

Appendix B:

Erosion & Sediment Control Plan

Erosion & Sediment Control Plan

Chugach Electric Association
Six Mile East Cable Terminal
Reactor Replacement

Anchorage, AK

2/8/2023

Prepared by



Midnight Sun Environmental, LLC
560 E 34th Ave Suite 102
Anchorage, Alaska 99503
907-344-3244

Includes:

Appendix A: Erosion Control Practices (BMPs)

Appendix B: ESCP Plan Set

Stormwater Best Management Practices Utility Installation and Operations

Introduction

The following stormwater management practices will be employed during construction activities to comply with Alaska Pollutant Discharge Elimination System (APDES) requirements. Appendix A contains plan sheets with Best Management Practices (BMPs). Appendix B contains the Erosion Sediment Control (ESCP) Plan Set.

Project: Six Mile East Cable Terminal Reactor Replacement

Location: Joint Base Elmendorf-Richardson

Size of Disturbance: 0.11 acres (approximately 5,000 square feet)

Contact Information

Chugach Electric Engineer: Stacey Bottorff
Chugach Electric Association
Project Engineer
907-762-4612
[Stacey Bottorff@chugachelectric.com](mailto:Stacey_Bottorff@chugachelectric.com)

CESCL Manager: Annie Collie
Midnight Sun Environmental
Project Scientist
560 E 34th Ave Suite 102
Anchorage, Alaska 99503
(907) 344-3244
Annie@midnightsunenv.com

Site Activity Description

The project is located on Joint Base Elmendorf-Richardson at the Six Mile East Cable Terminal Reactor. This project includes the installation of a new reactor, the construction of a new reactor foundation with oil containment, modifications to the existing bus to accommodate the new reactor profile, and miscellaneous control wiring improvements. Minimal soil disturbance is required in order to allow the removal and replacement of the reactor. BMPs will be installed within and surrounding the project area.

Schedule

- Install Erosion Control BMPs
- Remove existing deteriorated infrastructure
- Replace reactor
- Wiring improvements
- Install foundation
- Final cleanup – grade, and compact any disturbed areas within and outside the project area
- Removal of temporary BMPs

Affected Facilities

Employees and contracted service providers who install and maintain infrastructure. This work may involve saw-cutting or breaking pavement, trenching, pole placement, dewatering, backfilling, transformer repair and replacement, and road repair.

Best Management Practices (BMPs)

The following BMPs aim to ensure that utilities are installed and maintained with stormwater protection in mind. All contractors involved with utility installation and maintenance must review these BMPs as part of their training and incorporate them into practice to keep pollutants from entering the storm drain or waterbody.

Good Housekeeping and Waste Management

- Ensure that all waste areas and dumpsters are covered and are not leaking.
- Keep all container lids closed at all times unless adding or removing material.
- Arrange for waste to be picked up regularly and disposed of at approved disposal facilities. If the amount of generated waste exceeds the capacity of waste containers, obtain more containers, or increase the frequency of pickups.
- Protect or block storm drain inlets, open manholes, and roadside ditches with rock socks, wattles, or covers during utility activities. Always check that these BMPs are in place before starting work on a construction site.
- Only wash concrete mixing and pouring equipment in designated concrete washout areas at each job site. Never wash into a storm drain inlet.

Materials Storage and Handling

- Contain water and waste generated during saw-cutting and equipment cleanup. Use booms, inlet protection, and wet vacuums, or allow the area to dry before uncovering storm drain inlets.
- Provide secondary containment and cover for materials stored outside.

- Store maintenance supplies, including cement bags, sand, sealants, and asphalt, undercover (e.g., tarp), and away from drainage areas.
- Do not store materials in the street or near storm drains or gutters unless BMPs are used to protect storm drains from sediment runoff.
- Cover stockpiles and contain them within berms.
- Place excavated material on the uphill side of trenches when possible and safe.

Erosion Control during Construction

- Inspect and maintain all sediment and erosion controls daily, as well as during and after any storm, and make repairs or clean out (as necessary).
- Block storm drain inlets located within 25 feet and downgradient from work involving excavating. Place covers, rock wattles, sandbags, filter fabric, or bags around or over inlets to protect them from sediment, waste, dust, overspray, or slurry.
- Designate a concrete washout area at each job site. (A concrete washout area is a shallow excavation with a small perimeter berm to isolate concrete truck washout operations).
- Control erosion to the maximum extent possible. Provide permanent erosion controls that will remain effective for the life of the street.
- Ensure that projects over 500 square feet or excavations greater than five feet have the proper Stormwater Discharge Permits.
- Utilize BMPs to reduce erosion from the site. (See Appendix A of this document).

Sanitary Facilities

- Sanitary facilities (e.g., “port-a-potty”) shall be located in the stabilized area, away from drainage ways. Sanitary facilities must always be staked down and never be placed near storm drain inlets. These facilities must be secured to prevent tipping.

Street Sweeping

- Keep streets clean throughout the project. In the event of accidental tracking of mud on streets, the mud must be cleaned immediately. DO NOT wash materials into the storm sewers or into drainages that flow into navigable waters.
- Sweep (manually or mechanically) mud tracked onto paved areas daily.

Spill Response and Reporting

- Develop and implement a spill prevention and control plan. Post the spill response procedure information in a noticeable place(s) and ensure that staff is trained in spill handling on-site and/or on-call at all times. Spill control plans should include instructions on how to:

- Identify and stop the source of the spill.
- Contain any liquid.
- Cover spills with absorbent material (e.g. kitty litter or sawdust).
- Dispose of the used absorbent properly.
- Be prepared to notify dispatch (or ADEC in an emergency) if a spill enters the storm drain system. Contact: 1-800-478-9300
- Keep materials for cleaning up spills on-site and in all vehicles. Spills should be cleaned up immediately and the contaminated material disposed of properly.
- Report a release of any chemical, oil, petroleum product, sewage, etc., that may enter the waters of the state of Alaska, including surface water, groundwater, dry gullies, and storm sewers leading to surface water. Contact: 1-800-478-9300.
- Immediately report any accidental discharge into the sanitary sewer system to the appropriate local sewer authority and affected wastewater treatment plant.
- For additional information regarding releases to water, please review Guidance for Reporting Spills at <http://dec.alaska.gov/spar/spillreport.htm>
- Report releases of petroleum products and certain hazardous substances listed under the Federal Clean Water Act (CWA) (40 CFR Part 116) to the National Response Center, as well as ADEC. Contact: 1-800-424-8802.

Dewatering

- Trench or vault dewatering devices must discharge in a manner that will not affect streams, wetlands, drainage systems, or off-site property. See:
<http://dec.alaska.gov/water/wnpspc/stormwater/edhsgp.html>
- Discharge from the trench shall be free of any sediment.
- A dispersion pad and sediment shall be placed at the discharge end of the hose to prevent any additional erosion.
- Scrape or sweep any debris or residues incidentally left behind and dispose of them properly.
- Electrical equipment in vaults may contain mineral and insulating oils (possible PCBs); therefore, water in vaults should be checked for cloudiness, discoloration, unusual odors, sediment turbidity, visible floating materials, or oil sheen. If any of these are present, water must be containerized and disposed of properly.
- Follow BMPs if water is uncontaminated and can be discharged to vegetation. Ensure discharged water does not runoff into nearby waterbody. If water will enter the “waters of the United States,” then a permit must be obtained from the Alaska Department of Environmental Conservation (ADEC).

Required Employee and Contractor Training

- Provide training for any employees and contractors doing any road or utility construction work.
- Insert language in all construction or maintenance contracts that require contractors to implement all applicable BMPs when working on any project.
- Train all new hires and job transferees on BMPs.
- Conduct BMP refresher training for employees and contractors as needed.
- Ensure that all contracts stipulate that contracted employees must be trained in stormwater pollution prevention BMPs.
- Ensure that all contracts include stormwater pollution prevention language.
- Train all employees and contractors who may be required to clean up a spill or leak on proper spill cleanup procedures.
- Train all employees and contractors who work outdoors on good housekeeping and proper materials storage.
- Keep records of all stormwater-related training that employees have received.

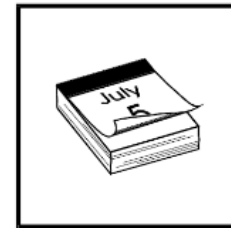
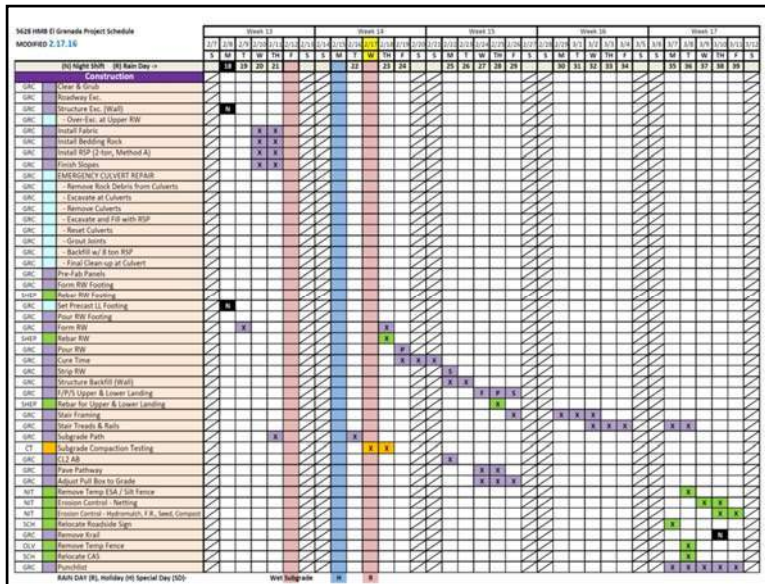
References

1. Alaska Storm Water Guide, Alaska Department of Environmental Conservation, December 2021.
<http://dec.alaska.gov/water/wnpspc/stormwater/Guidance.html>
2. Alaska Highway Drainage Manual, Alaska Department of Transportation and Public Facilities, June 1, 2004. http://www.dot.state.ak.us/stwddes/desbridge/assets/pdf/hwydrnman/ch16_all.pdf
3. Alaska Construction General Permit, Alaska Department of Environmental Conservation, January 31, 2021. <Downloads/2021-cgp-pmt-akr10-fnl-20201217.pdf>.

Appendix A

Erosion Control Practices

(BMPs)



Standard Symbol

BMP Objectives	
Soil Stabilization	<input checked="" type="checkbox"/>
Sediment Control	<input checked="" type="checkbox"/>
Tracking Control	<input checked="" type="checkbox"/>
Wind Erosion Control	<input checked="" type="checkbox"/>
Non-Stormwater Management	<input type="checkbox"/>
Materials and Waste Management	<input type="checkbox"/>

Definition and Purpose

This BMP involves developing, for every project, a schedule that includes sequencing of construction activities with the implementation of construction site BMPs such as temporary soil stabilization and temporary sediment control measures. The purpose is to reduce the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking, and to perform the construction activities and control practices in accordance with the planned schedule.

Appropriate Applications

Construction sequencing should be scheduled to minimize land disturbance during the wetter months for all projects. In addition, any construction windows required by regulatory permits, and any winter suspension work should be described in the schedule. Appropriate BMPs must be implemented year-round.

Limitations

Environmental constraints such as nesting season prohibitions reduce the full capabilities of this BMP.

Standards and Specifications

General Requirements

- Developing a schedule and planning the project operations to minimize erosion and the potential to discharge pollutants to stormwater are the very first steps in an effective stormwater program. The construction schedule must be incorporated into the SWPPP or WPCP. Refer to Section 8 and 13 of the Standard Specifications.

- The schedule should clearly show when work activities that could pollute stormwater with sediment or other contaminants would occur (e.g., grading, move-in, move-out, stockpiling, pile driving), and when soil stabilization, sediment control, and other BMPs associated with each phase of construction would be implemented.
- The schedule should include details on the implementation and deployment of:
 - Temporary and permanent soil stabilization BMPs
 - Temporary sediment control BMPs
 - Tracking control BMPs
 - Wind erosion control BMPs
 - Non-stormwater BMPs and
 - Waste management and materials pollution control BMPs
- The schedule should also include dates for significant long-term operations or activities that may have planned non-stormwater discharges such as dewatering, sawcutting, grinding, drilling, boring, crushing, blasting, painting, hydro-demolition, mortar mixing, bridge cleaning, etc.
- The construction schedule should reflect requirements for in-water work and other construction activity with potential to disturb water and biological resources contained in regulatory agency permits and approvals (RWQCB 401 WQC, USACE 404 permit, DFG 1602 permit, etc.).

Recommendations

- Schedule work to minimize soil disturbing activities during predicted rain events. Consider rescheduling activities for dry periods to minimize maintenance requirements.
- Develop the sequencing and timetable for the start and completion of each item such as site clearing and grubbing, grading, excavation, paving, pouring foundations, installing utilities, etc., to minimize the active construction area.
- Schedule major grading operations during dryer months when practical.
- Stabilize inactive areas within 15 days from the cessation of soil-disturbing activities or one day prior to the onset of precipitation, whichever occurs first. Must consider manufacturers recommendation for the selected soil stabilization BMP to ensure they meet the minimum dry time required. See Appendix B of this Manual for additional guidance.
- Monitor the weather forecast for storm events, which are storms that produce or are forecasted to produce at least 0.1 inch of precipitation within a 24-hour period. When rainfall is predicted, adjust the construction schedule to allow the implementation of soil stabilization, sediment controls, and, if applicable, sediment treatment controls on all disturbed areas prior to the onset of rain.

