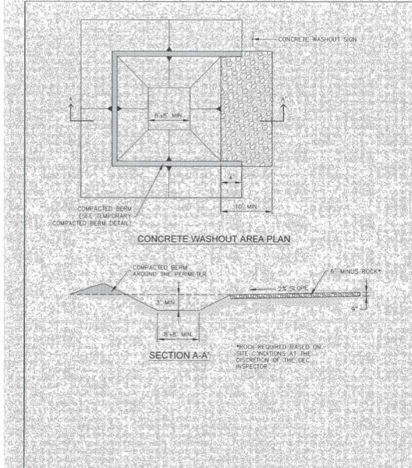


CONCRETE WASHOUT AREA PLAN

SECTION A-A'

CWA

CONCRETE WASHOUT AREA

INSTALLATION NOTES

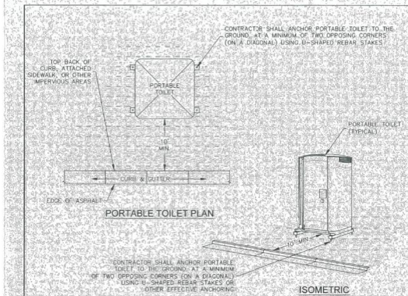
1. SEE PLAN VIEW FOR:
   -LOCATION OF CONCRETE WASHOUT AREA
2. LOCATE AT LEAST 50' AWAY FROM STATE WATERS MEASURED HORIZONTALLY.
3. AN IMPERMEABLE LINER (16 MIL MINIMUM THICKNESS) IS REQUIRED IF CONCRETE WASH AREA IS LOCATED WITHIN 400' OF STATE WATERS OR 1000' OF WELLS OR DRINKING WATER SOURCES.
4. DO NOT LOCATE IN AREAS WHERE SHALLOW GROUNDWATER MAY BE PRESENT.
5. THE CONCRETE WASH AREA SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE.
6. CONCRETE WASH AREA SHALL INCLUDE A FLAT SUBSURFACE PIT THAT IS AT LEAST 8' BY 8'.
7. BERM SURROUNDING SIDES AND BACK OF CONCRETE WASH AREA SHALL HAVE A MINIMUM HEIGHT OF 2 FEET.
8. CONCRETE WASH AREA ENTRANCE SHALL BE SLOPED 2% TOWARDS THE CONCRETE WASH AREA.
9. SIGNS SHALL BE PLACED AT THE CONCRETE WASH AREA.
10. USE EXCAVATED MATERIAL FOR PERIMETER BERM CONSTRUCTION.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. THE CONCRETE WASH AREA SHALL BE REPAIRED, CLEANED, OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR CONCRETE WASTE. CONCRETE MATERIALS ACCUMULATED IN THE PIT SHALL BE REMOVED ONCE THE MATERIALS HAVE REACHED A DEPTH OF ⅔ THE HEIGHT OF THE CONCRETE WASH AREA.
3. CONCRETE WASHOUT WATER, WASTED PIECES OF CONCRETE, AND ALL OTHER DEBRIS IN THE SUBSURFACE PIT SHALL BE TRANSPORTED FROM THE JOB SITE IN A WATER-TIGHT CONTAINER AND DISPOSED OF PROPERLY.
4. THE CONCRETE WASH AREA SHALL REMAIN IN PLACE UNTIL ALL CONCRETE FOR THE PROJECT IS PLACED.
5. PERMANENTLY STABILIZE AREA AFTER CONCRETE WASH AREA IS REMOVED.

CWA

CONCRETE WASHOUT AREA



PORTABLE TOILET PLAN

ISOMETRIC

INSTALLATION NOTES

1. PORTABLE TOILETS SHALL BE PLACED A MINIMUM OF 10 FEET BEHIND ALL CURBS, SIDEWALKS, AND OTHER IMPERVIOUS AREAS, 50 FEET FROM STORM INLETS, AND 100 FEET FROM WATERWAYS.
2. PORTABLE TOILETS IN THE RIGHT-OF-WAY ARE REQUIRED TO BE PLACED ON MOBILE TRAILERS AND MUST BE ANCHORED OR WEIGHTED DOWN. PORTABLE TOILETS MAY BE INSTALLED IN ACCORDANCE WITH NOTE #1 IN STAGING AREAS/YARDS.
3. PORTABLE TOILETS SHALL BE SECURELY ANCHORED TO THE GROUND USING U-SHAPED REBAR STAKES, OR OTHER EFFECTIVE ANCHORING.
4. ANCHORING SHALL BE POSITIONED ON AT LEAST TWO OPPOSING (DIAGONAL) CORNERS.
5. TOILET CONTAINMENT PANS MAY BE USED IN PLACE OF A TRAILER AT THE GEC INSPECTOR'S DISCRETION. TOILET CONTAINMENT PANS MUST BE ANCHORED IN PLACE AND MUST NOT BE USED WITHIN THE CITY R.O.W.

MAINTENANCE NOTES

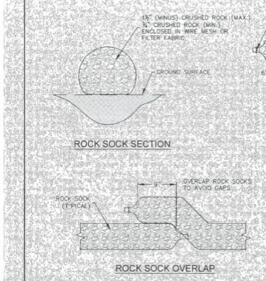
1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. PORTABLE TOILETS SHALL BE SERVICED AT THE NECESSARY INTERVALS TO ELIMINATE THE POSSIBILITY OF OVERFLOW.
3. WHEN THE PORTABLE TOILETS ARE REMOVED, ANY DISTURBED AREAS ASSOCIATED WITH THE INSTALLATION, MAINTENANCE, AND/OR REMOVAL OF THE TOILETS MUST BE PERMANENTLY STABILIZED.

PT

PORTABLE TOILET

APPROVED: SWENT MANAGER

ISSUED: 2/19/19 | REVISED: 8/19/2020 | DRAWING NO. 900-PTM



ROCK SOCK SECTION

ROCK SOCK PLAN

ROCK SOCK OVERLAP

GRADATION TABLE

SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES (No. 4)
2"	100
1½"	90-100
1"	20-55
¾"	0-15
⅜"	0-5

MATCHES SPECIFICATIONS FOR No. 4 COARSE AGGREGATE FOR CONCRETE PER AASHTO M-43. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES.

INSTALLATION NOTES

1. CRUSHED ROCK SHALL BE BETWEEN MAX. 1½" (MINUS) IN SIZE WITH A FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON THIS SHEET AND MIN. ¾" CRUSHED ROCK.
2. WIRE MESH SHALL HAVE OPENINGS SMALLER THAN THE SMALLEST SIZE ROCK.
3. WIRE MESH SHALL BE SECURED USING 'HOG RINGS' OR WIRE TIES AT 6" CENTERS ALONG ALL JOINTS AND AT 2" CENTERS ON ENDS OF SOCKS.

MAINTENANCE NOTES

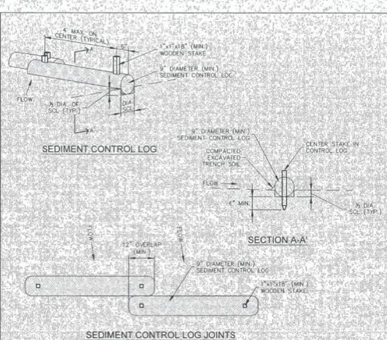
1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ROCK SOCKS SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED OR DAMAGED BEYOND REPAIR.
3. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN THE DEPTH REACHES ½ OF THE HEIGHT OF THE ROCK SOCK.
4. ROCK SOCKS ARE TO REMAIN IN PLACE UNTIL DISTURBED AREA IS STABILIZED.
5. PERMANENTLY STABILIZE AREA AFTER ROCK SOCKS HAVE BEEN REMOVED.

