DelDOT
Delaware Department of Transportation

EROSION & SEDIMENT CONTROL

FIELD GUIDE

EROSION AND SEDIMENT CONTROL FIELD GUIDE

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EROSION SEDIMENT CONTROL FIELD GUIDE

I. INTRODUCTION

PURPOSE OF THE GUIDE

This field guide contains information for the installation and maintenance of erosion and sediment control devices from the DelDOT Standard Construction Details and Specifications. Additional details and practices are also provided; however, the guide is not intended as a replacement to the Standard Construction Details and Specifications. The guide is intended for use by field construction personnel to aid in the implementation of proper erosion and sediment control practices.

EROSION AND SEDIMENT PROBLEMS ASSOCIATED WITH CONSTRUCTION SITES

Sediment washing into streams is one of the most serious water quality problems in Delaware. Construction and land development activities expose disturbed soils to precipitation and stormwater runoff. When sediment from unstabilized areas washes into surface waters, it can kill or weaken fish and other organisms and damage aquatic habitats. Water pollution, channel and reservoir siltation and damage to public facilities, as well as to private property, are some of many examples of problems caused by uncontrolled erosion and sedimentation.

Follow basic principles to minimize erosion and sediment loss from construction sites:

- Follow all phasing plans to minimize amount of soil disturbed at any time.
- Preserve existing vegetative whenever possible.
- Stabilize bare soil immediately.
- Use silt fence or other barriers to intercept and filter sediment in runoff.
- Use check dams or other products to prevent ditch erosion.
- Protect inlets and outfalls.
- Install sediment traps and settling basins. Use flocculants as needed to reduce turbidity of effluents.
- Maintain your BMPs!

ENVIRONMENTAL LAWS AND PERMIT PROGRAMS COVERING CONSTRUCTION ACTIVITIES

All construction sites require stormwater Best Management Practices (BMPs). Prevention of erosion and sediment loss

on your construction site is not just a good practice – It's the law!

The following is a brief outline of the Federal, State and DelDOT regulations and requirements that cover Erosion and Sediment (E&S) Control on construction sites. Failure to understand and/or comply with any of these may result in significant fines, penalties, delays or stoppage of work. More detailed information can be found in the websites and resources listed below. Or contact the DelDOT Stormwater Engineer's Office at (302) 760-xxxx.

National Pollutant Discharge Elimination System (NPDES):

Part of the Federal Clean Water Act, the NPDES permit program controls water pollution by regulating discharge of pollutants into waters of the United States. The NPDES Stormwater Program regulates stormwater discharges from three potential sources: municipal separate storm sewer systems (MS4s), construction activities, and industrial activities. In Delaware, any land disturbing activity over 5,000 square feet must have an approved Sediment and Stormwater Plan and must also submit a Notice of Intent (NOI) for Stormwater Discharges Associated with Construction Activity under the State NPDES General Permit.

Delaware Sediment and Stormwater Regulations:

The Department of Natural Resources and Environmental Control (DNREC) implements Delaware's sediment and stormwater program. A copy of the current Delaware Sediment and Stormwater Regulations is maintained on DNREC's website (http://www.dnrec.delaware.gov). DNREC has delegated to DelDOT authority to administer and enforce many of the state Sediment and Stormwater Program elements. This includes, on DelDOT projects:

- Erosion and sediment control and stormwater management plan approval
- Inspection during construction
- Post-construction inspection of permanent stormwater facilities
- Education and training

DelDOT Requirements and Standard Specifications:

All erosion, sediment control and stormwater management measures must be designed in accordance with the latest version of the Delaware Sediment and Stormwater

Regulations, DelDOT Standard Construction Details, DelDOT Standard Specifications and Design Guidance for drainage, erosion control and stormwater management. Copies of these documents can be found on the DelDOT website (www.deldot.gov). The special provisions of the DelDOT Standard Specifications for Road and Bridge Construction that govern erosion, sediment control and water pollution are found in Section 110. Additional specifications for the installation of E&S control devices can be found in Section 200.

Projects in certain watersheds may have additional requirements to meet Total Maximum Daily Loads (TMDLs) and any approved pollution control strategies. To verify if a project will need to follow these extra design requirements, contact the DelDOT Stormwater Engineer.

TOP COMPLIANCE ISSUES

The following have historically been among the most frequently cited E&S control and pollution problems on DelDOT construction sites. Special attention should be paid to these areas by all DelDOT construction staff, inspectors and contractors in order to avoid violations of state laws and potential penalties or work stoppages.

- Improper or missing BMPs
- Improper silt fence installation and/or maintenance
- Unprotected inlets
- Lack of stabilization
- Inadequate seeding rates
- Inadequate or improperly maintained construction entrances (soil on road)
- Tracking issues
- Blankets incorrectly anchored or trenched
- Good housekeeping problems (trash, storage, concrete washout, spills, etc.)
- Failure to correct deficiencies noted on CCR reports in a timely manner

USING THIS FIELD GUIDE

The guide has been developed using DelDOT standard details as base information. The details and associated installation notes from the standard details are presented on the first page(s) for each practice. Details have been colorized to emphasize flow patterns and

highlight filtering elements. In addition, the standard details have been augmented by notating installation and maintenance "hot spots" where particular attention should be paid to critical installation elements, areas of concentration for inspections, sediment removal and erosion monitoring.

The subsequent pages for each practice are intended to provide contractors and inspection personnel with guidance for maintenance in accordance with DelDOT's Standard Specifications and to present photographs depicting proper and improper installation and maintenance techniques.

The guide does not present requirements for material specification, measurement or payment. Contractors and field personnel should refer to the standard specifications for that information.

Any questions or comments about the practices in this field guide should be directed to the DelDOT Stormwater Section.

CONTACTS AND RESOURCES

DelDOT Stormwater Section

(302) 760-2259

http://www.deldot.gov/information/business/drc/stormwater.shtml

(This site includes links to approved product lists, manuals, DelDOT standard construction details, and DelDOT Standard Specifications)

DelDOT NPDES Section

(302) 760-2194

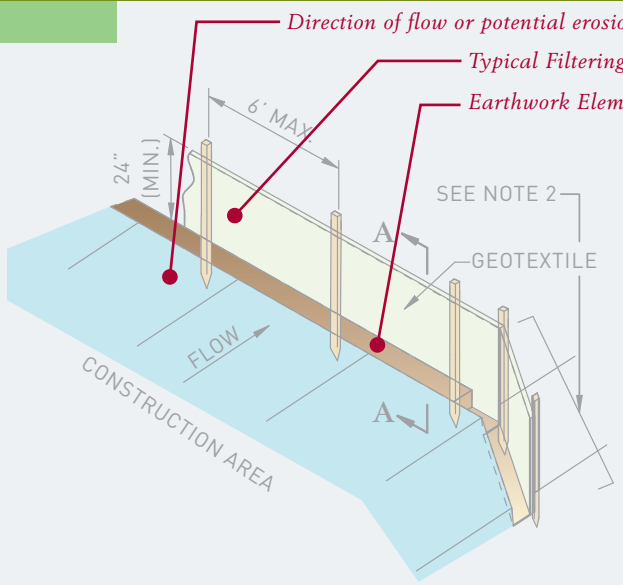
http://www.deldot.gov/stormwater

DNREC Sediment & Stormwater Program

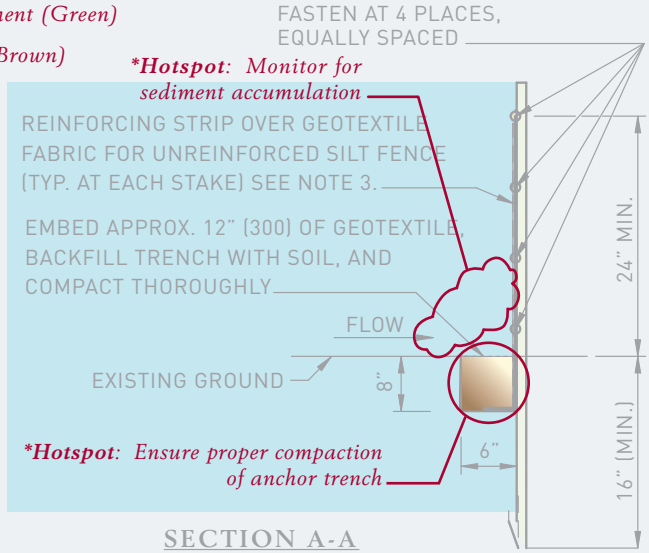
(302) 739-9921

http://www.swc.dnrec.delaware.gov/Pages/SedimentStormwater.aspx

(This site includes links to the Delaware Sediment and Stormwater Regulations, CCR certification resources, and NPDES construction permits)



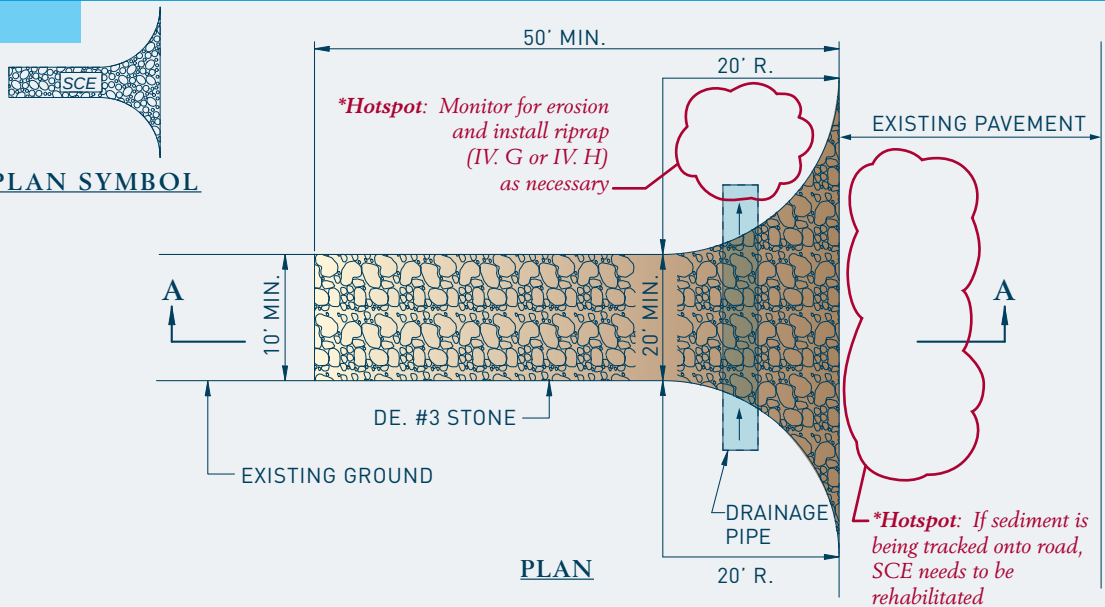
ISOMETRIC VIEW



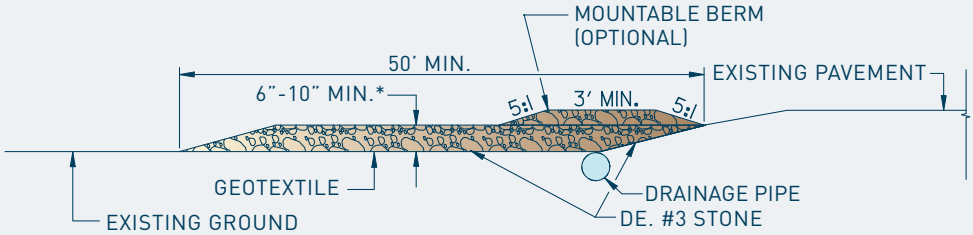
SECTION A-A

EROSION SEDIMENT CONTROL FIELD GUIDE

II. CONSTRUCTION ACCESS AND EARTH MOVING



A. Stabilized Construction Entrance



* 6" MIN. (≤ 3 AXLE)
10" MIN. (> 3 AXLE)

SECTION A-A

NOTES:

1. ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED UNDER THE ENTRANCE. IF NECESSARY, A MOUNTABLE BERM WITH 5:1 SLOPES SHALL BE ALLOWED TO FACILITATE PLACEMENT OF PIPES IN SHALLOW CONDITIONS.
2. THE LOCATION AND NUMBER OF STABILIZED CONSTRUCTION ENTRANCES SHALL BE AS INDICATED ON THE PLANS. ANY CHANGE IN LOCATION, ADDITION, OR DELETION OF AN ENTRANCE SHALL BE APPROVED IN ADVANCE BY THE ENGINEER.
3. DRAINAGE PIPE, IF UTILIZED, SHALL BE PAID FOR SEPARATELY UNDER THE APPROPRIATE BID ITEM.
4. THE TOP 2" OF STONE SHALL BE REMOVED AND REPLACED WITH 2" OF CLEAN STONE WHEN VOIDS ARE FILLED OR AS DIRECTED BY THE ENGINEER.

A. Stabilized Construction Entrance

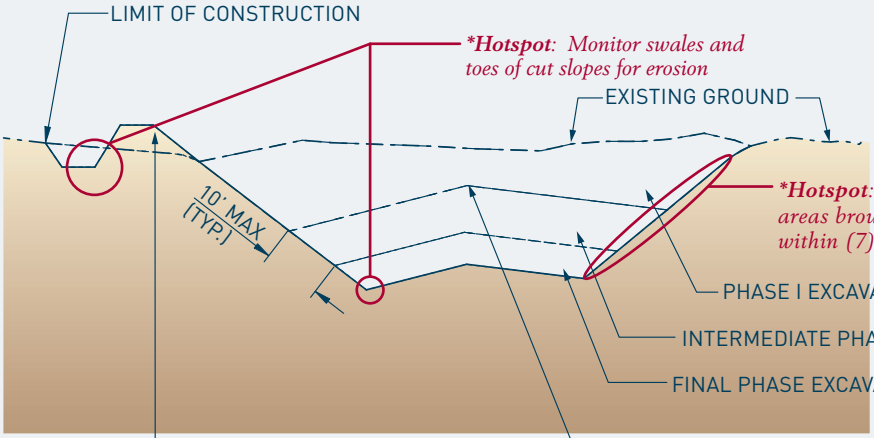
II. CONSTRUCTION ACCESSS AND EARTH MOVING

II.A - Maintenance

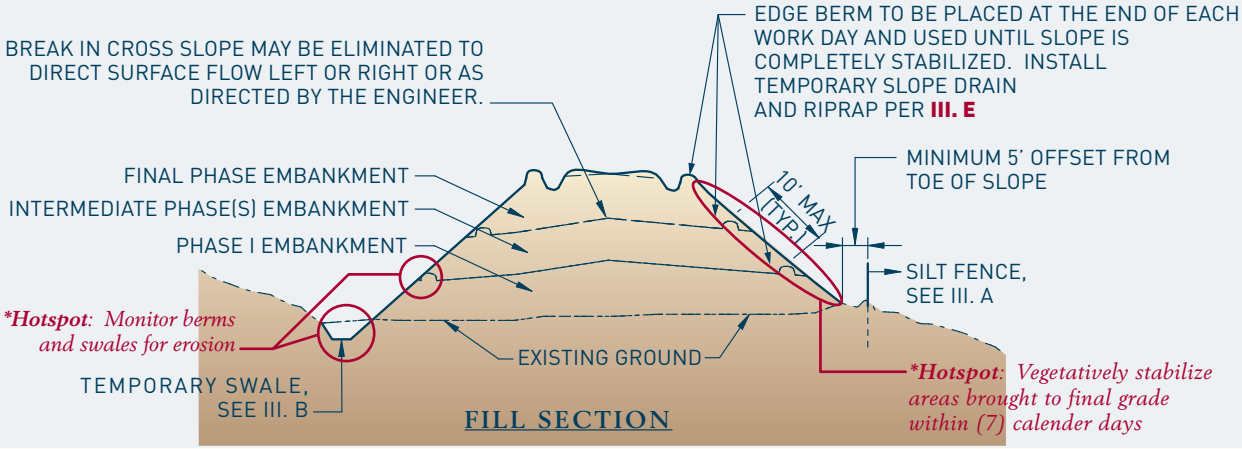
- The Contractor shall leave all paved surfaces adjoining the Project limits free of accumulated sediment at the end of each workday. The Contractor may utilize any means and methods available to remove sediment provided the cleaning operation itself does not violate water or air pollution laws of the State.
- After heavy use and after each rain, the Contractor shall inspect the stabilized construction entrance to ensure proper functioning. When the voids in the stone pad are filled, the Contractor shall rake the surface to reestablish the voids in the stone pad. If sedimentation of the entrance is severe, and the raking is unsuccessful in restoring void space, the Contractor shall replace the top 2" (50 mm) of the stone with 2" (50 mm) of clean Delaware No. 3 stone.
- If the Contractor chooses to clean construction vehicle wheels to remove sediment prior to entering public rights-of-way, the cleaning shall be done in aggregate stabilized areas that drain into approved sediment trapping devices. All sediment shall be prevented from entering storm drains, ditches, or watercourses.

