Erosion and Sediment Control Plan

Mountain Ash Limited Partnership Summit Pit

SLR Project No: 212.06650.00006 April 2021

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Erosion and Sediment Control Plan

Mountain Ash Limited Partnership Rocky View County, Alberta SLR Project No: 212.06650.00006

Prepared by SLR Consulting (Canada) Ltd. 200 – 708 11th Ave SW Calgary, Alberta, T2R 0ER

for

Mountain Ash Ltd. Partnership 1945 Briar Crescent NW Calgary, AB, T2N 3V6

April 2021

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1 copy (PDF) – Mountain Ash Limited Partnership 1 copy - SLR Consulting (Canada) Ltd.



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1.0 INTRODUCTION

Mountain Ash Limited Partnership (Mountain Ash) is planning to develop the Summit Pit (the Project) along Highway 567 within NW and SW 31-026-03 W5M, northeast of the Town of Cochrane, in Rocky View County (RVC), Alberta (Figure 1). The Project will encompass approximately 208 acres (84 ha) excluding existing road rights-of-way. Mountain Ash is applying for Phase 1 of a six-phase mining plan. This land is currently owned by 1410266 Alberta Ltd. (a general partner of Mountain Ash). Summit Pit received land use and a master site development plan (MSDP) approval on March 2, 2021 (Land Use Bylaw C-8051-2020).

1.1 Soil Description

Soils across the Project area are loam to clay loam Orthic Black Chernozemics of the Dunvargan soil series, with Gleysolic soils present in poorly drained wetland areas (SLR, 2020). These soils have low wind erosion risk and moderate water erosion risk (SLR, 2020). No sensitive soils were observed (SLR, 2020).

1.2 Surface Conditions

The Project is located within the Foothills Parkland Natural Subregion where hay or feed crops are dominant. Vegetation communities are primarily non-native hay crop, tame pasture and non-native species associated with the residences (SLR, 2020). Some native pasture remains, and pockets of aspen trees were found in south half of site (SLR, 2020).

1.3 Drainage Patterns

The Project area slopes southeast from topographic high to the north, with a low-relief valley feature running northwest to southeast across the NW ¼ section (SLR, 2020). The SW ¼ section slopes steeply south-westerly into a valley running west-northwest to east-southeast, leading to Bighill Creek (SLR, 2020).

2.0 EROSION AND SEDIMENT CONTROL

The primary objectives of Erosion and Sediment Control (ESC) are to prevent offsite sedimentation into adjacent vegetated lands and specifically into any adjacent permanent or ephemeral watercourses/wetlands.

2.1 Stormwater Management During Operations

During operations, a series of conveyance ditches will be in place to capture onsite drainage/stormwater and transport it to a series of settlement ponds. The intent is to install these stormwater control measures around the entire site, encompassing all 6 phases. For the purposes of this plan, only controls associated with Phase 1 will be considered and constructed at this time. See Figure 2 for locations of diversion and conveyance ditches and settlement ponds.

See section 2.2.1 for recommended ESC measures for these conveyance ditches.

2.2 Temporary Erosion and Sediment Control Measures

Temporary ESC measures are necessary during construction and will be installed in specified work areas as required. In post-construction, when areas are suitably stabilized, temporary sediment control measures will be removed.

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Temporary ESC measures are summarized below and shown on Figure 2:

- temporary sediment control (perimeter silt fence) primarily along south and east boundaries of phase 1
- temporary sediment control (silt fence) along haul route adjacent to wetland preservation area
- temporary sediment control (v-ditch/berm with check dams) to provide some runoff storage in unprotected areas
- run-on control (diversion ditch) along west and north boundaries to intercept drainage from upslope areas
- temporary erosion control (scour matting) at exit points from diversion ditches into surrounding environment
- stormwater controls (conveyance ditches and settlement ponds) to convey runoff to ponds to allow sediments to settle
- temporary erosion control (rolled erosion control product) in diversion and conveyance ditches to prevent erosion and reduce potential for downslope sedimentation
- temporary sediment control (check dams) in diversion and conveyance ditches to reduce runoff velocity
- temporary erosion control (hydro-mulch/tackifier) on all overburden areas and other disturbed areas that need to be stabilized beyond the short-term
- good housekeeping (gravel access pad) to reduce dirt/mud tracking onto adjacent paved roadways
- dust control applications, namely Calcium Chloride used on internal haul routes and potentially other gravel surfaces that accommodate common vehicle movements and traffic during operations