RS

ROCK SOCK

APPROVED: SWENT MANAGER

ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-RS



SEDIMENT CONTROL LOG

SECTION A-A'

SEDIMENT CONTROL LOG JOINTS

INSTALLATION NOTES

1. ALL SEDIMENT CONTROL LOGS MUST BE EMBEDDED TO ⅓ OF THE HEIGHT OF THE LOG.
2. LARGER DIAMETER SEDIMENT CONTROL LOGS NEED TO BE EMBEDDED DEEPER.
3. PLACE SEDIMENT CONTROL LOG AGAINST SIDEWALK OR BACK OF CURB WHEN ADJACENT TO THESE FEATURES.
4. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR OR COCONUT FIBER, AND SHALL BR FREE FROM ANY NOXIOUS WEED SEEDS OF DEFECTS INCLUDING RIPS, HOLES AND OBVIOUS WEAR.
5. IF USING AS SLOPE PROTECTION, INSTALL SEDIMENT CONTROL LOGS ALONG THE CONTOUR.

MAINTENANCE NOTES

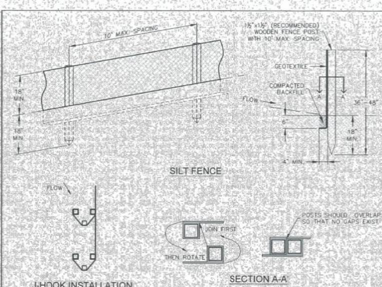
1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES ½ OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.
3. PERMANENTLY STABILIZE AREA AFTER SEDIMENT CONTROL LOGS HAVE BEEN REMOVED.

SCL

SEDIMENT CONTROL LOGS

APPROVED: SWENT MANAGER

ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-SCL



SILT FENCE

J-HOOK INSTALLATION

SECTION A-A'

INSTALLATION NOTES

1. SILT FENCE MUST BE PLACED ON A FLAT SURFACE 2'-5' AWAY FROM TOE OF THE SLOPE TO ALLOW FOR PONDING AND DEPOSITION.
2. COMPACT THE TRENCH USING A JUMPING JACK OR WHEEL ROLLING TO THE POINT THAT THE FENCE RESISTS BEING PULLED OUT OF THE GROUND BY HAND.
3. SILT FENCE SHALL BE TAUT WITH NO SAGS AFTER IT HAS BEEN ANCHORED.
4. FABRIC SHALL BE ATTACHED TO POSTS WITH 1" HEAVY DUTY STAPLES OR 1" NAILS. THESE SHOULD BE PLACED VERTICALLY DOWN THE POST, 3" APART.
5. THE PREFERRED INSTALLATION METHOD USES A TRENCHER OR SILT FENCE INSTALLATION DEVICE.
6. INSTALL SILT FENCE ALONG THE CONTOUR OF THE SLOPES OR IN A MANNER TO AVOID CREATING CONCENTRATED FLOW (SUCH AS A "J-HOOK" INSTALLATION).

MAINTENANCE NOTES

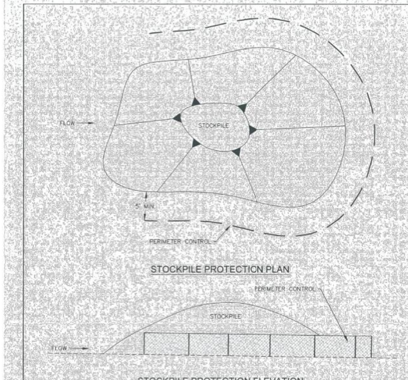
1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES ½ OF THE DESIGN HEIGHT OF THE SILT FENCE.
3. SILT FENCE MUST REMAIN UNTIL THE UPSTREAM DISTURBANCE AREA IS STABILIZED.
4. PERMANENTLY STABILIZE AREA AFTER SILT FENCE IS REMOVED.

SF

SILT FENCE

APPROVED: SWENT MANAGER

ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-SF



STOCKPILE PROTECTION PLAN

STOCKPILE PROTECTION ELEVATION

INSTALLATION NOTES

1. INSTALL PERIMETER CONTROL AROUND STOCKPILE ON DOWNGRADIENT SIDE. PERIMETER CONTROL MUST BE SUITABLE TO SITE CONDITIONS AND INSTALLED ACCORDING TO THE RELEVANT DETAIL.
2. FOR STOCKPILES ON THE INTERIOR PORTION OF A CONSTRUCTION SITE, WHERE OTHER DOWNGRADIENT CONTROLS INCLUDING PERIMETER CONTROL ARE IN PLACE, STOCKPILE PERIMETER CONTROLS MAY NOT BE REQUIRED.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. IF PERIMETER CONTROLS MUST BE MOVED TO ACCESS STOCKPILE, REPLACE PERIMETER CONTROLS BY THE END OF THE WORK DAY.
3. ACCUMULATED SEDIMENT MUST BE REMOVED ACCORDING TO PERIMETER CONTROL DETAIL.

SP

STOCKPILE PROTECTION

APPROVED: SWENT MANAGER

ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-SP

SEEDING & MULCHING

ALL SOIL TESTING, SOILS AMENDMENT AND FERTILIZER DOCUMENTATION, AND SEED LOAD AND BAG TICKETS MUST BE ADDED TO THE CSWMP.

SOIL PREPARATION

1. IN AREAS TO BE SEEDED, THE UPPER 6 INCHES OF THE SOIL MUST NOT BE HEAVILY COMPACTED, AND SHOULD BE IN FRIABLE CONDITION. LESS THAN 85% STANDARD PROCTOR DENSITY IS ACCEPTABLE. AREAS OF COMPACTION OR GENERAL CONSTRUCTION ACTIVITY MUST BE SCARIFIED TO A DEPTH OF 6 TO 12 INCHES PRIOR TO SPREADING TOPSOIL TO BREAK UP COMPACTED LAYERS AND PROVIDE A BLENDING ZONE BETWEEN DIFFERENT SOIL LAYERS.
2. AREAS TO BE PLANTED SHALL HAVE AT LEAST 4 INCHES OF TOPSOIL SUITABLE TO SUPPORT PLANT GROWTH.
3. THE CITY RECOMMENDS THAT EXISTING AND/OR IMPORTED TOPSOIL BE TESTED TO IDENTIFY SOIL DEFICIENCIES AND ANY SOIL AMENDMENTS NECESSARY TO ADDRESS THESE DEFICIENCIES. SOIL AMENDMENTS AND/OR FERTILIZERS SHOULD BE ADDED TO CORRECT TOPSOIL DEFICIENCIES BASED ON SOIL TESTING RESULTS.
4. TOPSOIL SHALL BE PROTECTED DURING THE CONSTRUCTION PERIOD TO RETAIN ITS STRUCTURE, AVOID COMPACTION, AND TO PREVENT EROSION AND CONTAMINATION. STRIPPED TOPSOIL MUST BE STORED IN AN AREA AWAY FROM MACHINERY AND CONSTRUCTION OPERATIONS, AND CARE MUST BE TAKEN TO PROTECT THE TOPSOIL AS A VALUABLE COMMODITY. TOPSOIL MUST NOT BE STRIPPED DURING UNDESIRABLE WORKING CONDITIONS (E.G. DURING WET WEATHER OR WHEN SOILS ARE SATURATED). TOPSOIL SHALL NOT BE STORED IN SWALES OR IN AREAS WITH POOR DRAINAGE.

