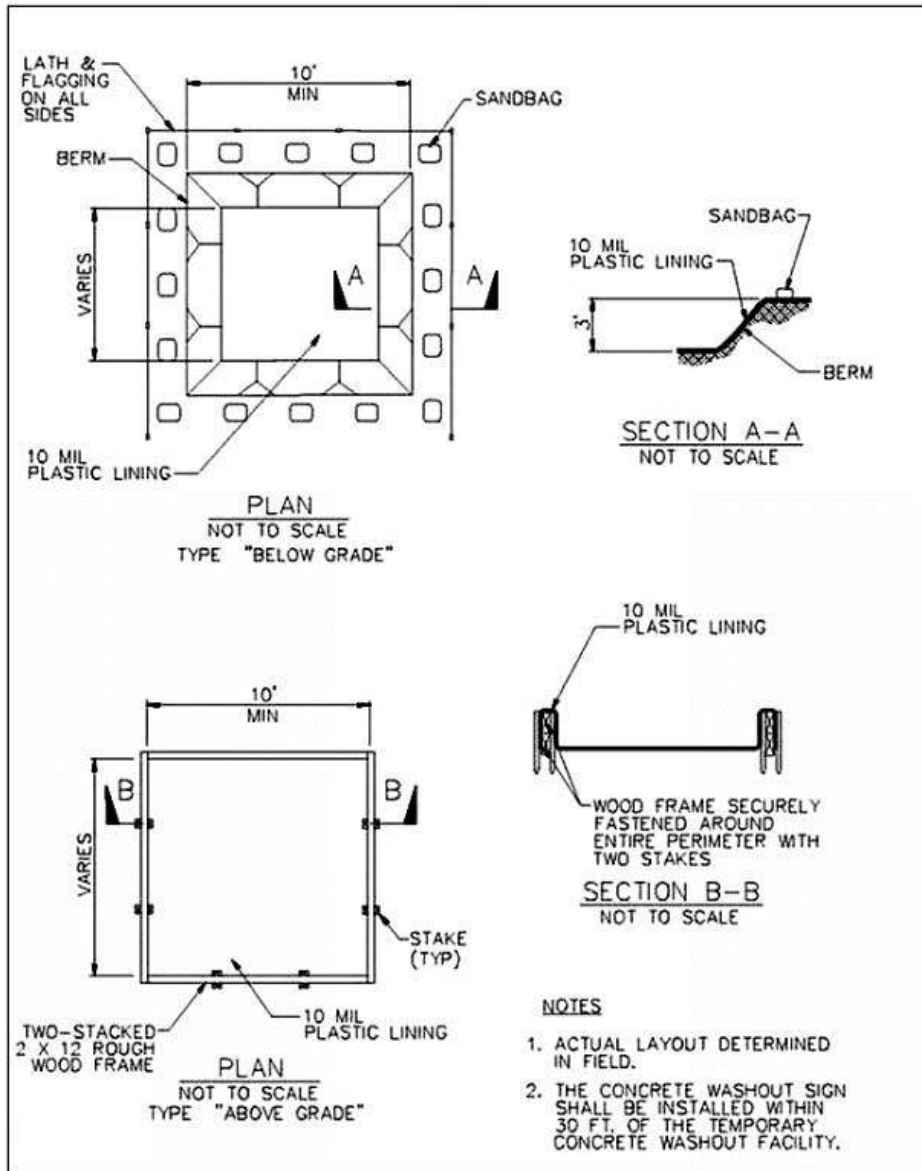


Figure 3 - 7: Temporary Concrete Washout Facility

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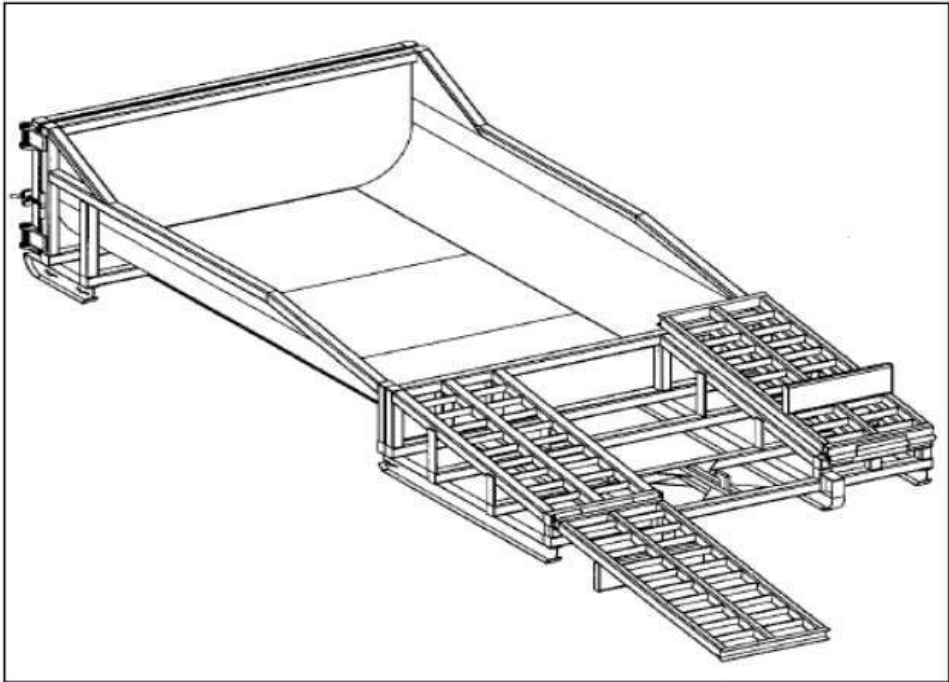


Figure 3 - 8: Prefabricated Concrete Washout Container with Ramp

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## 1.23 BMP C160: Erosion and Sediment Control Lead

### 1.23.1 Purpose

The project proponent must designate at least one person as the responsible representative in charge of erosion and sediment control (ESC) and water quality protection. The designated person shall be the erosion and sediment control (ESC) lead, who is responsible for ensuring compliance with all local, state, and federal erosion and sediment control and water quality requirements.

### 1.23.2 Conditions of Use

- An erosion and sediment control contact is required for all project sites.
- A certified erosion and sediment control lead (CESCL) or certified professional in erosion and sediment control (CPESC) is required on projects that include, but are not limited to:
  - Construction activity that disturbs one acre of land or more.
- Projects disturbing less than one acre must have an Erosion Sediment Control Lead (ESC) conduct inspections. The ESC Lead does not have to have CESCL or CPESC certification.
- The CESCL, CPESC, or ESC Lead shall be identified in the SWPPP and shall be onsite or on-call at all times.
- The CESCL, CPESC, or ESC Lead must be knowledgeable in the principles and practices of erosion and sediment control and have the skills to assess:
  - Site conditions and construction activities that could impact the quality of stormwater.
  - Effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges.