A. Stabilized Construction Entrance

A. Stabilized Construction Entrance


LIMIT OF CONSTRUCTION
*Hotspot: Monitor swales and toes of cut slopes for erosion
EXISTING GROUND
*Hotspot: Vegetatively stabilize areas brought to final grade within (7) calender days
10' MAX (TYP.)
PHASE I EXCAVATION
INTERMEDIATE PHASE(S) EXCAVATION
FINAL PHASE EXCAVATION
PERIMETER/DIKE SWALE USED AS A CLEAN WATER DIVERSION, SEE III. C
BREAK IN CROSS SLOPE MAY BE ELIMINATED TO DIRECT SURFACE FLOW LEFT OR RIGHT OR AS DIRECTED BY THE ENGINEER.

CUT SECTION



NOTES:

1. EDGE BERMS AND TEMPORARY SLOPE DRAINS SHALL BE CONSTRUCTED ALONG THE TOP OF ALL SLOPES TO INTERCEPT RUNOFF AND CONVEY IT DOWN THE SLOPE FACES WITHOUT CREATING GULLIES OR WASHOUTS.
2. SLOPE FACES SHALL BE TRACKED WITH CLEATED EQUIPMENT SUCH THAT THE CLEAT MARKS ARE ORIENTED HORIZONTALLY.
3. ALL CUT AND FILL SLOPES OF THE HIGHWAY EMBANKMENT SHALL BE PERMANENTLY STABILIZED AS THE WORK PROGRESSES IN INCREMENTS NOT TO EXCEED 10' MEASURED ALONG THE SLOPE.
4. CROSS SLOPES SHALL BE 2% MINIMUM, 6% MAXIMUM.

B. Incrementral Stabilization

II.C – Stockpiling

Erodible earth material designated on the Plans or required by the Engineer to be excavated and temporarily stockpiled for later use in the project shall be located away from live streams and wetlands and placed only in areas deemed appropriate by the Engineer.

The Contractor shall install the erosion and sediment control items designated on the Plans or as directed by the Site Reviewer and the Engineer about the base of the pile in advance of the actual stockpiling operation. Erodible earth material shall be placed in piles of neat conformations. Side slopes shall be seeded and mulched as the pile is placed. All remaining unstabilized surfaces shall be seeded and mulched immediately following completion of the stockpiling operation.

If the Contractor proposes to stockpile erodible earth material in areas not designated on the Plans, it shall be the Contractor's responsibility to prepare and submit erosion and sediment control plans for those proposed areas, which are located within Department rights-of-way and easements for approval by the Site Reviewer and the Engineer. Materials shall not be stockpiled until an erosion and sediment control plan for the proposed stockpile has been approved by the Site Reviewer and the Engineer. The Contractor is also responsible for getting any permits that are necessary.

If the Contractor proposes to stockpile erodible earth material in areas outside of Department rights-of-way and easements, it shall be the Contractor's responsibility to prepare and submit for approval a plan for the use of the proposed site to the appropriate agencies having jurisdiction. No stockpiling operation shall commence in areas outside the Department rights-of-way and easements until the Engineer has received copies of all plans and permits approved by the appropriate regulatory agencies and received copies of statements signed by the property owners, as required under Subsection 110.07, which release the Department from any claims arising from the use of the property. The Contractor shall be responsible for all costs associated with the installation of erosion and sediment controls required by other agencies having jurisdiction on stockpiles located outside the Department's rights-of-way.

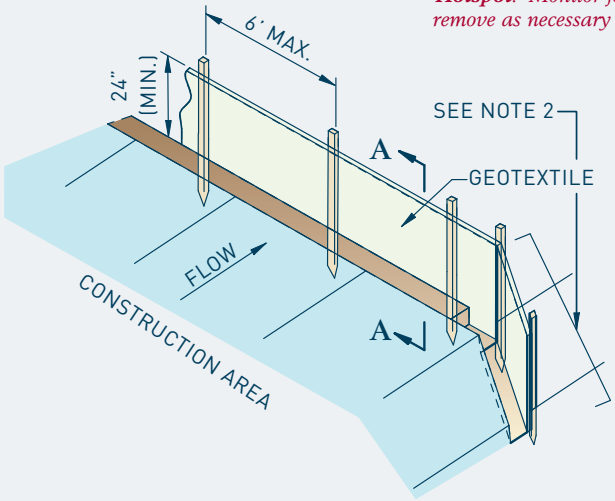
C. Stockpiling

EROSION SEDIMENT CONTROL FIELD GUIDE

III. PERMETER CONTROLS, DIVERSION AND INLET PROTECTION

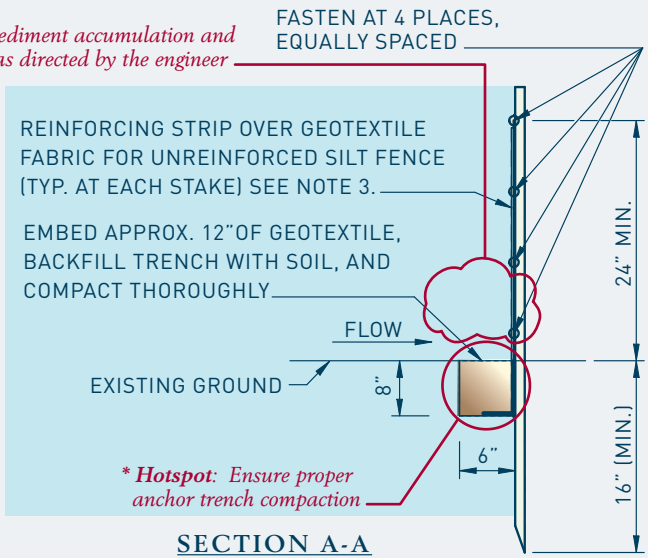
SF
RSF

PLAN SYMBOLS



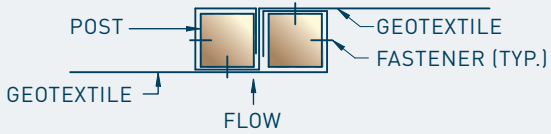
ISOMETRIC VIEW

* ***Hotspot***: *Monitor for sediment accumulation and remove as necessary or as directed by the engineer*

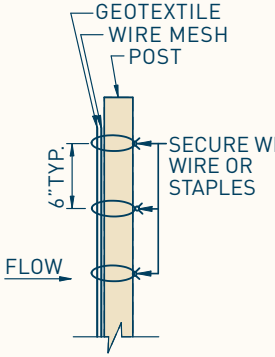


SECTION A-A

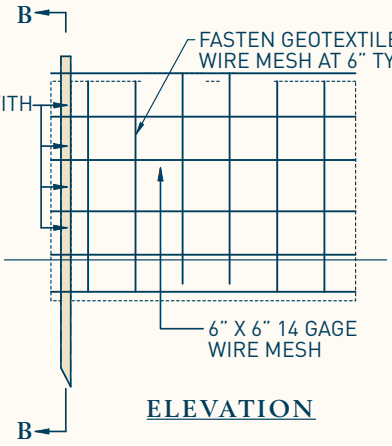
A. Silt Fence and Reinforced Silt Fence



SILT FENCE
CONNECTION DETAIL



SECTION B-B



ELEVATION

WIRE MESH DETAIL
(REINFORCED SILT FENCE ONLY)

NOTES:

1. THIS DEVICE IS INTENDED TO CONTROL SHEET FLOW ONLY. IT SHALL NOT BE USED IN AREAS OF CONCENTRATED FLOW.
2. SILT FENCE ENDS SHALL BE TURNED UPSLOPE TO CONTAIN RUNOFF EVERY 200-FT OR AS DIRECTED BY THE ENGINEER
3. REINFORCING STRIP IS TO BE ONE COMPLETE STRIP COVERING ALL GEOTEXTILE FABRIC AT POST.

A. Silt Fence and Reinforced Silt Fence

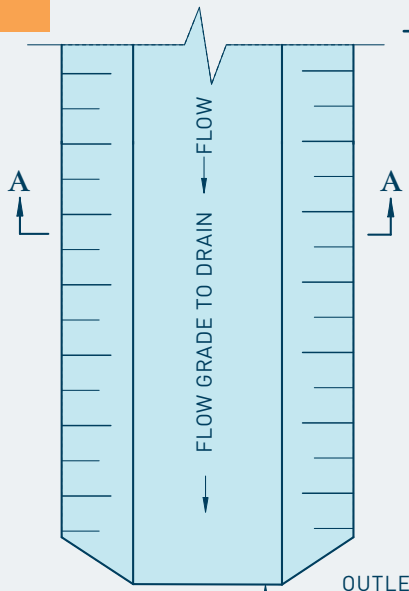
III. PERMETER CONTROLS, DIVERSIONS AND INLET PROTECTION

III.A - Maintenance

- Throughout the Project construction period, the silt fence shall be maintained by removing trapped sediment. The Contractor shall clean the geotextile of trapped sediment by tapping the geotextile when dry. No trash shall be allowed to accumulate to the height of the fence. Any geotextile that does not function due to clogging or deterioration shall be replaced.
- After every heavy rainfall, the Contractor shall check for excessive buildups of sediment which must be removed so that the silt fence can continue to function

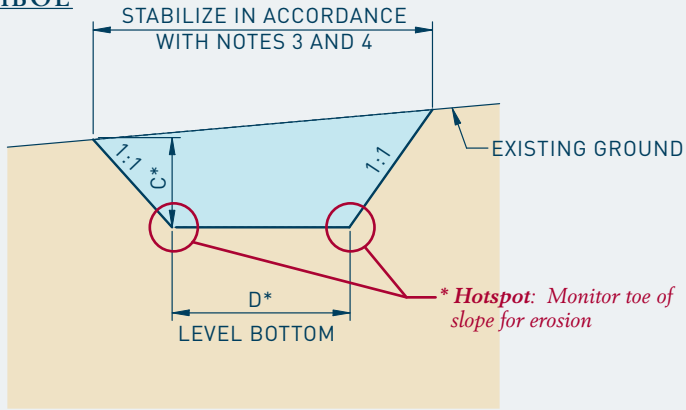
A. Silt Fence and Reinforced Silt Fence

A. Silt Fence and Reinforced Silt Fence



PLAN

PLAN SYMBOL



SECTION A-A

*SEE CHART B

B. Temporary Swale

NOTES:

1. DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
2. DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET DIRECTLY INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSIVE VELOCITY.
3. IF TEMPORARY SWALES OR CLEAN WATER DIVERSIONS ARE TO BE OPERATIONAL FOR MORE THAN 14 DAYS, THEY SHALL BE STABILIZED IN ACCORDANCE WITH THE CONTRACT PLANS PRIOR TO BECOMING OPERATIONAL.
4. IF TEMPORARY SWALES OR CLEAN WATER DIVERSIONS ARE TO BE OPERATIONAL FOR LESS THAN 14 DAYS, THEY SHALL BE STABILIZED WITH GEOTEXTILE IN ACCORDANCE WITH THE STANDARD DETAIL, "GEOTEXTILE-LINED CHANNEL DIVERSION".

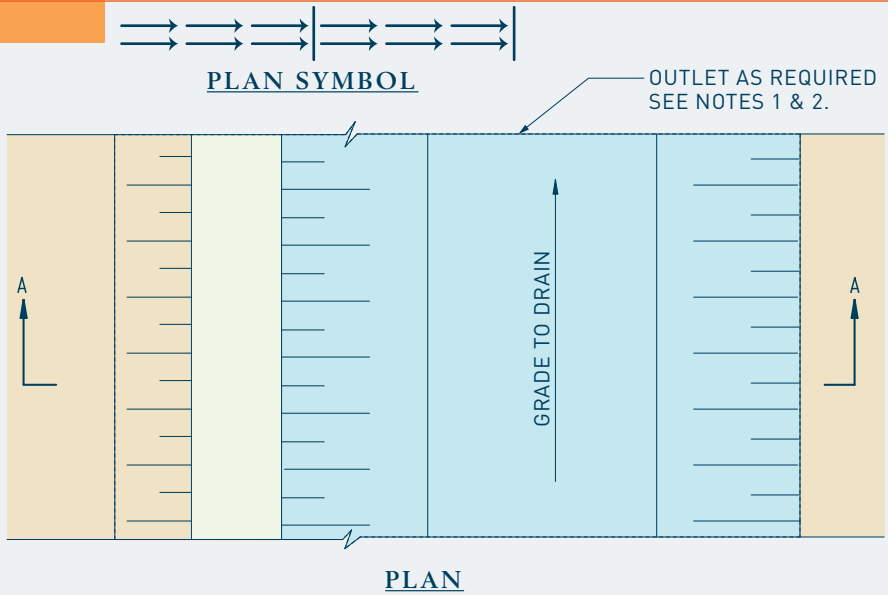
B. Temporary Swale

III.B - Maintenance

- Throughout the Project construction period, the Contractor shall maintain the temporary swale to the original dimensions and function of the temporary swale.
- After each rainfall, the Contractor shall check for excessive buildups of sediment which must be removed so that the temporary swale continues to function as intended. The Contractor shall remove all accumulated sediment when it reaches 50% of the height of the swale or when the accumulated sediment impedes drainage of the temporary swale, whichever comes first.

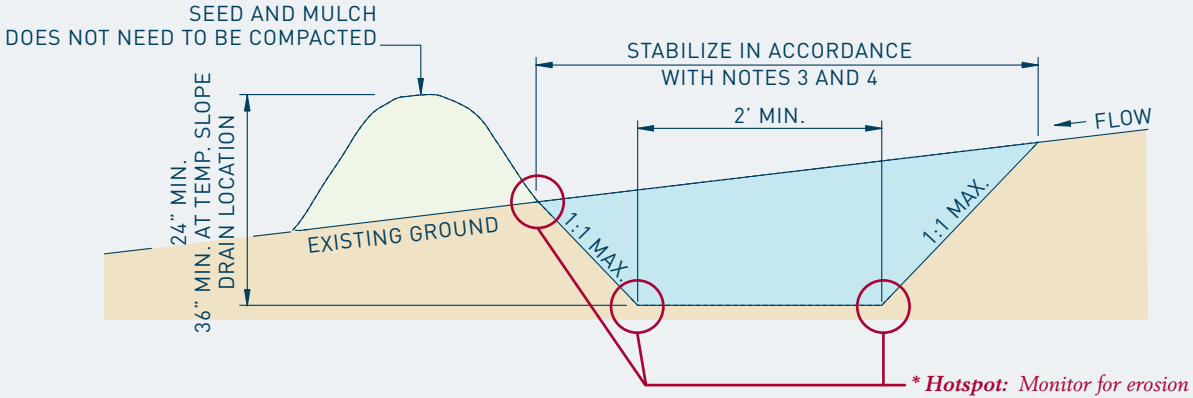
No stabilization. Improper swale cross section

B. Temporary Swale



NOTES:

1. DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
2. DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET DIRECTLY INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSIVE VELOCITY.
3. IF PERIMETER DIKE SWALES ARE TO BE OPERATIONAL FOR MORE THAN 14 DAYS, THEY SHALL BE STABILIZED IN ACCORDANCE WITH THE CONTRACT PLANS PRIOR TO BECOMING OPERATIONAL.
4. IF TEMPORARY SWALES OR CLEAN WATER DIVERSIONS ARE TO BE OPERATIONAL FOR LESS THAN 14 DAYS, THEY SHALL BE STABILIZED WITH GEOTEXTILE IN ACCORDANCE WITH THE STANDARD DETAIL, "GEOTEXTILE-LINED CHANNEL DIVERSION".