2.2.1 Extraction Area and Overburden

2.2.1.1 Diversion Ditch

- Diversion ditches will be built along north and west boundaries of phase 1 to capture runoff from upslope areas and direct it away from active extraction area.
- To prevent erosion and reduce downstream sedimentation, conveyance ditches will be covered with a Rolled Erosion Control Product (RECP). In most areas, a straw-coconut erosion control blanket will suffice to handle sheer stress velocity and prevent erosion. However, in steeper areas, a more durable RECP such as turf reinforcement matting (TRM) may have to be used to handle a higher runoff velocity. To prevent undermining by runoff, ensure that the top or leading edge of RECP is trenched in and covered with soil and that enough staples are used. Always install per manufacturer's specifications and instructions. See construction detail on Figure 3.

Mountain Ash Limited Partnership Summit Pit | Erosion and Sediment Control Plan

• To further reduce runoff velocity in ditches, check dams (e.g., sediment logs, Geo-Ridges) should be installed, especially in steeper areas. In very steep areas, rock check dams should be installed to ensure durability during storm events. See construction detail for rock check dam in Figure 3.

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 To prevent erosion at exit points of diversion ditches into surrounding natural environment, install ScourStop™ (or equivalent product) at exit points. Locations are shown in Figure 2. Once ditch is in place install, ScourStop™ per manufacturer's specifications. See Appendix A for ScourStop™ design and installation guide.

2.2.1.2 Conveyance Ditch

Conveyance ditch around perimeter of site is still in conceptual mode. Final design of conveyance ditch will not be exactly as shown in Figure 2. Still, same measures for cover (i.e., RECP) and runoff velocity reduction (i.e., check dams) will apply to conveyance ditch.

2.2.1.3 Silt Fence

- Before construction, trench in silt fence i) along east and south boundaries of phase 1, ii) along south boundary and around southwest corner of overburden to the west of phase 1, and iii) along east side of access road at north end, adjacent to wetland preservation area. Locations are shown in Figure 2. See construction detail on Figure 3 for silt fence installation and maintenance instructions. Ensure j- hooks are installed at least every 30 m, and even closer together in steeper areas.
- Silt fence not keyed in properly or otherwise not installed per manufacturer's recommendations must be removed and re-installed.
- Repair as soon as damaged and remove sediment build-up when it reaches half of fence height.
- Remove all silt fencing once upslope areas have been vegetated or upon project completion.

2.2.1.4 V-ditch/Berm with Check Dams

- To provide for temporary detainment of runoff, install v-ditch/berm with check dams along south boundary between west overburden area and south end of diversion ditch. Location is shown in Figure 2. Dig ditch with tilting blade bulldozer, backhoe with articulating bucket or skid steer. Track pack or bucket-pack berms and check dams. Install check dams at minimum intervals of 10 m and below the height of the ditch. See construction detail on Figure 3 for installation instructions.
- Pump water out of ditches when half full to restore storage capacity. Pump water to sediment ponds that does not drain to environmentally sensitive areas.
- Repair any breaches in ditches or check dams. When accumulated sediment reaches one third the depth of the ditch, remove excess sediment and spread in an area that will not flow to environmentally sensitive areas.

2.2.2 Access Road

Access road (Range Road 40), off Highway 567 is paved, and starting in northwest corner of overall site and extending southwards for approximately 200 m and the eastwards, then south into to phase 1 extraction area. See location in Figure 2.

Temporary internal haul road, within site, will be graded and surfaced with a gravel base and treated with Calcium Chloride for dust control. During operations, the north access point will be paved. If temporary stabilization is needed before paving, install gravel pad to help reduce offsite dirt tracking and dust. See construction detail scale area in Figure 3.