### 1.23.3 Specifications

- The CESCL lead shall:
  - Have a current certified erosion and sediment control lead (CESCL) certificate proving attendance in an erosion and sediment control training course that meets the minimum ESC training and certification requirements established by Ecology.
- For additional information concerning the Certified Professional in Erosion and Sediment Control program please go to <https://envirocertintl.org/cpesc/>.
- The ESC lead shall have authority to act on behalf of the contractor or developer and shall be available, on call, 24 hours per day throughout the period of construction.
- The Construction SWPPP shall include the name, telephone number, email, and address of the designated ESC lead.
- An ESC lead may provide inspection and compliance services for multiple construction projects in the same geographic region.
- Duties and responsibilities of the ESC lead shall include, but are not limited to, the following:
  - Inspecting all areas disturbed by construction activities, all BMPs and all locations where runoff leaves the site at least once every calendar week and within 24 hours of



any discharge from the site. The ESC lead may reduce the inspection frequency for temporary stabilized, inactive sites to monthly.

- Examining stormwater visually for the presence of suspended sediment, turbidity, discoloration, and oil sheen.
- Evaluating the effectiveness of BMPs.
- Maintaining a permit file onsite at all times which includes the SWPPP and any associated permits and plans.
- Directing BMP installation, inspection, maintenance, modification, and removal.
- Updating all project drawings and the Construction SWPPP with changes made.
- Keeping daily logs and inspection reports. Inspection reports should include:
  - Inspection date/time.
  - Weather information, general conditions during inspection, and approximate amount of precipitation since the last inspection.
  - A summary or list of all BMPs implemented, including observations of all erosion/sediment control structures or practices. The following shall be noted:
    - Locations of BMPs inspected,
    - Locations of BMPs that need maintenance,
    - Locations of BMPs that failed to operate as designed or intended, and
    - Locations where additional or different BMPs are required.
  - Visual monitoring results, including a description of discharged stormwater. The presence of suspended sediment, turbid water, discoloration, and oil sheen shall be noted, as applicable.
  - Any water quality monitoring performed during inspection.
  - General comments and notes, including a brief description of any BMP repairs, maintenance, or installations made as a result of the inspection.
- Facilitate, participate in, and take corrective actions resulting from inspections performed by outside agencies or the owner.
- Keep an inventory of equipment onsite.

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## **1.24 BMP C162: Scheduling**

### **1.24.1 Purpose**

Sequencing a construction project reduces the amount and duration of soil exposed to erosion.

### **1.24.2 Conditions of Use**

The construction sequence schedule is an orderly listing of all major land-disturbing activities together with the necessary erosion and sediment control measures planned for the project. This type of schedule guides the contractor on work to be done before other work is started so serious erosion and sedimentation problems can be avoided.

Following a specified work schedule that coordinates the timing of land-disturbing activities and the installation of control measures is perhaps the most cost-effective way of controlling erosion during construction. The removal of surface ground cover leaves a site vulnerable to accelerated erosion. Construction procedures that limit land clearing, provide timely installation of erosion and sedimentation controls, and restore protective cover quickly can significantly reduce the erosion potential of a site.

### **1.24.3 Design Considerations**

- Minimize construction during rainy periods.
- Schedule projects to disturb only small portions of the site at any one time. Complete grading as soon as possible. Immediately stabilize the disturbed portion before grading the next portion. Practice staged seeding in order to revegetate cut and fill slopes as the work progresses.

### 1.35 BMP C220: Stormwater System Inlet Protection

#### 1.35.1 Purpose

To prevent coarse sediment from entering stormwater systems prior to permanent stabilization of the disturbed area.

#### 1.35.2 Conditions of Use

- Use where inlets are to be made operational before permanent stabilization of the disturbed area.
- Provide protection for all stormwater system inlets downslope and within 500 feet of a disturbed or construction area, unless those inlets are preceded by another sediment trapping device.
- Table 3 - 11: Stormwater System Inlet Protection lists several options for inlet protection. All of the methods for stormwater system inlet protection are prone to plugging and require a high frequency of maintenance. Contributing areas should be limited to 1 acre or less. Emergency overflows may be required where stormwater ponding would cause a hazard. If an emergency overflow is provided, additional end-of-pipe treatment may be required.

**Table 3 - 11: Stormwater System Inlet Protection**

Type of Inlet Protection	Emergency Overflow	Applicable for Paved/ Earthen Surfaces	Conditions of Use
Excavated drop inlet protection	Yes, temporary flooding will occur	Earthen	Applicable for heavy flows. Easy to maintain. Large area requirement: 30' x 30' per acre.
Block and gravel drop filter	Yes	Paved or earthen	Applicable for heavy concentrated flows. Will not pond.
Gravel and mesh filter	No	Paved	Applicable for heavy concentrated flows. Will pond. Can withstand traffic.
Catch basin filters	Yes	Paved or earthen	Frequent maintenance required.
Curb inlet protection with a wooden weir	Small capacity overflow	Paved	Used for sturdy, more compact installation.
Block and gravel curb inlet protection	Yes	Earthen	Sturdy, but limited filtration.
Culvert inlet sediment trap			18-month expected life.

#### 1.35.3 Design and Installation Specifications

##### *Excavated Drop Inlet Protection*

- An excavated impoundment around the inlet. Sediment settles out of the stormwater prior to entering the stormwater conveyance system..

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- Provide depth of 1 to 2 feet, as measured from the crest of the inlet structure.
- Slope sides of excavation no steeper than 2H:1V.
- Minimum volume of excavation 35 cubic yards.
- Shape excavation to fit site with longest dimension oriented toward the longest inflow area.
- Install provisions for collection and conveyance to prevent standing water problems.
- Clear the area of all debris.
- Grade the approach to the inlet uniformly.
- Drill weep holes into the side of the inlet.
- Protect weep holes with screen wire and washed aggregate.
- Seal weep holes when removing structure and stabilizing area.
- It may be necessary to build a temporary dike to the down slope side of the structure to prevent bypass flow.

**Block and Gravel Filter**

- A block and gravel filter is a barrier formed around the stormwater system inlet with standard concrete blocks and gravel. See Figure 3 - 17: Drop Inlet with Block and Gravel Filter.
- Provide a height 1 to 2 feet above inlet.
- Recess the first row 2 inches into the ground for stability.
- Support subsequent courses by placing a piece of 2x4 lumber through the block opening.
- Do not use mortar.
- Lay some blocks in the bottom row on their side for dewatering the pool.
- Place hardware cloth or comparable wire mesh with ½-inch openings over all block openings.
- Place gravel just below the top of blocks on slopes of 2H:1V or flatter.
- An alternative design is a gravel berm surrounding the inlet with the following characteristics:
  - Provide an inlet slope of 3H:1V.
  - Provide an outlet slope of 2H:1V.
  - Provide a 1-foot wide level stone area between the structure and the inlet.
  - Use inlet slope stones 3 inches in diameter or larger.
  - For outlet slope use gravel ½- to ¾-inch at a minimum thickness of 1-foot.