SEEDING

1. ALLOWABLE SEED MIXES ARE INCLUDED IN THE CITY OF COLORADO SPRINGS STORMWATER CONSTRUCTION MANUAL. ALTERNATIVE SEED MIXES ARE ACCEPTABLE IF INCLUDED IN AN APPROVED LANDSCAPING PLAN.
2. SEED SHOULD BE DRILL-SEEDED WHENEVER POSSIBLE.
   • SEED DEPTH MUST BE ⅓ TO ½ INCHES WHEN DRILL-SEEDING IS USED.
3. BROADCAST SEEDING OR HYDRO-SEEDING WITH TACKIFIER MAY BE SUBSTITUTED ON SLOPES STEEPER THAN 3:1 OR ON OTHER AREAS NOT PRACTICAL TO DRILL SEED.
   • SEEDING RATES MUST BE DOUBLED FOR BROADCAST SEEDING OR INCREASED BY 50% IF USING A BRILLION DRILL OR HYDRO-SEEDING.
   • BROADCAST SEEDING MUST BE LIGHTLY HAND-RAKED INTO THE SOIL.

MULCHING

1. MULCHING SHOULD BE COMPLETED AS SOON AS PRACTICABLE AFTER SEEDING, HOWEVER PLANTED AREAS MUST BE MULCHED NO LATER THAN 14 DAYS AFTER PLANTING.
2. MULCHING REQUIREMENTS INCLUDE:
   • HAY OR STRAW MULCH
     - ONLY CERTIFIED WEED-FREE AND CERTIFIED SEED-FREE MULCH MAY BE USED. MULCH MUST BE APPLIED AT 2 TONS/ACRE AND ADEQUATELY SECURED BY CRIMPING AND/OR TACKIFIER.
     - CRIMPING MUST NOT BE USED ON SLOPES GREATER THAN 3:1 AND MULCH FIBERS MUST BE TUCKED INTO THE SOIL TO A DEPTH OF 3 TO 4 INCHES.
     - TACKIFIER MUST BE USED IN PLACE OF CRIMPING ON SLOPES STEEPER THAN 3:1.
   • HYDRAULIC MULCHING
     - HYDRAULIC MULCHING IS AN OPTION ON STEEP SLOPES OR WHERE ACCESS IS LIMITED.
     - IF HYDRO-SEEDING IS USED, MULCHING MUST BE APPLIED AS A SEPARATE, SECOND OPERATION.
     - WOOD CELLULOSE FIBERS MIXED WITH WATER MUST BE APPLIED AT A RATE OF 2,000 TO 2,500 POUNDS/ACRE, AND TACKIFIER MUST BE APPLIED AT A RATE OF 100 POUNDS/ACRE.
   • EROSION CONTROL BLANKET
     - EROSION CONTROL BLANKET MAY BE USED IN PLACE OF TRADITIONAL MULCHING METHODS.

SM

SEEDING & MULCHING

Kimley»Horn

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2 North Nevada Avenue, Suite 900
Colorado Springs, Colorado 80903 (719) 453-0180

DESIGNED BY: KRK
DRAWN BY: RES
CHECKED BY: KRK
DATE: 8/31/23

CSU GAS - MESA TO MANITOU
PHASES 5.2 & 5.3
GEC PLANS
DETAILS

COLORADO REGISTERED PROFESSIONAL ENGINEER KEVIN REX KOFFORD 49487 8/31/2023

PROJECT NO. 067607121

SHEET 16

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Description

Photograph SSA-1. Example of a staging area with a gravel surface to prevent mud tracking and reduce runoff. Photo courtesy of Douglas County.

A stabilized staging area is a clearly designated area where construction equipment and vehicles, stockpiles, waste bins, and other construction-related materials are stored. The contractor office trailer may also be located in this area. Depending on the size of the construction site, more than one staging area may be necessary.

Appropriate Uses

Most construction sites will require a staging area, which should be clearly designated in SWMP drawings. The layout of the staging area may vary depending on the type of construction activity. Staging areas located in roadways due to space constraints require special measures to avoid materials being washed into storm inlets.

Design and Installation

Stabilized staging areas should be completed prior to other construction activities beginning on the site. Major components of a stabilized staging area include:

- Appropriate space to contain storage and provide for loading/unloading operations, as well as parking if necessary.
- A stabilized surface, either paved or covered, with 3-inch diameter aggregate or larger.
- Perimeter controls such as silt fence, sediment control logs, or other measures.
- Construction fencing to prevent unauthorized access to construction materials.
- Provisions for Good Housekeeping practices related to materials storage and disposal, as described in the Good Housekeeping BMP Fact Sheet.
- A stabilized construction entrance/exit, as described in the Vehicle Tracking Control BMP Fact Sheet, to accommodate traffic associated with material delivery and waste disposal vehicles.

Over-sizing the stabilized staging area may result in disturbance of existing vegetation in excess of that required for the project. This increases costs, as well as requirements for long-term stabilization following the construction period. When designing the stabilized staging area, minimize the area of disturbance to the extent practical.

Stabilized Staging Area	
Functions	
Erosion Control	Yes
Sediment Control	Moderate
Site/Material	Yes

Minimizing Long-Term Stabilization Requirements

- Utilize off-site parking and restrict vehicle access to the site.
- Use construction mats in lieu of rock when staging is provided in an area that will not be disturbed otherwise.
- Consider use of a bermed contained area for materials and equipment that do not require a stabilized surface.
- Consider phasing of staging areas to avoid disturbance in an area that will not be otherwise disturbed.

See Detail SSA-1 for a typical stabilized staging area and SSA-2 for a stabilized staging area when materials staging in roadways is required.

Maintenance and Removal

Maintenance of stabilized staging areas includes maintaining a stable surface cover of gravel, repairing perimeter controls, and following good housekeeping practices.

When construction is complete, debris, unused stockpiles and materials should be recycled or properly disposed. In some cases, this will require disposal of contaminated soil from equipment leaks in an appropriate landfill. Staging areas should then be permanently stabilized with vegetation or other surface cover planned for the development.

ECO VEHICLE TRACKING PAD (EVT)

EVT

PAGE 1 OF 2

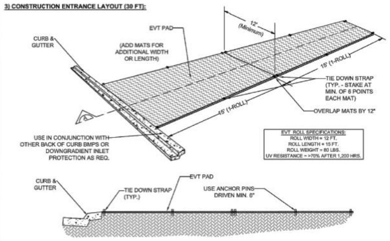
1) DESCRIPTION AND PURPOSE

A STABILIZED CONSTRUCTION ACCESS IS DEFINED BY A POINT OF ENTRANCE/EXIT TO A CONSTRUCTION SITE THAT IS STABILIZED TO REDUCE THE TRACKING OF MUD AND DIRT ONTO PUBLIC ROADS BY CONSTRUCTION VEHICLES. EVT PADS CONSIST OF POCKETED, DOUBLE-WALL, HIGH-STRENGTH FABRIC WITH HIGH TENSILE REINFORCING RIBS CONFINED WITHIN EACH SLEEVE WHICH ALLOWS FOR EASY DEPLOYMENT AND STRUCTURAL STABILITY. INTERIOR RIBS CONSIST OF THERMALLY FUSED RECYCLED TIRE CHIPS. GROUND PRESSURE FROM VEHICLE TIRES IS REDUCED UP TO 40 TIMES, CAUSING MINIMAL GROUND DISTURBANCE.

2) SUITABLE APPLICATIONS

- WHERE DIRT OR MUD CAN BE TRACKED ONTO PUBLIC ROADS.
- ADJACENT TO WATER BODIES.
- WHERE POOR SOILS ARE ENCOUNTERED.
- WHERE DUST IS A PROBLEM DURING DRY WEATHER CONDITIONS.
- FOR BEST RESULTS THE MAT SHOULD BE COMPACTED SOILS ON A LEVEL SURFACE.

3) CONSTRUCTION ENTRANCE LAYOUT (30 FT):



SECTION A

SEE PAGE 2 FOR IMPLEMENTATION AND INSPECTION & MAINTENANCE INFORMATION.