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2.3 Dust Control

Dust emissions during construction activities will be controlled, as necessary. Water truck will be used on disturbed areas and haul routes, especially during dry, windy conditions.

For comprehensive account of dust control measures, refer to SLR's Dust Control Plan for Summit Pit (April 2021) written for the development permit application.

2.4 Stockpile Stabilization

Stripped materials during the development of Phase 1 will be placed in three stockpiles, topsoil, subsoil and overburden. Overburden removed from south portion of Phase 1 will be placed along south boundary of Phase 1, and overburden taken from north portion of Phase 1 will be directly placed into the reclamation zone created in the south portion of Phase 1.

Before excavation, silt fence will be installed along south boundary, downslope of these proposed overburden areas, to address and mitigate the potential for sediment transfer to adjacent areas.

Once overburden areas are in place, hydro-mulch/tackifier will be applied in these areas to provide temporary stabilization until final reclamation efforts occur. See Figure 2. Before stabilization, watering of stockpiles may be necessary to suppress dust. All stockpiles will be vegetated and maintained to prevent soil erosion and stockpile loss.

2.5 Permanent Erosion and Sediment Control Measures

Final reclamation plan for phase 1 has not yet been completed. ESC objective is to return all disturbed areas, including overburdens, to a vegetated state.

Ultimately, a 15 m wide berm will be built along the entire east boundary. It will be vegetated, including a row of trees planted along the top of the berm.

2.6 Best Management Practices

2.6.1 Before Construction

- Clearly stake out work area with flagging tape to minimize extent of disturbance and vegetation is not unnecessarily removed.
- Locate all laydown areas on flat terrain. If necessary, install containment measures (e.g., sediment logs, containment berms) around these areas.
- Install perimeter ESC measures (e.g., silt fence) before earthworks and placement of overburden starts.
- Install stabilized access point into site to reduce potential of dirt/mud tracking onto adjacent roadways.



2.6.2 During Construction

- Install additional ESC measures, as needed, to ensure onsite runoff is dealt with and not leading to offsite sedimentation.
- Provide enough watering or other approved dust control measures (e.g., calcium chloride) to minimize dust on haul roads, stockpiles and any other loose soil onsite, especially during dry windy conditions.
- Complete an erosion and sediment control inspection and report weekly and after a significant or prolonged rainfall event or snowmelt. A significant rainfall event is typically defined as greater than 12 mm of rainfall during a 24-hour period. See Section 2.7.

2.6.3 Post Construction

- Restore/reclaim all disturbed areas as soon as practical and where possible.
- Re-use salvageable subsoil for backfill and remove all other excavated material.
- To minimize slope erosion, apply topsoil and regionally approved native grass seed mix.
- Remove and dispose all temporary sediment control measures when no longer needed.
- Remove all unused materials from site and dispose construction debris at an approved waste transfer facility.

2.6.4 General Mitigation Measures

- Ensure all vehicles and equipment brought onsite are free of debris, grease, oil, mud or leaks.
- Conduct cleaning, fueling and servicing of all equipment at a safe distance (preferably 100 m) away from watercourses, wetlands or environmentally sensitive areas. If necessary, conduct these activities in a contained area that is lined and bermed.
- Halt work during heavy rains/snowfall.
- Site-specific spill response plan that includes emergency contact numbers and outlines measures to contain, control, report and clean-up spills and releases of deleterious substances. At a minimum, if a release or spill occurs, immediately notify the Site Construction Supervisor; estimate the volume of fluid released and cease operations to assess the need for and extent of containment measures.
- Report all environmental emergencies and/or releases to:
 - o Alberta 24 Hour Spill Reporting Line: 1.800.222.6514; and/or
 - o DFO Emergency Response Line: 1.800.889.8852
- Keep a copy of ESC Plan and all regulatory approvals onsite during construction activity.