**Gravel and Wire Mesh Filter**

- A gravel and wire mesh filter is a gravel barrier placed over the top of the inlet (see ). This structure does not provide an overflow.
- Use a hardware cloth or comparable wire mesh with 1/2-inch openings.



- Place wire mesh over the drop inlet so that the wire extends a minimum of 1-foot beyond each side of the inlet structure.
- Overlap the strips if more than one strip of mesh is necessary.
- Place coarse aggregate over the wire mesh.
  - Provide at least a 12-inch depth of aggregate over the entire inlet opening and extend at least 18-inches on all sides.

**Catch Basin Filters**

- Inserts (Figure 3 - 19: Catch Basin Filter) shall be designed by the manufacturer for use at construction sites. The limited sediment storage capacity increases the frequency of inspection and maintenance required, which may be daily for heavy sediment loads. The maintenance requirements can be reduced by combining a catch basin filter with another type of inlet protection. This type of inlet protection provides flow bypass without overflow and therefore may be a better method for inlets located along active rights-of-way.
- Provide a minimum of 5 cubic feet of storage.
- Requires dewatering provisions.
- Provide a high-flow bypass that will not clog under normal use at a construction site.
- The catch basin filter is inserted in the catch basin just below the grating.

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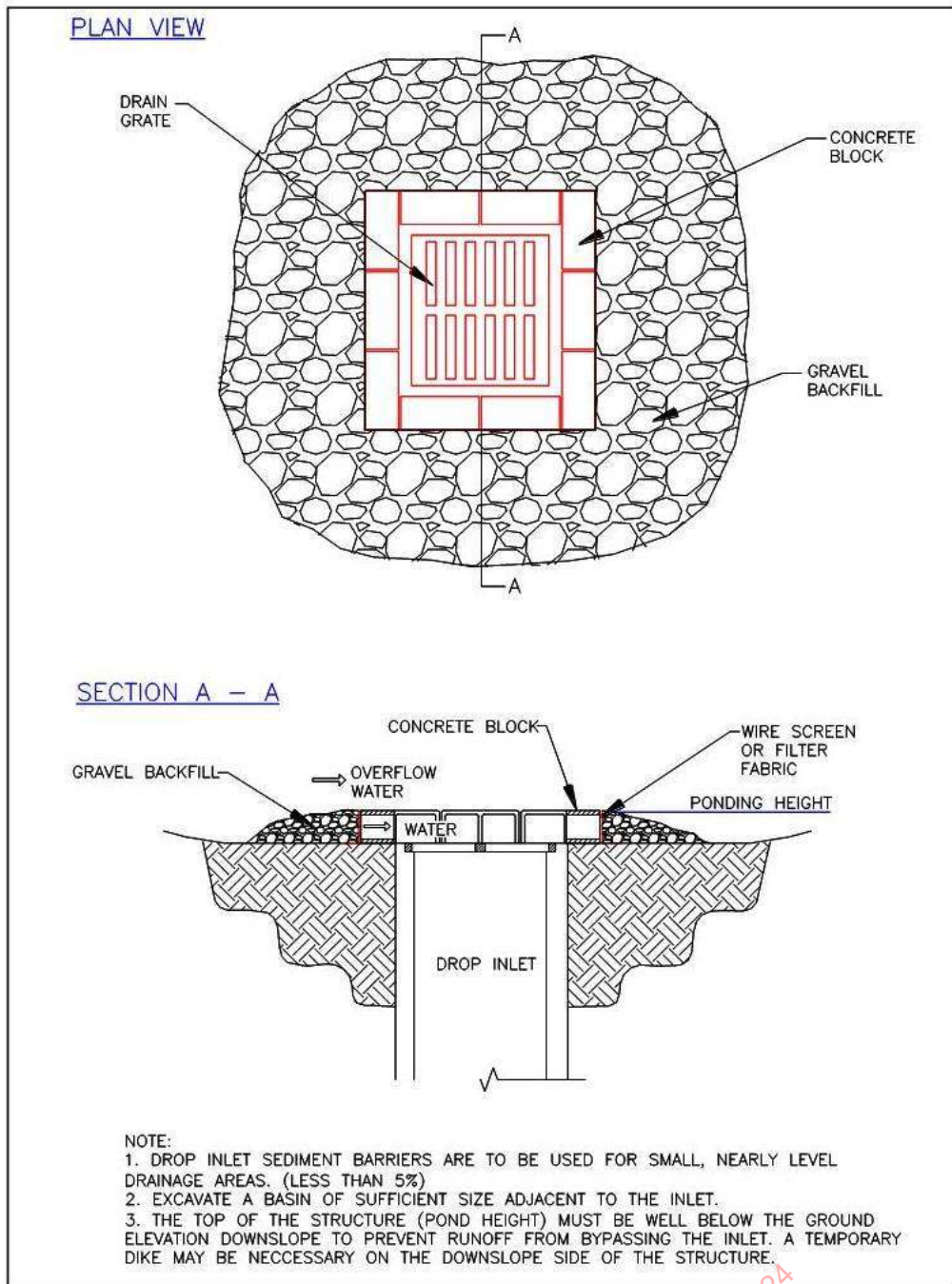


Figure 3 - 17: Drop Inlet with Block and Gravel Filter

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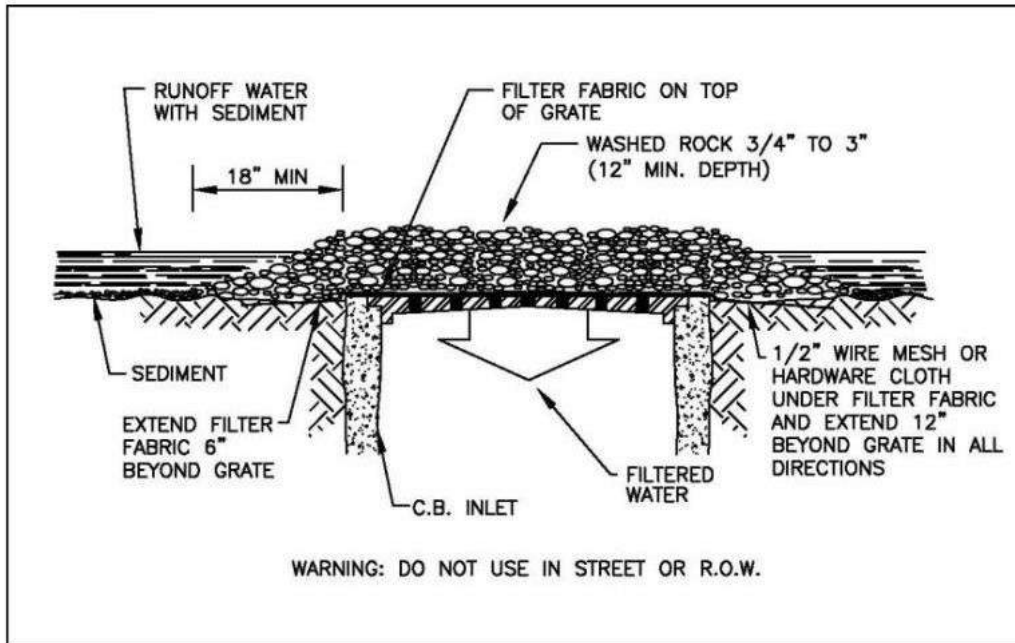