- Ensure ample supply of BMP materials are on site in order to quickly mobilize and implement required BMPs, particularly ahead of rain events when materials may be in short supply or back order.
 - Be prepared year-round to deploy soil stabilization and sediment control practices. Erosion may be caused during dry seasons by unseasonal rainfall, wind, and vehicle tracking. Keep the site stabilized year-round, and retain and maintain sediment trapping devices in operational condition.
 - Sequence trenching activities so that most open portions are closed before new trenching begins. Trenched material should be stored on the upstream side of the trenches.
 - Incorporate staged seeding and re-vegetation of graded slopes as work progresses.
 - Consider the early planting and establishment of permanent vegetation in the schedule to maximize plant establishment success and minimize irrigation and continuous maintenance needs.
 - Apply permanent erosion control to areas deemed substantially complete during the project's defined seeding window.
- Maintenance and Inspection
- Verify that work is progressing in accordance with the schedule. If progress deviates, take corrective actions.
 - Keep the schedule up to date and ensure it is consistent with the contractor's three-week look ahead, or other routine schedule submitted to the RE under the contract.
 - Amend the schedule when changes are warranted or when directed by the RE.
- SWPPP or WPCP
- A Water Pollution Control Schedule (WPCS) must include construction operations and BMP implementation for the entire duration of the project. The WPCS is to be included as an attachment and discussed in section 500.7 of the SWPPP or Section 30.5 of the WPCP.

BMP 08.00. Culvert Inlet Protection

DESIGN CONSIDERATIONS

Objectives

Culvert Inlet Protection is used to trap sediment and reduce the amount of sediment entering a culvert.

Description

Culvert Inlet Protection is a low barrier, similar to a check dam, placed up-gradient of a culvert inlet to temporarily impound water and trap sediment while still allowing flow to enter the culvert. There are several types of temporary barriers applicable for different conditions:

- Geotextile-wrapped foam barriers
- Sand bags or gravel-filled sand bags
- Fiber rolls
- Geotextile-wrapped wire cage barrier

Other Names

Filter Inlet.

Applicability

Culvert Inlet Protection is applicable when there is potential for sediment to be transported to and through the culvert. Placement in the flowline is applicable for culverts conveying runoff or project drainage that must remain operational before permanent stabilization of the disturbed area. Placement above (all the way around) a culvert inlet is applicable when earth disturbing activities are occurring upslope of the inlet, to prevent sediment and runoff from entering the culvert inlet from above. Culvert Inlet Protection is not generally placed in the flowline of culverts conveying stream flow, since the purpose of the best management practice (BMP) is to treat run-off before it reaches receiving waterbodies such as streams. If placement in the flowline of streams is required, applicable permits must be obtained.

Selection Considerations

- Culvert Inlet Protection should be sited and constructed in a manner that will facilitate cleanout and disposal of trapped sediment.

- Culvert Inlet Protection should be constructed in a manner that will allow flow to pass and minimize ponding after the run-off has ceased.
- Blocking the inlet can cause flooding affecting streets and the construction area. Where flooding would cause a hazard, consider where overflow will go in extreme events and provide emergency overflows with additional treatment.
- Slope Gradient: The slope of the ditch discharging to the culvert inlet should not exceed 5 percent or flow velocity exceeding 2.5 to 3 cubic feet per second. The steeper the slope or the higher the velocity and shear stress, the larger the particle diameter that can be transported. The flatter the slope and the slower the flow, the longer the travel distance and time behind the barrier, allowing for sediment to settle. If Culvert Inlet Protection is required on steeper grades, consider using a series of barriers or a widened channel to provide velocity reduction or barriers of greater depth to lengthen the settling distance.
- Inlet protection should extend all the way around the inlet when upgradient slopes are not stabilized.
- Consider the effects if the barrier were to fail when water is ponded. Provide additional downstream protection if warranted.

Design

Drainage Area: The area of the construction drainage area to the culvert inlet should not exceed 1-acre. The total drainage area to the inlet may be larger than 1-acre, provided that the additional area is vegetated and/or permanently stabilized and that the spillway and ponding area is sized to adequately treat, impound, and convey the runoff from the tributary area.

Depth: Provide a temporary minimum ponding depth of 6 to 8 inches. The design must specify fiber rolls of adequate diameter, foam barriers, or sandbags of adequate thickness to provide the minimum ponding depth, and spillways with minimum elevations and width must be provided to limit the maximum ponding depth.

Relationship to Other Erosion and Sediment Control Measures

Erosion control measures in the contributing areas must be in place to minimize the amount of sediment that must be treated at inlets. Culvert Inlet Protection is installed as a secondary measure to remove residual sediment that was not removed by other measures such as check dams, grassed swales, and sediment traps.

Common Failures or Misuses

- Sediment accumulation resulting in reduced settling capacity.
- Improper installation, resulting in sediment bypassing filter and entering the culvert.
- Tearing, undermining, or collapsing of the barrier, resulting in sediment entering the culvert.

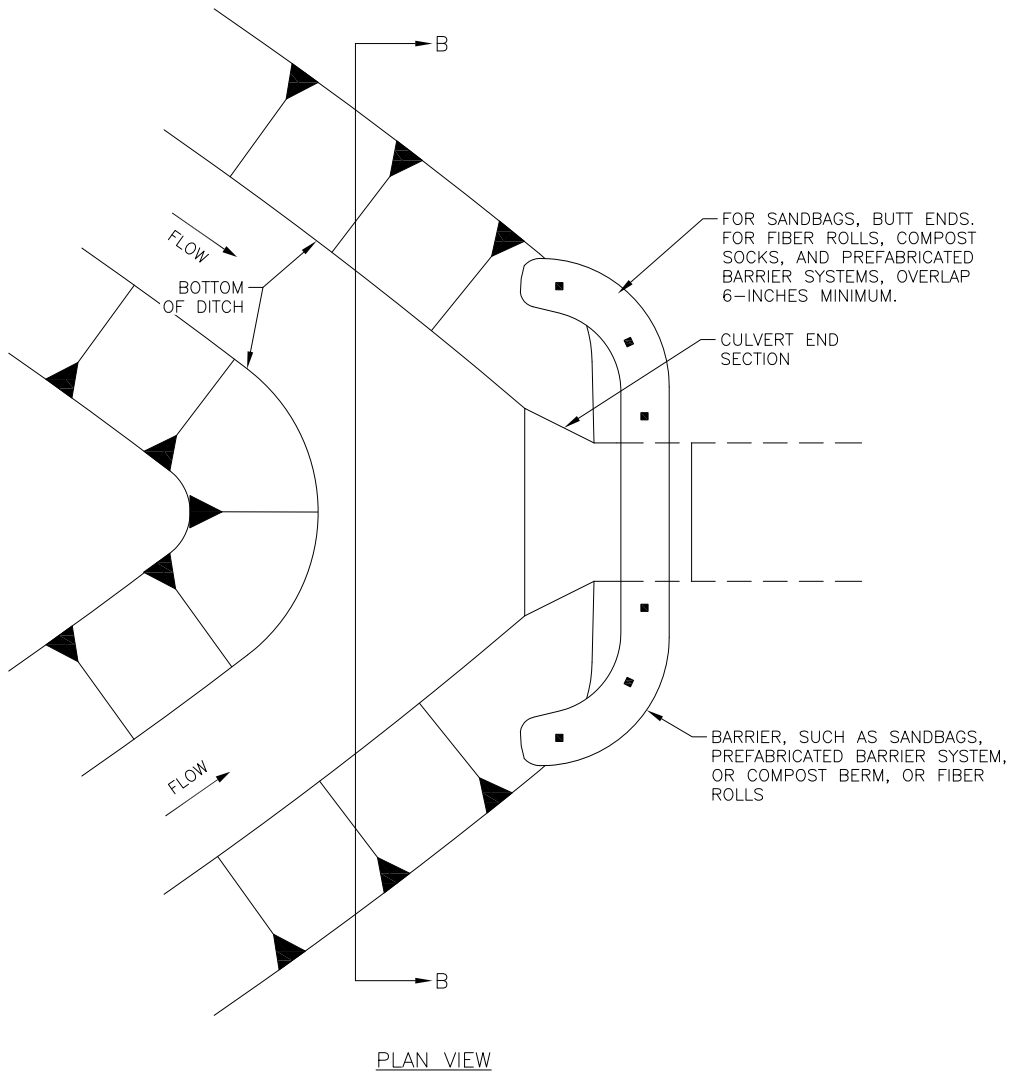
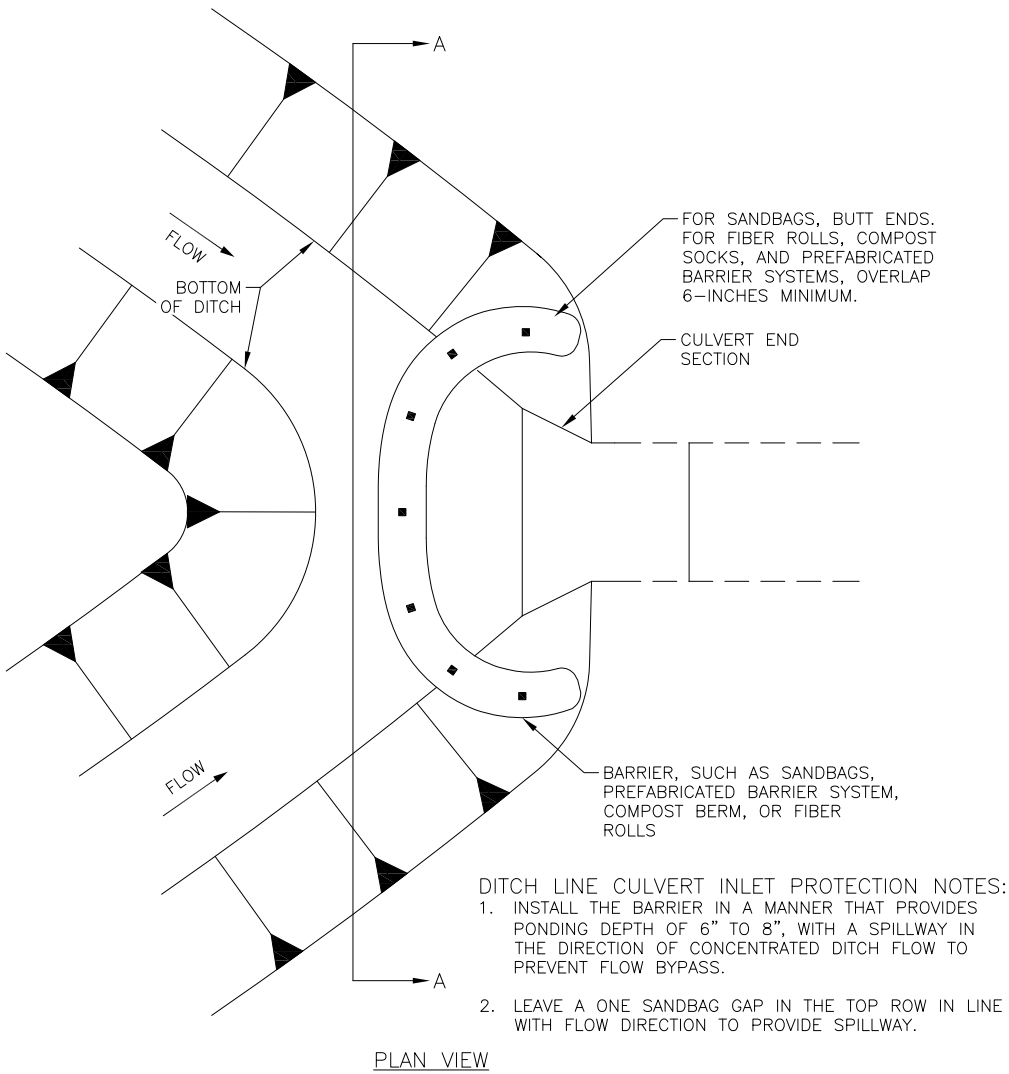
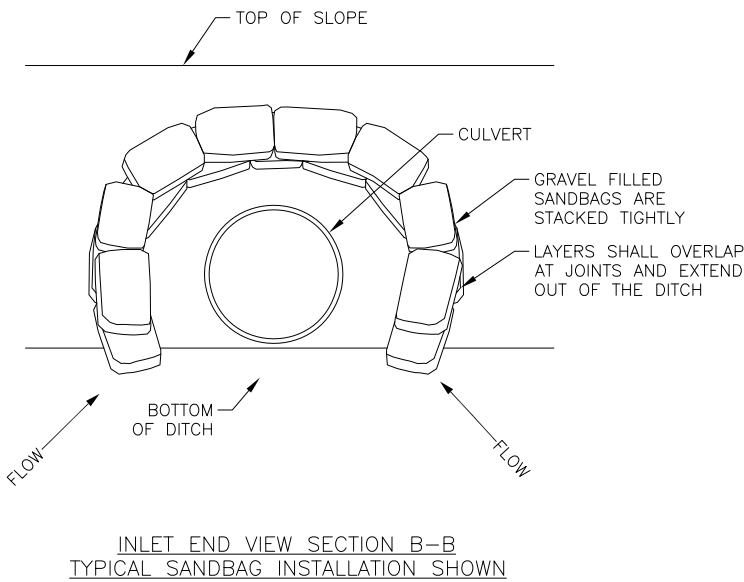
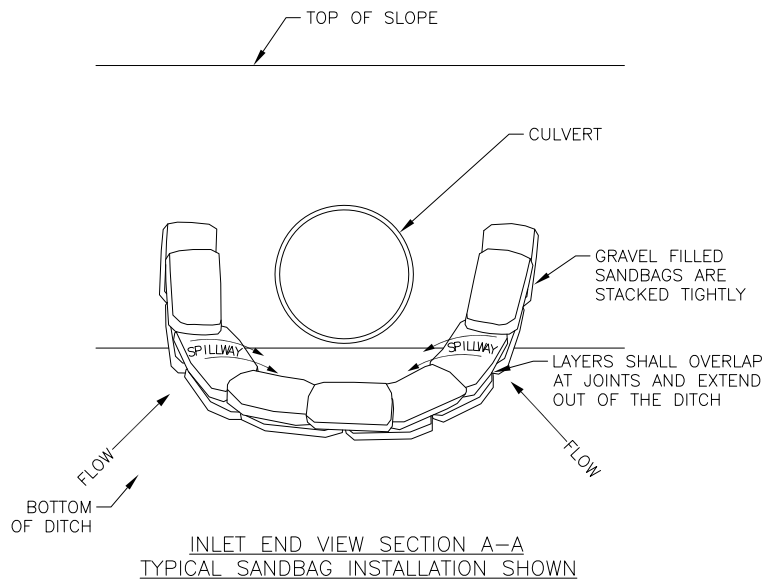
SPECIFICATIONS