2.7 Monitoring

Regular supervision and environmental monitoring during construction process is required, to ensure regulatory compliance, oversee implementation of works in accordance with design plans, minimize site disturbances, limit seepage into work areas and apply preventative control measures.

All erosion and sediment control measures will be continually monitored. A formal inspection and report will be conducted weekly and after a heavy or prolonged rainfall event or snowmelt. A heavy rainfall event is typically defined as greater than 12 mm of rainfall during a 24 hour period.

ESC inspection report will be a written and photographic record of ESC conditions and maintenance requirements. Digital photos will confirm that erosion and sediment control measures were installed and identify requirements for remedial actions. Each photo will be dated and identified by a photo number.

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A copy of each inspection report will be kept onsite. Maintenance must be carried out in timely and diligent manner, ideally within 48 hours of discovering any damaged installation.

Erosion and sediment control inspection reports will be made available to all government regulators on request. In addition, all other regulatory approvals will be kept onsite during construction.

If there is a temporary work stoppage, inspection and maintenance of erosion and sediment control measures must continue.

3.0 REFERENCES

SLR Consulting (Canada) Ltd. 2020. Mountain Ash Limited Partnership Aggregate Operation NW and SW 31-26-03 W5M, Rocky View County, Alberta Biophysical Impact Assessment Report. January 2020. Calgary, Alberta.

4.0 STATEMENT OF LIMITATIONS

This report has been prepared and the work referred to in this report has been undertaken by SLR for Mountain Ash Limited Partnership., hereafter referred to as the "Client". The report has been prepared in accordance with the Scope of Work and agreement between SLR and the Client. It is intended for the sole and exclusive use of the Client. Other than by the Client and as set out herein, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of SLR.

This report has been prepared for specific application to this site and site conditions existing at the time work for the report was completed. Any conclusions or recommendations made in this report reflect SLR's professional opinion.

Information contained within this report may have been provided to SLR from third party sources. This information may not have been verified by a third party and/or updated since the date of issuance of the external report and cannot be warranted by SLR. SLR is entitled to rely on the accuracy and completeness of the information provided from third party sources and no obligation to update such information.

Nothing in this report is intended to constitute or provide a legal opinion. SLR makes no representation as to the requirements of compliance with environmental laws, rules, regulations, or policies established by federal, provincial, or local government bodies. Revisions to the regulatory standards referred to in this report may be expected over time. As a result, modifications to the findings, conclusions, and recommendations in this report may be necessary.



Erosion and Sediment Control Plan

Mountain Ash Limited Partnership Summit Pit SLR Project No: 212.06650.00006





Project Information Legal Description: Within of N.	W. & S.W. Sec.31-26-03-W5M		Con : Sprir	struction Start g 2021				
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		The information contained herein may be compiled without prior notification. While every effort has beer time of publication, ECC assumes no liability fo	from numerous third party materials t made by ECC to ensure the accuracy r any errors, omissions, or inaccura	hat are subject to periodic change of the information presented at the acies in the third party material.





General Construction ESC Notes:

- 1) Keep the following information on site and available upon request::
 - a. The Erosion and Sediment Control (ESC) Drawing(s), including all amendments; and,
 - b. Weekly documentation (including photos and up-to-date written records) detailing implementation, inspection and maintenance of ES measures.
- 2) Complete and document inspections of all ESC measures weekly and at critical times when erosion or sediment releases could occur after heavy and/or prolonged rainfall and rapid snowmelt (defined as >12 mm precipitation within any 24 hour period or snowmelt on wet or thawi soils).
- 3) Update approved ESC Report and/or Drawing(s) when there are changes to the erosion and sediment control measures or implementation. 4) Promptly address deficiencies documented during inspection of ESC measures and document the maintenance. Immediately report off-site
- releases of sediment-laden water or other contaminants to the environment. Contact Alberta 24 Hour Spill Reporting Line: 1.800.222.6514 5) Cover or stabilize longer term stockpiles (in place more than 30 days) with mulch and tackifier, vegetation cover or other suitable measures Place stockpiles on site so material will not be eroded to off-site areas. Where necessary, install sediment control measures (silt fence, sediment logs, etc.) on the down-gradient side of stockpiles.
- 6) Where necessary, control dirt tracking at all site access points during construction, by means of a stabilized, well-maintained entrance/exit. 7) Should all or part of the site be left in a state where active construction is not occurring for a period greater than six months, the following
- conditions must be met: a. Maintain the inspection frequency listed in #2 unless there is written approval from Rockyview County that states otherwise; and, b. Keep pertinent documentation onsite. Documentation may be kept at an alternate specified location via an amendment.
- 8) Conduct a pre-winter inspection to note any ESC deficiencies that need to be addressed before freeze-up.