Figure 3 - 18: Gravel and Wire Mesh Filter

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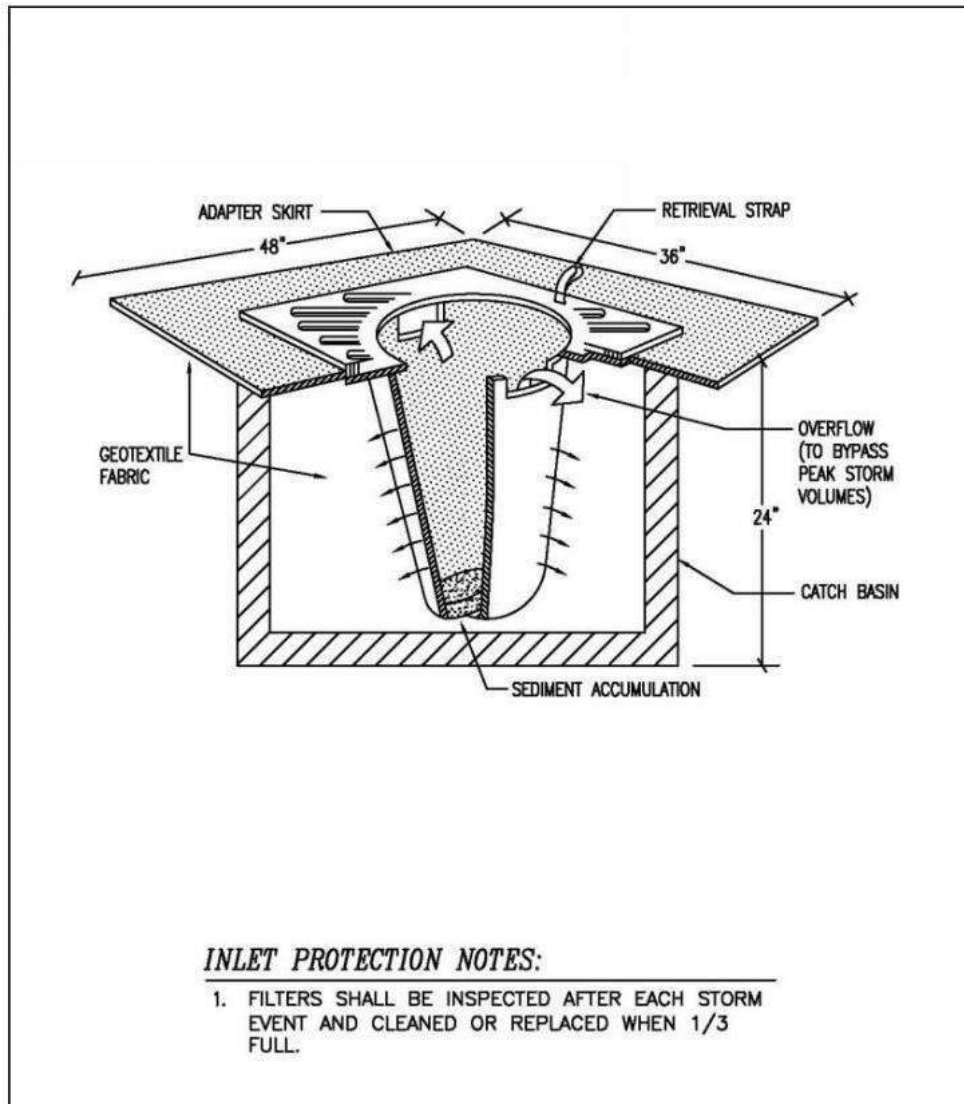


Figure 3 - 19: Catch Basin Filter

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**Curb Inlet Protection with Wooden Weir**

Barrier formed around a curb inlet with a wooden frame and gravel.

- Use wire mesh with ½-inch openings.
- Use extra strength filter cloth.
- Construct a frame.
- Attach the wire and filter fabric to the frame.
- Pile coarse washed aggregate against the wire and fabric.
- Place weight on frame anchors.

**Block and Gravel Curb Inlet Protection**

Barrier formed around an inlet with concrete blocks and gravel. See Figure 3 - 20: Block and Gravel Curb Inlet Protection.

- Use wire mesh with ½-inch openings.
- Place two concrete blocks on their sides abutting the curb at either side of the inlet opening. These are spacer blocks.
- Place a 2x4 stud through the outer holes of each spacer block to align the front blocks.
- Place blocks on their sides across the front of the inlet and abutting the spacer blocks.
- Place wire mesh over the outside vertical face.
- Pile coarse aggregate against the wire to the top of the barrier.

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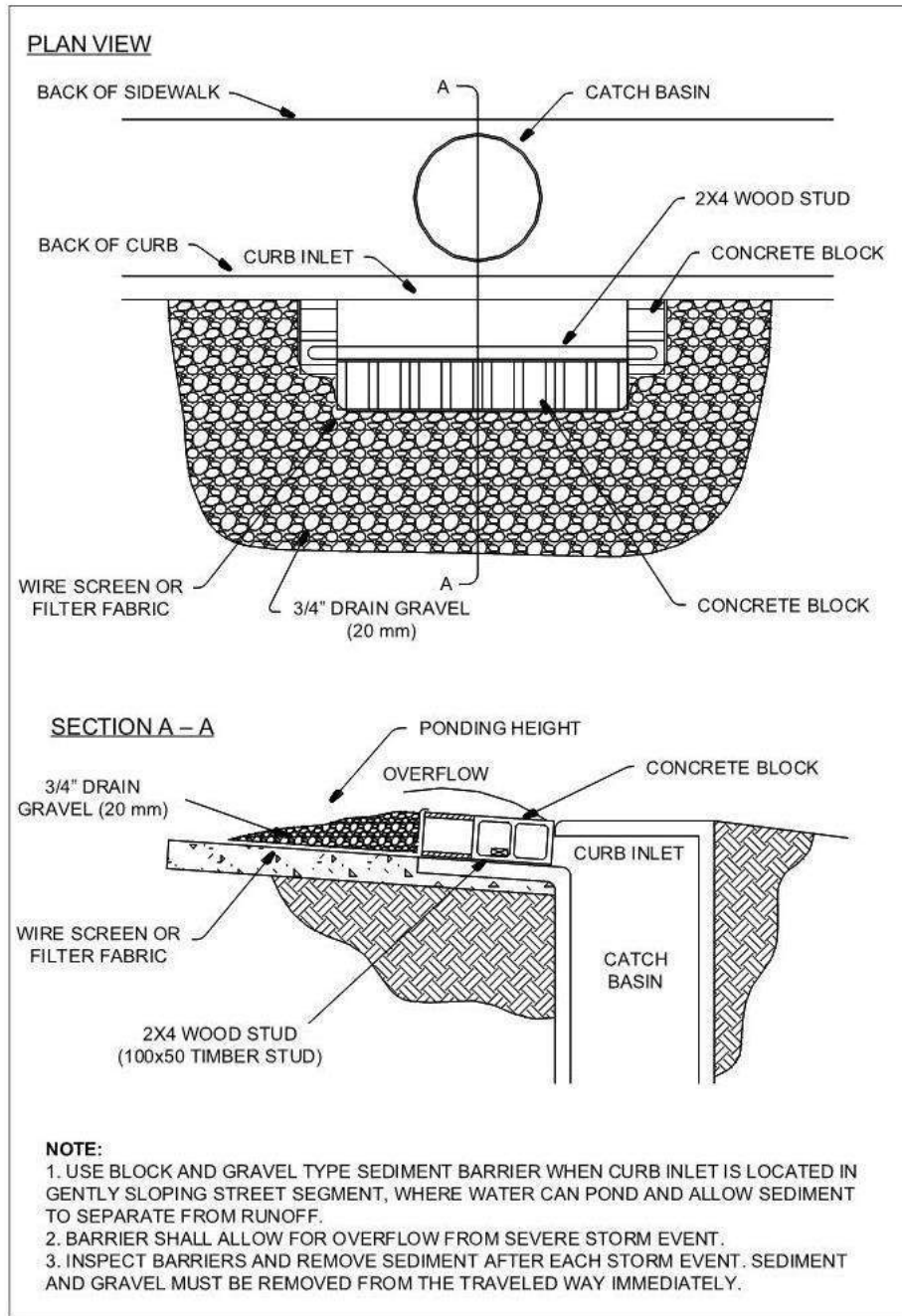