Standard Specification

- 667 – Culvert Inlet Protection

Drawing

- BMP – 08.00 Culvert Inlet Protection



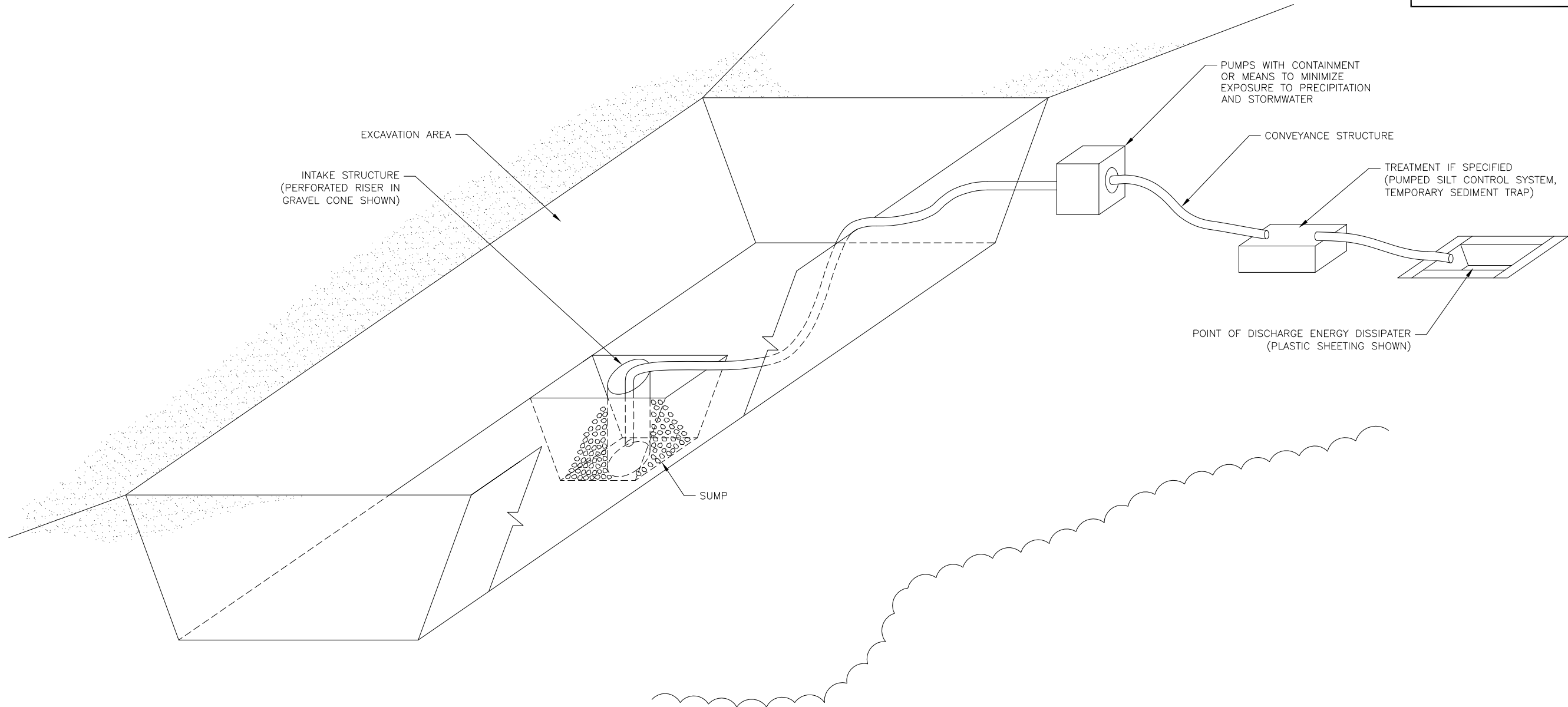
- CULVERT INLET PROTECTION NOTES:
- MATERIALS
- BARRIER MATERIALS:**
- PREFABRICATED BARRIER SYSTEM, AS SHOWN ON DRAWING BMP-13.00.
 - SANDBAG BARRIER, CONSISTING OF TIGHTLY WOVEN BURLAP OR WOVEN GEOTEXTILE BAG MATERIAL SUFFICIENTLY DURABLE TO REMAIN INTACT FOR THE TIME INTENDED. BAGS 2/3 FULL OF GRAVEL OR SAND WITH A GRADATION SUCH THAT NO FINE SEDIMENT PASSES THROUGH THE BAG. IF THE SANDBAGS ARE NEEDED FOR MORE THAN ONE SUMMER SEASON, PROVIDE BAG MATERIAL THAT HAS ULTRAVIOLET STABILITY OF AT LEAST 70% IN CONFORMANCE WITH ASTM D4355 REQUIREMENTS. SECURELY CLOSE THE SANBAGS.
 - FIBER ROLL, AS SHOWN ON DRAWING BMP-10.00, 8 INCHES MINIMUM DIAMETER.
 - COMPOST SOCK, AS SHOWN ON DRAWING BMP-05.00.
- INSTALLATION
- INSTALL WHERE INDICATED IN THE PLANS OR WHERE APPROVED BY THE ENGINEER.
 - ASSURE THAT BARRIER MAKES FULL CONTACT WITH SOIL ALL AROUND THE INLET.
 - IF PROTECTING BOTH DITCHLINE AND TOP OF PIPE, THE PROTECTION BARRIER CAN BE A SINGLE CONTINUOUS CIRCLE.
 - IN ADDITION:
 - PREFABRICATED BARRIER SYSTEM – ANCHOR WITH WIRE STAPLES ON SOIL, OR ADHESIVE ON PAVEMENT. OVERLAP 6 INCHES.
 - SANDBAG BARRIER – LAYER AND OVERLAP AT JOINTS.
 - FIBER ROLL – TRENCH A MINIMUM OF 2 INCHES. SEE STAKING REQUIREMENTS ON DRAWING BMP-10.00.
 - COMPOST SOCK – SEE STAKING REQUIREMENTS ON DRAWING BMP-05.00. STAKING REQUIRED WHEN PLACED WITHIN FLOWLINE/DITCH.

- INSPECTION
- CONFIRM THAT BARRIERS ARE IN FULL CONTACT WITH THE SOIL AND THAT BYPASS ROUTES ARE NOT PRESENT.
 - INSPECT FOR SEDIMENT ACCUMULATION, DISPLACEMENT, AND STRUCTURAL DAMAGE.
- MAINTENANCE
- REMOVE ACCUMULATED SEDIMENT BEFORE IT REACHES ONE-THIRD OF THE DESIGN DEPTH OF SPILLWAY.
 - RESTORE STRUCTURE TO ITS ORIGINAL DIMENSIONS AND FULL CONTACT WITH SOIL AROUND THE INLET AS SOON AS PRACTICABLE.
 - REPAIR ANY STRUCTURAL DAMAGE, INCLUDING REPLACING DAMAGED SANDBAGS, AS SOON AS PRACTICABLE.

REVISIONS		
Date	Description	By
State of Alaska DOT&PF		
CULVERT INLET PROTECTION		
APPROVED		
Date	12/2015	X/XX/XX

DITCH LINE CULVERT INLET PROTECTION
NOT TO SCALE

TOP OF PIPE CULVERT INLET PROTECTION
NOT TO SCALE



EXCAVATION DEWATERING
NOT TO SCALE

EXCAVATION DEWATERING NOTES:

MATERIALS
PUMP: SIZED FOR DESIGN FLOW IN CONTRACT, INTAKE LINE, FITTINGS, AND NOZZLES.

INTAKE STRUCTURES: RISERS, SCREENS, GRAVEL CONES, GRAVEL FILTER BERMS, GEOTEXTILE, OR EQUIVALENT,

CONVEYANCE SYSTEM: FLEXIBLE HOSE, WITH PROPER FITTINGS OR EQUIVALENT.

ENERGY DISSIPATER: PLASTIC SHEETING, RIPRAP, SANDBAGS, T-BAR SPREADER, OR EQUIVALENT.

TREATMENT: UPLAND VEGETATIVE AREA, PUMPED SILT CONTROL SYSTEM, OR TEMPORARY SEDIMENT TRAP.

INSTALLATION

1. INSTALL THE CONVEYANCE STRUCTURE. FOR PIPED CONVEYANCE, ENSURE THAT IT IS ADEQUATELY SECURED AGAINST MOVEMENT DURING PUMPING.
2. PLACE THE PUMP IN AN AREA DESIGNED FOR ITS USE AND OPERATION.
3. INSTALL SPILL PREVENTION BMPS PRIOR TO OPERATION.
4. INSTALL THE ENERGY DISSIPATER.
5. CONNECT THE CONVEYANCE STRUCTURE TO THE DOWNSTREAM DISCHARGE POINT.

INSPECTION

1. WHEN PUMPING, MONITOR PUMPS AND INTAKE AND DISCHARGE POINTS.
2. INSPECT THE CONVEYANCE STRUCTURE FOR LEAKS, EROSION, OR OTHER DEFECTS.
3. INSPECT THE TREATMENT CONTROLS FOR BYPASS, CLOGGING, AND SIGNS OF INADEQUATE TREATMENT.
4. INSPECT DISCHARGE POINT FOR EROSION OR FAILURE OF THE ENERGY DISSIPATION MATERIAL.
5. INSPECT THE EQUIPMENT AREA FOR PROPERLY STORED FUEL AND OTHER POTENTIALLY HAZARDOUS SUBSTANCES.

MAINTENANCE

1. REINFORCE, REPAIR, OR RESTORE ANY PORTION OF THE TREATMENT CONTROLS, CONVEYANCE SYSTEM, OR ENERGY DISSIPATER.

REMOVAL

1. REMOVE THE INTAKE HOSE.
2. REMOVE THE ENERGY DISSIPATER AND TREATMENT CONTROLS, IF THEY ARE NOT PART OF THE PERMANENT SITE FEATURES.
3. REMOVE THE CONVEYANCE SYSTEM.
4. AS REQUIRED, BACKFILL OR REGRADE THE CONVEYANCE SYSTEM ALIGNMENT AND TREATMENT AREA AND RESTORE TO ORIGINAL CONTOURS.
5. REGRADE AND SEED OR PERMANENTLY STABILIZE ALL DISTURBED AREAS.

REVISIONS		
Date	Description	By

State of Alaska DOT&PF

EXCAVATION
DEWATERING

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D

Date 12/2015 X/XX/XX

BMP 55.00. Street Sweeping and Vacuuming for Sediment Control

DESIGN CONSIDERATIONS

Objectives

Street Sweeping and Vacuuming for Sediment Control is used to remove sediment from paved surfaces to prevent it from entering storm drain systems or waters of the U.S.

Description

Sediment is removed from roads and paved surfaces by power sweepers or manual methods and disposed of in a controlled sediment disposal area.

Applicability

Sweeping is implemented anywhere sediment is tracked from the project area onto public or private paved roads and other paved surfaces. Street Sweeping and Vacuuming for Sediment Control should be conducted when sediment accumulation is visible on paved surfaces. Typically, this will be concentrated at the exit to the construction site

Selection Considerations

- Sweepers that pick up sediment and control dust emissions should be specified. Of the four types of mechanical power sweepers available, three (vacuum, regenerative air, and high efficiency sweepers) are acceptable. Prohibit the use of methods that use only mechanical kick brooms. Conventional mechanical broom sweepers have been found to have a negative effect on the amount of stormwater runoff pollution. Mechanical sweepers may only be used if followed by a vacuum-assisted sweeper.
- Manual broom sweeping with pickup is acceptable. On smaller construction sites and in areas not accessible by power sweepers, sweeping can be conducted manually using a broom and shovel.
- The use of leaf blowers and other similar equipment for sweeping is unacceptable.
- Reasonable measures must be employed to prevent dust from becoming airborne during any operation where material that may create dust is handled, transported, or stored.