Specific Site ESC Notes:

- 1) Before construction, trench in silt fence i) along east and south boundaries of phase 1, ii) along south boundary and around southwest corn overburden - to the west of phase 1, and iii) along east side of access road at north end, adjacent to wetland preservation area. Locations a shown in Figure 2. See construction detail on Figure 3 for silt fence installation and maintenance instructions. Ensure j-hooks are installed a least every 30 m, and even closer together in steeper areas.
- 2) During operations, the north access point will be paved. If temporary stabilization is needed before paving, install gravel pad to help reduce offsite dirt tracking. See construction detail for gravel pad in Figure 3.
- 3) To provide for temporary detainment of runoff, install v-ditch/berm with check dams along south boundary between west overburden area a south end of diversion ditch. Location is shown in Figure 2. Dig ditch with tilting blade bulldozer, backhoe with articulating bucket or skid stee Track pack or bucket pack berms and check dams. Install check dams at minimum intervals of 10 m and below the height of the ditch. See construction detail on Figure 3 for installation instructions.
- 4) To prevent erosion and reduce downstream sedimentation, conveyance ditches will be covered with a Rolled Erosion Control Product (REC In most areas, a straw-coconut erosion control blanket will suffice to handle sheer stress velocity and prevent erosion. However in steeper areas, a more durable RECP such as turf reinforcement matting (TRM) may have to be used to handle a higher runoff velocity. To prevent undermining by runoff, ensure that the top or leading edge of RECP is trenched in and covered with soil and that enough staples are used. Always install per manufacturer's specifications and instructions. See construction detail on Figure 3.
- 5) To further reduce runoff velocity in ditches, check dams (e.g. sediment logs, Geo-Ridges) should be installed, especially in steeper areas. In very steep areas, rock check dams should be installed to ensure durability during storm events. See construction detail for rock check dams Figure 3.
- 6) To prevent erosion at exit points of diversion ditches into surrounding natural environment, install ScourStop™ (or equivalent product) at exit points. Locations are shown in Figure 2. Once ditch is in place install, ScourStop™ per manufacturer's specifications. See Appendix A for ScourStop™ design and installation guide.
- 7) Dust emissions during construction activities will be controlled as necessary. Water truck should be used on disturbed areas and haul routes especially during dry, windy conditions. In addition, for haul routes, an approved dust suppressant (e.g. calcium chloride) may be used to ke dust down. Developer is responsible for dust control twenty-four hours a day, seven days a week throughout the duration of the project.
- 8) Once overburden areas are in place, hydro-mulch/tackifier will be applied in these areas to provide temporary stabilization until final reclamation efforts occur. See Figure 2. Before stabilization, watering of stockpiles may be necessary to suppress dust.

9) Promptly clean any dirt/mud tracked onto adjacent roadways.

APPRO	OVING AUTHORITY OFFICE USE	FILE No.	
Project Information		Construction Start Spring 2021	
Legal Description: Within of I	N.W. & S.W. Sec.31-26-03-W5M	-F	
Total Site Area:90.69 haPhase 1 Area:14.38 ha			
Key Plan	22		Cit Air
	Cochrane Lake	Road 567	
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Scour Stop Specifications and Installation Guide

Erosion and Sediment Control Plan

Mountain Ash Limited Partnership Summit Pit SLR Project No: 212.06650.00006



ScourStop® DESIGN GUIDE Circular Culvert Outlet Protection

why use the **SCOURSTOP SYSTEM?**

ScourStop transition mats protect against erosion and scour at culvert outlets with a vegetated solution in areas traditionally protected with rock or other hard armor.