PAGE 1 OF 2

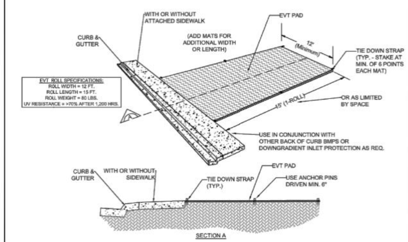
ECO VEHICLE TRACKING PAD (EVT)

EVT

PAGE 2 OF 2

4) RESIDENTIAL LOT ACCESS:

NOTE: MATERIAL DELIVERIES SHOULD INVOLVE PARKING ON EVT THEN DROPPING MATERIAL JUST BEYOND PAD.



SECTION A

5) IMPLEMENTATION

- CONSTRUCT ON LEVEL GROUND WHERE POSSIBLE.
- CONSTRUCT TO DIMENSIONS SHOWN ABOVE.
- LIMIT THE POINTS OF ENTRANCE/EXIT TO THE CONSTRUCTION SITE.
- PROPERLY GRADE EACH CONSTRUCTION ENTRANCE/EXIT TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.
- ROUTE RUNOFF FROM STABILIZED ENTRANCES/EXITS THROUGH A SEDIMENT TRAPPING DEVICE BEFORE DISCHARGE IF NEEDED.
- DESIGN STABILIZED ENTRANCE/EXIT TO SUPPORT HEAVIEST VEHICLES AND EQUIPMENT THAT WILL USE IT.
- REQUIRE THAT ALL EMPLOYEES, SUBCONTRACTORS, AND SUPPLIERS UTILIZE THE STABILIZED CONSTRUCTION ACCESS.

6) INSPECTION AND MAINTENANCE

- INSPECT IN ACCORDANCE WITH LOCAL REGULATIONS AND SITE SWMP.
- REMOVE AND DISPOSE OF SEDIMENT IF CONSTRUCTION ENTRANCE/EXIT IS CLOGGED WITH SEDIMENT.
- KEEP ALL TEMPORARY ROADWAY DITCHES CLEAR.
- CHECK FOR DAMAGE AND REPAIR AS NEEDED.
- REMOVE ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS IMMEDIATELY.
- REMOVE EVT AT COMPLETION OF CONSTRUCTION. STABILIZE IF REQUIRED.

PAGE 2 OF 2

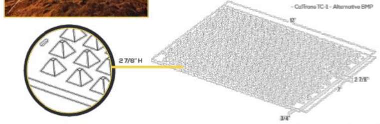
Engineering Data Sheet

FODS TCM MODEL # 1100 APPLICATION

The FODS Composite trackout control system is designed to be used as a temporary construction entrance which provides site access while minimizing sediment leaving the site. The top surface of the FODS mat is a geometric pattern formed in the shape of pyramids. The mats are unidirectional and are meant to have the staggered pyramids in the direction of travel. Individual mats are connected together with hardware to form various configurations to fit your jobsite.

FEATURES

- Re-Usable
- Increased Effectiveness at Reducing Site Trackout
- U/V Stable
- Highly Visible
- Crush rating of 20,000 lbs per pyramid
- Compression Molded HDPE
- Extreme Durability
- Excavation not required
- Chemical Resistant
- Rock-less
- Easy and efficient to transport from site-site
- Mat Size: 12'(w) x 7' (l) x 3 3/4" (t) (2 7/8" pyramid height)
- 3 year manufacture warranty
  - Certification and Compliance
  - US Patent #US 8,061,927 B1
  - CalTrans TC-1 - Alternative BMP



FODS Trackout Control Mat - Technical Data Sheet

SUITABLE INSTALLATION SUBSTRATE

- Un-Excavated Soil
- Excavated Soil (Min CBR: 4)
- Asphalt
- Concrete
- Rock
- Any existing project substrate

FODS Trackout Control System should be installed near the site exit point, as close to the location where vehicles enter the roadway as is safely as possible. FODS mats should not be installed at a low point on the site where water will pool.

FODS ANCHORING SYSTEMS

- Form-Stakes (18" or 24")
- Cable Earth Anchor
- All-Thread Earth Anchor
- Concrete Sleeve Anchor (asphalt)
- Suitable anchor for substraight

CLEANING / MAINTENANCE

Mats should be cleaned once 2.5" of sediment has built up in the lane of travel.

- Skid-steer broom attachment (enclosed broom for dust control)
- FODS Shovel
- Street Sweeper (requires adjusted bristle head
- Pressure Washer (must have ability to contain water)
- Water Truck (must have ability to contain water)

WARNINGS

- Caution is to be used when crossing mats with metal tracked equipment.
- Equipment with aggressive metal tracks should not cross mats
- Do not drag metal equipment across mats
- Do not use mats for bridging

Before using earth anchors, call 811 for locates to mark underground utilities

811 Know what's below. Call before you dig.

FODS LLC | The Mud Stops Here | GetFods.com | 1-844-200-3637

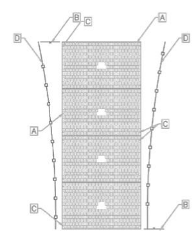
FODS TRACKOUT CONTROL SYSTEM

THE PURPOSE AND DESIGN OF THE FODS TRACKOUT CONTROL SYSTEM IS TO EFFECTIVELY REMOVE MOST SEDIMENT FROM VEHICLE TIRES AS THEY EXIT A DISTURBED LAND AREA ONTO A PAVED STREET. THIS A GENERAL GUIDE FROM WHICH TO INSTALL A FODS TRACKOUT CONTROL SYSTEM. (NOTE: THIS IS NOT A ONE SIZE FITS ALL GUIDE.) THE INSTALLATION MAY NEED TO BE MODIFIED TO MEET THE EXISTING CONDITIONS, EXPECTATIONS, OR DEMANDS OF A PARTICULAR SITE. THIS IS A GUIDELINE. ULTIMATELY THE FODS TRACKOUT CONTROL SYSTEM SHOULD BE INSTALLED SAFELY WITH PROPER ANCHORING AND SIGNS PLACED AROUND THE ENTRANCE AND EXIT TO CAUTION USERS AND OTHERS.

KEY NOTES:

A. FODS TRACKOUT CONTROL SYSTEM MAT.
B. FODS SAFETY SIGN.
C. ANCHOR POINT OR STRAP LOCATION.
D. SILT OR ORANGE CONSTRUCTION FENCE.

CALL UTILITY NOTIFICATION CENTER 811



1x4 LAYOUT

INSTALLATION:

1. THE SITE WHERE THE FODS TRACKOUT CONTROL SYSTEM IS TO BE PLACED SHOULD CORRESPOND TO BEST MANAGEMENT PRACTICES AS MUCH AS POSSIBLE. THE SITE WHERE FODS TRACKOUT CONTROL SYSTEM SHOULD ALSO MEET OR EXCEED THE LOCAL JURISDICTION OR STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REQUIREMENTS.
2. CALL FOR UTILITY LOCATES 3 BUSINESS DAYS IN ADVANCE OF THE FODS TRACKOUT CONTROL SYSTEM INSTALLATION FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES. CALL THE UTILITY NOTIFICATION CENTER AT 811.
3. ONCE THE SITE IS ESTABLISHED WHERE FODS TRACKOUT CONTROL SYSTEM IS TO BE PLACED, ANY EXCESSIVE UNEVEN TERRAIN SHOULD BE LEVELED OUT OR REMOVED SUCH AS LARGE ROCKS, LANDSCAPING MATERIALS, SUDDEN ABRUPT CHANGES IN ELEVATION, AND SIMILAR. FODS WILL SPAN AND SUPPORT OVER MOST OBSTACLES, BUT THE FLATTER AND SMOOTHER THE TERRAIN UNDER THE FODS TRACKOUT CONTROL SYSTEM WILL BE MORE EFFICIENT AND SAFER.
4. NEXT THE INDIVIDUAL MATS CAN START TO BE PLACED IN POSITION. THE FIRST MAT SHOULD BE PLACED NEXT TO THE PAVED SURFACE AND/OR CURB AT THE CLOSEST POINT OF EGRESS. THIS WILL ENSURE THAT THE VEHICLE WILL EXIT STRAIGHT FROM THE SITE TO THE PAVED SURFACE. FROM THE SITE TO THE PAVED SURFACE.
5. AFTER THE FIRST MAT IS PLACED DOWN IN ITS PROPER LOCATION, AN H BRACKET SHOULD BE PLACED AT THE END OF THE FIRST MAT, BEFORE ANOTHER MAT IS POSITIONED ADJACENT TO THE FIRST MAT.
6. ONCE THE SECOND MAT IS PLACED ADJACENT TO THE FIRST MAT, MAKE SURE THE H BRACKET IS CORRECTLY SITUATED BETWEEN THE TWO MATS.
7. NEXT, THE CONNECTOR STRAP SHOULD BE INSTALLED TO CONNECT THE TWO MATS TOGETHER.
8. AFTER THE FIRST MAT IS PLACED DOWN IN ITS PROPER LOCATION, IT SHOULD BE ANCHORED TO PREVENT THE POTENTIAL MOVEMENT WHILE THE ADJOINING MATS ARE INSTALLED NEXT. ANCHORS SHOULD BE PLACED AT EVERY ANCHOR POINT (IF FEASIBLE) TO HELP MAINTAIN THE MAT IN ITS CURRENT POSITION.
9. ONCE THE FIRST MAT IS ANCHORED DOWN, THE SUCCESSIVE MATS CAN THEN BE PLACED TO CREATE THE FODS® TRACKOUT CONTROL SYSTEM.
10. UPON PLACEMENT OF EACH NEW MAT IN THE SYSTEM, THAT MAT SHOULD BE ANCHORED AT EVERY ANCHOR POINT TO HELP STABILIZE THE MAT AND ENSURE THE SYSTEM IS CONTINUOUS WITH NO GAPS IN BETWEEN THE MATS.
11. AFTER INSTALLATION OF THE FODS TRACKOUT CONTROL SYSTEM, FODS SAFETY SIGNS SHOULD BE PLACED AT THE ENTRANCE AND EXIT SIDES OF THE FODS TRACKOUT CONTROL SYSTEM.
12. A SILT FENCE OR ORANGE CONSTRUCTION FENCE SHOULD ALSO BE INSTALLED ON THE SIDES OF THE FODS TRACKOUT CONTROL SYSTEM TO DIRECT VEHICLES DOWN THE MATS AND BARRICADE PEDESTRIANS FROM CROSSING THE MATS. PEDESTRIANS SHOULD ALSO USE EXTREME CAUTION WHEN CROSSING THE MATS AS THE SURFACE IS UNEVEN AND MAY BE DIFFICULT TO WALK ON.

USE AND MAINTENANCE

1. VEHICLES SHOULD TRAVEL DOWN THE LENGTH OF THE FODS TRACKOUT CONTROL SYSTEM AND NOT CUT ACROSS THE MATS.
2. DRIVERS SHOULD TURN THE WHEEL OF THEIR VEHICLES SUCH THAT THE VEHICLE WILL TAKE A SERPENTINE ROUTE DOWN THE LENGTH OF THE FODS TRACKOUT CONTROL SYSTEM.
3. MATS SHOULD BE CLEANED ONCE THE VOIDS BETWEEN THE PYRAMIDS BECOME FULL OF SEDIMENT. TYPICALLY THIS TASK WILL NEED TO BE PERFORMED WITHIN TWO WEEKS AFTER A STORM EVENT. BRUSHING IS THE PREFERRED METHOD OF CLEANING, EITHER MANUALLY OR MECHANICALLY.
4. THE USE OF ICE MELT, ROCK SALT, SNOW MELT, DEICER, ETC. SHOULD BE UTILIZED AS NECESSARY DURING THE WINTER MONTHS AND AFTER A SNOW EVENT.

REMOVAL

1. REMOVAL OF FODS TRACKOUT CONTROL SYSTEM IS THE REVERSE ORDER OF THE INSTALLATION.
2. STARTING WITH THE LAST MAT, THE MAT THAT IS PLACED AT THE INNERMOST POINT OF THE SITE OR THE MAT FURTHEST FROM THE EXIT OR PAVED SURFACE SHOULD BE REMOVED FIRST.
3. THE CABLE ANCHORS SHOULD BE CUT WITH WIRE ROPE CUTTERS.
4. THE CONNECTOR STRAPS SHOULD BE UNBOLTED AT ALL LOCATIONS IN THE FODS TRACKOUT CONTROL SYSTEM.
5. STARTING WITH THE LAST MAT IN THE SYSTEM, EACH SUCCESSIVE MAT SHOULD THEN BE MOVED AND STACKED FOR LOADING BY FORKLIFT OR EXCAVATOR ON TO A TRUCK FOR REMOVAL FROM THE SITE.

FIG. 1

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DRAWN BY: RES
CHECKED BY: KRK
DATE: 8/31/23

CSU GAS - MESA TO MANITOU
PHASES 5.2 & 5.3
GEC PLANS
DETAILS

COLORADO REGISTERED PROFESSIONAL ENGINEER KEVIN REX KOFFORD 49487 8/31/2023

PROJECT NO. 067607121

SHEET 17

K:\COS_Civil\067607121_CSU Manitou to Mesa\CADD\PlanSheets\GEC\GEC_DETAIL.dwg Schnelbach, Ryan 8/31/2023 3:06 PM

1.1

filtrexx®
SUSTAINABLE TECHNOLOGIES

SECTION 1: CONSTRUCTION

Filtrexx® Sediment/Perimeter Control (SiltSoxx™)

PURPOSE & DESCRIPTION

Filtrexx® SiltSoxx™ is a three-dimensional tubular sediment control and stormwater runoff filtration device typically used for **Sediment/Perimeter Control** of sediment and soluble pollutants (such as phosphorus and petroleum hydrocarbons), on and around construction activities. Perimeter control traps sediment and soluble pollutants by *filtering* runoff water as it passes through the matrix of the Soxx™ *and* by allowing water to temporarily pond behind the Soxx, allowing *deposition* of suspended solids. Perimeter control is also used to reduce runoff flow velocities on sloped surfaces.

APPLICATION

Perimeter control is to be installed down slope of any disturbed area requiring erosion and sediment control and filtration of soluble pollutants from runoff. Perimeter control is effective when installed perpendicular to sheet or low concentrated flow, and in areas that silt fence is normally considered appropriate. Acceptable applications include:

- Site perimeters
- Above and below disturbed areas subject to sheet runoff, interrill and rill erosion
- Above and below exposed and erodable slopes
- Along the toe of stream and channel banks
- Around area drains or inlets located in a 'sump'
- On compacted soils where trenching of silt fence is difficult or impossible
- Around sensitive trees where trenching of silt fence is not beneficial for tree survival or may unnecessarily disturb established vegetation
- On frozen ground where trenching of silt fence is impossible
- On paved surfaces where trenching of silt fence is impossible

Perimeter control can be applied to areas of high sheet runoff and erosion, on slopes up to a 1:1 grade (should be used in conjunction with slope stabilization/erosion control technology on slopes

Installation Method – Perimeter Control

> 4:1), around inlets, and in other disturbed areas of construction sites requiring sediment control. Perimeter control may also be used in sensitive environmental areas, where migration of wildlife may be impeded by the use of fences or trenching may damage roots.

It is possible to drive over perimeter control during construction (although not recommended), however, these areas should be immediately repaired by manually moving perimeter control back into place, if disturbed. Continued heavy construction traffic may destroy the fabric mesh, reduce the dimensions, and reduce the effectiveness of the perimeter control.