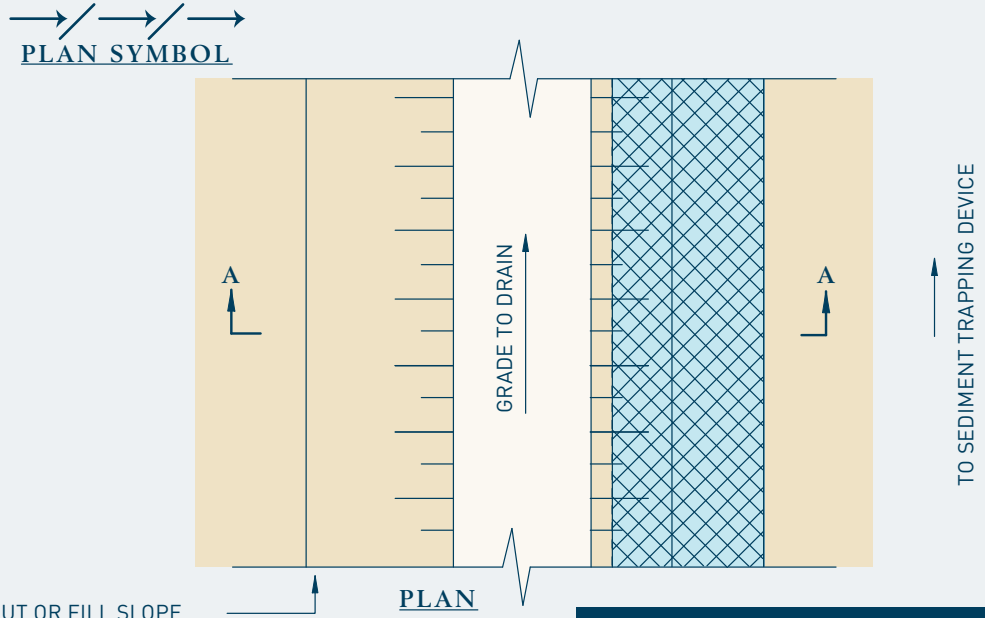
SECTION A-A

C. Perimeter Dike/Swale

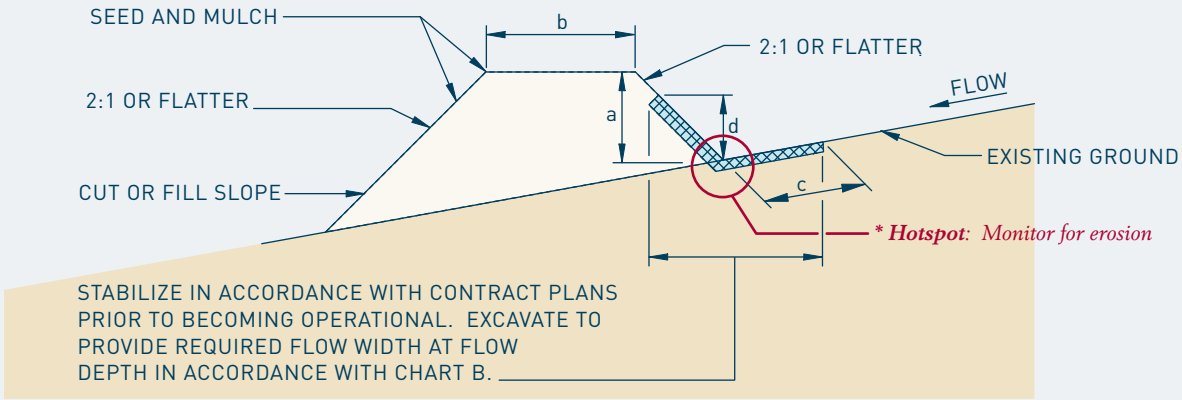
III.C - Maintenance

- Throughout the Project construction period, the Contractor shall maintain the perimeter dike/swale to the original dimensions and function of the swale and of the dike.
- After each rainfall, the Contractor shall check for excessive buildup of sediment that must be removed so that the perimeter dike/swale continues to function as intended. The Contractor shall remove all accumulated sediment when it reaches 50% of the height of the swale.

C. Perimeter Dike/Swale


PLAN SYMBOL
A
GRADE TO DRAIN
A
TO SEDIMENT TRAPPING DEVICE
CUT OR FILL SLOPE
PLAN

D. Earth Dike



SECTION A-A

NOTES:

1. IF DESIRED, TOP WIDTH MAY BE WIDER AND SIDE SLOPES MAY BE FLATTER TO FACILITATE CROSSING BY CONSTRUCTION TRAFFC.
2. FIELD LOCATION SHOULD BE ADJUSTED AS NEEDED TO ENSURE A STABILIZED OUTFALL.

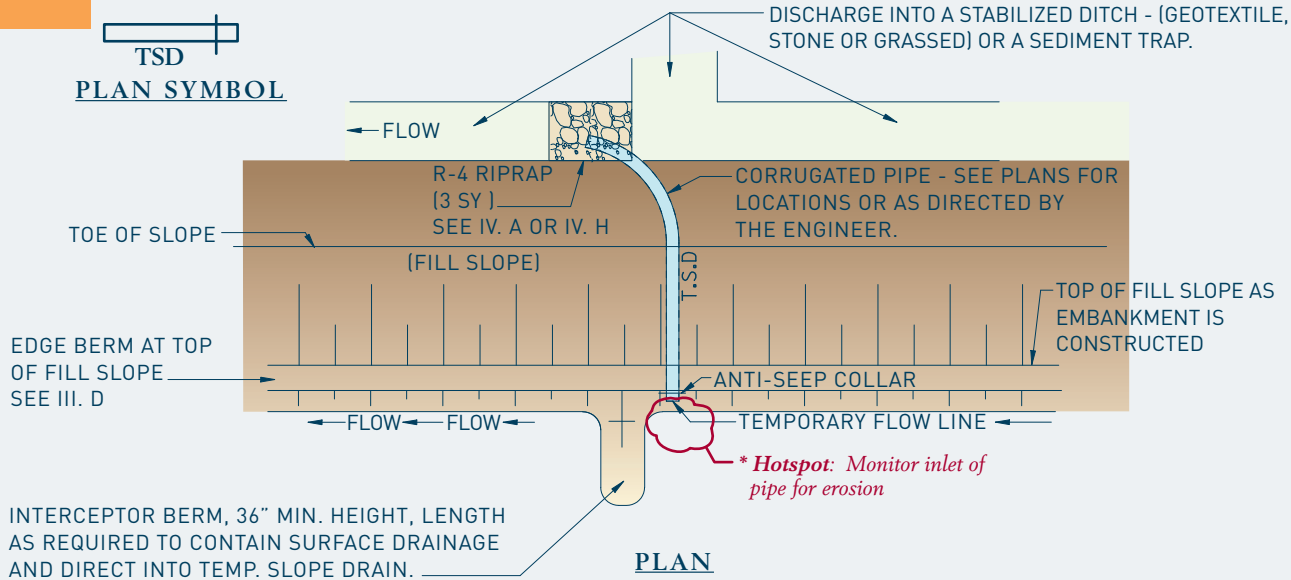
D. Earth Dike

III.D - Maintenance

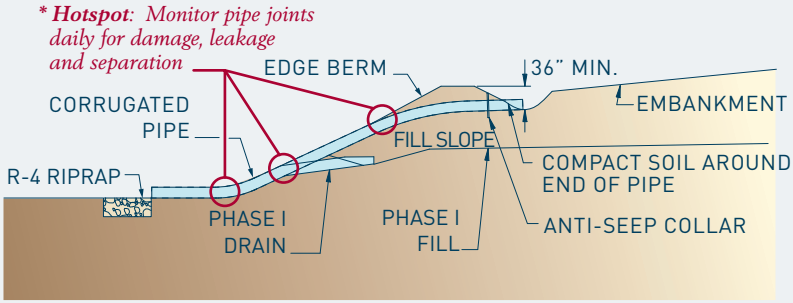
- Throughout the Project construction period, the Contractor shall maintain the earth dike to the original dimensions and function of the channel and the dike.
- After each rainfall, the Contractor shall check for excessive buildups of sediment which must be removed so that the earth dike can continue to function as intended. The Contractor shall remove all accumulated sediment when it reaches 50% of the height of the earth dike.

Good berm construction, but needs more vegetation

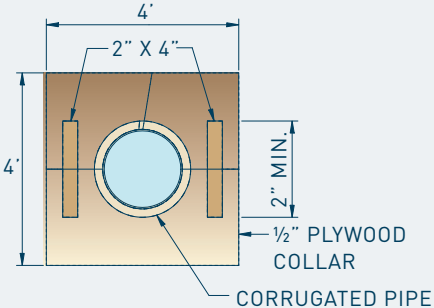
D. Earth Dike



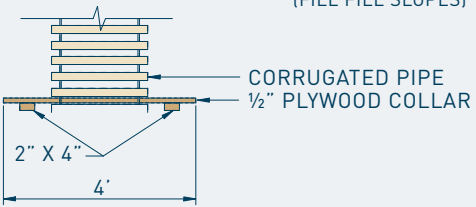
E. Temporary Slope Drain



SLOPE DRAIN PROFILE
(FILL FILL SLOPES)



ELEVATION



ANTI-SEEP COLLAR PLAN

NOTES:

1. ALL TEMPORARY SLOPE DRAINS SHALL DISCHARGE INTO THE BACK OF SEDIMENT TRAPS, INTO SEDIMENT BASINS OR DITCHES DISCHARGING INTO TRAPS OR BASINS.
2. TEMPORARY SLOPE DRAINS SHALL BE USED AT THE TOP OF FILL SLOPES AS EMBANKMENT IS CONSTRUCTED, TO PREVENT EXCESSIVE EROSION UNTIL SHOULDERS ARE CONSTRUCTED AND THE SLOPES ARE SEEDED AND MULCHED.

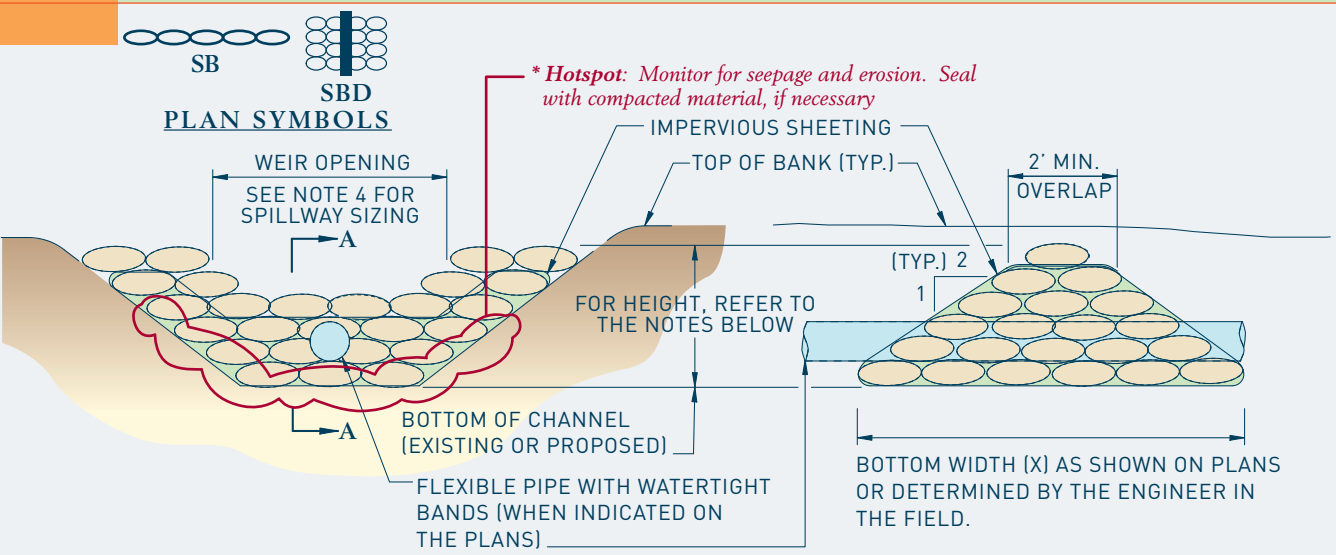
E. Temporary Slope Drain

III.E - Maintenance

- Maintenance of embankment slopes, edge berms, and interceptor berms shall conform to the requirements of Section 202.
- The drain system shall be inspected for clogging and rips or breaks and shall be cleaned and repaired as required to remain functional.

E. Temporary Slope Drain

E. Temporary Slope Drain


SB
SBD
PLAN SYMBOLS
* Hotspot: Monitor for seepage and erosion. Seal with compacted material, if necessary
IMPERVIOUS SHEETING
TOP OF BANK (TYP.)
2' MIN. OVERLAP
WEIR OPENING
SEE NOTE 4 FOR SPILLWAY SIZING
A
A
(TYP.) 2
1
FOR HEIGHT, REFER TO THE NOTES BELOW
BOTTOM OF CHANNEL (EXISTING OR PROPOSED)
FLEXIBLE PIPE WITH WATERTIGHT BANDS (WHEN INDICATED ON THE PLANS)
BOTTOM WIDTH (X) AS SHOWN ON PLANS OR DETERMINED BY THE ENGINEER IN THE FIELD.
ELEVATION
SECTION A-A

NOTES:

1. THE WORK SHALL CONSIST OF INSTALLING A SANDBAG DIKE FOR THE PURPOSE OF EROSION CONTROL WHEN CONSTRUCTION ACTIVITIES TAKE PLACE WITHIN THE STREAM CHANNEL SUCH AS BANK STABILIZATION OR BRIDGE ABUTMENT CONSTRUCTION.
2. THE SANDBAG DIKE SHALL BE INSTALLED AT THE UPSTREAM LOCATION FIRST.
3. THE HEIGHT OF THE SANDBAG DIKE SHALL BE 1' ABOVE THE PEAK ELEVATION OF THE ONE YEAR STORM, OR EQUAL WITH THE TOP OF BANK, WHICHEVER IS LESS. SEE PLANS FOR INFORMATION.
4. THE SPILLWAY SHALL BE SIZED TO PASS A (1) ONE YEAR STORM EVENT PEAK FLOW, SEE PLANS.
5. THE PIPE, WHEN UTILIZED, SHALL BE SIZED TO PASS THE STREAM BASE FLOW.

F. Sandbag Dike

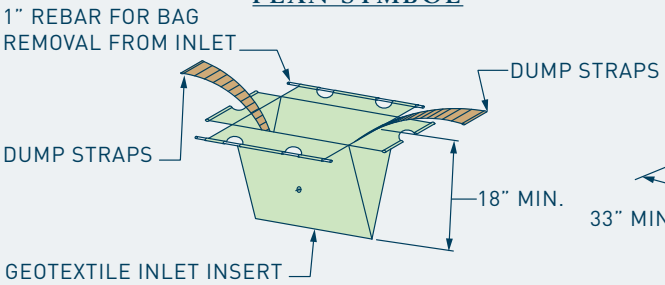
III.F - Maintenance

- The Contractor shall maintain the original dimensions of the accepted sandbag dikes and sandbag diversions.