Figure 3 - 20: Block and Gravel Curb Inlet Protection

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**Curb and Gutter Sediment Barrier**

Sandbag or rock berm (riprap and aggregate) 3 feet high and 3 feet wide in a horseshoe shape. See Figure 3 - 21: Curb and Gutter Sediment Barrier.

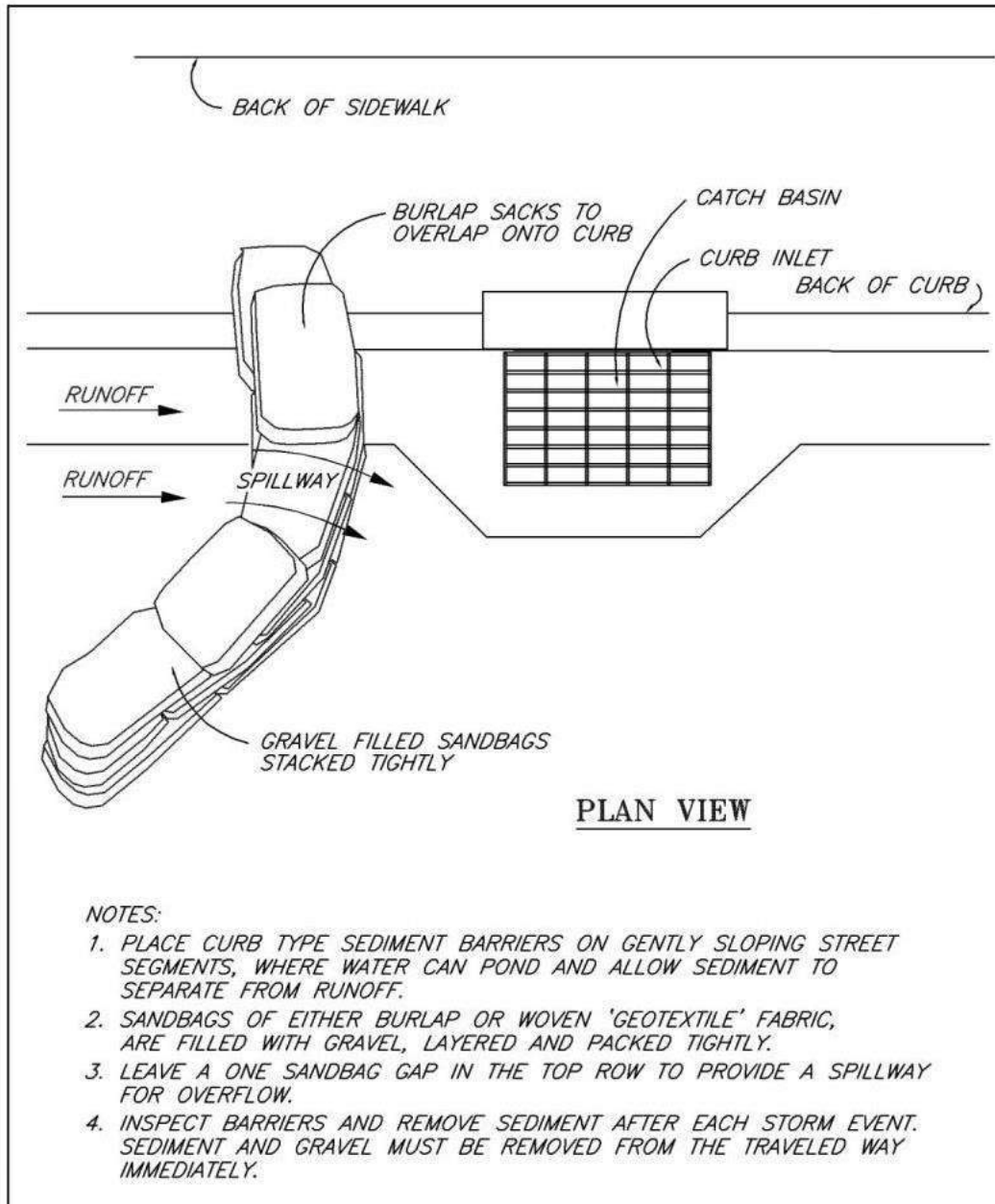
- Construct a horseshoe shaped berm, faced with coarse aggregate if using riprap, 3 feet high and 3 feet wide, at least 2 feet from the inlet.
- Construct a horseshoe shaped sedimentation trap on the outside of the berm sized to sediment trap standards for protecting a culvert inlet.

**1.35.4 Maintenance Standards**

- Inspect inlet protection frequently, especially after storm events. If the insert becomes clogged, clean or replace it.
- For systems using stone filters: If the stone filter becomes clogged with sediment, the stones must be pulled away from the inlet and cleaned or replaced. Since cleaning of gravel at a construction site may be difficult, an alternative approach would be to use the clogged stone as fill and put fresh stone around the inlet.
- Do not wash sediment into the stormwater system while cleaning. Spread all excavated material evenly over the surrounding land area or stockpile and stabilize as appropriate.
- Do not allow accumulated sediment to enter the stormwater system.
- Inlet protection shall be removed when area is fully stabilized and erosion and sediment controls are no longer needed.