ADVANTAGES AND DISADVANTAGES

Advantages

- Tubular filtration matrix allows for better trapping and removal of sediment and soluble pollutants in stormwater runoff compared to planar constructed sediment control devices (i.e., silt fence).
- Greater surface area contact with soil than typical sediment control devices reduces potential for runoff to create rills under the device leading to unfiltered sediment.
- No trenching is required; therefore soil is not disturbed upon installation or removal.
- Perimeter control can be installed year-round in difficult soil conditions such as frozen or wet ground, and dense and compacted soils, as long as stakes can be driven.
- Perimeter control is easily implemented as a treatment in a greater treatment train approach to erosion and sediment control.
- Organic matter and humus colloids in FilterMedia™ (filler material in perimeter control) have the ability to bind and adsorb phosphorus, metals, and hydrocarbons that may be in stormwater runoff.
- Microorganisms in FilterMedia have the ability to degrade organic pollutants and cycle captured nutrients in stormwater runoff.
- Soxx (the mesh netting containment system) allows perimeter control to be placed in areas of high sheet flow and low concentrated flow.
- Perimeter control can be direct seeded at time of application to provide greater stability and filtration capability once vegetation is established.
- FilterMedia is organic and can be left on site after permanent stabilization is complete, to be used in landscape design and/or seeded and planted with permanent vegetation.
- FilterMedia improves existing soil structure if spread out and used as a soil amendment after construction activity is complete.
- Biodegradable or photodegradable perimeter control can be left on site after construction activity and may eliminate the need for removal and labor and disposal costs.
- Perimeter control can be used on slopes to slow down runoff velocity, disperse concentrated runoff, and reduce effective slope lengths, reducing the erosive potential of stormwater runoff.
- Perimeter control is less likely to obstruct wildlife movement and migration than planar/silt fence sediment control practices.
- Perimeter control is available in 5 in. (125mm), 8 in.(200mm), 12 in. (300mm), 18 in. (450mm), 24 in. (600mm), and 32 in (800mm) diameters for customized applications and challenging situations.
- Perimeter control is available in up to 200 ft (61m) continuous lengths to prevent weak sections and creation of concentrated flow situations typical to low points in runs of other sediment control devices. End points are sleeved together to form continuous runs of unlimited lengths without low or break points.
- Perimeter control may assist in qualification for LEED® Green Building Rating and Certification credits under LEED Building Design & Construction (BD+C), New Construction v4. Awarded credits may be possible from the categories of Sustainable Sites, Water Efficiency, Materials & Resources, and Innovation. *Note: LEED is an independent program offered through the U.S. Green Building Council. LEED credits are determined on a per project basis by an independent auditing committee. Filtrexx neither guarantees nor assures LEED credits from the use of its products. LEED is a trademark of the U.S. Green Building Council.*

ADVANTAGES	LOW	MED	HIGH
Installation Difficulty	✓		
Durability			✓
Sediment Control			✓
Soluble Pollutant Control		✓	
Runoff Flow Control		✓	
Life Cycle Cost	✓		

Disadvantages

- If filler material of perimeter control is not Filtrexx® Certified℠ FilterMedia™, performance may be diminished.
- If not installed correctly, maintained or used for a purpose or intention that does not meet specifications performance may be diminished.
- If land surface is extremely bumpy, rocky, or changes elevation abruptly ground surface contact to perimeter control may be diminished thereby adversely effecting performance.

MATERIAL SPECIFICATIONS

Perimeter control use only photodegradable or biodegradable Soxx netting materials available from Filtrexx International and are the only mesh materials accepted in creating perimeter control for any purpose. For Soxx tubular mesh material specifications see Table 1.1.

FILTERMEDIA™ CHARACTERISTICS

Specifications for perimeter control use only Filtrexx Certified FilterMedia which is a coarse composted material that is specifically designed for removal of solids and soluble pollutants from stormwater runoff. FilterMedia can be altered or customized to target specific pollutants in runoff as approved by the Engineer or Filtrexx International. All Filtrexx Certified FilterMedia has been third party tested and certified to meet minimum performance criteria defined by Filtrexx International. Performance parameters include; hydraulic flow through rate, total solids removal efficiency, total suspended solids removal efficiency, turbidity reduction, nutrient removal efficiency, metals removal efficiency, and motor oil removal efficiency. For information on the physical and chemical properties of Filtrexx Certified FilterMedia refer to the Filtrexx Design Manual, section 5.1. Look for the Filtrexx Certified FilterMedia Seal from our international network of Filtrexx Certified Installers and Manufacturers.

PERFORMANCE

Performance testing and research on perimeter control has been extensive. Results from testing and research programs conducted on perimeter control include: hydraulic flow through rate, ponding rate and calculation (behind perimeter control), sediment storage capacity (inside + behind tool), total solids removal efficiency, suspended solids removal efficiency (with and w/out biopolymer and polymer flocculants), turbidity reduction (with and w/out biopolymer and polymer flocculants), nitrate-N removal efficiency, total P removal efficiency, soluble reactive P removal efficiency (with and w/out Nutrient Agent), petroleum hydrocarbon (motor oil) removal efficiency, and heavy metals (Cu, Fe, Mn, Zn) removal efficiency. For a summary of performance testing, research results, and design specifications see Table 1.1 and Table 1.2. For copies of full reports visit www.filtrexx.com.

Successful bidders will furnish adequate research support showing their manufactured product meets or exceeds performance and design criteria outlined in this standard specification. Research or performance testing will be accepted if it meets the following criteria: conducted by a neutral third party, utilizes standard test methods reported by ASTM or referenced in a peer reviewed scientific journal, product and control treatments are tested in triplicate, performance results are reported for product and control (control should be a bare soil under the same set of environmental and experimental conditions), results are peer reviewed, results indicate a minimum 60% TSS removal efficiency and a minimum hydraulic flow through rate of 5 gpm/ft². Bidders shall attach a copy of the research report indicating test methodologies utilized and results.
Note: the Contractor is responsible for establishing a working erosion and sediment control system and may, with approval of the Engineer, work outside the minimum construction requirements as needed. Where the perimeter control deteriorates or fails, it shall be repaired or replaced with an effective alternative.

DESIGN CRITERIA

The sediment and pollutant removal process characteristic to perimeter control combines both filtering and deposition from settling solids. This is different than methods that rely on ponding for deposition of solids for perimeter control (i.e., silt fence). Ponding occurs when water flowing to the perimeter control accumulates faster than the hydraulic flow through rate of the perimeter control. Typically, hydraulic flow-through rates for perimeter control are 50% greater than geotextile filter fabric (silt fence). *Greater hydraulic flow-through rates reduce ponding, therefore reducing the need for taller sediment control structural design height.* Additionally, perimeter control does not blind as easily with small soil/sediment colloids, such as clay soils, as do planar geotextile sediment control barriers (such as silt fence). However, installation and maintenance is especially important for proper function and performance. For engineering design details see Figure 1.1. For a summary of specifications for product/practice use, performance and design see Table 1.1 and Table 1.2.

Filtering Water

For most standard perimeter control applications, a 12 in (300mm) diameter perimeter control can replace a 24 to 36 in (600 to 900mm) silt fence. See Table 1.3 and 1.4 and Figure 1.2 for standard design specifications for maximum allowable slope lengths. Note: In some low flow conditions, an 8 in (200mm) perimeter control may replace a 24 in (600mm) silt fence. Design consideration should be given to the duration of the project, total area of disturbance, rainfall/runoff potential, soil erosion potential, and sediment loading.