- If the sediment or soil is wet or muddy, paved surfaces will need to be scraped manually or mechanically.

Relationship to Other Erosion and Sediment Control Measures

Erosion and sediment control measures in the contributing areas must be in place to minimize the amount of sediment that must be swept. Stabilized Construction Exit (BMP-23 and BMP-24) or Tire Wash (BMP-36 and BMP-37) should be included in the contract. Street Sweeping and Vacuuming for Sediment Control is a secondary measure to remove residual sediment that was not removed by other measures. Well-maintained stabilized construction exits, vehicle tracking controls, and tire wash facilities can help reduce the necessary frequency of Street Sweeping and Vacuuming for Sediment Control.

Common Failures or Misuses

- Insufficient erosion controls in the contributing disturbed area.

SPECIFICATIONS

Standard Specifications

- 656 Street Sweeping and Vacuuming for Sediment Control

BMP AK-23

Vehicle and Equipment Maintenance

Purpose and Description

- Vehicle and equipment cleaning areas, procedures and practices are designed to minimize or prevent discharge of pollutants and hazardous wastes into water courses and/or storm drain systems.¹

Applicability

- Procedures and practices are used everywhere that onsite maintenance and washing takes place.
- When practical, maintenance must be done offsite.

Design and Installation

- When vehicle and equipment maintenance cannot be done offsite or within a structure equipped with proper containment and disposal facilities¹ it must be done at an onsite maintenance area with the following characteristics:
 - Located at least 50ft from any downstream drainages or waterbodies.
 - Protected from storm water run-on and run-off by diversion dikes or berms which are configured to contain spills and pollutants.
 - Have drip pans, absorbent pads and spill kits on site.
 - Absorbent pads, contaminated soil, or any other waste product produced by vehicle or equipment maintenance operations must be disposed of properly.

- Fuels and lubricants must not be dumped on the ground.¹
- Tires must not be buried.¹
- Batteries must be disposed up properly or recycled.¹
- No liquids (oil, fuel, anti-freeze, etc...) will be poured or otherwise go into a storm drain system. They must be disposed of per manufacturer's instructions.²
- Secondary containment is required when storing oil, fuel and chemicals in drums onsite.¹

Maintenance and Inspection

- Any vessel used to store waste fluids must be inspected regularly and maintained in a leak-proof condition.¹
- Inspect construction vehicles and equipment daily and immediately fix any leaks or remove problem vehicle(s) and/or equipment from the site.²
- Maintenance area and secondary containment must be inspected regularly.

References

¹Caltrans Storm Water Quality Handbooks, March 2003, Construction Site Best Management Practices Manual, NS-10 Vehicle and Equipment Maintenance, http://www.dot.ca.gov/hq/construc/stormwater/CSBMPPM_303_Final.pdf

²USEPA (United States Environmental Protection Agency), October 2000, National Menu of Best Management Practices, Vehicle Maintenance and Washing Areas at Construction Sites, <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=34&minmeasure=4>

WM-6 SOLID WASTE MANAGEMENT



BMP Objectives

- ☐ Perimeter Control
- ☐ Slope Protection
- ☐ Borrow and Stockpiles
- ☐ Drainage Areas
- ☐ Sediment Trapping
- ☒ Stream Protection
- ☐ Temporary Stabilizing
- ☐ Permanent Stabilizing

Definition and Purpose

Solid waste management procedures and practices are designed to minimize or eliminate the discharge of pollutants to the drainage system or to watercourses as a result of the creation, stockpiling, or removal of construction site and domestic wastes.

Appropriate Applications

Solid waste management procedures and practices are implemented on all construction projects that generate solid wastes.

Solid wastes include but are not limited to:

- Construction wastes including brick, mortar, timber, steel and metal scraps, sawdust, pipe and electrical cuttings, non-hazardous equipment parts, and Styrofoam and other materials used to transport and package construction materials.
- Highway planting wastes, including vegetative material, plant containers, and packaging materials.
- Litter, including food containers, beverage cans, coffee cups, paper bags, plastic wrappers, and smoking materials, including litter generated by the public.

Limitations

It may be difficult to schedule waste disposal at projects located in remote areas.

General Considerations

The Contractor's Water Pollution Control Manager (WPCM) shall oversee, schedule, and enforce proper solid waste procedures and practices.

Education

- Instruct employees and subcontractors on identification of solid and hazardous waste.
- Educate employees and subcontractors on solid waste storage and disposal procedures.
- Hold regular meetings (or incorporate into regular safety meetings) to discuss and reinforce disposal procedures.

- Require that employees and subcontractors follow solid waste handling and storage procedures.
- Prohibit littering by employees, subcontractors, and visitors.
- Promote good housekeeping practices on all sites.
- Wherever possible, minimize production of solid waste materials.

Collection, Storage, and Disposal

- Dumpsters of sufficient size and number shall be provided to contain the solid waste generated by the project and properly serviced.
- Littering is prohibited.
- To prevent clogging of the storm drainage system, litter and debris removal from drainage grates, trash racks, and ditch lines shall be a priority.
- Trash receptacles shall be provided in the Contractor's yard, field trailer areas, and at locations where workers congregate for lunch and break periods.
- Construction debris and litter from work areas within the construction limits of the project site shall be collected and placed in dumpsters at least weekly regardless of whether the litter was generated by the Contractor, the public, or others. Collected litter and debris shall not be placed in or next to drain inlets, stormwater drainage systems, or watercourses.
- Full dumpsters shall be removed from the project site and the contents shall be disposed of properly. Clean up immediately if containers overflow.
- Litter stored in collection areas and containers shall be handled and disposed of by trash-hauling contractors.
- Construction debris and non-hazardous waste shall be removed from the site regularly or as directed by the Engineer.
- Construction material visible to the public shall be stored or stacked in an orderly manner to the satisfaction of the Engineer.
- Stormwater run-on shall be prevented from contacting stored solid waste through the use of berms, dikes, or other temporary diversion structures or through the use of measures to elevate waste from site surfaces.
- Solid waste storage areas shall be located at least 50 feet from drainage facilities and watercourses and shall not be located in areas prone to flooding or ponding.
- Except during fair weather, construction and highway planting waste not stored in dumpsters shall be securely covered with tarps or plastic sheeting. .
- Dumpster washout on the project site is not allowed.
- Trash-hauling contractors shall be notified that only dumpsters are acceptable for use on-site.

- Additional containers and more frequent pickups will likely be needed during the demolition phase of construction.
- Construction waste shall be stored in a designated area approved by the Engineer.
- Potentially hazardous waste shall be segregated from non-hazardous construction site waste.
- The site shall be kept clean of litter debris through good housekeeping practices.
- Toxic liquid wastes (e.g., used oils, solvents, and paints) and chemicals (e.g., acids, pesticides, additives, and curing compounds) shall not be disposed of in dumpsters designated for construction debris.
- WM-7 (Hazardous Waste Management) contains information on disposal of hazardous waste. Hazardous waste shall be removed to an appropriate disposal and/or recycling facility by a licensed contractor.
- Useful vegetation debris, packaging, and/or surplus building materials shall be salvaged or recycled when practical. For example, trees and shrubs from land clearing can be converted into wood chips, then used as mulch on graded areas. Wood pallets, cardboard boxes, and construction scraps can also be recycled.

Maintenance and Inspection

- Inspections shall be conducted as required by the NPDES permit or contract specifications.
- The WPCM shall monitor on-site solid waste storage and disposal procedures.
- The site shall be policed for litter and debris.

BMP 23.00 & 24.00. Stabilized Construction Exit

DESIGN CONSIDERATIONS

Objectives

Stabilized Construction Exits are used to clean mud and sediment from vehicle tires, minimizing the amounts transported off-site from construction projects.

Description

A Stabilized Construction Exit provides a stabilized rock area or pad underlined with a geotextile and located where traffic exits the construction site.

Other Names

Vehicle Tracking Exit/ Entrance, Construction Exit, Construction Entrance

Applicability

Stabilized Construction Exits are necessary for projects where sediment or mud can be tracked off-site. Stabilized Construction Exits are also applicable for projects adjacent to waters of the U.S., where poor soils have been encountered, or where dust is a problem during dry weather conditions.

Selection Considerations

Stabilized Construction Exits should be installed at project access points prior to commencing major grading operations.

- Limit exits to the project.
- Avoid exits that have steep grades or are located where sight distance may be a problem.
- Slope exit towards the project where possible to retain sediment on-site.
- Provide drainage to carry water to sediment trap or other suitable outlet.
- Design exit for heaviest/longest vehicles and equipment to be used on-site.
- Exit shall be a minimum length to provide for three complete revolutions of the largest vehicle tires and 12 feet wide.
- Use fencing as necessary to direct traffic to the exit.
- Construct exit on a firm compacted subgrade when practicable.

- Avoid crossing sidewalks or back-of-walk drains.
- Avoid constructing exits at curves in public roads.
- Separation geotextile may be placed under the Stabilized Construction Exit to prevent fine sediment from pumping up into the exit structure.
- If project conditions determine the need for Stabilized Construction Exits at specific locations, provide the location on the plans.

Relationship to Other Erosion and Sediment Control Measures

Stabilized Construction Exits may be used in combination with street sweeping and tire washing to minimize the amount of sediment transported off-site.

Common Failures or Misuses

- Failure to periodically “top dress” (provide additional rock) when sediment accumulates on the surface.
- Failure to repair and/or clean out any structures used to trap sediment.
- Failure to provide adequate depth and length of rock.
- Not having a Stabilized Construction Exit and using street sweeping as a substitute.
- Use of asphalt concrete grindings, crushed concrete, cement, or calcium chloride resulting in an increase in pH levels in stormwater.

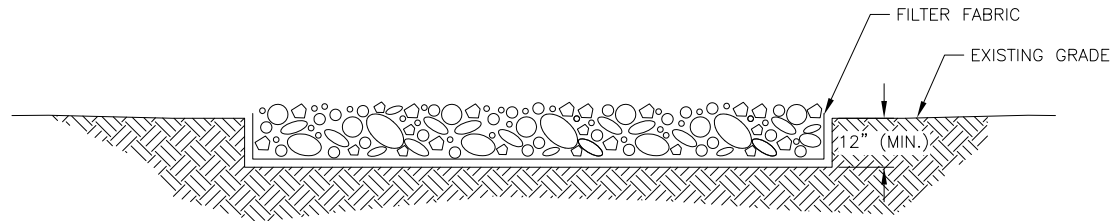
SPECIFICATIONS

Standard Specification

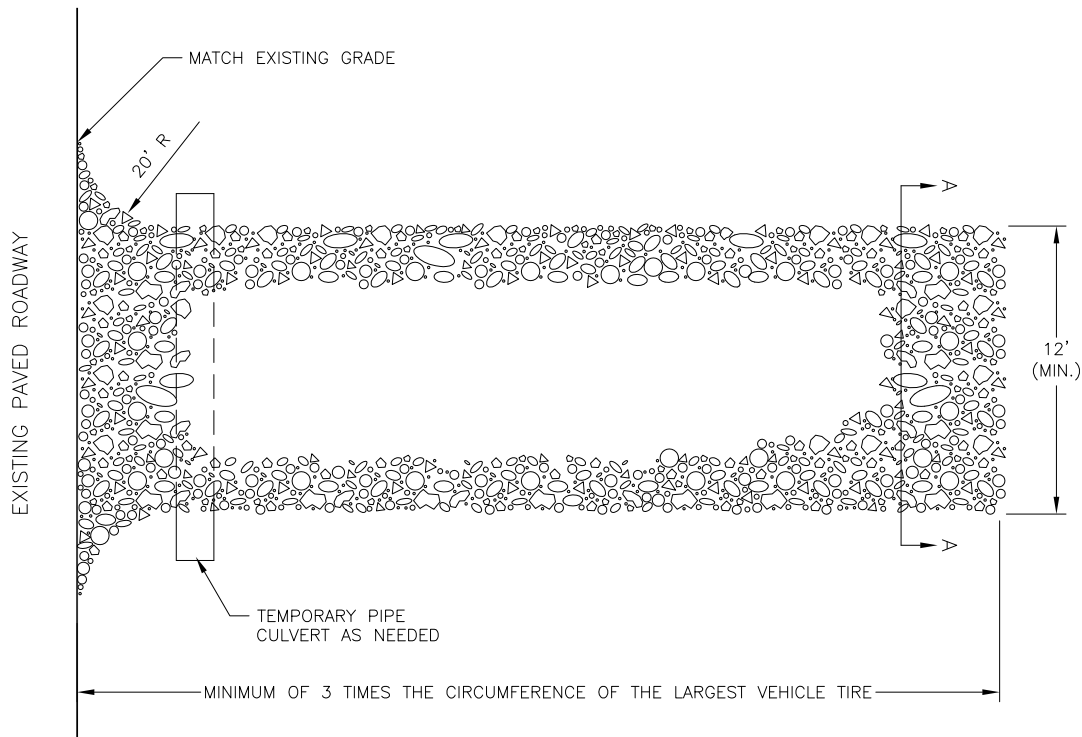
- 682 – Stabilized Construction Exit

Drawing:

- BMP-23.00 Stabilized Construction Exit (Sheets 1 of 2)
- BMP-24.00 Stabilized Construction Exit (Metal Plate, Sheet 2 of 2)



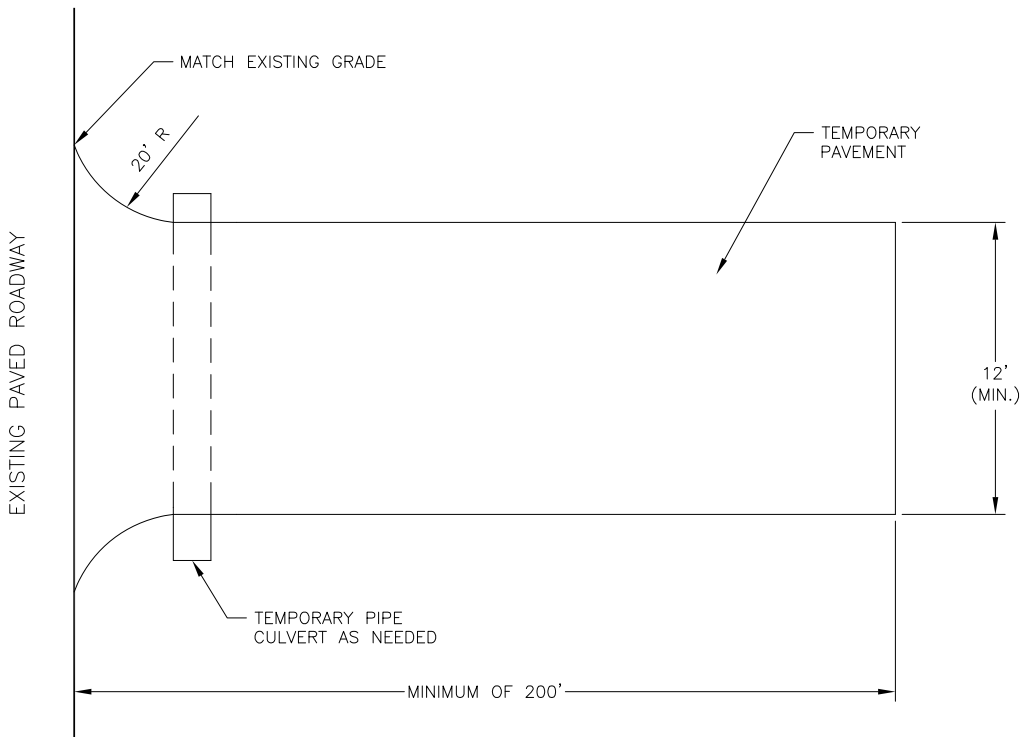
SECTION A-A



PLAN

ROCK CONSTRUCTION EXIT
NOT TO SCALE

- ROCK CONSTRUCTION EXIT NOTES:
- MATERIALS
- ROCK: 2- TO 3-INCH COARSE AGGREGATE OR 3- TO 6-INCH QUARRY SPALL OR ANGULAR ROCK, WHICHEVER IS APPROPRIATE TO THE PROJECT FLEET.
- INSTALLATION
- PLACE THE FILTER FABRIC AND ROCK TO THE SPECIFIC GRADE SHOWN ON THE PLANS.
- MAINTENANCE
- REMOVE ACCUMULATED SEDIMENT OR MUD.
 - REPLACE ROCK MATERIAL WHEN SURFACE VOIDS ARE FILLED WITH SEDIMENT. REPLACE FABRIC AS NEEDED.
 - TOP DRESS WITH 2 TO 3 INCHES OF COARSE AGGREGATE OR 3- TO 6-INCH COARSE ROCK WHEN THE PAD BECOMES LADEN WITH SEDIMENT.
- INSPECTION
- INSPECT FOR ROCK THAT HAS BEEN DISPLACED FROM THE PAD.



PLAN

TEMPORARY PAVEMENT CONSTRUCTION EXIT
NOT TO SCALE

- TEMPORARY PAVEMENT CONSTRUCTION EXIT NOTES:
- INSPECTION
- INSPECT TEMPORARY PAVEMENT FOR DAMAGE.
- MAINTENANCE
- SWEEP DESIGNATED PAVED EXIT TO PREVENT SEDIMENT TRACK-OUT.
 - REPAIR DAMAGED TEMPORARY PAVEMENT.

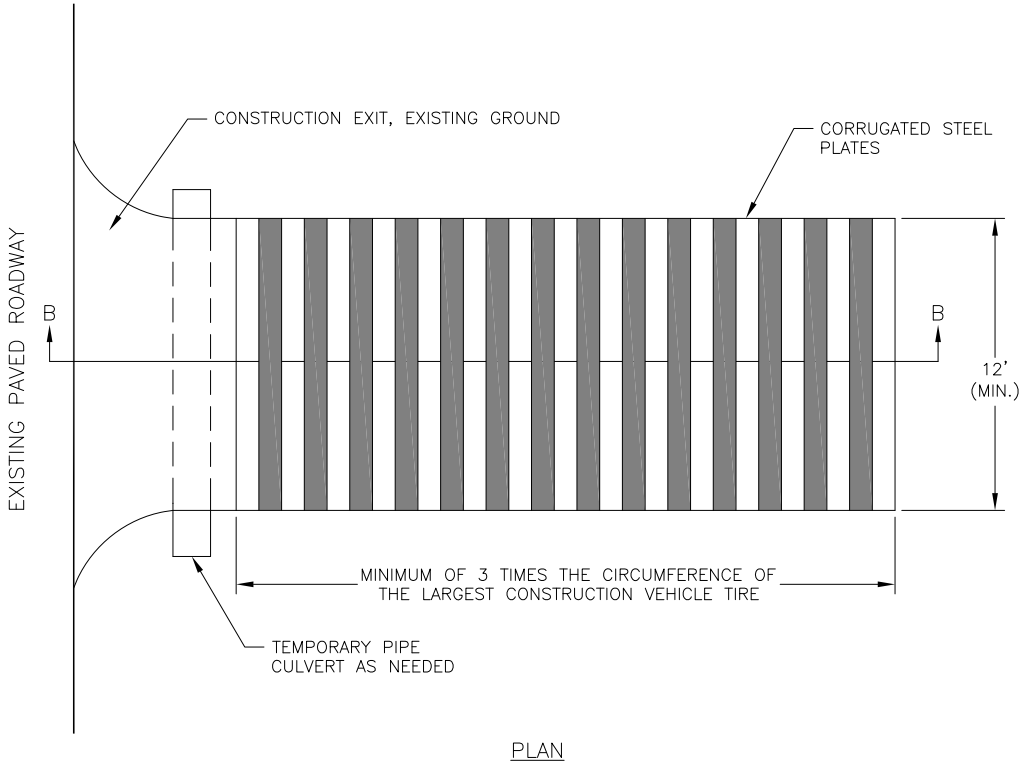
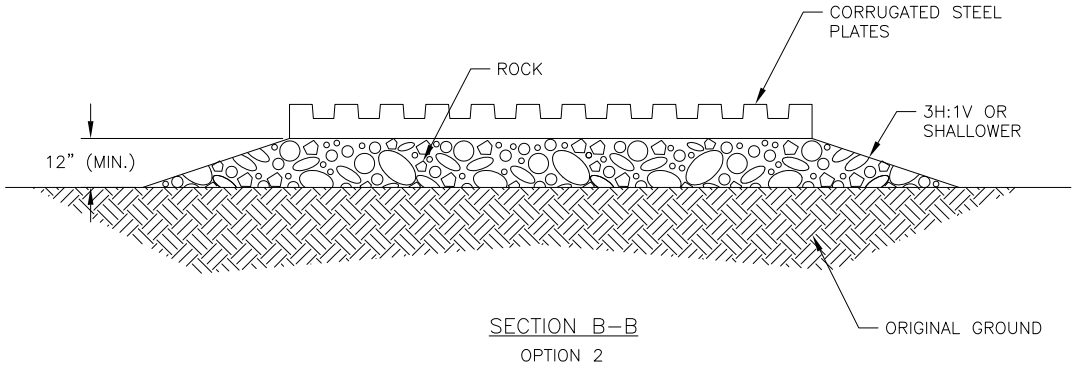
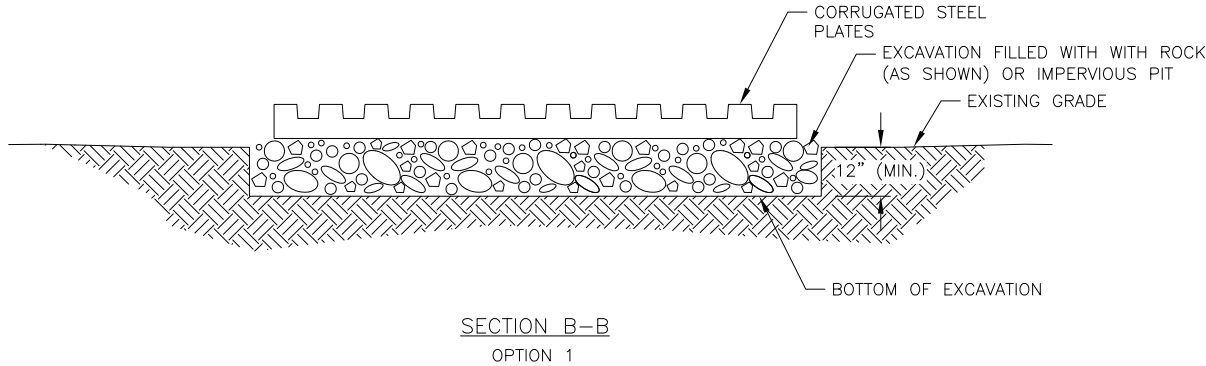
- STABILIZED CONSTRUCTION EXIT GENERAL NOTES:
- INSTALLATION
- INSTALL STABILIZED CONSTRUCTION EXIT PRIOR TO EARTH WORK.
 - CLEAR THE EXIT AREA OF ALL VEGETATION, ROOTS, AND OTHER MATERIAL.
 - PROVIDE DRAINAGE TO CARRY WATER TO A SEDIMENT TRAP, VEGETATIVE SEDIMENT FILTER OR OTHER PROTECTED OUTLET.
 - EXCAVATE AND GRADE THE AREA FOR ROCK PLACEMENT.
 - INSTALL SIGNS, FENCING OR BARRICADES TO CHANNEL OUTGOING TRAFFIC TO THE STABILIZED CONSTRUCTION EXIT.

- INSPECTION
- INSPECT STABILIZED CONSTRUCTION EXIT FOR SEDIMENT ACCUMULATION AND MATERIAL DISPLACEMENT.
 - INSPECT ROADWAY FOR SEDIMENT TRACK-OUT.
 - INSPECT DITCHES TO ENSURE NO SEDIMENT ACCUMULATION.

- MAINTENANCE
- MAINTAIN EACH EXIT IN A CONDITION THAT WILL PREVENT TRACKING OF MUD OR SEDIMENT ONTO PUBLIC RIGHT-OF-WAY.
 - REPAIR AND/OR CLEAN OUT ANY STRUCTURES USED TO TRAP SEDIMENT.
 - REMOVE ALL MUD AND SEDIMENT DEPOSITED ON PAVED ROADWAYS.
 - ADD MORE SIGNS, FENCING OR BARRICADES WHEN VEHICLES ARE EXITING THE PROJECT WITHOUT USING THE STABILIZED CONSTRUCTION EXIT. INSTALL ADDITIONAL STABILIZED CONSTRUCTION EXITS IF NEEDED, YET USE SIGNS AND BARRICADES TO MINIMIZE THE NUMBER OF STABILIZED CONSTRUCTION EXITS.
 - PREVENT TRACK-OUT BY USING ADDITIONAL BMPs, SUCH AS A TIRE WASH.

- REMOVAL
- REMOVE THE STABILIZED CONSTRUCTION EXIT AND ANY SEDIMENT TRAPPING STRUCTURES AFTER THEY ARE NO LONGER NEEDED, OR WITH FINAL SITE STABILIZATION.
 - REGRADE AND PERMANENTLY STABILIZE THE REMAINING DISTURBED AREAS ACCORDING TO THE PLANS.

REVISIONS		
Date	Description	By
State of Alaska DOT&PF		
STABILIZED		
CONSTRUCTION EXIT		
(NOTES, ROCK &		
TEMPORARY PAVEMENT)		
APPROVED		
Date	12/2015	X/XX/XX



METAL PLATE CONSTRUCTION EXIT
NOT TO SCALE

METAL PLATE CONSTRUCTION EXIT NOTES:
MATERIALS

CORRUGATED STEEL PLATES: SHAKER/RUMBLE PLATES, CORRUGATED STEEL PLATES, OR EQUIVALENT DESIGNED FOR ANTICIPATED TRAFFIC LOADS.

ROCK: 2- TO 3-INCH COARSE AGGREGATE.

INSTALLATION

- IF CORRUGATED STEEL PLATES ARE OPEN TO THE SURFACE BELOW, INSTALL GRAVEL OR IMPERVIOUS PIT.
- PLACE CORRUGATED STEEL PLATES.

INSPECTION

- INSPECT CORRUGATED STEEL PLATES FOR DAMAGE.