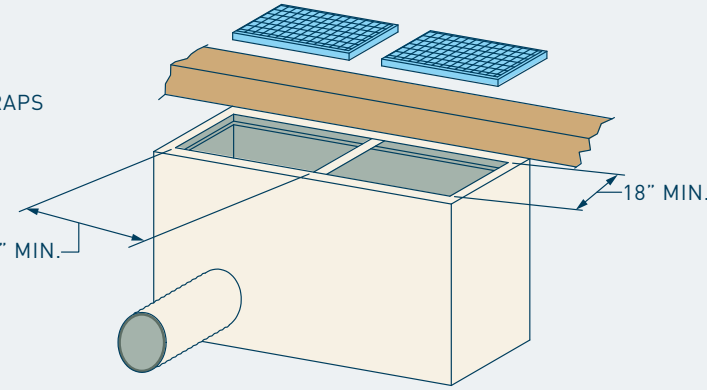
F. Sandbag Dike

F. Sandbag Dike

PLAN SYMBOL



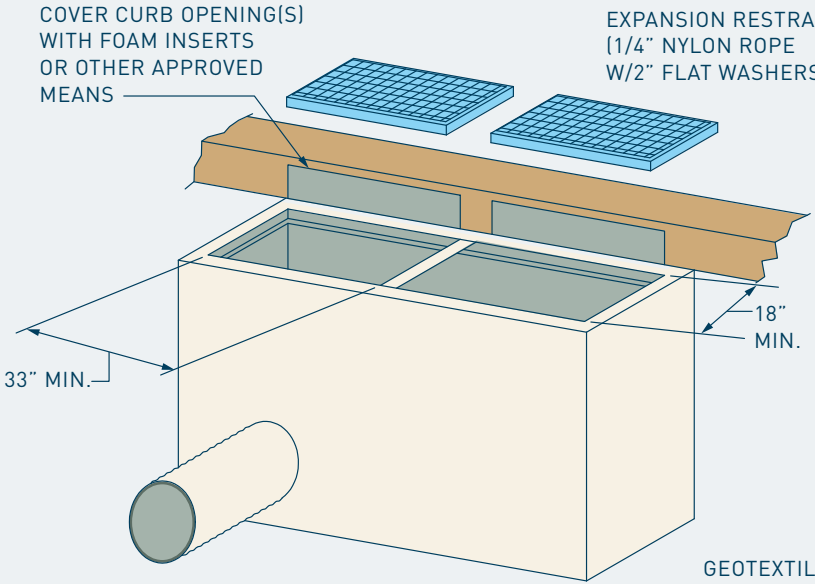
INSERT CROSS-SECTION



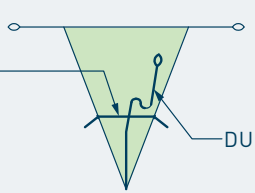
PERSPECTIVE VIEW

NOTES:

1. ONE (1) GEOTEXTILE INLET INSERT SHALL BE INSTALLED PER GRATE OPENING.



PERSPECTIVE VIEW



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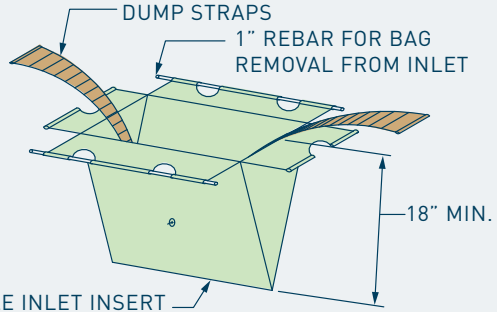


G. Curb Inlet Sediment Control

III.G - Maintenance

- Throughout the Project construction period, the inlet sediment controls shall be maintained and remain functional. Maintenance shall include cleaning the geotextile of trapped sediment by tapping the geotextile when it is dry. After every rainfall, the Contractor shall inspect the inlet sediment control. The geotextile insert shall be replaced when 50% of the voids are clogged. Any geotextile that does not function due to clogging or deterioration shall be replaced.

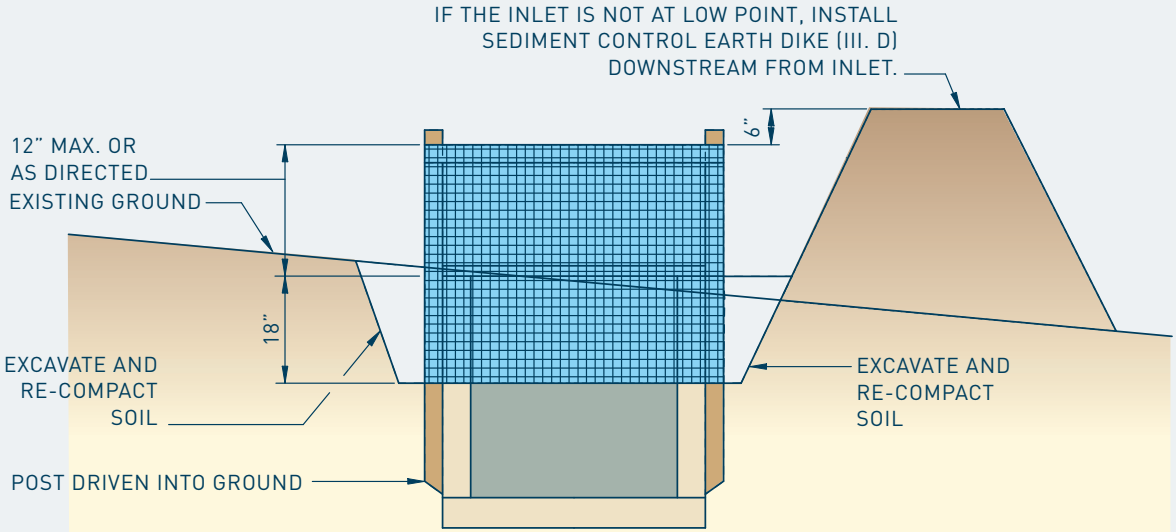
G. Curb Inlet Sediment Control

G. Curb Inlet Sediment Control

PLAN SYMBOL

ISOMETRIC VIEW

H. Drainage Inlet Sediment Control



SECTION A-A

H. Drainage Inlet Sediment Control

III.H - Maintenance

- Throughout the Project construction period, the inlet sediment controls shall be maintained and remain functional. Maintenance shall include cleaning the geotextile of trapped sediment by tapping the geotextile when it is dry. After every rainfall, the Contractor shall inspect the inlet sediment control. The geotextile and, if applicable, the stones shall be replaced when 50% of the voids are clogged. Any geotextile that does not function due to clogging or deterioration shall be replaced.
- The Contractor shall remove all accumulated sediment from around the drainage inlet sediment control when the sediment has reached 6" (150 mm) from the top of the geotextile. When the sediment has reached 50% of the height of the curb, the Contractor shall remove all accumulated sediment from around the curb inlet sediment control.

H. Drainage Inlet Sediment Control

H. Drainage Inlet Sediment Control

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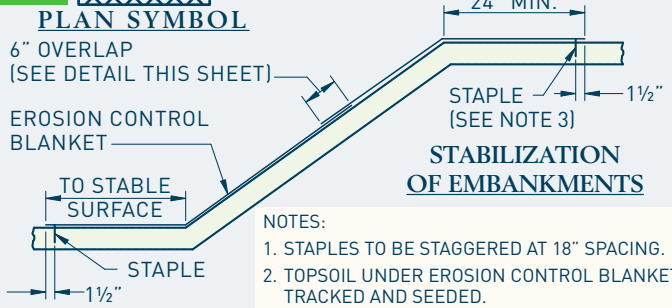
Delaware Department of Transportation

EROSION SEDIMENT CONTROL FIELD GUIDE

IV. STABILIZATION AND EROSION CONTROL

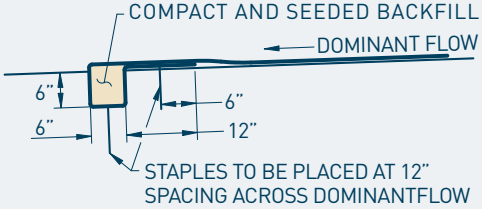
PLAN SYMBOL



STABILIZATION OF EMBANKMENTS

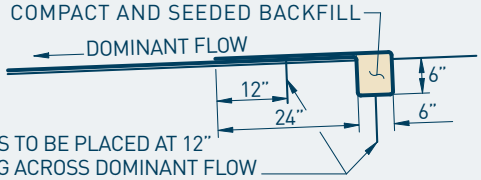
NOTES:

1. STAPLES TO BE STAGGERED AT 18" SPACING.
2. TOPSOIL UNDER EROSION CONTROL BLANKET IS TO BE TRACKED AND SEEDED.
3. WHEN OFFSITE RUNOFF OCCURS, ADDITIONAL MEASURES AS DIRECTED BY THE ENGINEER SHALL BE USED TO ENSURE STABILITY OF EMBANKMENT.



INITIAL TRENCH ANCHOR DETAIL

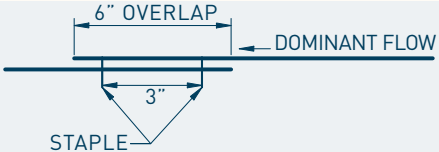
APPLIED AT THE DOWNSTREAM END OF DITCH



TERIMNAL TRENCH ANCHOR DETAIL

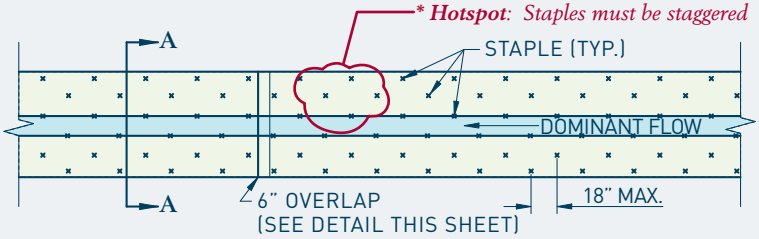
APPLIED AT THE UPSTREAM END OF DITCH

STAPLE DETAIL



OVERLAP DETAIL

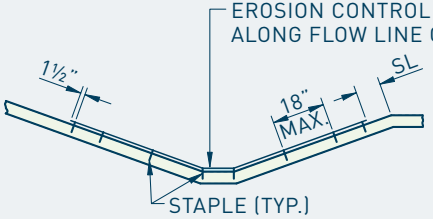
STAPLES TO BE STAGGERED AT 6" SPACING



STABILIZATION OF DITCHES PLAN

NOTES

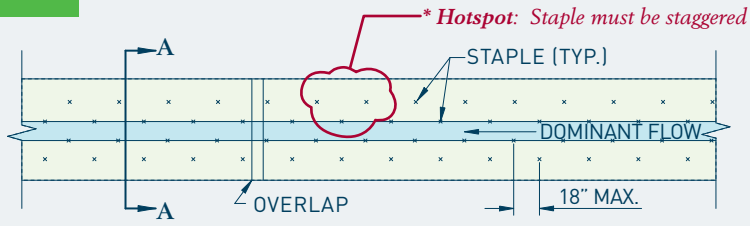
1. ADDITIONAL STAPLES NOT SHOWN ARE REQUIRED AT OVERLAPS SEE OVERLAP DETAIL FOR STAPLE PLACEMENT.
2. STAPLES ARE TO BE STAGGERED.
3. TOPSOIL UNDER EROSION CONTROL BLANKET IS TO BE TRACKED AND SEEDED.



STABILIZATION OF DITCHES SECTION A-A

STAPLES ALONG LONGITUDINAL EDGES SHALL BE SPACED AS FOLLOWS:

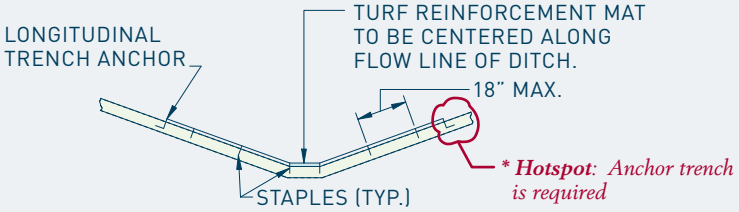
18" WHEN SL ≤ 20'
9" WHEN SL > 20'



STABILIZATION OF DITCHES
PLAN

NOTES:

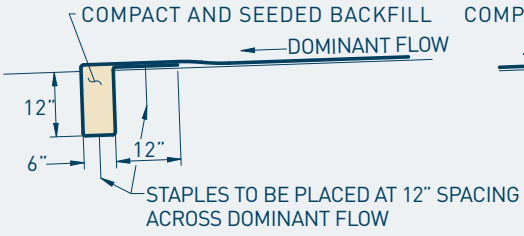
1. ADDITIONAL STAPLES NOT SHOWN REQUIRED AT OVERLAPS ENDS, CHECK SLOTS AND EDGES. SEE APPROPRIATE DETAILS FOR STAPLE PLACEMENT.
2. STAPLES ARE TO BE STAGGERED.
3. TOPSOIL UNDER TURF REINFORCEMENT MAT IS TO BE TRACKED AND SEEDED.



STABILIZATION OF DITCHES
SECTION A-A

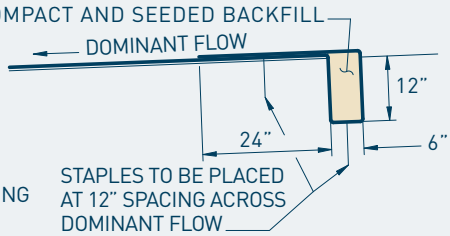
STAPLE DETAIL

B. Turf Reinforcement Mat Application



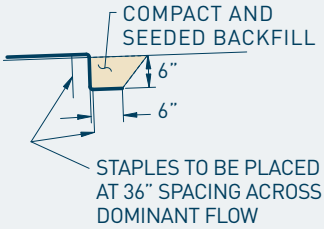
INITIAL TRENCH ANCHOR DETAIL

APPLIED AT THE DOWNSTREAM END OF DITCH

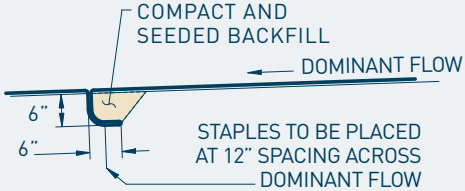


TERMINAL TRENCH ANCHOR DETAIL

APPLIED AT THE DOWNSTREAM END OF DITCH

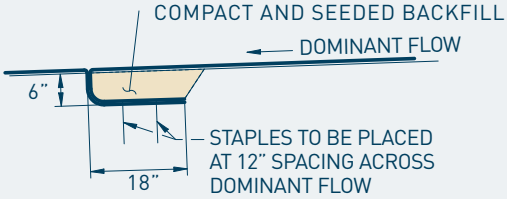


LONGITUDINAL TRENCH ANCHOR DETAIL



CHECK SLOT DETAIL

(AS NEEDED PER PLANS)



OVERLAP DETAIL

B. Turf Reinforcement Mat Application

A/B. Blanket and Matting

Improper stapling at overlap

Failure due to no anchoring or stapling

More than 6" indicates improper stapling. Staples not staggered

"Tenting" due to improper stapling

SEEDING :

The work included in this item shall consist of providing an acceptable uniform stand of established perennial turf grasses, including mulching, on all areas to be treated as shown on the plans or where designated by the Engineer. The Contractor shall refer to the most current standard seeding specification (Section 734) for specific information regarding temporary and permanent turf establishment. The information contained in this section of the Erosion and Sediment Control Field Guide highlights basic guidance for turf establishment.