ScourStop is part of a system that includes semi-rigid transition mats installed over sod or turf reinforcement mats. Each 4' x 4' x $^{1}/_{2}$ " mat is made of high-density polyethylene and secured tightly to the ground with anchors.



Circular Culvert Outlet Protection

DIDE	VELOCITY S	10 FT/SEC	10 < VELOCITY < 16 FT/SEC				
DIAMETER	TRANSITION MAT W x L	QUANTITY OF MATS	TRANSITION MAT W x L	QUANTITY OF MATS			
12"	4' x 4'	1	4' x 8'	2			
24"	8' x 8'	4	8' x 12'	6			
36"	8' x 12'	6	12' x 20'	15			
48"	12' x 16'	12	12' x 24'	18			
60"	12' x 20'	15	16' x 32'	32			
72"	16' x 24'	24	20' x 36'	45			

These are minimum recommendations. More ScourStop protection may be needed depending upon site and soil conditions, per project engineer.

- If velocity is greater than 16 fps, contact manufacturer for design assistance.
- ScourStop mats have been shown to at least double the effectiveness of turf reinforcement mats.
- ScourStop fully vegetated channel (2:1 slope): velocity = 31 fps, shear stress = 16 psf.







ScourStop® Installation Recommendations



- 1. ScourStop mats must be installed over a soil cover: sod, seeded turf reinforcement mat (TRM), geotextile, or a combination thereof.
- 2. For steep slopes (>10%) or higher velocities (>10 ft/sec), sod is the recommended soil cover.
- 3. Follow manufacturer's ScourStop Installation Guidelines to ensure proper installation.
- 4. Install ScourStop mats at maximum 1-2" below flowline of culvert or culvert apron. (No waterfall impacts onto ScourStop mats.)
- 5. Performance of protected area assumes stable downstream conditions.





PERFORMANCE • AESTHETICS NPDES-COMPLIANT • COST-EFFECTIVE

ScourStop may be used in many applications: culvert outlets, curb outfalls, spillways, overflow structures, stream banks, slopes, etc. The details in this example are for typical culvert outlet protection. Project engineer shall determine the limits of soil cover and ScourStop.

Downstream: Continue soil cover beyond outlet apron area to properly protect downstream channel and prevent head-cutting.

> Width: Install soil cover wider than proposed ScourStop protection (recommend soil cover full width of channel - across bottom and up both slopes).



- **Electric Hammer:** Rotary hammer or demolition hammer the greater the impact energy (ft/lbs) and the heavier the hammer, the greater the driving force to install bullet anchors into soil (e.g., Makita HM1214C, Hilti or other).
 - Use hammer-only mode, no rotation.
 - Use 3/4" Ground Rod Driver, which fits onto ScourStop HD Driver.
 - Recommend two ScourStop drivers per electric hammer to achieve maximum efficiency.

Maintenance:

HANES" GEO COMPONENTS"

A Leggett & Platt & COMPANY

- No maintenance is required for a ScourStop solution.
- Mowing over a vegetated ScourStop solution is allowed minimum height of 4" recommended.
- Mowing is not recommended where soft, saturated soils exist.
- ScourStop surface may be slippery when wet use caution.
- New construction: soil may consolidate, so lock washers may need to be re-tightened after settling.

A LEADER in the **GEOSYNTHETIC** and **EROSION CONTROL** industries Learn more about our products at: HanesGeo.com | 888.239.4539







ScourStop[®] **INSTALLATION GUIDELINES**

- **Site Preparation:** 1 Finish grading to ensure positive drainage and eliminate ponding. 2 Create defined drainage channel to carry stormwater at outlet and downstream.
 - 3 Compact soil in all areas of fill to create firm seed bed.
 - 4 Install subsurface drainage tile if constant water is expected.
 - 5 Grade a smooth transition from outlet to discharge area (allow for soil cover thickness and ScourStop thickness).
 - 6 Max. 2" drop from culvert outlet/curb opening to top of ScourStop mats (no waterfall impact).