MAINTENANCE

- REPLACE DAMAGED CORRUGATED STEEL PLATES AS NECESSARY.
- LIFT PLATE AND REMOVE ACCUMULATED SEDIMENT.
- WHEN SURFACE VOIDS FILL WITH SEDIMENT, REPLACE ROCK MATERIAL.

ADDITIONAL NOTES:

SEE STABILIZED CONSTRUCTION EXIT GENERAL NOTES ON BMP 23.00 STABILIZED CONSTRUCTION EXIT (NOTES, ROCK & TEMPORARY PAVEMENT).

REVISIONS		
Date	Description	By

State of Alaska DOT&PF

STABILIZED
CONSTRUCTION EXIT
(METAL PLATE)

APPROVED

Date12/2015X/XX/XX

BMP 10.00.a. Fiber Rolls for Erosion Control

DESIGN CONSIDERATIONS

Objectives

The purpose of Fiber Rolls for Erosion Control is to shorten the slope and help to slow, filter, and spread overland flows. They capture sediment, organic matter, and seeds that might otherwise be washed downslope.

Description

Fiber Rolls are long rolls of material such as wood excelsior, rice or wheat straw, flax, coconut fibers, or compost, which is rolled or bound in a tight tubular roll and wrapped in plastic or biodegradable netting. They are typically about 8 inches in diameter and under 30 feet long.

They may come pre-fabricated or they can be fabricated on-site.

Other Names

Wattles, Straw Wattles, Straw Rolls, Coir Logs, Excelsior Log, Straw Log, Filter Logs, Fiber Logs.

Applicability

Fiber Rolls can be applied to steep or long slopes and slopes that are susceptible to freeze/thaw activity, sheet and rill erosion, or dry ravel. They can be placed along the toe, top, face, and at grade-breaks on disturbed or erodible slopes. They can be used as a temporary berm to direct flow around exposed soils or to a sediment trap and as a check dam in unlined ditches. They can be used at other locations at the project site for sediment control.

Selection Considerations

- Use in areas of low shear stress.
- Avoid use on slopes that could build up ice; for instance, where seepage occurs.
- They are effective for one to two seasons.
- Fiber Rolls can be staked to the ground using willow cuttings to increase the revegetation effort. Since the fiber roll will retain moisture, it will provide a good site for the willow cuttings to root. The Alaska Department of Fish and Game (ADF&G) has prepared guidance for willow cuttings and dormant cuttings in the

Streambank Revegetation and Protection: A Guide for Alaska at:

<http://www.adfg.alaska.gov/index.cfm?adfg=streambankprotection.staking>

and

<http://www.adfg.alaska.gov/index.cfm?adfg=streambankprotection.cuttings>

- The quantity of sediment that a roll can capture prior to maintenance is limited to one-half the exposed height of the roll.
- Rolls will be difficult to move once they are saturated. Determine whether Fiber Rolls must be removed at the end of the project based on the use of the area. If removal is required, specify in the plan set and require removal of netting upon final stabilization.

Relationship to Other Erosion and Sediment Control Measures

Fiber Rolls are best used in combination with seeding, mulch, hydraulic erosion control products (HECPs), and/or rolled erosion control products (RECPs). They can be used to stabilize slopes until the permanent vegetation becomes established.

Common Failures or Misuses

- Unless they are placed in a trench, run-off can flow underneath Fiber Rolls and cause failure.
- Unless they are properly staked, Fiber Rolls can be transported by high flows.
- Water can flow between Fiber Rolls if they are not overlapped.
- Fiber Rolls must be placed perpendicular to flow (parallel to the slope contour).
- Fiber Rolls will not work if the slope is slumping, creeping, or sliding.

SPECIFICATIONS

Standard Specification

- 669 – Fiber Rolls for Erosion and Sediment Control

Drawings

- BMP-10.00 Fiber Rolls for Erosion and Sediment Control
- BMPs -31.00, 32.00 and 33.00 Temporary Check Dam

BMP 10.00.b. Fiber Rolls for Sediment Control

DESIGN CONSIDERATIONS

Objectives

The purpose of Fiber Rolls for Sediment Control is to trap sediment and prevent it from being transported out of the project area, to another area, or to waters of the U.S.

Description

Fiber Rolls are long rolls of material such as wood excelsior, rice or wheat straw, flax, coconut fibers, or compost, which is rolled or bound in a tight tubular roll and wrapped in plastic or biodegradable netting. They are typically about 8 inches in diameter and under 30 feet long.

They may come pre-fabricated or they can be fabricated on-site.

Other Names

Wattles, Straw Wattles, Straw Rolls, Coir Logs, Excelsior Log, Straw Log, Filter Logs, Fiber Logs.

Applicability

Fiber Rolls can be placed at the perimeter of a project, below the toe of exposed and erodible slopes, and around temporary stockpiles. They may also be used for inlet protection. They can be used at other locations at the project site for erosion control.

Selection Considerations

- Use in areas of low shear stress.
- Avoid use on slopes that could build up ice; for instance, where seepage occurs.
- They are effective for one to two seasons.
- Fiber Rolls can be staked to the ground using willow cuttings to increase revegetation efforts. Since the Fiber Roll will retain moisture, it will provide a good site for the willow cuttings to root. The Alaska Department of Fish and Game has prepared guidance for willow cuttings and dormant cuttings in the *Streambank Revegetation and Protection: A Guide for Alaska* at:
<http://www.adfg.alaska.gov/index.cfm?adfg=streambankprotection.staking>

and

<http://www.adfg.alaska.gov/index.cfm?adfg=streambankprotection.cuttings>

- The quantity of sediment that a roll can capture prior to maintenance is limited to one-half the exposed height of the roll.
- Rolls will be difficult to move once they are saturated. Determine whether Fiber Rolls must be removed at the end of the project based on the use of the area. If removal is required, specify in the plan set and require removal of netting upon final stabilization.

Relationship to Other Erosion and Sediment Control Measures

Fiber Rolls are best used in combination with seeding, mulch, hydraulic erosion control products (HECPs), and/or rolled erosion control products (RECPs).

- Fiber Rolls can be used in place of silt fence. The advantage of fiber rolls over silt fence is that installation is much easier, they do not have to be removed, and hydroseeding can be done after their installation.
- Compost socks can be used in place of Fiber Rolls and do not require trenching. Compost socks are also heavy enough that they can be placed on paved surfaces.
- A prefabricated barrier system can be used in place of fiber rolls and requires a smaller trench. A prefabricated barrier system can also be adhered to paved surfaces.

Common Failures or Misuses

- Unless they are placed in a trench and have tamped backfill in the trench on the uphill side, runoff can flow underneath Fiber Rolls and cause failure.
- Unless they are properly staked, Fiber Rolls can be transported by high flows.
- Water can flow between Fiber Rolls if they are not overlapped.

- Fiber Rolls must be placed perpendicular to flow (parallel to the slope contour).
- Fiber Rolls will not work if the slope is slumping, creeping, or sliding.

SPECIFICATIONS

Standard Specification

- 669 – Fiber Rolls for Erosion and Sediment Control

Drawings

- BMP-10.00 Fiber Rolls for Erosion and Sediment Control
- BMP-08.00 Culvert Inlet Protection
- BMPs -25.00, 26.00, 27.00, 28.00 and 29.00 Storm Drain Inlet Sediment Protection

FIBER ROLL GENERAL NOTES:
MATERIALS
FIBER ROLLS: THE NETTING MAY BE UV-DEGRADABLE POLYPROPYLENE, BIODEGRADABLE BURLAP, JUTE OR COIR. THE FILLINGS MAY BE STRAW, FLAX, RICE, OR COCONUT-FIBER. MINIMUM DIAMETER OF 6 INCHES.

STAKES: 1-INCH BY 1-INCH WOODEN STAKES 24 INCHES LONG (18 INCHES IF SOILS ARE ROCKY) OR 3/8-INCH REBAR WITH SAFETY CAPS OR 3/4-INCH TO 1 1/2-INCH DIAMETER LIVE WILLOW CUTTINGS. IF USING LIVE WILLOW CUTTINGS, DO NOT INSTALL ROPE.

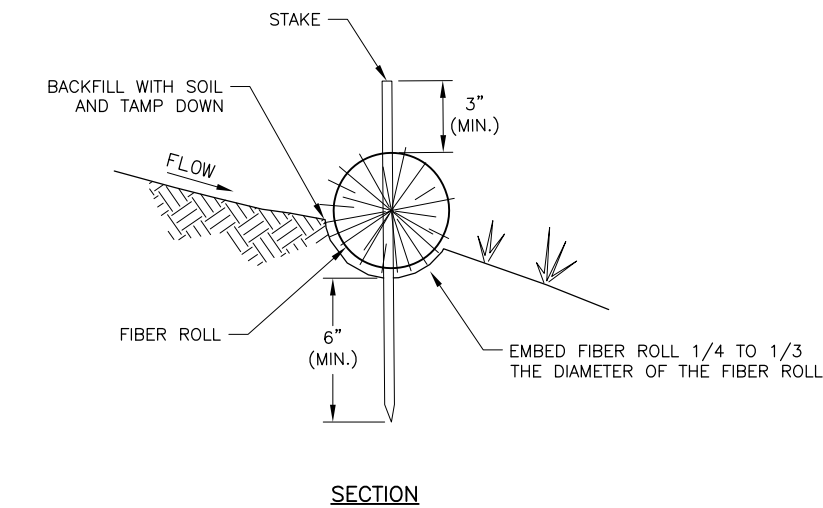
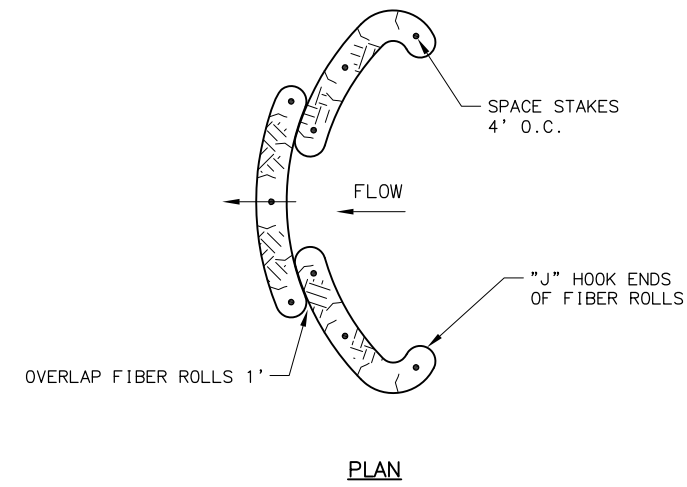
- INSTALLATION
- PLACE FIBER ROLLS PERPENDICULAR TO FLOW AND PARALLEL TO THE SLOPE CONTOUR.
 - AT THE END OF THE ROLL, TURN THE END UPSLOPE TO PREVENT RUN-OFF FROM GOING AROUND THE ROLL END.

- INSPECTION
- ENSURE THAT THE ROLLS ARE IN CONTACT WITH THE SOIL AND THOROUGHLY ENTRENCHED.
 - LOOK FOR SCOURING UNDERNEATH THE ROLLS.
 - LOOK FOR SPLIT, TORN, UNRAVELING, OR SLUMPING FIBER ROLLS.
 - ENSURE EQUIPMENT HAS NOT DRIVEN OVER THE INSTALLED FIBER ROLLS.

- MAINTENANCE
- REPLACE DAMAGED SECTIONS OF FIBER ROLL.
 - REMOVE ACCUMULATED SEDIMENT UPSLOPE OF THE ROLL BEFORE IT REACHES ONE-HALF THE DISTANCE BETWEEN THE TOP OF THE FIBER ROLL AND THE GROUND SURFACE. WHEN PROTECTING A WATER BODY OR STORM DRAIN INLET, REMOVE ACCUMULATED SEDIMENT UPSLPE OF THE ROLL WHEN IT REACHES ONE-THIRD OF THE DISTANCE BETWEEN THE TOP OF THE FIEBER ROLL AND THE GROUND SURFACE.

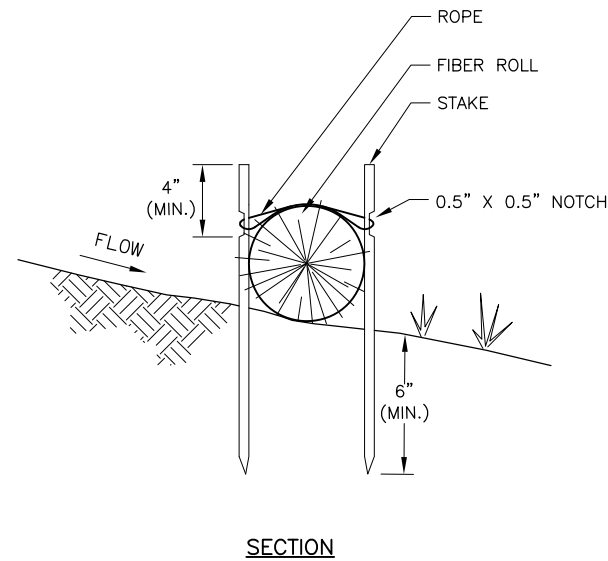
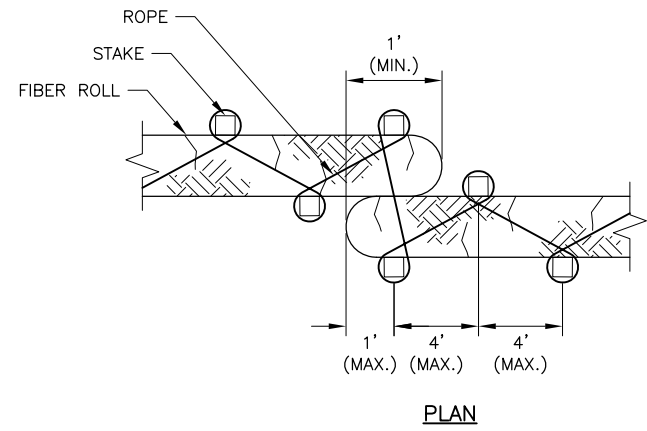
- REMOVAL
- REMOVE FIBER ROLLS WHEN THE AREA IS STABILIZED OR WHEN THEY ARE NO LONGER NECESSARY.
 - COLLECT AND DISPOSE OF THE ACCUMULATED SEDIMENT.
 - REMOVE AND DISPOSE OF FIBER ROLLS.
 - FILL THE TRENCHES AND STAKE HOLES TO BLEND WITH THE ADJACENT GROUND AND REVEGETATE AS NECESSARY.