ACCEPTABLE MATERIALS:

- Water: Any water used for this item shall conform to the requirements of Section 803.
- Mulch: Use only mulch that is biodegradable and free of contaminants.
- Grass and Agricultural Seed Mixes: The Seeding Charts on the following pages shall be used for the following specified seeding:
  - Permanent Grass Seeding - Dry Ground (PGS-DG)
  - Permanent Grass Seeding - Wet Ground (PGS-WG)
  - Permanent Grass Seeding - Subdivision (PGS-SUB)
  - Temporary Grass Seeding - Dry Ground (TGS-DG)
  - Temporary Grass Seeding – Wet Ground (TGS-WG)

SEEDING CHART					
Type	Species	Max. % Weed Seed[1]	% Purity	% Germination	Seeding Rate (lb/acre)
PGS-DG (≤ 1V:3H) or	Turf Type Fall Fescue *(Lolium arundinaceum, formerly; Festuca arundinacea)*	0.5	98	90	200

SEEDING CHART

Type	Species	Max. % Weed Seed[1]	% Purity	% Germination	Seeding Rate (lb/acre)
PGS-SUB	Perenial Ryegrass (Lolium perene)	0.4	90	90	20
	Kentucky Bluegrass (Poa pratensis)	0.4	90	80	30
	Redtop (Argrostis alba) (PGS-DG ONLY)	75	95	90	5
	Annual Ryegrass - Option[5] (Lolium multiflorum)	0.15	95	90	10

SEEDING CHART					
Type	Species	Max. % Weed Seed[1]	% Purity	% Germination	Seeding Rate (lb/acre)
PGS-DG (>1V:3H)	Hard Fescue Mixture *(Festuca longifolia and Festuca trachyphylla)*	0.15	98	85	140
	Creeping Red Fescue *(Poa pratensis)*	0.15	98	85	85
	Redtop *(Argrostis alba)*	75	95	90	5
	Annual Ryegrass *(Lolium multiflorum)*	0.15	95	90	10

SEEDING CHART

Type	Species	Max. % Weed Seed[1]	% Purity	% Germination	Seeding Rate (lb/acre)
PGS-WG[3]	Redtop *(Argrostis alba)*	0.75	95	90	40
	Creeping Red Fescue *(Poa pratensis)*	0.75	98	90	25
	Sheep Fescue[2] *(Festuca ovina)*	0.5	98	85	35
	Rough-Stalked Bluegrass *(Pao trivialis)*	0.5	98	80	25

SEEDING CHART					
Type	Species	Max. % Weed Seed[1]	% Purity	% Germination	Seeding Rate (lb/acre)
TGS-DG	Annual Ryegrass - Optional *(Lolium multiflorum)*	0.15	95	90	40
TGS-WG[4]	Annual Barnyard Grass/Duck Millet *(Echinocloa spp.)*	1.00	90	90	40

[1]Title 3 Delaware Code, Chapter 15, Seeds and its associated regulations identify several species of seed designated as Noxious Weeds by the Delaware Department of Agriculture and therefore may not be part of the allowable percentage of weed seeds in any quantity.

[2]Festuca ovina shall be an improved variety of Sheep Fescue as approved by the Department. Selection should be based on performance within the Mid-Atlantic region as determined by the most current National Turfgrass Evaluation Program Progress Report.

[3]Permanent Seeding - Wet Ground should be used on saturated or seasonally flooded areas as dictated by the wetland limits on the Plans.

[4]Wet, bare ground, leaf litter covered or partially vegetated retention ponds, traps, or basins, or all intermittently flooded sites in general may be seeded with Temporary Seeding - Wet Ground. No wood fiber mulch shall be added to the hydroseeder. Unless indicated on the Plans, Echinocloa spp. is equivalent to E. muricata, E. crusgalli, or E. walteri. No mulching, fertilizer or limestone shall be applied with this seeding.

[5]The Contractor has the option of adding at his or her expense, up to 10 lbs. Annual Ryegrass (Lolium multiflorum) to the PGS-DG (↖ 1V:3H) and PGS-SUB seed mixes.

CONSTRUCTION NOTES:

- General: This work shall consist of preparing the soil, placing the seed and applying any soil supplements necessary to provide a suitable stand of turf grass and placing mulch.
- Seeding Season. The calendar dates for seeding shall be Spring – March 1 to May 15 and Fall – August 15 to October 31. Sussex County fall season is August 15 to November 15. All disturbed soil areas shall be treated during the seeding seasons as follows:
    - Areas meeting final grade. Seeding and mulching shall be completed.
    - "Out of Season" Periods. During "out of season" periods, unseeded areas shall be treated in accordance with temporary stabilization as per Section 110.09 (d).
    - "Out of Season" seeding. "Out of Season" seeding shall be performed in the same manner as "in-season" seeding. Requests for out of season seeding will be considered if sufficient written justification is provided, with the understanding that in-season re-seeding will be required, at no cost to the Department, if the turf stand fails to conform to 734.07.
    - Temporary grass seeding. Temporary grass seeding, when required, prior to Permanent Grass Seeding, shall be mowed and tracked (tracking shall be accomplished by driving cleated equipment such as a bulldozer over the surface).

MAINTENANCE

- The Contractor shall maintain all seeded and mulched areas free from weeds and debris in accordance with Section 105.13. Grass mowing shall be completed at the direction of the Engineer or as specified in the contract. Payment for grass mowing shall be incidental to the project unless it is included in another item of work.

ACCEPTANCE OF PERMANENT AND TEMPORARY GRASS SEEDING

- Acceptance of permanent grass seeding will require production of a uniform stand of established perennial grass species, as specified in Section 734.04, having attained a height of 3 inches with a density of 70% of the seeded area (a minimum of 100 plants per square foot). Any area identified without a uniform density of 70% specified perennial grass cover shall be repaired at the Contractor's expense. Acceptance of Temporary seeding will be made at time of placement, provided the seed is mixed and placed as specified in Section 734.04

MAINTENANCE BOND

- Upon Substantial Completion of the Work, the Contractor shall furnish to the Department a Maintenance Bond on the form provided by the Department for item 734XXX - Seeding. The Maintenance Bond shall meet the all of the following requirements:
  - A sum equal to 100% of the value of all Permanent Grass Seeding Items paid to the Contractor
  - All signatures are original signatures, in ink, and not mechanical reproductions or facsimiles of any kind
  - The Contractor is the named principle
  - The term of the bond is for one full year.
  - Seeding Work items associated with permanent seeding requires completion after substantial completion of the Project. The term of the Maintenance Bond will be for a period of one year beyond the completion of permanent seeding Work
  - Written by a Surety or insurance company that is in good standing and currently licensed to write surety bonds in the State of Delaware by the Delaware Department of Insurance.

METHOD OF MEASUREMENT

- The Engineer will measure the quantity of acceptably placed permanent or temporary grass seed. The quantity of seeding will be measured in square yards (square meters) of surface area. Unless otherwise specified on the plans, mulching will not be measured.

WORKING DAYS

- When the sequence of construction precludes completion of 734 – Seeding Work items associated with permanent seeding within the Calendar Day Contract Completion date, the Contractor will submit with his/her bid proposal a separate Working Day schedule to govern completion of 734 – Seeding items. The Contractor shall submit a separate schedule in Bar Chart Format reflecting all work associated with this item for review and approval at the preconstruction meeting. Failure to submit an acceptable Working Day schedule for completion of 734 – Seeding items may result in delay in "Notice to Proceed." Failure to complete 734 – Seeding items within the specified number of Working Days above will result in assessment of Liquidated Damages based on the total of Item 734xxx, per Working Day as detailed in Subsection 108.09, Schedule of Liquidated Damages. Sections 734.09, Method of Measurement, and Section 734.10, Basis of Payment, remain unaffected by this requirement.

C. Seeding

Poor seeding application

C. Seeding


Insufficient Cover


Crabgrass not acceptable

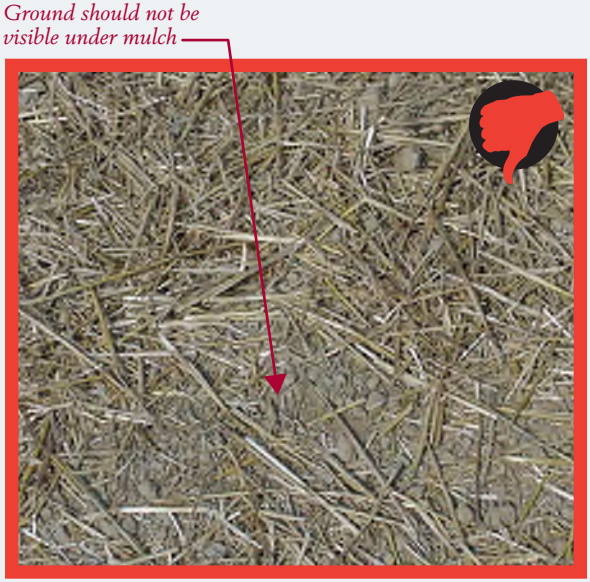
IV.D - Mulching

- This work consists of furnishing, placing, and anchoring mulch over seeded areas.
- Small Grain Straw for mulching shall be from oats, wheat, rye, or other approved grain crops that are free from noxious weeds, mold, or other objectionable material. Straw mulch shall be in an air-dry condition and shall be suitable for placing with an approved mechanical blower.
- Construction Methods.
  - ❑ Small Grain Straw mulching shall be used on all slopes flatter than 3:1 (vertical to horizontal) with the exception of slopes or sites not accessible to tracking or crimping tools and equipment. In these situations, straw-coconut fiber blankets or bonded fiber matrix shall be used.
  - ❑ Small grain straw shall be uniformly and evenly applied immediately after seeding has been completed.
  - ❑ An approved mechanical blower shall be used to apply the straw. Straw mulch applied by blowers shall provide a loose depth of not less than 1/2 nor more than 2" (13 nor more than 50 mm). Ninety-five percent of the blown and shredded straw mulch shall be 6" (150 mm) or more in length when in place.

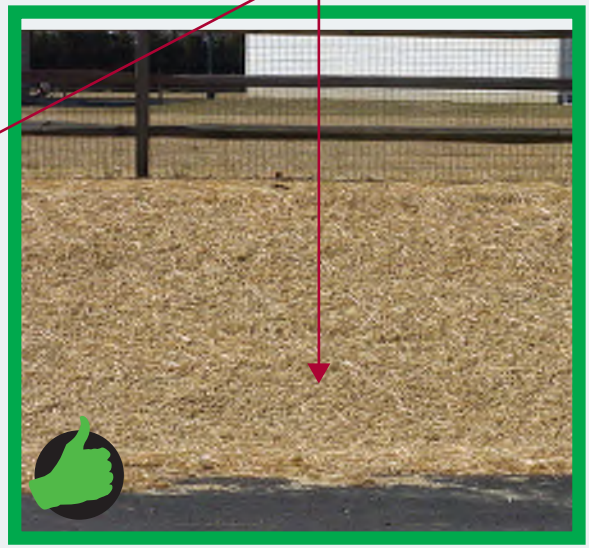
Insufficient mulch coverage

D. Mulching

- Straw mulch shall be applied at the rate of 4000 lb/ac (4500 kg/ha) and secured by one of the following methods:
  - 1. Crimping Method. This method of incorporating the straw into the ground shall be accomplished with the use of crimping device that produces horizontally oriented indentation. Straw mulch shall be incorporated into the soil to a minimum depth of 2" (50 mm). The crimping device shall be approved by the Engineer.
  - 2. Tracking Method. This method may be used on all sites mulched with straw and shall involve the use of steel-cleat track-type equipment driving up and down the slopes producing horizontally oriented indentations with the cleats. Cleats shall be capable of incorporating the straw mulch into the soil to a minimum depth of 12" (40 mm). The equipment used and the method of tracking shall be approved by the Engineer.



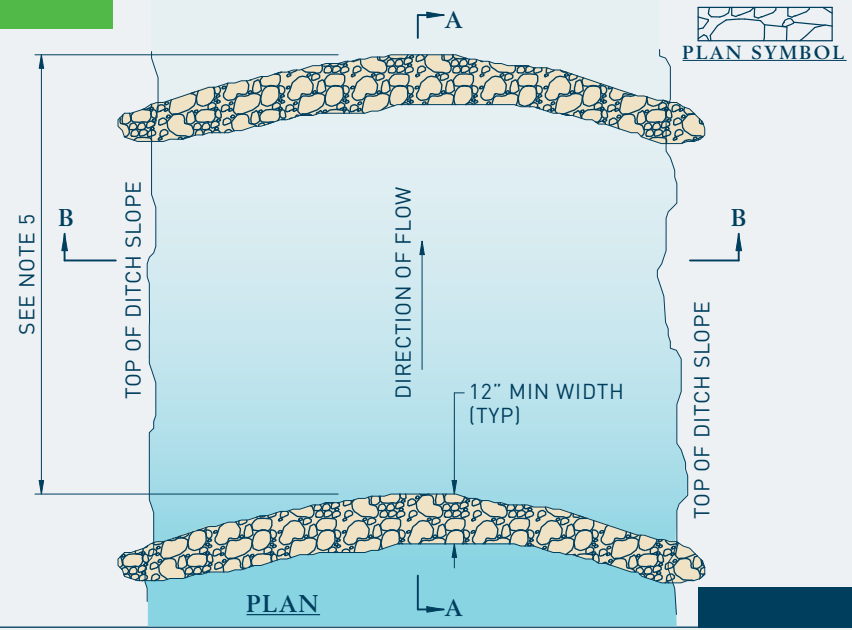
D. Mulching



D. Mulching

Good tracking prior to mulch application

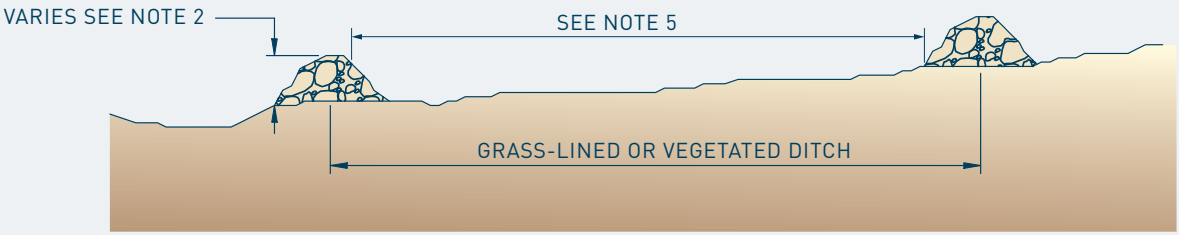
Tracking is in wrong direction



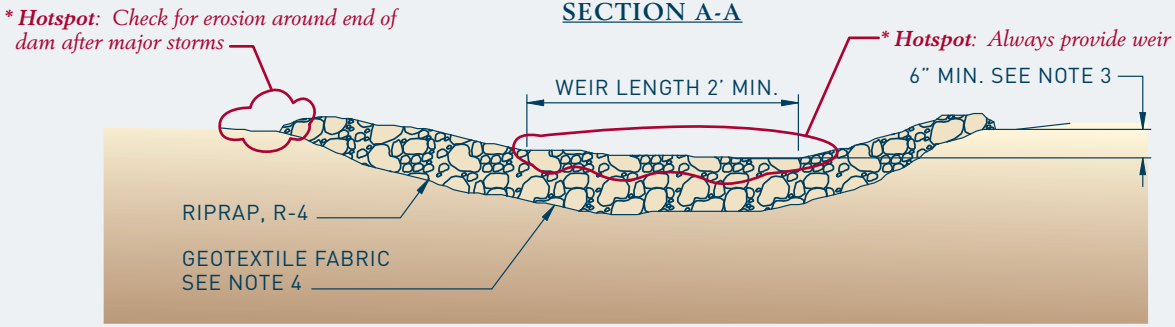
NOTES:

1. FOR DITCHES LESS THAN 30" IN DEPTH, PLACE DAM AS DIRECTED BY THE ENGINEER.
2. THE CHECK DAM HEIGHT MUST NOT EXCEED 2' AT THE CENTER OF THE WEIR.
3. THE CHECK DAM IS TO BE CONSTRUCTED SO THAT THE CENTER IS 6" MIN. LOWER THAN THE OUTER EDGES, FORMING A WEIR THAT WATER CAN FLOW ACROSS.
4. GEOTEXTILE FABRIC IS TO BE INSTALLED UNDERNEATH RIPRAP ON PERMANENT CHECK DAMS ONLY.
5. THE MAXIMUM SPACING BETWEEN DAMS SHALL BE THE DISTANCE IN THE DITCH WHERE THE TOE OF THE UPSTREAM DAM IS AT THE SAME ELEVATION AS THE TOP OF THE DOWNSTREAM DAM AT THE CENTER OF THE WEIR.