- Soil Cover: 1 ScourStop must be placed over soil cover (sod, TRM, or geotextile) not over bare ground, therefore, install soil cover first.
 - 2 Channel flow data must be evaluated to determine proper soil cover.
 - 3 Install sod; water thoroughly after completing installation.
 - 4 Or install turf reinforcement mat (TRM), after seed and fertilizer, then water thoroughly after completing installation.
 - 5 Non-vegetated: install geotextile (minimum 6 oz. non-woven geotextile fabric).



ScourStop Transition Mat Installation:

- 1 After proper grading and installation of selected soil cover, place ScourStop mats beginning at culvert outlet/curb opening, or at toe of slope, stream bank, or spillway.
- 2 Place ScourStop mat(s) adjacent to culvert/curb and adjacent to other ScourStop mats to avoid gaps.
- 3 Do not overlap adjacent mats unless necessary to conform to channel geometry.
- 4 If desired, ScourStop mats may be cut with circular saw or hand saw.



ScourStop Bullet Anchors:

Direction of flow

SDS MAX .75" Ground Rod Drive

Bullet Anchor Drive

×

Anchor pattern



- 2 Insert bullet anchor strap into lock washer (3"-4").
- 5 Twist and pull the driver out of the soil. Wipe driver tip with rag or glove to remove soil.
- 6 Grasp end of strap with one hand and push down on lock washer with the other until lock washer is flush with mat.
- 7 Place foot on top of lock washer, then give a firm tug on the strap (quick tug, like setting a fish hook) to set the pivoting bullet anchor.
- 8 Use additional anchors if necessary to secure mats tightly to soil surface.



Manual slide hammer or economy driver also

PERFORMANCE • AESTHETICS • NPDES-COMPLIANT • COST-EFFECTIVE



- 1 Use ScourStop bullet anchors (minimum of 8 anchors per mat) to secure mats on top of soil cover and tightly to the soil surface.
- 3 Insert the machined end of the driver into the bullet anchor.
- 4 Drive anchor through a 2" hole in mat (per recommended anchor
- pattern), stopping before lock washer is at least 1" above mat.







ScourStop® Transition Mats

ScourStop[®] Transition Mats are an engineered, proven, bio-technical alternative to traditional hard-armor systems. ScourStop[®] Transition Mats are manufactured of a semi-rigid HDPE. When combined with soft-armor soil cover and deep-soil earth anchors, the ScourStop[®] system mechanically protects soil from severe scour and erosion. The ScourStop[®] system offers greater protection than vegetation alone or rip rap and is lab-tested and field-proven to protect against considerably higher shear stresses and velocities. ScourStop[®] Transition Mats provide a permanent, low-maintenance solution with immediate, day-one protection and impact resistance over highly erosive areas such as stormwater outfalls, curb outfalls, overflow structures, drainage channels, levees, and shorelines. ScourStop[®] Transition Mats conform to the property values listed below:

PROPERTY	TEST METHOD	ENGLISH	METRIC
Properties			
Mass/Unit Area	ASTM D6566	0.942 lbs/ft ²	4.599 kg/m ²
Thickness	ASTM D6525	0.463 in	11.735 mm
Wide Width Tensile Strength	ASTM D4595	3053 lbs/ft	4.139 kN/m
Percent Open Area	Calculated	50 %	50 %
UV Stability	ASTM D4355	87 %	87 %
Manning's n	Calculated	0.039	0.039
Culvert Outfall Test Exit Velocity Discharge	Prototype	16 ft/sec	4.877 m/sec
Velocity Day 1 Performance Fully Vegetated	Flume Testing ASTM D6460	19 ft/sec	5.791 m/sec
Shear Day 1 Performance Fully Vegetated	Flume Testing ASTM D6460	13 lbs/ft ²	63.472 kg/m ²

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