- RETENTION
- LEAVE FIBER ROLLS IN PLACE WHEN THE AREA IS STABILIZED OR WHEN THEY ARE NOT NECESSARY.
 - COLLECT AND DISPOSE OF THE ACCUMULATED SEDIMENT.
 - REMOVE AND DISPOSE OF THE NETTING, STAKES, AND ROPE.

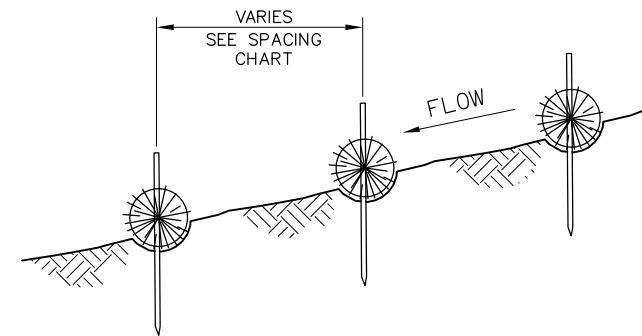


TRENCHED INSTALLATION
NOT TO SCALE

- TRENCHED INSTALLATION NOTES:
- DIG TRENCHES AND PLACE FIBER ROLLS IN THE TRENCHES.
 - CURVE BACK THE UPSLOPE END OF THE FIBER ROLL IN A "J" HOOK.
 - SPREAD EXCAVATED MATERIAL EVENLY ALONG THE UPHILL SLOPE AND COMPACT USING HAND TAMPING OR OTHER METHODS.
 - STAKE THE ROLL EVERY 4 FEET AND WITHIN 1-FOOT OF THE ENDS. LEAVE 3 INCHES OF THE STAKE ABOVE THE ROLL.
 - DRIVE STAKES THROUGH THE MIDDLE OF THE FIBER ROLL.
 - IF REQUIRED, PILOT HOLES FOR THE STAKES MAY BE CREATED BY DRIVING A STRAIGHT BAR THROUGH THE ROLL.



ROPE INSTALLATION
NOT TO SCALE



TYPICAL SPACING CHART	
SLOPE	SPACING (FEET)
1:1	10
2:1	20
3:1	30

SLOPE INSTALLATION
NOT TO SCALE

- SLOPE INSTALLATION NOTES:
- INSTALL ON A SLOPE TO SHORTEN THE SLOPE LENGTH.
 - START INSTALLATION DOWNSLOPE.
 - SPACE ROLLS ACCORDING TO THE SPACING CHART AND DECREASE SPACING ON MORE ERODIBLE SOILS AND INCREASE SPACING ON ROCKY SOILS.

REVISIONS		
Date	Description	By
State of Alaska DOT&PF		
FIBER ROLLS FOR EROSION AND SEDIMENT CONTROL		
APPROVED		
Date	12/2015	X/XX/XX

BMP 38.00. Vegetation Buffer

DESIGN CONSIDERATIONS

Objectives

A Vegetation Buffer is intended to reduce the quantity of suspended soil sediments in construction-related stormwater runoff by using living strips of vegetation suitable to reducing run-off velocities. The application for this type of control can include, but is not limited to the following:

- Type I – Perimeter Control - Provides a Vegetation Buffer as a perimeter control between the on-site construction related activities and the project boundaries.
- Type II – Natural Buffer - Provides a Vegetation Buffer between the construction related activities and sensitive areas such as waters of the U.S. and riparian areas (as required by the Alaska Construction General Permit [CGP]).

Description

Vegetation Buffers can be strips of existing vegetation or can be areas that are graded and planted with grass or other types of vegetation. They are intended to be used adjacent to where construction activities will occur and are primarily designed to treat sheet flow. Vegetation Buffers should not be used in areas with concentrated flows. Larger areas must be used to accommodate the larger run-off volume. These strips function by reducing the velocity of run-off to allow the suspended sediments and other pollutants to settle and partially infiltrate into the underlying soils.

Other Names

Vegetated Sediment Filtration Areas, Buffer Strips, Vegetated Strips

Applicability

Vegetation Buffer strips can be used at numerous locations over a project but are best suited if installed at locations where the soil is well drained and where the water table and bedrock are well below the surface. Vegetation Buffers may also be effectively used on the top and bottom of slopes. They can be used either temporarily or as permanent installations.

Selection Considerations

During the design phase of a project any area specified to be a natural Vegetation Buffer area should be identified. The type of vegetation, soil conditions, and the estimated volume of stormwater run-off should be considered when selecting a natural Vegetation Buffer.

Vegetation Buffer areas that are installed (or planted) should be located directly adjacent to where construction activities will occur. These areas should be graded and planted to establish a healthy vigorous stand of vegetation prior to any construction occurring. Other erosion and sediment control measures should be installed to help protect and stabilize the Vegetation Buffer while the planted vegetation becomes established.

When retaining existing vegetation as a Vegetative Buffer, minimize the disturbed areas by locating temporary roadways to avoid stands of vegetation and following the existing contours to reduce cutting and filling. To avoid disturbing the root-zone of existing trees, the edge of the tree canopy or drip-line should be noted when locating these temporary roadways.

Vegetated Buffers must be on land controlled by the project. If in wetlands, they must be recognized in the wetland permit.

Design

The designer should consider the type of Vegetation Buffer (Type I or II) and the slope of the proposed Vegetation Buffer area, the soil type and infiltration rate, the water table level, the type of proposed or existing vegetation, the estimated stormwater flow in the area, and the protection of sensitive areas. There may be site specific constraints that dictate alternate widths for a Vegetation Buffer or require the use of a different perimeter control measure.

Vegetation Buffer areas should be fully established with vegetation prior to construction occurring. A fully established Vegetation Buffer should be composed of species that are capable of growing a sod forming mass that covers 90 percent of the selected area. New Vegetation Buffers with planted vegetation should be composed of more than just one species and be hardy to the area. The

combination of species should be capable of creating a perennial stand of vegetation and be able to withstand frequent inundation from run-off. See BMP-53 Permanent Seeding.

All Vegetation Buffer areas with either naturally-occurring or planted stands of vegetation should be delineated prior to and throughout construction to prevent damage to the vegetation and its roots. All Vegetation Buffer areas should be inspected for impacts from soil deposited by construction related activities, damage from channelized run-off, excess accumulation of sediment, and disturbance or damage from construction activities. It may be necessary to employ other erosion and sediment control measures upstream to support existing Vegetation Buffer areas. Do not include the acreage of Vegetation Buffers in the acreage of disturbed areas for the purpose of the Notice of Intent (NOI) acreage.

The two types of buffers for Vegetation Buffer landscaping include the following:

Type I Perimeter Control Vegetation Buffers are used to help filter sediments from run-off before it leaves the job site. These can be composed of existing or newly planted vegetation. The length of these buffers should be determined by the steepness of the slope.

Type II Natural Buffer Vegetation Buffers are used when required by the Alaska CGP to protect sensitive areas (such as waters of the U.S. or riparian areas). The minimum width shall be 25 feet unless found to be infeasible. However, in some cases the governing local ordinance may specify an alternate minimum width. In such cases, it is the responsibility of the designer and the contractor to review and adhere to the specific requirements for a Vegetation Buffer in the local ordinance. Local ordinances governing nonpoint source pollution in Alaska can be found here:

<http://www.commerce.state.ak.us/dca/nonpoint/ordinances.cfm?type=Hy>

Relationship to Other Erosion and Sediment Control Measures

Vegetation Buffers areas with existing vegetation may not require other erosion and sediment control measures; however, installing or planting new Vegetation Buffer areas will require other erosion

and sediment control measures during the establishment period of the specified vegetation.

Common Failures or Misuses

Common failures are generally due to faulty application and maintenance. These failures include:

- Damage to the roots or stalks of the vegetation from construction activities.
- Overwhelming the buffer with excessive quantities of stormwater run-off, sediments, channelized run-off, and pollutants.
- Inadequate subsurface soil, vegetation, and size of Vegetation Buffer strip
- Non-observance of delineated Vegetation Buffer areas.
- Designer does not visit site and fails to take site specific conditions into account.

SPECIFICATIONS

Standard Specifications

- 688 – Vegetation Buffer
- 201 – Clearing and Grubbing
- 203 – Excavation and Embankment
- 620 – Topsoil
- 651 – Hydraulic Erosion Control Product
- 652 – Soil Amendments
- 655 – Site Delineation
- 712-2.01 – Water
- 724 – Seed
- 725 – Fertilizer
- 726 – Topsoil
- 751 – Hydraulic Erosion Control Products
- 752 – Tackifier
- 753 – Soil Amendments

Drawing

- BMP-38.00 Vegetation Buffer

VEGETATION BUFFER NOTES:
MATERIAL
SITE DELINEATION MATERIAL: SEE SPECIFICATION SECTION 655 SITE DELINEATION.

- INSPECTION
1. INSPECT NATURAL EXISTING VEGETATION BUFFER AREAS TO ENSURE THAT THE SITE DELINEATION TO MARK THE NON-DISTURBANCE AREAS IS IN PLACE.
 2. CHECK FOR DAMAGE BY EQUIPMENT AND VEHICLES.
 3. INSPECT NEW VEGETATION BUFFER AREAS FOR THE PROGRESS OF GERMINATION AND PLANT GROWTH.
 4. ENSURE STORMWATER FLOWING THROUGH THE AREA IS NOT FORMING PONDS, RILLS, OR GULLIES.
 5. INSPECT FOR SEDIMENT DEPOSITION THROUGHOUT THE BUFFER.

- MAINTENANCE
1. REPLACE OR REPAIR SITE DELINEATION (SUCH AS FENCING, STAKING, OR FLAGGING) AS NECESSARY TO DELINEATE THE VEGETATION BUFFER AREAS.
 2. REPAIR ANY DAMAGE BY EQUIPMENT OR VEHICLES.
 3. PROVIDE ADDITIONAL SEED, FERTILIZER, AND WATER TO REPAIR SEEDED AREAS DAMAGED BY EROSION OR PONDING OF WATER.
 4. IF SEDIMENT IS DEPOSITING IN THE BUFFER, INSTALL IMPROVED EROSION CONTROL MEASURES UPSLOPE OF THE BUFFER.

- REMOVAL
1. PROVIDE THE NECESSARY PERMANENT STABILIZATION TO AREAS WITH TEMPORARY VEGETATION BUFFER AS REQUIRED BY PLANS.
 2. REMOVE SITE DELINEATION MATERIAL AFTER FINAL STABILIZATION OF WORK AREAS. WORK TO REMOVE THE SITE DELINEATION MATERIAL SHALL NOT DAMAGE THE EXISTING VEGETATION OR ANY STABILIZATION MEASURE.

VEGETATION BUFFER TABLE	
AVERAGE SLOPE	BUFFER WIDTH (MIN.)
0%–2%	25 FEET
3%–5%	29–37 FEET
5%–10%	37–57 FEET
10%–20%	57–100 FEET
20% MAXIMUM	100 FEET

- VEGETATION BUFFER TABLE NOTES:
1. THE MINIMUM WIDTH FOR ANY VEGETATION BUFFER IS 25 FEET. FOR EVERY 1% INCREASE OF THE SLOPE ADD 4 FEET TO THE VEGETATION BUFFER WIDTH.
 2. INSTALL VEGETATION BUFFERS ENTIRELY WITHIN THE RIGHT-OF-WAY.
 3. FOR VEGETATION BUFFERS THAT ARE USED AS PERIMETER CONTROL (TYPE 1):
 - a. THE MINIMUM WIDTH FOR ANY VEGETATION BUFFER IS 25 FEET WHEN BUFFER WIDTHS LISTED IN THE TABLE ABOVE ARE NOT FEASIBLE.
 - b. USE ADDITIONAL BMPS WHEN THE MINIMUM BUFFER WIDTH CANNOT BE ACHIEVED.
 4. THE WIDTH OF VEGETATION BUFFERS THAT ARE NATURAL BUFFER AREAS AS REQUIRED BY THE CGP (TYPE II) MUST ALSO COMPLY WITH THE WIDTH REQUIRED BY LOCAL ORDINANCES, IF GREATER THAN 25 FEET.