E. Stone Check Dam



SECTION A-A



SECTION B-B

E. Stone Check Dam

IV.E - Maintenance

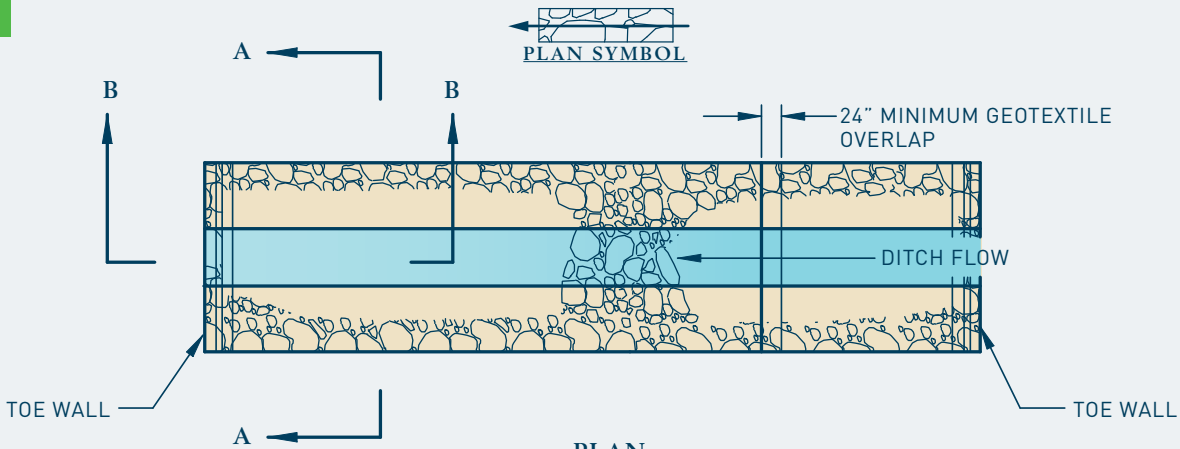
- After each rainfall, the Contractor shall inspect the stone check dam for sediment accumulation or washout. The Contractor shall replace the riprap whenever washout, construction traffic damage, or silt accumulation among the riprap occurs and whenever the stone check dam ceases to function as intended.
- Sediment shall be removed from behind the check dams when it has accumulated to one-half of the original height of the stone check dam at the spillway.

E. Stone Check Dam

Failure to clean sediment and maintain check dam

Poor application no ditch line

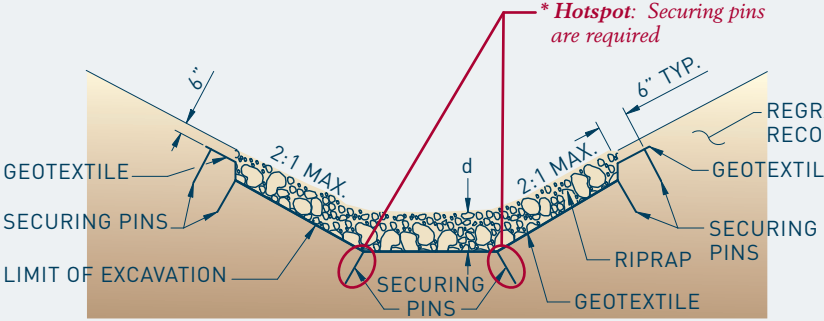
E. Stone Check Dam



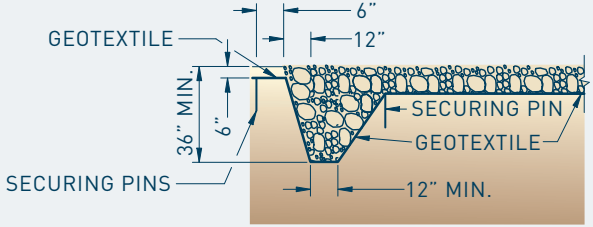
PLAN

NOTES:

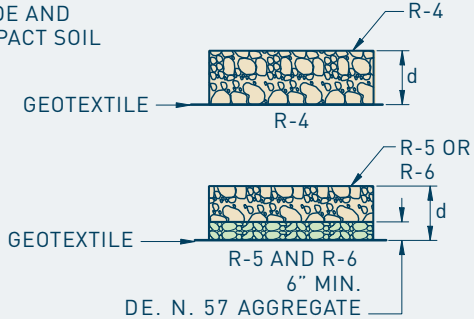
1. SECURING PINS ARE TO BE PLACED AT LOCATIONS SHOWN AND AT 24" LONGITUDINAL AND LATERAL SPACING.
2. SEE PLANS FOR LOCATION, DIMENSIONS, GRADES, ETC.



SECTION A-A



SECTION B-B



SECTION DETAILS

CLASS RIPRAP

R-4 d = 14" MIN.
R-5 d = 26" MIN.
R-6 d = 34" MIN.

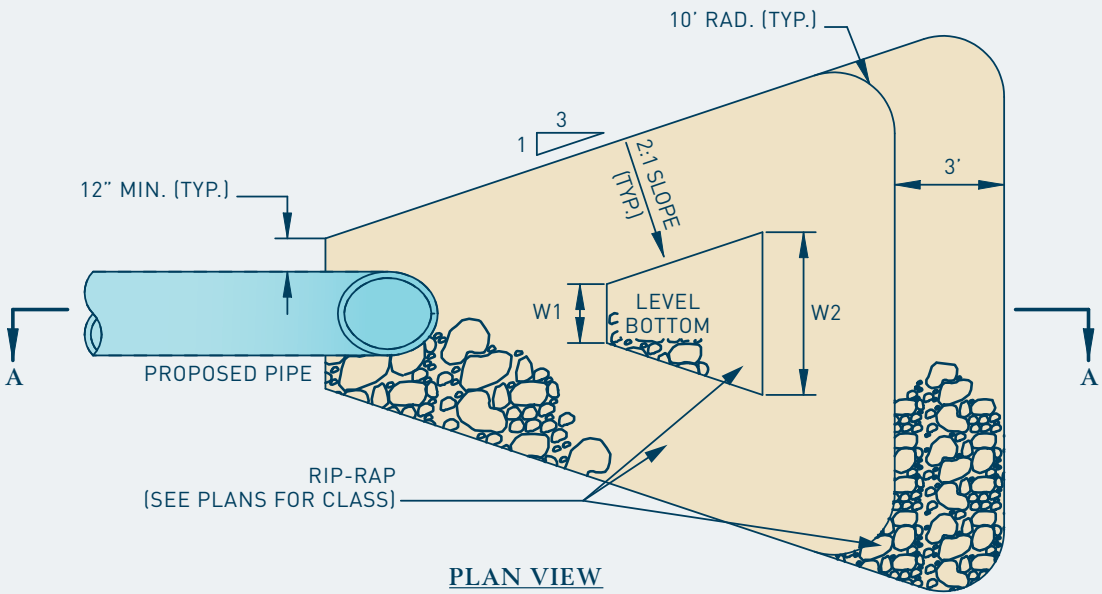
F. Riprap Ditch

IV.F - Maintenance

- Throughout the Project construction period, the Contractor shall maintain the original dimensions and function of the riprap ditch.

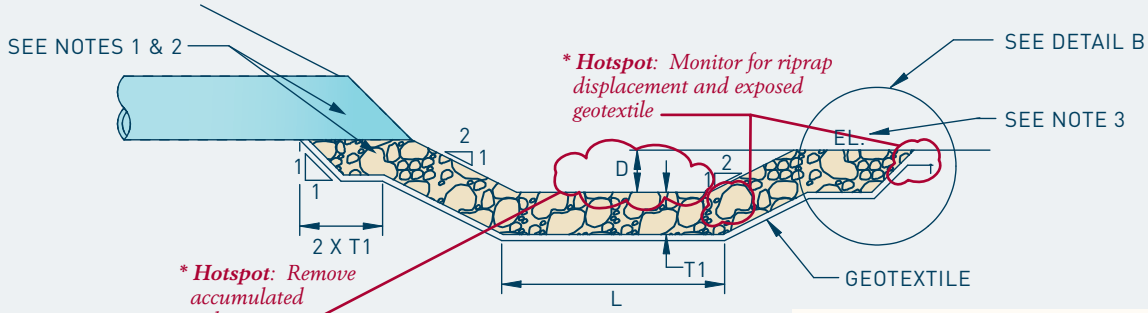
F. Riprap Ditch

F. Riprap Ditch

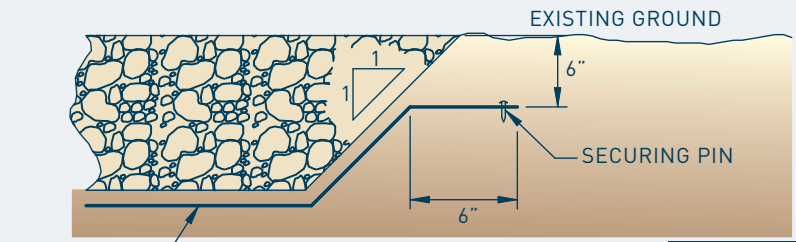


PLAN VIEW

G. Riprap Energy Dissipator



SECTION A-A



DETAIL B

NOTES:

1. RIPRAP IS TO BE PLACED PRIOR TO PLACING PIPE.
2. PLACE DELAWARE NO. 3 STONE UNDER PIPE.
3. ELEVATION (EL.) SHOULD NOT BE HIGHER THAN PIPE INVERT.
4. REFER TO THE PIPE ENERGY DISSIPATOR SCHEDULE ON THE CONSTRUCTION PLANS FOR THE VALUE OF DIMENSION VARIABLES.

G. Riprap Energy Dissipator

IV.G - Maintenance

- Throughout the Project construction period, the Contractor shall maintain the original dimensions and function of the riprap energy dissipator.

No No. 3 stone under end section

Insufficient riprap coverage. No geotextile

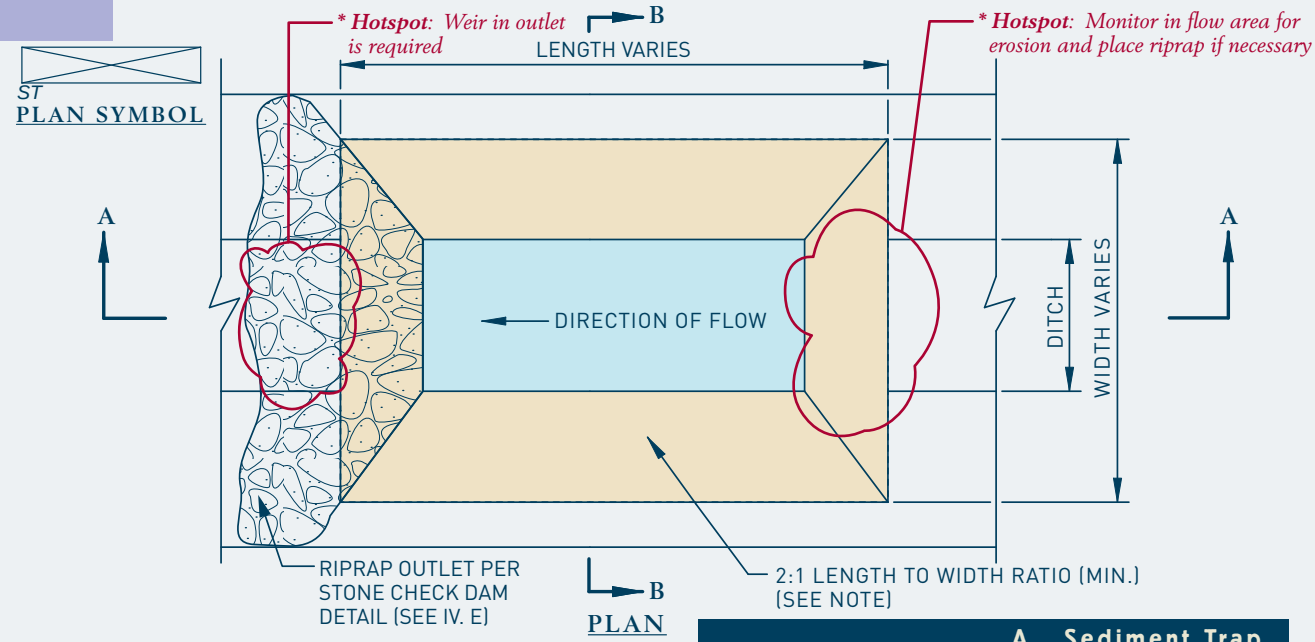
G. Riprap Energy Dissipator

G. Riprap Energy Dissipator

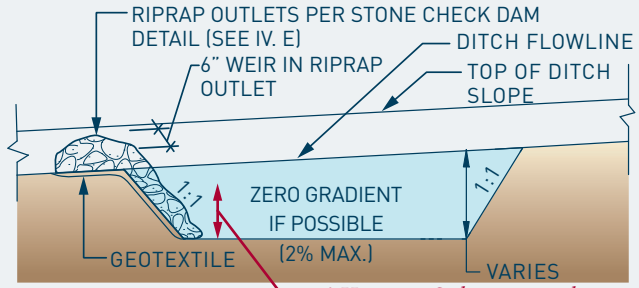
DelDOT
Delaware Department of Transportation

EROSION SEDIMENT CONTROL FIELD GUIDE

V. SEDIMENT TRAPS AND BASINS

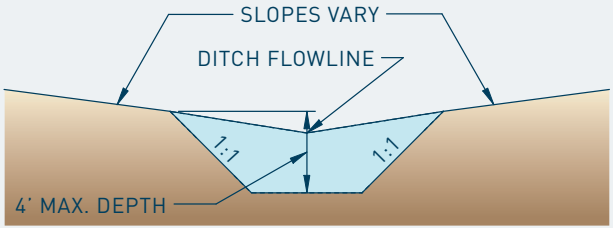


A. Sediment Trap



SECTION A-A

* ***Hotspot***: *Sediment must be removed when accumulated to ½ the depth of the trap*



SECTION B-B

NOTES

1. SEDIMENT TRAPS ARE INTENDED FOR USE IN EXISTING, PROPOSED AND TEMPORARY DITCHES OF ALL TYPES WITH A MAXIMUM DRAINAGE AREA OF 15 ACRES, AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.
2. SIDE SLOPES SHALL BE STABILIZED WITH "TEMPORARY GRASS SEEDING, DRY GROUND" AND STRAW MULCH.
3. AN OUTLET STRUCTURE IS REQUIRED, STONE CHECK DAMS, PERFORATED RISER PIPES, SKIMMER DEWATERING DEVICES, OR DRAINAGE INLETS MAY BE USED. SEE APPROPRIATE STANDARD SHEET FOR ADDITIONAL INFORMATION.
4. FOR SIZE, LOCATION, ETC. OF SEDIMENT TRAP, SEE CONSTRUCTION PHASING, M.O.T., AND EROSION CONTROL PLANS.
5. ALL FILL SLOPES SHALL BE 2:1.
6. A 2:1 LENGTH TO WIDTH RATIO SHOULD BE ACHIEVED WHERE POSSIBLE. IF THIS IS NOT POSSIBLE, THE USE OF BAFFLES OR OTHER SPECIAL DESIGNS SHOULD BE INCORPORATED TO INCREASE FLOW TIME.

A. Sediment Trap

V. SEDIMENT TRAPS AND BASINS

V.A - Maintenance

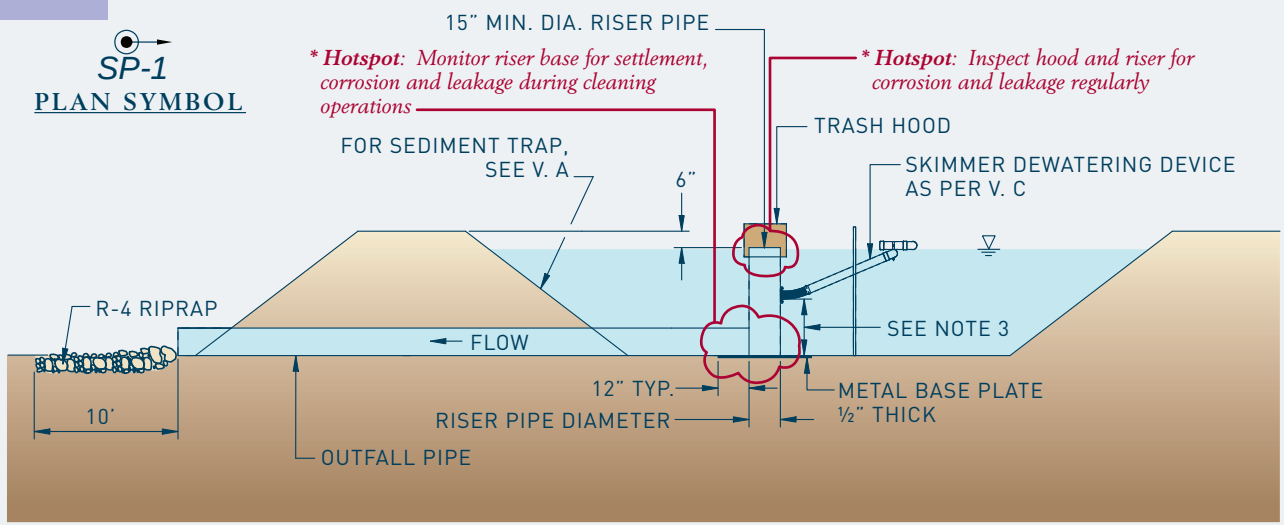
- Throughout the phases of construction that require erosion and sediment control, the Contractor shall maintain the sediment trap to the original dimensions and function of the sediment trap. Immediately after every rainfall, the Contractor shall inspect the sediment trap and make repairs as needed.
- When sediment has accumulated to one-half the design depth of the trap, the sediment shall be removed and the trap restored to its plan dimensions and elevations. The Contractor shall clearly mark the cleanout elevation on a stake driven into the ground at the bottom of the trap. Sediment removed from the trap shall be disposed of in a manner suitable to the Engineer.