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**Figure 3 - 21: Curb and Gutter Sediment Barrier**

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## **1.45 BMP C251: Construction Stormwater Filtration**

### **1.45.1 Purpose**

Filtration removes sediment from runoff originating from disturbed areas of the site.

### **1.45.2 Conditions of Use**

Traditional BMPs used to control soil erosion and sediment loss from sites under development may not be adequate to ensure compliance with the water quality standard for turbidity in the receiving water. Filtration may be used in conjunction with gravity settling to remove sediment as small as fine silt (0.5  $\mu\text{m}$ ). The reduction in turbidity will be dependent on the particle size distribution of the sediment in the stormwater. In some circumstances, sedimentation and filtration may be sufficient to achieve compliance with the water quality standard for turbidity.

The use of construction stormwater filtration does not require approval from Ecology as long as treatment chemicals are not used. Filtration in conjunction with BMP C250: Construction Stormwater Chemical Treatment requires testing under the Chemical Technology Assessment Protocol – Ecology (CTAPE) before it can be initiated. Approval from the appropriate regional Ecology office must be obtained at each site where chemical use is proposed prior to treatment. For more guidance on stormwater chemical treatment see BMP C250: Construction Stormwater Chemical Treatment.

### **1.45.3 Design and Installation Specifications**

Two types of filtration systems may be applied to construction stormwater treatment: rapid and slow. Rapid filtration systems are the typical system used for water and wastewater treatment. They can achieve relatively high hydraulic flow rates, on the order of 2 to 20 gpm/sf, because they have automatic backwash systems to remove accumulated solids. In contrast, slow filtration systems have very low hydraulic rates, on the order of 0.02 gpm/sf, because they do not have backwash systems. Slow filtration systems are generally used to treat stormwater. Slow filtration is mechanically simple in comparison to rapid sand filtration but requires a much larger filter area.

#### ***Filtration Equipment***

Sand media filters are available with automatic backwashing features that can filter to 50  $\mu\text{m}$  particle size. Screen or bag filters can filter down to 5  $\mu\text{m}$ . Fiber wound filters can remove particles down to 0.5  $\mu\text{m}$ . Filters should be sequenced from the largest to the smallest pore opening. Sediment removal efficiency will be related to particle size distribution in the stormwater.

#### ***Treatment Process Description***

Stormwater is collected at interception point(s) on the site and is diverted to an untreated stormwater sediment pond or tank for removal of large sediment and storage of the stormwater before it is treated by the filtration system. The untreated stormwater is pumped from the trap, pond, or tank through the filtration system in a rapid filtration system. Slow filtration systems are designed as flow through systems using gravity.

**Sizing Criteria for Flow-Through Treatment Systems\**

Filtration treatment systems must be designed to control the velocity and peak volumetric flowrate that is discharged from the system and consequently the project site. See Element #3: Control Flowrates. The untreated stormwater storage pond or tank should be sized to hold 1.5 times the runoff volume of the 10-year, 24-hour storm event assuming a Type 1A rainfall distribution (3.0-inches) minus the treatment system flowrate for an 8-hour period. For a chitosan-enhanced sand filtration system, the treatment flowrate should be sized using a hydraulic loading rate between 6-8 gpm/ft<sup>2</sup>. Other hydraulic loading rates may be more appropriate for other systems. Bypass should be provided around the chemical treatment system to accommodate extreme storms. Runoff volumes shall be calculated using the methods presented in Volume 4. Worst-case conditions (i.e., producing the most runoff) should be used for analyses (most likely conditions present prior to final landscaping).

**1.45.4 Maintenance Standards**

- Rapid sand filters typically have automatic backwash systems that are triggered by a pre-set pressure drop across the filter. If the backwash water volume is not large or substantially more turbid than the untreated stormwater stored in the holding pond or tank, backwash return to the untreated stormwater pond or tank may be appropriate. However, other means of treatment and disposal may be necessary.
- Clean and/or replace screen, bag, and fiber filters when they become clogged.
- Remove sediment from the storage and/or treatment ponds as necessary. Typically, sediment removal is required once or twice during a wet season and at the decommissioning of the ponds.

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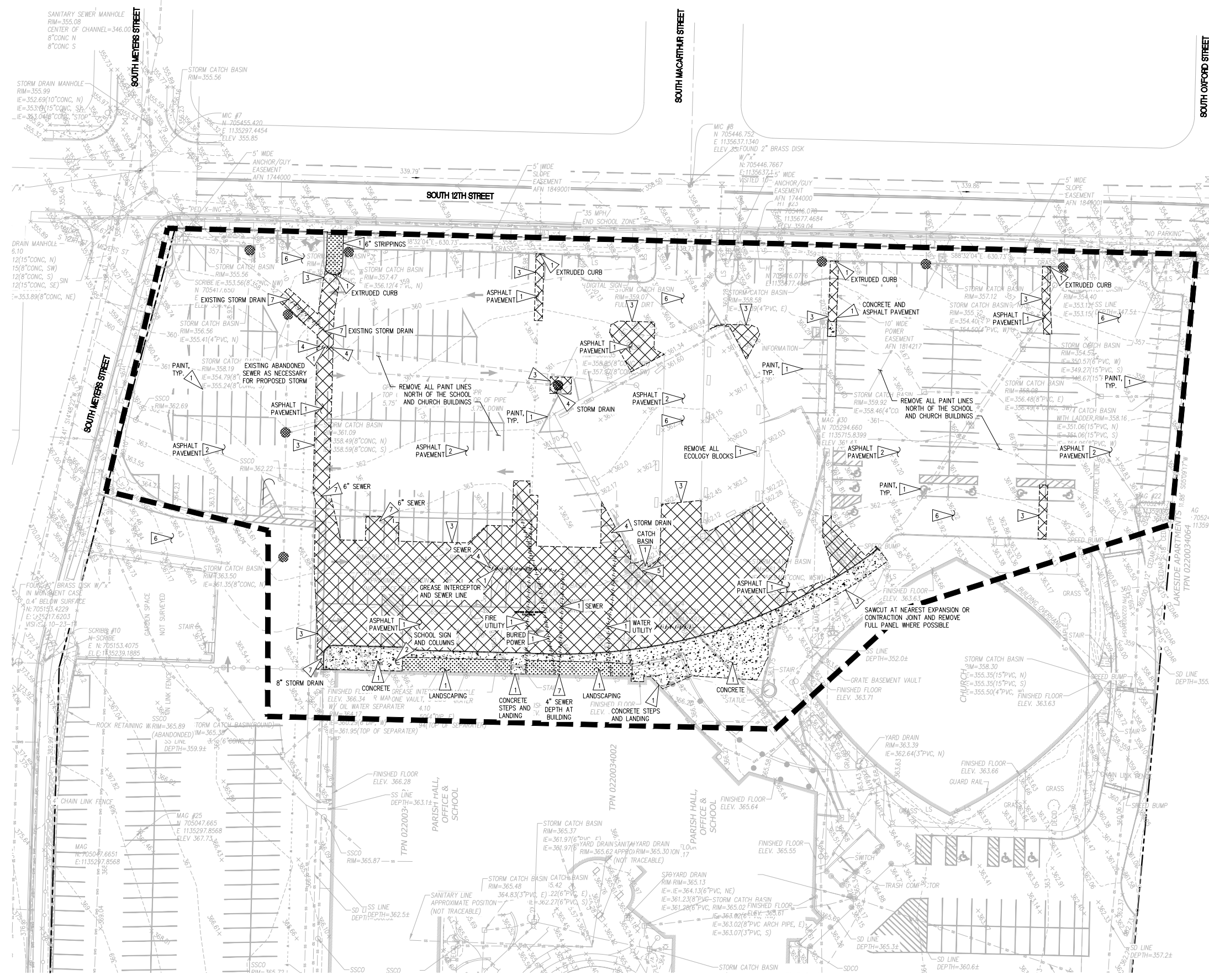
**Appendix B      Demolition and Temporary Erosion and Sediment  
Control Plans**