Runoff Flow:
Sheet runoff flow and ponding depth should not exceed the height of the perimeter control. If overflow of the device is a possibility, larger diameter perimeter control should be constructed, other sediment control devices may be used, or management practices to reduce runoff should be installed. Alternatively, a second perimeter control may be constructed or used in combination with compost erosion control blankets or rolled erosion control blankets to slow runoff and reduce erosion. The Filtrexx Design Tool can assist in planning and designing what diameter perimeter control should be used, correct spacing requirements, and what rainfall and site conditions can lead to runoff breaching of the perimeter control. For instructions and a copy of the Filtrexx Design Tool, refer to the Filtrexx Design Manual, Section 5.4 and 5.4a.

Figure 1.3 Filtrexx® Sediment Control Design Tool for Sediment Control Applications.

Step 1: Choose units. ft or m		ft			
Step 2: Choose input: Tr or I		Tr			
total rainfall	inches	1.5	storm duration	hours: 24	
Step 3: Choose input: A or W		W			
width of area	ft	400.00	length of slope	ft: 250	43560
Step 4: Input slope	%	10			452.588
Step 5: Input reduction runoff percent	%	10			
		sediment control (8,12,16)	silt fence (24, 30)		
Step 6: Input effective length of filter	ft	400	400		
Step 7: Input diameter/height of filter	inches	12	36		

Step 8: Find time to overflow filter and total flow/ft the filter can handle

Step 9: On figure find for given flow expected time to overflow filter

Part A. Evaluation of q_i

I inches/hr	A acres	s percent	Q gpm	L_w ft	q gpm/ft
0.063	2.2957	10	58.15	400	0.145

Part B. Predicted time and total flow to top filter.

	q_i gpm/hr	D inches	Effective D inches	Time Overflow hr	Total Flow gal/f	Filter OKAY time > tr
Sediment control (Coarse Material)	0.145	12	9.6	99.1	865	OKAY
Silt Fence	0.145	36	30.6	97.5	851	OKAY

Use on Ecologically Sensitive Sites

the Filtrexx Design Tool, refer to the Filtrexx Design Manual, Section 5.4 and 5.4a.

Level Contour:
Perimeter control should be placed on level contours to assist in dissipating low concentrated flow into sheet flow and reducing runoff flow velocity. Do not construct perimeter control to concentrate runoff or channel water. Sheet flow of water should be perpendicular to the perimeter control at impact and relatively un-concentrated. Placing perimeter control on undisturbed soil will reduce the potential for undermining.

Runoff and Sediment Accumulation:
Where possible, perimeter control should be placed at a 5 ft (1.5m) or greater distance away from the toe of the slope to allow for proper runoff accumulation for sediment deposition and to allow for maximum sediment storage capacity behind the device. If a 5 ft (1.5m) distance is not available, due to construction restrictions, a second perimeter control may be installed to increase ponding and sediment accumulation capacity. Steeper slopes allow less sediment storage behind the perimeter control device and may require larger perimeter control or shorter slope lengths.

End Around Flow:
In order to prevent water flowing around the ends of perimeter control, the ends of the perimeter control must be constructed pointing upslope so the ends are at a higher elevation. A minimum of 10 linear ft (3m) per end each placed at a 30 degree angle is recommended.

Vegetated Perimeter Control:
For permanent areas perimeter control can be direct-seeded to allow vegetation established directly in the device, and may be expanded to 5 ft (1.5m) upslope and downslope from the device, for added performance. Vegetation on and around the perimeter control will assist in slowing runoff velocity for increased deposition and filtration of pollutants. The option of adding vegetation will be at the discretion of the Engineer. No additional soil amendments or fertilizer are required for vegetation establishment in the perimeter control.

Slope Spacing & Drainage Area:
Maximum drainage area to, and slope spacing between perimeter control is dependent on: rainfall intensity and duration used for specific design/plan, slope steepness, and width of area draining to the perimeter control. Refer to the Filtrexx Design Tool developed by The Ohio State University to accurately design a plan based on your site and climate conditions. See *Design Capacity Prediction Tool for SiltSoxx™ and Silt Fence* and *Flow-Through Rates and Evaluation of Solids Separation of Compost FilterMedia™ vs. Silt Fence in Sediment Control Applications* (http://www.filtrexx.com/research-library/) for more information on the Design Tool or the research project and results used to create the tool. Figure 1.3 provides an example of the user interface for the Design Tool. A specification for maximum slope lengths, based on a 1 in (25 mm)/24 hr rainfall event is provided in Table 1.3 and Figure 1.2; and for a 2 in (50 mm)/24 hr rainfall event is provided in Table 1.4.

INSTALLATION

1. Perimeter control used for control of sediment and soluble pollutants in storm runoff shall meet Filtrexx Soxx Material Specifications and use Filtrexx Certified FilterMedia.
2. Contractor is required to be Filtrexx Certified or use pre-filled Filtrexx® SiltSoxx™ products manufactured by a Filtrexx Certified Manufacturer as determined by Filtrexx International (call Filtrexx at 877-542-7699 for a current list of installers). Certification shall be considered current if appropriate identification is shown during time of bid or at time of application. Look for the Filtrexx Certified Seal.
3. Perimeter control will be placed at locations indicated on plans and in a manner as directed by the Engineer or Manufacturer.
4. Perimeter control should be installed parallel to the base of the slope or other disturbed area. In challenging conditions (i.e., 2:1 slopes), a second perimeter control shall be constructed at the top of the slope, or staking may be increased.
5. Effective Soxx height in the field should be as follows: 5" diameter Soxx = 4" high; 8" diameter Soxx = 6.5" high; 12" diameter Soxx = 9.5" high; 18" diameter Soxx = 14.5" high; 24" diameter Soxx = 19" high.
6. Stakes should be installed through the middle of the perimeter control on 10 ft (3m) centers, using 2 in (50mm) by 2 in (50mm) by 3 ft (1m) wooden stakes. In the event staking is not possible, i.e., when perimeter control is used on pavement, heavy concrete blocks shall be used behind the perimeter control to help stabilize during rainfall/runoff events.
7. Staking depth for sand and silt loam soils shall be 12 in (300mm), and 8 in (200mm) for clay soils.
8. Loose compost may be backfilled along the upslope side of the perimeter control, filling the seam between the soil surface and the device, improving filtration and sediment retention.
9. If the perimeter control is to be left as a permanent filter or part of the natural landscape, it may be seeded at time of installation for establishment of permanent vegetation. The Engineer will specify seed requirements.
10. Perimeter control is not to be used in perennial, ephemeral, or intermittent streams.

See design drawing schematic for correct installation (Figure 1.1).

INSPECTION

Routine inspection should be conducted within 24 hrs of a runoff event or as designated by the regulating authority. Perimeter control should be regularly inspected to make sure they maintain their shape and are producing adequate hydraulic flow-through. If ponding becomes excessive, additional perimeter control may be required to reduce effective slope length or sediment removal may be necessary. Perimeter control shall be inspected until area above has been permanently stabilized and construction activity has ceased.

MAINTENANCE

1. The Contractor shall maintain the perimeter control in a functional condition at all times and it shall be routinely inspected.
2. If the perimeter control has been damaged, it shall be repaired, or replaced if beyond repair.
3. The Contractor shall remove sediment at the base of the upslope side of the perimeter control when accumulation has reached 1/2 of the effective height of the Soxx, or as directed by the Engineer. Alternatively, a new perimeter control can be placed on top of and slightly behind the original one creating more sediment storage capacity without soil disturbance.
4. Perimeter control shall be maintained until disturbed area above the device has been permanently stabilized and construction activity has ceased.
5. The FilterMedia will be dispersed on site once disturbed area has been permanently stabilized, construction activity has ceased, or as determined by the Engineer.
6. For long-term sediment and pollution control applications, perimeter control can be seeded at the time of installation to create a vegetative filtering system for prolonged and increased filtration of sediment and soluble pollutants (contained vegetative filter strip). The appropriate seed mix shall be determined by the Engineer.