V.B - Maintenance

- Throughout the Project construction period, the Contractor shall maintain the assembly by replacing any clogged geotextile and cleaning any clogged pipe and stone.

A. Sediment Trap

A. Sediment Trap



B. Riser Pipe Assembly for Sediment Trap (2)

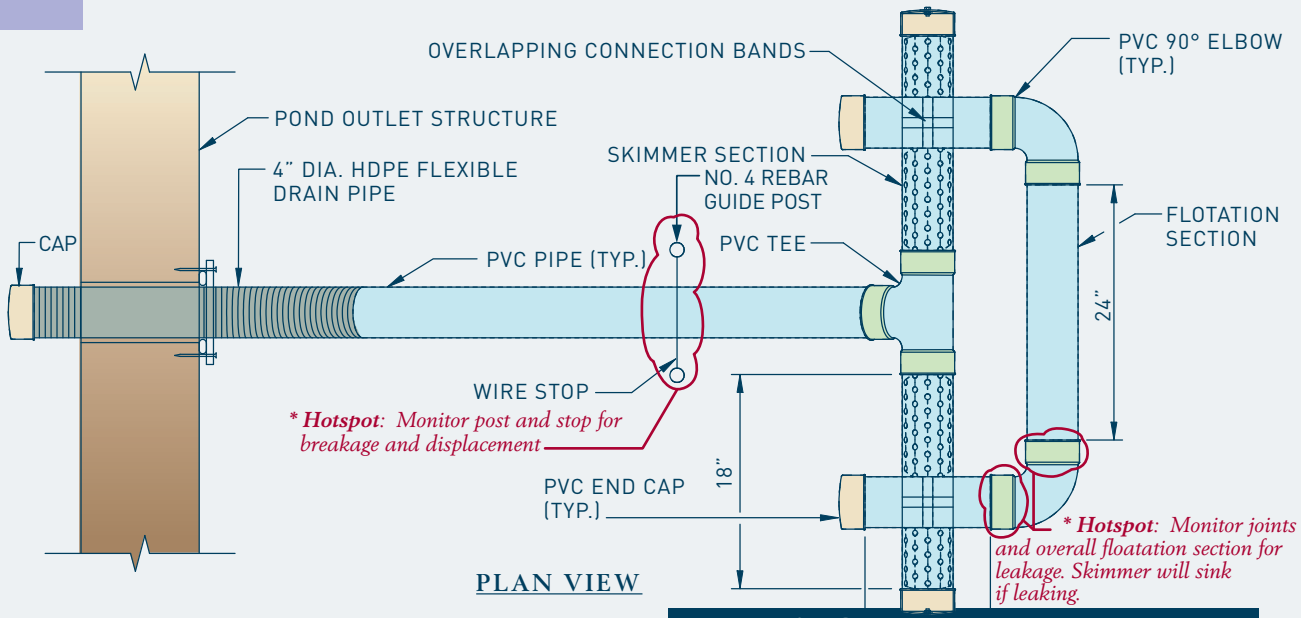
MIN. OUTFALL* PIPE DIA.	MIN. RISER DIA.
12"	15"
15"	18"
18"	21"
21"	24"
24"	27"

* OUTFALL PIPE DIAMETER MAY BE SAME SIZE AS RISER DIAMETER.

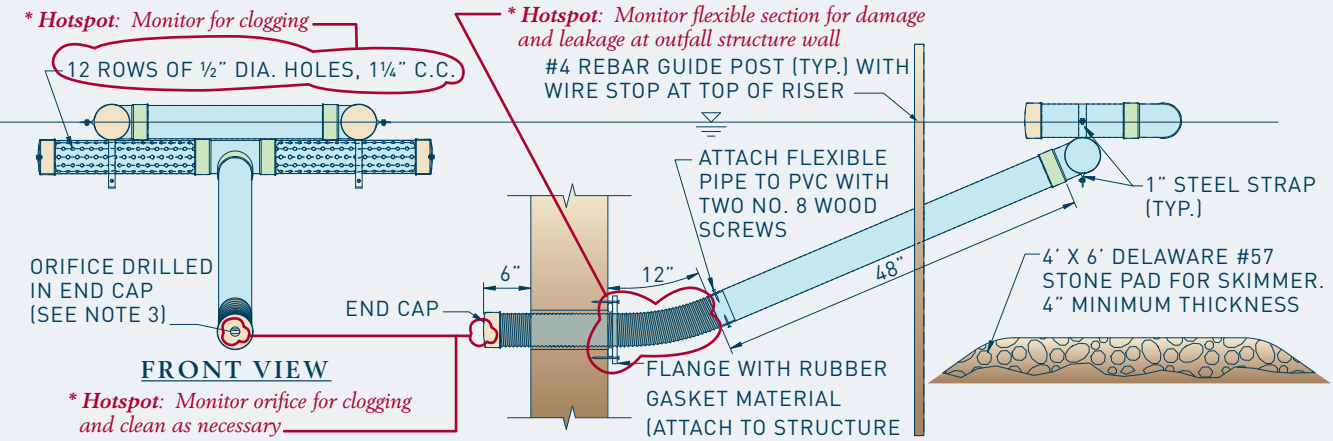
NOTES

1. THE DEVICE IS INTENDED TO BE USED AS AN OUTLET FOR SEDIMENT TRAPS.
2. THE PIPE OUTLET SHOWN SHALL ONLY BE USED WITH SEDIMENT TRAPS WITH DRAINAGE AREAS OF 5 ACRES OR LESS. LARGER DRAINAGE AREAS REQUIRE AN ENGINEERED DESIGN.
3. THE HEIGHT OF THE SKIMMER DEWATERING DEVICE SHALL BE SPECIFIED BY THE ENGINEER IN THE FIELD.

B. Riser Pipe Assembly for Sediment Trap (2)



C. Skimmer Dewatering Device



NOTES

1. ALL P.V.C. PIPES ARE TO BE 4" I.D., SCHEDULE 40.
2. 4" HDPE FLEXIBLE DRAIN PIPE IS TO BE ATTACHED TO THE POND OUTLET STRUCTURE WITH WATER-TIGHT CONNECTIONS.
3. ORIFICE DIMENSION PER PLANS.

C. Skimmer Dewatering Device

V.C - Maintenance

- After each rainfall when the water level returns to the normal wet storage elevation, the Contractor shall inspect the skimmer, in particular the flexible portion of the device and its connection to the outlet structure for damage, rupturing or other separation resulting in a non-watertight seal. Any component of the skimmer that becomes defective, or not watertight at the joints, shall be repaired immediately.

*Hotspot:
Guides for skimmer are required

C. Skimmer Dewatering Device

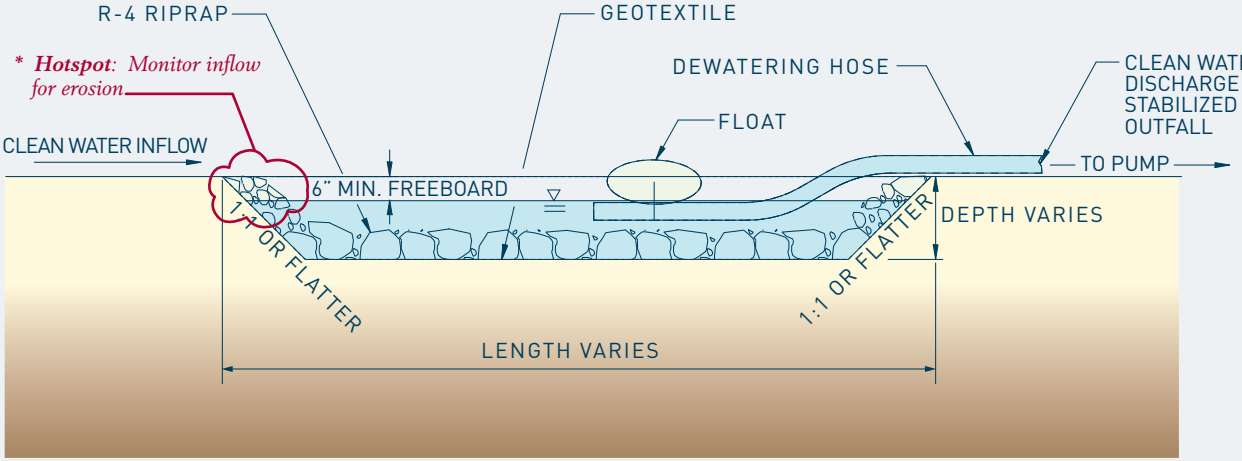
C. Skimmer Dewatering Device

EROSION SEDIMENT CONTROL FIELD GUIDE

VI. PUMPING OERATIONS

SW

PLAN SYMBOL



A. Stilling Well

VI.A - Maintenance

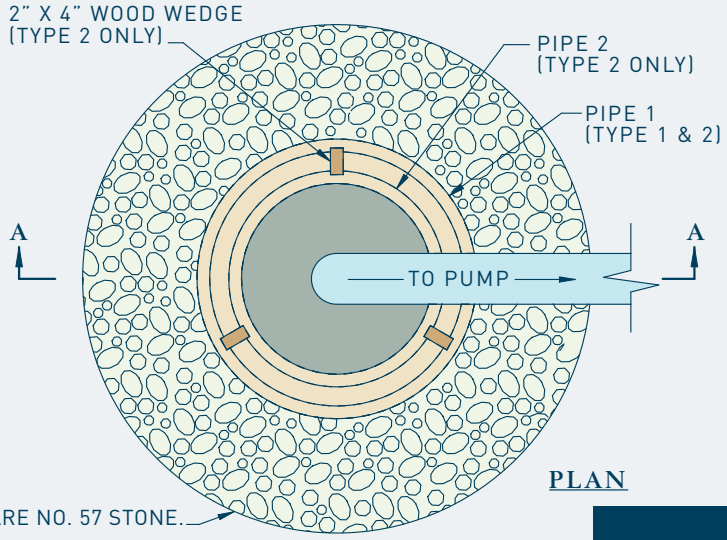
- Throughout the Project construction period, the Contractor shall maintain the stilling well to the original dimensions and function of the stilling well. The Contractor shall remove and dispose of all trash and debris that enters the stilling well and interferes with the functioning of the stilling well.

NOTES

1. THE WORK SHALL CONSIST OF CONSTRUCTING A STILLING WELL FOR THE PURPOSE OF PUMPING CLEAN WATER AROUND A DISTURBED CONSTRUCTION AREA TO A STABILIZED OUTFALL.
2. THE DIMENSIONS OF THE STILLING WELL SHALL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

SP-1

PLAN SYMBOL

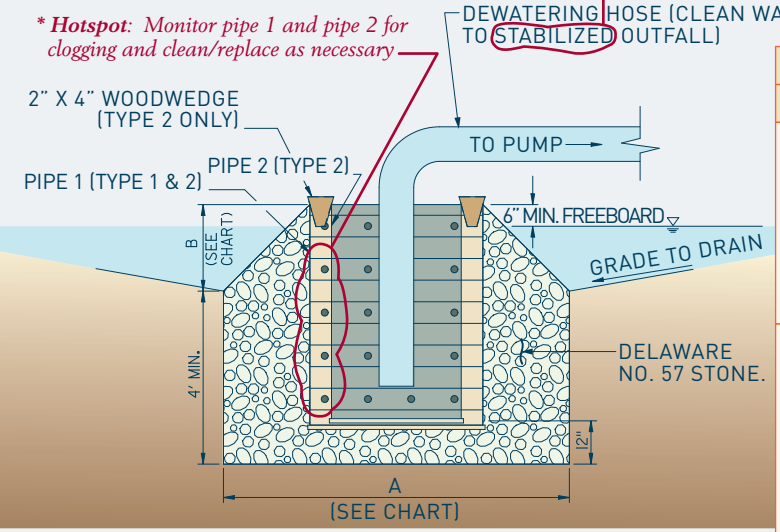


PLAN

NOTES

1. THE WORK SHALL CONSIST OF CONSTRUCTING A SUMP PIT FOR THE PURPOSE OF FILTERING AND PUMPING WATER TO A STABILIZED OUTFALL.
2. GEOTEXTILE FOR THE 36" CMP SHALL BE REPLACED WHEN CLOGGED WITH SEDIMENT.
3. ½" X ½" 19 GAGE WIRE MESH SHALL BE PLACED AROUND THE REMOVABLE 36" CMP BEFORE ATTACHING THE GEOTEXTILE TO INCREASE FLOW THROUGH THE GEOTEXTILE.
4. ALL PERFORATIONS SHALL BE 1" IN DIAMETER AND 12" ON CENTER IN ALL DIRECTIONS.
5. TYPE 1 SUMP PIT SHALL BE USED ONLY WHEN PUMPING IS NEEDED FOR LESS THAN 7 DAYS.

B. Sump Pit, Type 1 and 2



SECTION A-A

SUMP PIT CHART				
TYPE	PIPE 1	PIPE 2	A	B
1	PERFORATED 24" CMP WITH PERFORATED CAP WELDED ON BOTTOM AND COMPLETELY WRAPPED WITH GEOTEXTILE.	N/A	4' MIN.	12"
2	PERFORATED 48" CMP WITH PERFORATED CAP WELDED ON BOTTOM	REMOVABLE PERFORATED 36" CMP WITH PERFORATED CAP WELDED ON BOTTOM AND COMPLETELY WRAPPED WITH GEOTEXTILE.	8' MIN.	24"

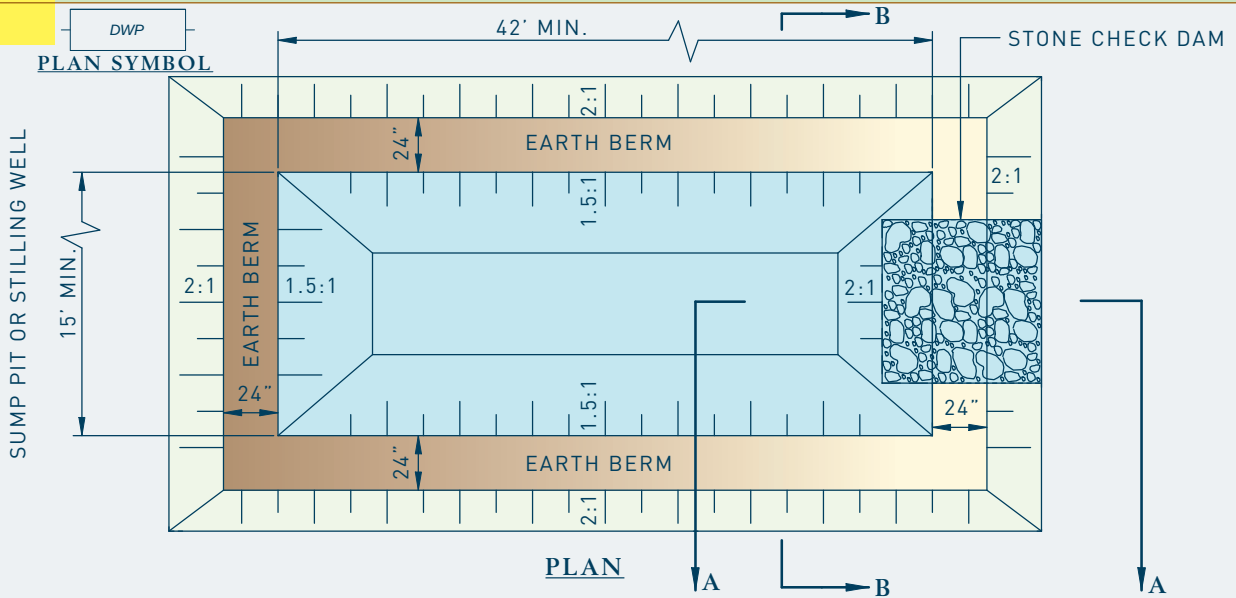
B. Sump Pit, Type 1 and 2

VI.B - Maintenance

- When clogged with sediment, the Contractor shall replace the geotextile and, if applicable, the wire mesh on the removable pipe and bottom cap.