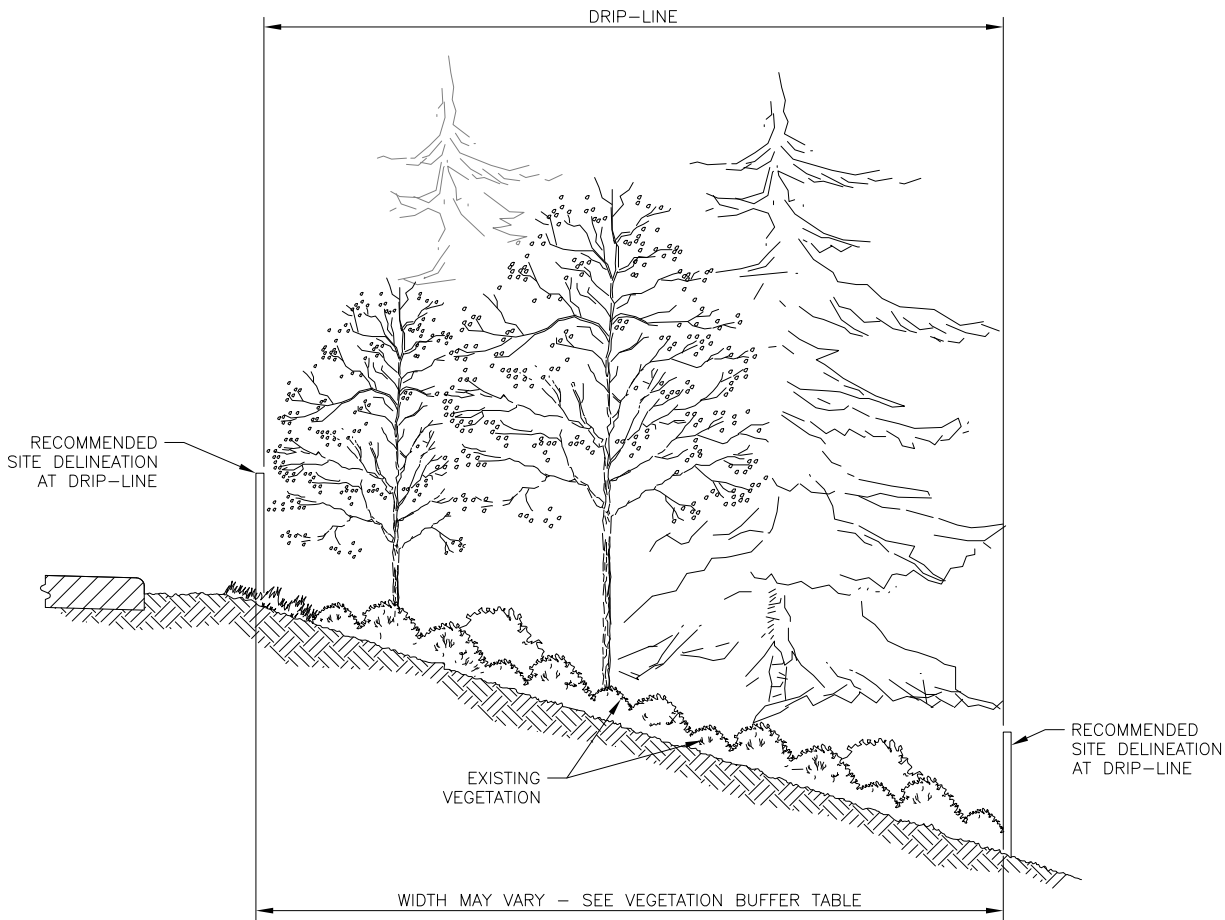
REVISIONS		
Date	Description	By

State of Alaska DOT&PF

VEGETATION
BUFFER

APPROVED

Date12/2015X/XX/XX

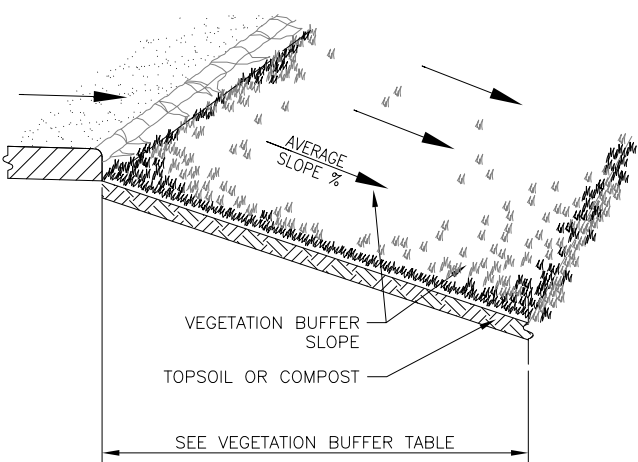


SECTION

EXISTING VEGETATION BUFFER

NOT TO SCALE

- EXISTING VEGETATION BUFFER AREA NOTES:
- INSTALLATION
1. DELINEATE UNDISTURBED NATURAL AREAS OF VEGETATION IDENTIFIED IN THE PLANS WITH METHODS CONSISTENT WITH THE SITE DELINEATION SPECIFICATION PRIOR TO COMMENCEMENT OF CLEARING AND GRUBBING OPERATIONS OR OTHER SOIL DISTURBING ACTIVITIES.
 2. ENSURE ALL OTHER SEDIMENT CONTROL MEASURES USED IN CONJUNCTION WITH THE VEGETATION BUFFER AREAS ARE IN PLACE AND FUNCTIONING PROPERLY.
 3. DO NOT ALLOW CONSTRUCTION MATERIALS, EQUIPMENT, OR PARKING ON THE VEGETATION BUFFER AREAS OR WHERE THE ROOT-ZONE OF THE VEGETATION MAY BE DAMAGED.



PERSPECTIVE

NEW VEGETATION BUFFER

NOT TO SCALE

- NEW VEGETATION BUFFER AREA NOTES:
- THIS BMP IS NOT APPROPRIATE FOR PROJECTS LASTING LESS THAN 30 DAYS. THIS BMP IS NOT APPROPRIATE FOR ALL CLIMATE ZONES IN ALASKA.
- MATERIAL
TOPSOIL OR COMPOST

SEED, FERTILIZER, MULCH

- INSTALLATION
1. ENSURE ALL SEDIMENT CONTROL MEASURES IDENTIFIED IN THE SWPPP (SUCH AS SILT FENCE AND DIVERSIONS) ARE IN PLACE TO PROTECT WATERS OF THE U.S. UNTIL THE VEGETATION BUFFER AREA IS ESTABLISHED.
 2. ESTABLISH VEGETATION USING SPECIFIED SEED, FERTILIZER, AND MULCH. IF SEED MIX IS NOT SPECIFIED, USE PERMANENT SEED MIX FOR PERMANENT, POST-CONSTRUCTION BUFFERS AND FAST GROWING ANNUAL RYE FOR TEMPORARAY BUFFERS.
 3. MAINTAIN VEGETATION AND PROVIDE IRRIGATION AS NECESSARY TO ENSURE VIGOROUS GROWTH AND TO PREVENT DIEBACK.
 4. DELINEATE VEGETATION BUFFER AREAS WITH METHODS CONSISTENT WITH THE SITE DELINEATION SPECIFICATION AT THE EDGE OF THE NEW VEGETATION BUFFER.
 5. AVOID DAMAGE TO THE VEGETATION BUFFER OR ROOT-ZONE BY NOT ALLOWING CONSTRUCTION MATERIALS, EQUIPMENT OR PARKING ON THEM.

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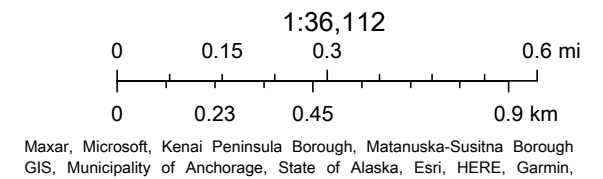
Appendix B

ESCP Plan Set

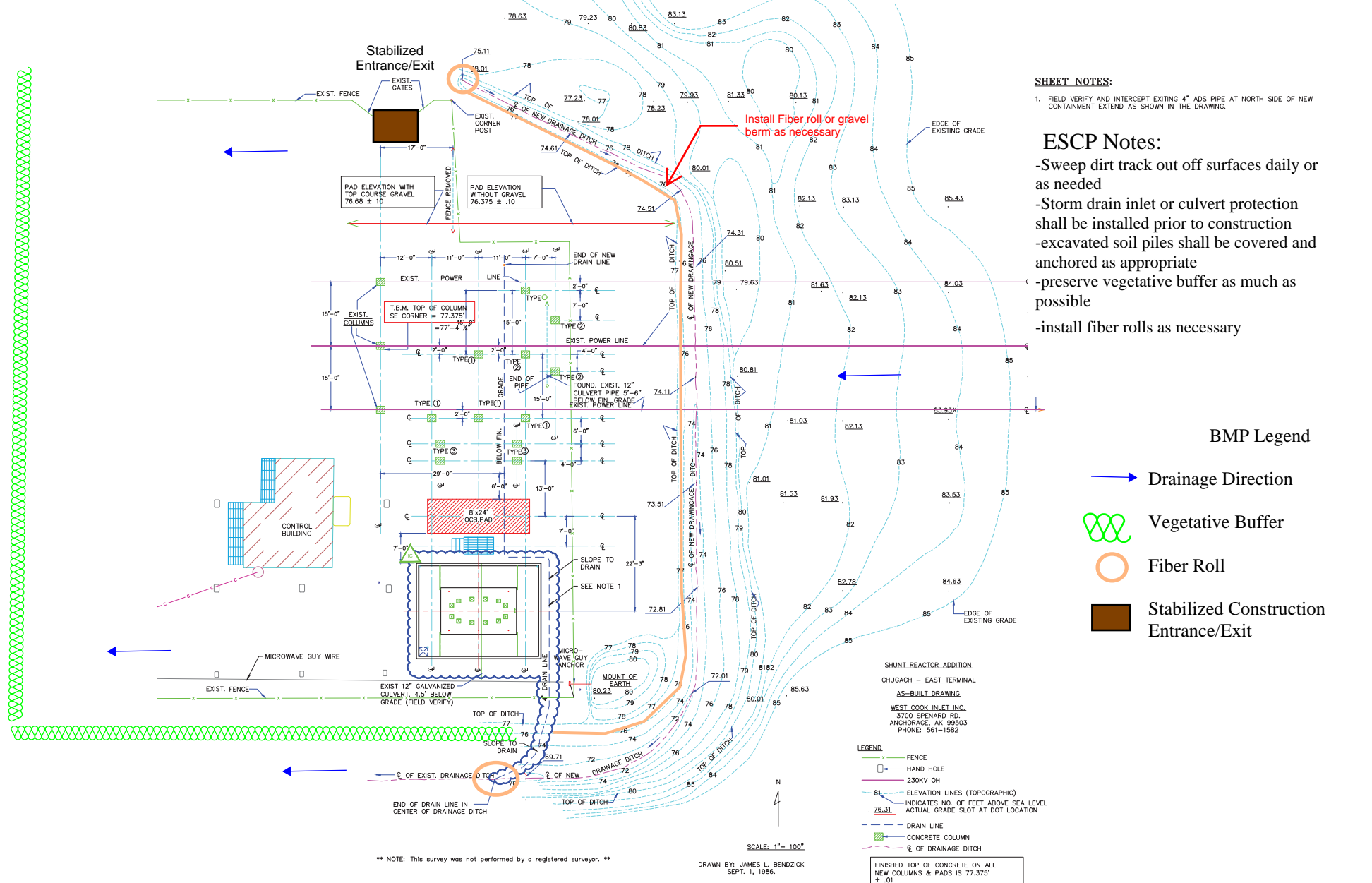
Six Mile East Reactor Replacement



February 7, 2023



ESCP Plan Set



PROJECT: SIX MILE EAST CABLE TERMINAL REACTOR REPLACEMENT					
ENG./DESIGN: JESSE MOE / AUNG THUYA					
W.O. # E2120054					
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN. BY/DATE	REVIEWED MOD./SUPP./DATE	APPROVED DIRECTOR/DATE	ENG. STAMP
1	35% SUBMITTAL	AAS 12/09/22			

NO.	RECORD REVISION	CAD DRAWN BY	W.P.#	N.O. NUMBER	RECORD APPROVED	DATE
0		DWB	-	-	-	-
1	ADD TITLE BLOCK AND CLEANED UP	ARCTIC CAD	-	-	-	11/2/99
2	NEW DRAWING NUMBER ISSUED	DC	-	H9958708	-	1/30/01
3	MOVE FROM ELECT TO SITE & STRUCT	JOS/GJ	-	-	L. SUMAN	8/16/07
4	HYBRID INTO CEA TITLE BLOCK	BH	-	-	-	12/17/18
5	CONVERT RASTER IMAGE TO CAD DRAWING BY DESIGN PRESENTATIONS	DP	-	-	AM	11/09/21



Chugach Electric Association, Inc.
5601 Electron Drive - P.O. Box 196300
Anchorage, Alaska 99519-6300

DRAWING NAME:		SIX MILE EAST CT SITE & STRUCTURAL SITE PLAN	
CONFIDENTIAL		SMET-SS-0026-0001-3-1.dwg	
DRAWING NO.:		SMET-SS-0026	
SHEET: 0001 OF 1		PAGE: 4 / 22	

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