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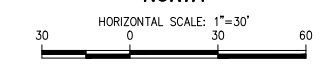
**LEGEND**

**PROPOSED FEATURES:**

- ASPHALT PAVEMENT REMOVAL
- CONCRETE PAVEMENT REMOVAL
- LANDSCAPE AND STRIPPINGS REMOVAL
- SAWCUT LINE
- DEMOLISH FEATURE
- LIMITS OF WORK
- CATCH BASIN PROTECTION

- GENERAL NOTES**
- THE BURIED UTILITIES ON THIS PROJECT ARE SHOWN IN THEIR APPROXIMATE LOCATION WHERE KNOWN BASED ON THE FIELD SURVEY. OTHER EXISTING BURIED UTILITIES MAY NOT BE SHOWN ON THESE PLANS. THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES AND HAVE THE RELOCATION MARKED ON THE GROUND PRIOR TO CONSTRUCTION. THE CONTRACTOR WILL PROTECT, OR IMMEDIATELY REPAIR, DAMAGED UTILITY "DISCOVERED" ON THIS PROJECT WITHOUT ADDITIONAL COSTS.
  - CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS AND NOTIFY ENGINEER IMMEDIATELY IF THERE ARE ANY DISCREPANCIES AFFECTING THE NEW CONSTRUCTION.
  - CONTRACTOR TO COORDINATE ALL UTILITY SHUTOFFS WITH OWNER.
  - CONTRACTOR TO PROTECT EXISTING FEATURES BEYOND THE LIMITS OF WORK AND REPAIR ANY DAMAGE AT NO ADDITIONAL COST TO THE OWNER.
  - CONTRACTOR TO INSTALL TEMPORARY FENCING/PLATES TO COVER UTILITY TRENCHES WHEN LEFT OPEN AND UNSUPERVISED.
  - SEE SHEET C1.01 FOR PROJECT TEST AND DEMOLITION NOTES.
  - INSTALL CATCH BASIN INLET PROTECTION PER DETAIL 01/C1.01 AT ALL NEW CATCH BASINS AS SOON AS THEY ARE INSTALLED.
  - CONTRACTOR TO PROTECT SOIL STOCKPILES PER DETAIL 02/C1.01 AND NOTES ON C1.01.
  - THE CONTRACTOR SHALL COORDINATE PARKING LOT DEMOLITION AND PAVING IMPROVEMENTS WITH OWNER AND MAKE PROVISIONS FOR TEMPORARY TREATED ASB SURFACING FOR SCHOOL AND CHURCH FUNCTIONS AS NECESSARY.

- DEMOLITION AND EROSION CONTROL KEY NOTES**
- DEMOLISH FEATURE AND DISPOSE AT AN APPROVED OFFSITE FACILITY
  - PROTECT FEATURE AS NOTED
  - SAWCUT FULL DEPTH TO STRAIGHT, SMOOTH UNYIELDING EDGE
  - CAP UTILITY AND ABANDON IN PLACE.
  - RELOCATE TRANSFORMER AND BURIED POWER AND TELEPHONE LINES, COORDINATE WITH ELECTRICAL PLANS.
  - SWEEP ADJACENT PAVEMENT REGULARLY AND PREVENT TRACKING DIRT ONTO CITY STREETS.
  - CONTRACTOR TO POTHOLE EXISTING UTILITY LOCATION AND REPORT PIPE CROWN AND INVERT TO CIVIL ENGINEER PRIOR TO BEGINNING ANY UTILITY WORK.



REVISIONS

NO.	DATE	BY	DESCRIPTION



**sh sitts & hill**

CIVIL | STRUCTURAL | SURVEY

4815 CENTER STREET | TACOMA, WA 98409

PHONE: (253) 474-9449 | FAX: (253) 474-0183

http://www.sittshill.com/

ST CHARLES BORROMEO  
7112 SOUTH 12TH STREET  
TACOMA, WA 98465  
MICHAEL MCDERMOTT: 253-564-5785

ST CHARLES BORROMEO PARISH  
ADMINISTRATION BUILDING  
TACOMA, WASHINGTON

DEMOLITION AND TESC PLAN

C100  
PROJECT NO.  
20126

**811** Call 811  
two business days  
before you dig

Approved 07/17/2024  
Site Development  
SDEV24-0120

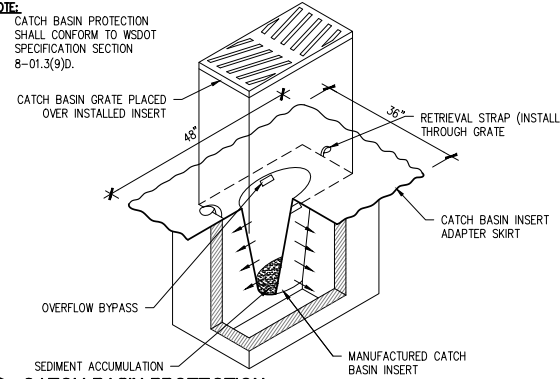
Reviewed for Tacoma  
City Code Compliance

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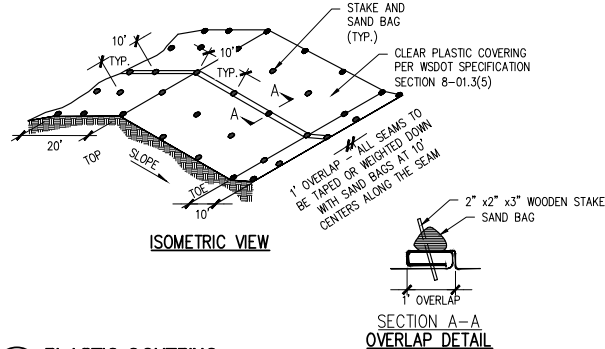
NOTE:

- 1. CATCH BASIN PROTECTION SHALL CONFORM TO WSDOT SPECIFICATION SECTION 8-01.3(9)D.



01 CATCH BASIN PROTECTION

SCALE: N.T.S.



02 PLASTIC COVERING

SCALE: N.T.S.