DISPOSAL/RECYCLING

FilterMedia is a composted organic product recycled and manufactured from locally generated organic, natural, and biologically based materials. Once all soil has been stabilized and construction activity has been completed, the FilterMedia may be dispersed with a loader, rake, bulldozer or similar device and may be incorporated into the soil as an amendment or left on the soil surface to aid in permanent seeding or landscaping. Leaving the FilterMedia on site reduces removal and disposal costs compared to other sediment control devices. The mesh netting material will be extracted from the FilterMedia and disposed of properly by the Contractor. The photodegradable mesh netting material (Soxx) may degrade if left on site. Biodegradable mesh netting material is available and may eliminate the need and cost of removal and disposal.

Close Up of Sediment Control

METHOD OF MEASUREMENT

Bid items shall show measurement as 5 (125), 8 (200), 12 (300), 18 (450), 24 (600), 32 (800) inch (mm) diameter Filtrexx® Sediment/Perimeter Control or SiltSoxx™ per linear foot (or linear meter), installed.

Engineer shall notify Filtrexx of location, description, and details of project prior to the bidding process so that Filtrexx can provide design aid and technical support.

ADDITIONAL INFORMATION

For other references on this topic, including additional research reports and trade magazine and press coverage, visit the Filtrexx website at www.filtrexx.com

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Call for complete list of international installers.

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BioSoxx, CECB [Compost Erosion Control Blanket], CSWB [Compost StormWater Blanket], DitchChexx, EdgeSaver, FilterCell, FilterMedia, FilterSoxx, GrowingMedia, InletSoxx, LivingWall, Lockdown, NitroLoxx, PhosLoxx, SiltSoxx, Soft Blocks, and Soxx are Trademarks of Filtrexx International.

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Evaluation of Storm Water from Compost and Conventional Erosion Control Practices in Construction

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DRAWN BY: RES
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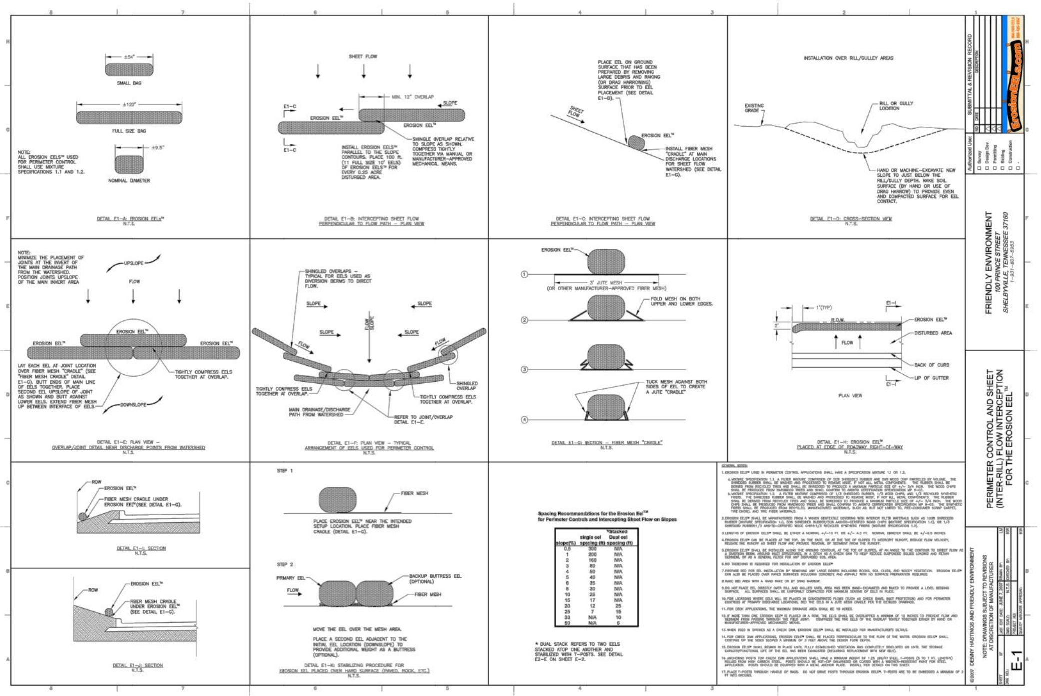
DATE: 8/31/23

CSU GAS - MESA TO MANITOU
PHASES 5.2 & 5.3
GEC PLANS
DETAILS

COLORADO REGISTERED PROFESSIONAL ENGINEER
KEVIN REX KOFFORD
49487
8/31/2023

PROJECT NO.
067607121

SHEET
18



Special Specification

Erosion Eels™

1. **Description**. Furnish, install, maintain, and remove Erosion Eels™ as shown on plans or as directed.

2. **Materials.**

   1. **Core Material.** Erosion Eels™ shall consist of core, internal filter materials comprised of one of two mixtures:

      I. **Mixture Specification 1.0.** A filter mixture comprised of 100% shredded rubber that has been washed and processed to remove most, if not all, metal components. The material shall be derived from recycled tires and shall be shredded to produce a maximum particle size of +/- ¾ inch.

      II. **Mixture Specification 2.0.** A filter mixture comprised of 100% shredded rubber that has been washed and processed to remove most, if not all, metal components. The material shall be derived from recycled tires and shall be shredded to produce a maximum particle size of +/-2-inches.

   2. **Containment Material.** The containment material for the filter core particles shall be a woven, polypropylene geotextile with UV-stabilizers and inert to biological decay and chemically resistant to naturally occurring chemicals, alkalis, and acids. Minimum fabric permeability shall be equal to or greater than 0.05 cm/sec per ASTM D 4491. Minimum strength retained relative to UV exposure shall be 70% when tested per ASTM D 4355 for 500 hours.

   3. **Size.** Erosion Eels™ shall be produced with a nominal diameter of +/-9.5 inches and +/-20 inches and standard nominal lengths of +/-4.5 feet and +/-10 feet.

3. **Construction.** Install Erosion Eels™ near the downstream perimeter of a disturbed area to intercept sediment from sheet flow. Incorporate the Erosion Eels™ into the erosion control measures used to the control sediment on construction sites. Install, align, and locate the Erosion Eels™ as specified below, as shown on the plans, as direction.

   A. **Stabilizing/Securing.** Secure Erosion Eels™ in a method adequate to prevent displacement as a result of normal rain events and such that flow is not allowed under the bags.

   B. **Maintenance.** Inspect and maintain the Erosion Eels™ in good condition. Maintain the integrity of the control, including keeping the bags free of accumulated silt, debris, etc., until permanent erosion control features are in place, or the disturbed area has been adequately stabilized. Stabilize the areas damaged by the removal process using appropriate methods as approved. Repair or replace damaged Erosion Eels™ as required and as directed. Temporarily remove and replace Erosion Eels™ as required to facilitate work. Remove sediment and debris when accumulation affects the performance of the devices, after a rain, and when directed. Dispose of sediment and debris at an approved site in a manner that will not contribute to additional siltation.

   C. **Removal.** Remove and reuse Erosion Eels™ when directed.

4. **Measurement.** This item will be measured by the linear foot along the centerline of the top of the control bags.

5. **Payment.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for a the unit price bid for "Erosion Eels™" of the size specified. This price is full compensation for furnishing, placing, maintaining, temporarily removing and replacing as required to facilitate construction operations, and removing of the bags and for all other materials, labor, tools, equipment, and incidentals.

End-of Section

Note: Specifications are subject to revisions at the discretion of the Manufacturer.

Kimley»Horn

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CHECKED BY: KRK
DATE: 8/31/23

CSU GAS - MESA TO MANITOU
PHASES 5.2 & 5.3
GEC PLANS
DETAILS

COLORADO REGISTERED PROFESSIONAL ENGINEER 8/31/2023

PROJECT NO.
067607121

SHEET
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