STANDARD TESC NOTES

2016 CITY OF TACOMA R.O.W. MANUAL

- 1. THE IMPLEMENTATION OF THESE TESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF TESC FACILITIES IS THE RESPONSIBILITY OF THE APPLICANT/CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED...

DEMOLITION NOTES

- 1. REMOVE ALL DELETERIOUS MATERIAL FOUND ON-SITE INCLUDING VEGETATION, SCRAP WOOD, TRASH, ETC. AND DISPOSE OF AT AN APPROVED OFF-SITE LOCATION.

SOIL PRESERVATION AND AMENDMENT NOTES (DEPARTMENT OF ECOLOGY BMP T5.13)

DISTURBED SOILS TO BE AMENDED AS SPECIFIED BY "OPTION 3 - STOCKPILE SITE TOPSOILS PRIOR TO GRADING FOR REAPPLICATION" FROM SECTION 3.1.4 VOLUME III OF THE 2015 PIERCE COUNTY STORMWATER MANAGEMENT MANUAL:

- IN ANY AREAS REQUIRING GRADING, REMOVE AND STOCKPILE THE DUFF LAYER AND TOPSOIL ON SITE IN A DESIGNATED, CONTROLLED AREA, WHICH IS NOT ADJACENT TO PUBLIC RESOURCES AND CRITICAL AREAS.

MULCHING NOTES

- 1. MULCH MATERIALS USED SHALL BE AS NOTED AND SHALL BE APPLIED AT THE RATE LISTED BELOW.

MULCH MATERIALS, RATES AND USES

Table with columns: MULCH MATERIAL, QUALITY STANDARDS, APPLICATION PER 1,000 SF, APPLICATION PER ACRE, DEPTH OF APPLICATION, REMARKS.

SEEDING NOTES

- 1. SEED MIXTURES SHALL BE PER THE "SEED MIXTURE FOR EROSION CONTROL" TABLE BELOW, AND SHALL BE APPLIED AT THE RATE OF 120 LB. PER ACRE.

SEED MIXTURE FOR EROSION CONTROL

Table with columns: NAME, PROPORTIONS BY WEIGHT, PERCENT PURITY, PERCENT GERMINATION.

POLLUTION PREVENTION NOTES

- 1. EQUIPMENT LUBRICATION AND FUELING OPERATIONS SHALL OCCUR AT AN APPROVED OFF-SITE LOCATION.

STOCKPILE NOTES

- 1. STOCKPILES SHALL BE STABILIZED (WITH PLASTIC COVERING OR OTHER APPROVED DEVICE) DAILY BETWEEN NOVEMBER 1 AND MARCH 31.

SEASONAL LIMITATIONS ON CONSTRUCTION ACTIVITIES

THE FOLLOWING SHALL BE ADHERED TO ON ALL CONSTRUCTION SITES WITH ERODIBLE SOILS AND/OR A GRADIENT OF GREATER THAN TWO PERCENT FOR LIMITING EXPOSED SOILS TO EROSION PROCESSES.

OCTOBER 1ST TO APRIL 30TH (WET SEASON)

ON SITES WHERE UNINTERRUPTED CONSTRUCTION ACTIVITY IS IN PROGRESS, THE CLEARING OF LAND, INCLUDING THE REMOVAL OF EXISTING VEGETATION OR OTHER GROUND COVER, SHALL BE LIMITED TO ONLY AS MUCH LAND AREA AS CAN BE COVERED OR STABILIZED WITHIN 24 HOURS IN THE EVENT A MAJOR STORM IS PREDICTED AND/OR EROSION/SEDIMENT TRANSPORT OFFSITE IS OBSERVED.

ADDITIONALLY, ALL CLEARED OR DISTURBED AREAS WILL RECEIVE APPROPRIATE PROTECTIVE COVER OR BE OTHERWISE STABILIZED (SUCH AS MULCHING, NETTING, PLASTIC SHEETING, EROSION BLANKETS, FREE DRAINING MATERIAL, ETC....) WITHIN FIVE DAYS AFTER HAVING BEEN CLEARED OR OTHERWISE DISTURBED IF NOT BEING ACTIVELY WORKED.

THE CONTRACTOR SHALL AT ALL TIMES HAVE AVAILABLE FOR THE PROJECT SUFFICIENT QUANTITIES OF PROTECTIVE COVERING MATERIALS TO IMMEDIATELY STABILIZE ALL DISTURBED AREAS IN CASE THE PROJECT ENGINEER OR COUNTY DIRECTS THEM TO COVER DUE TO OBSERVED MIGRATION OF SOILS OR INCLEMENT WEATHER.

MAY 1ST TO SEPTEMBER 30TH (DRY SEASON)

THE CLEARING OF LAND, INCLUDING THE REMOVAL OF EXISTING VEGETATION OR OTHER GROUND COVER, MUST BE LIMITED TO ONLY AS MUCH LAND AREA AS CAN RECEIVE APPROPRIATE PROTECTIVE COVER OR BE OTHERWISE STABILIZED AFTER HAVING BEEN CLEARED OR OTHERWISE DISTURBED BY NO LATER THAN SEPTEMBER 30TH OF A GIVEN YEAR.

UNLESS OTHERWISE APPROVED BY THE COUNTY, SEEDING, FERTILIZING AND MULCHING OR CLEARED OR OTHERWISE DISTURBED AREAS SHALL BE PERFORMED DURING THE FOLLOWING PERIODS: MARCH 1ST THROUGH MAY 15TH AND AUGUST 15TH THROUGH OCTOBER 1ST.

IN THE EVENT THAT CONSTRUCTION ACTIVITIES OR OTHER SITE DEVELOPMENT ACTIVITIES ARE DISCONTINUED FOR FOUR CONSECUTIVE DAYS OR MORE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSPECTION OF ALL EROSION AND SEDIMENTATION CONTROL FACILITIES IMMEDIATELY AFTER STORM EVENTS AND AT LEAST ONCE EVERY WEEK.

THE CONTRACTOR SHALL PROVIDE MATERIALS ONSITE READILY AVAILABLE TO IMMEDIATELY STABILIZE DENUDATED AREAS DURING PERIODS OF INCLEMENT WEATHER WHICH RESULT IN EROSION AND SEDIMENT TRANSPORT OFFSITE.

THE CONTRACTOR SHALL ENSURE THE PROPER CONTINUED FUNCTIONING OF THE ESC FACILITIES BY PROMPT CLEANING AND MAINTENANCE AFTER EACH EROSION AND SEDIMENT PRODUCING RAINFALL EVENT.

Vertical sidebar containing project information, logos (sh, sitts & hill, Tacoma City Seal), and contact details for ST CHARLES BORROMEO PARISH ADMINISTRATION BUILDING.



Approved 07/17/2024 Site Development SDEV24-0120

ST CHARLES BORROMEO PARISH ADMINISTRATION BUILDING TACOMA, WASHINGTON DEMOLITION AND TESC NOTES AND DETAILS

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