B. Sump Pit, Type 1 and 2

B. Sump Pit, Type 1 and 2



C. Dewatering Basin

NOTES

1. A DEWATERING BASIN (DWB) IS USED TO REMOVE SEDIMENT FROM SEDIMENT-LADEN WATER PUMPED FROM A CONSTRUCTION SITE BEFORE THE WATER RE-ENTERS THE WATERWAY. THE DWB SHALL HAVE A MINIMUM TOP WIDTH OF 15' AND A MINIMUM DEPTH OF 2.5'. THE MINIMUM TOP LENGTH SHOWN IN THE PLAN IS USED ONLY FOR QUANTITY CALCULATIONS BY THE ENGINEER. THE ACTUAL TOP LENGTH IN THE FIELD SHALL BE CALCULATED BY THE EQUATION:

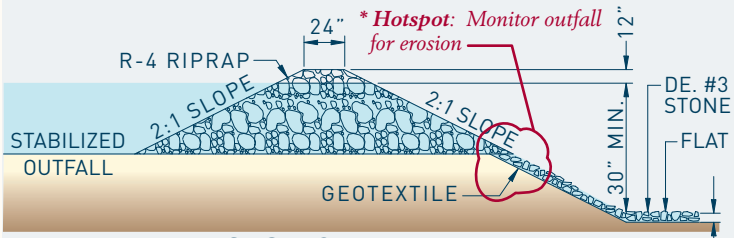
   TOP LENGTH (FEET) - 26' + .01 x Y

2. THE OUTFALL FROM THE BASIN TO THE RECEIVING WATERS SHALL BE STABILIZED. PUMPING INTO THE DWB SHALL CEASE WHEN THE EFFLUENT FROM THE BASIN BECOMES SEDIMENT-LADEN.

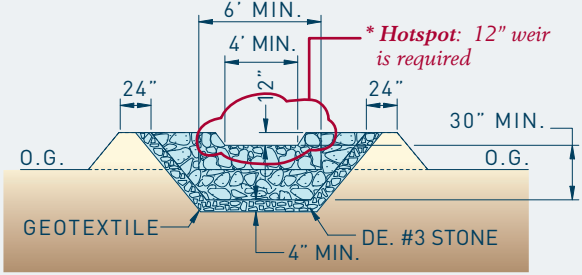
3. A SUMP PIT OR STILLING WELL (SEE STANDARD SHEETS) SHALL BE USED IN CONJUNCTION WITH A DWB. THE BASIN MAY BE BYPASSED INTO THE STABILIZED OUTFALL IF THE WATER BEING PUMPED IS NON-SEDIMENT-LADEN, DIRECT DISCHARGE TO THE RECEIVING WATERS SHALL CEASE AND BE REDIRECTED TO THE DWB WHEN EFFLUENT FROM THE PUMP BECOMSE SEDIMENT-LADEN.

4. MAINTENANCE MUST BE PERFORMED IN ORDER FOR THE DWB TO FUNCTION PROPERLY, ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED DISPOSAL AREA WHEN THE BASIN IS FILLED TO WITHIN 12" (33) FROM THE CREST.

5. WHEN USED IN CONJUNCTION WITH A COFFERDAM, DEWATERING SHALL BEGIN NO SOONER THAN 12 HOURS AFTER COFFERDAM INSTALLATION IN ORDER TO ALLOW SEDIMENT PRODUCED DURING INSTALLATION TO SETTLE COMPLETELY.



SECTION A-A



SECTION B-B

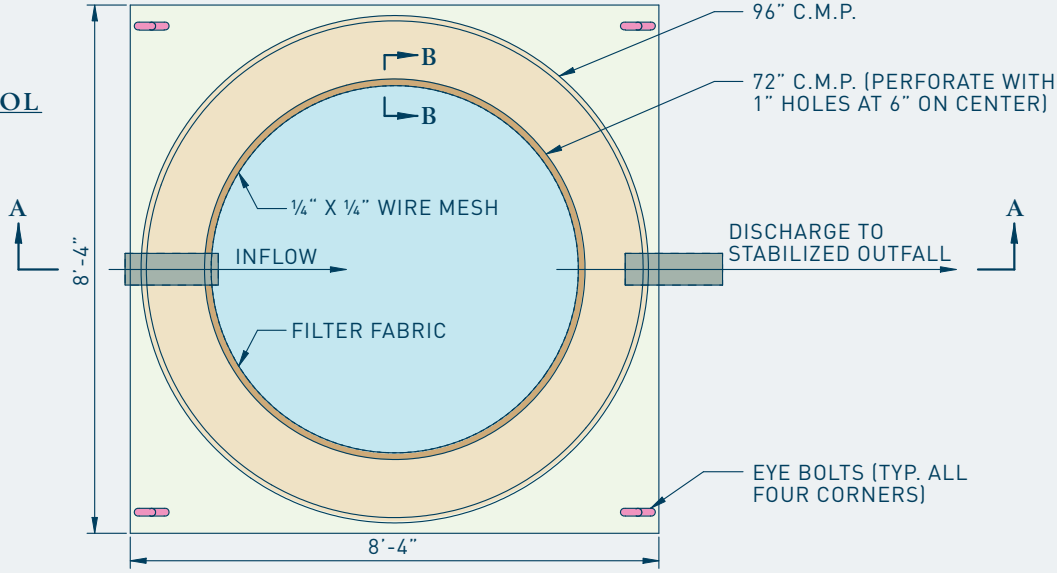
C. Dewatering Basin

VI.C - Maintenance

- Throughout the Project construction period, the Contractor shall maintain the dewatering basin to its original dimensions and function.
- The Contractor shall remove all accumulated sediment when the basin is filled to one-half of its original basin.

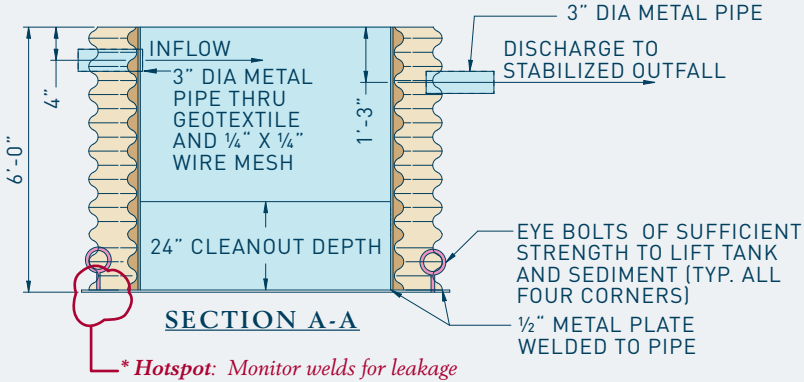
PST

PLAN SYMBOL

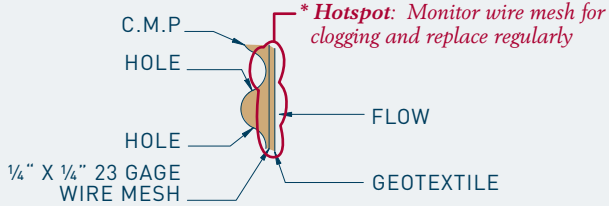


PLAN

D. Portable Sediment Tank



SECTION A-A



SECTION B-B

NOTES

1. THE PORTABLE SEDIMENT TANK SHOWN MAY BE USED IN SITES WHERE SPACE IS LIMITED TO CONSTRUCT A DEWATERING BASIN.
2. THE MAXIMUM PUMP DISCHARGE INTO THIS TYPICAL PORTABLE SEDIMENT TANK SHALL BE 425 GALLONS PER MINUTE. THE FILTER FABRIC SHALL BE REPLACED WHEN THE PORTABLE SEDIMENT TANK CAN NO LONGER ALLOW THIS FLOW RATE, WHEN THERE IS A TEAR, OR WHEN DIRECTED BY THE ENGINEER.
3. SEVERAL UN-CONNECTED OR CONNECTED IN PARALLEL PORTABLE SEDIMENT TANKS MAY BE USED WHEN A HIGHER FLOW RATE IS NEEDED TO DE-WATER THE JOB.

D. Portable Sediment Tank

VI.D - Maintenance

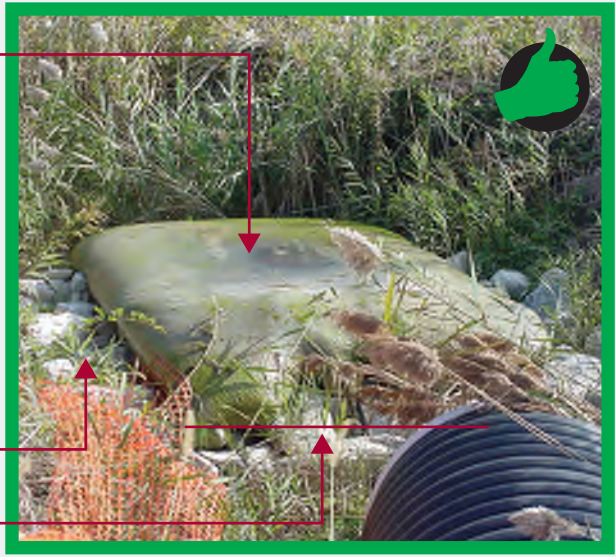
- The Contractor shall make any required repairs to the portable sediment tank to ensure that the portable sediment tank functions as intended.
- The Contractor shall remove the sediment when it accumulates to a depth of 24" in a tank designed according to Standard Construction Detail, Portable Sediment Tank, and when it accumulates to one-third of the portable sediment tank height for an alternate design. All sediment collected in the portable sediment tank shall be disposed of in an approved disposal area or as approved by the Engineer.

D. Portable Sediment Tank

Filter bag. Acceptable alternative

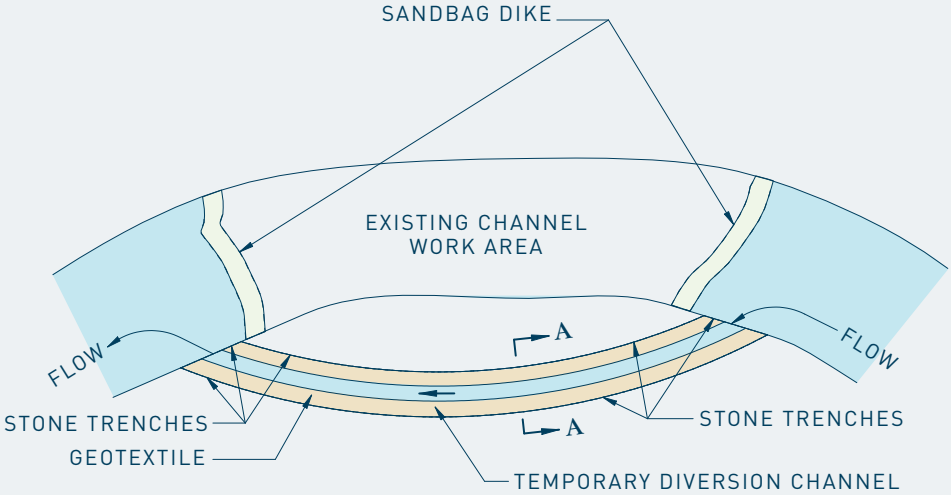
Riprap or stone underneath

Bag to be laid flat at grade



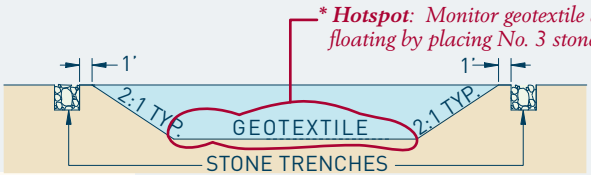
D. Portable Sediment Tank

EROSION SEDIMENT CONTROL FIELD GUIDE



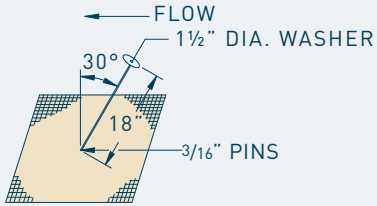
PLAN

A. Geotextile-lined Diversion Channel

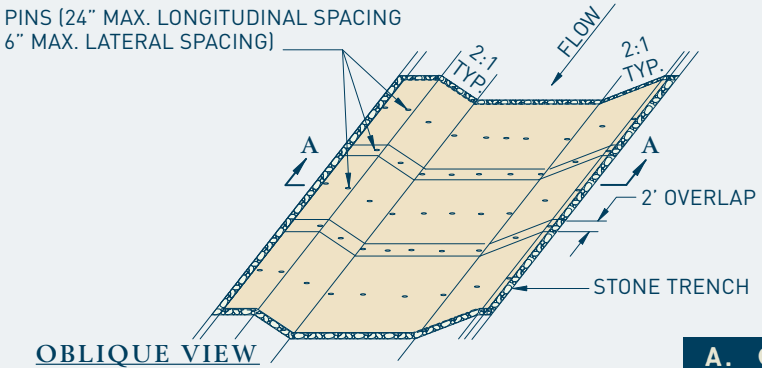


SECTION A-A

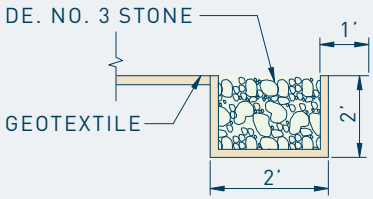
NOTE: SEE PLANS FOR LOCATION, DIMENSIONS, GRADES, ETC.



FASTENING DETAIL



OBLIQUE VIEW



TRENCHING DETAIL

A. Geotextile-lined Diversion Channel

(Section 110, 111 and reference to Section 200)

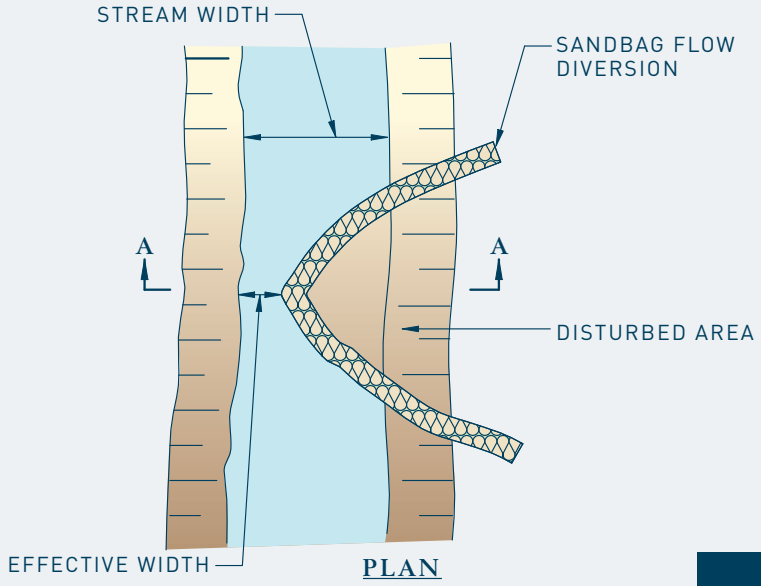
VII. WATERWAY CONSTRUCTION

VII.A - Maintenance

- Throughout the Project construction period, the Contractor shall maintain the geotextile lined channel diversion to the original dimensions and function of the geotextile lined channel diversion.

A. Geotextile-lined Diversion Channel

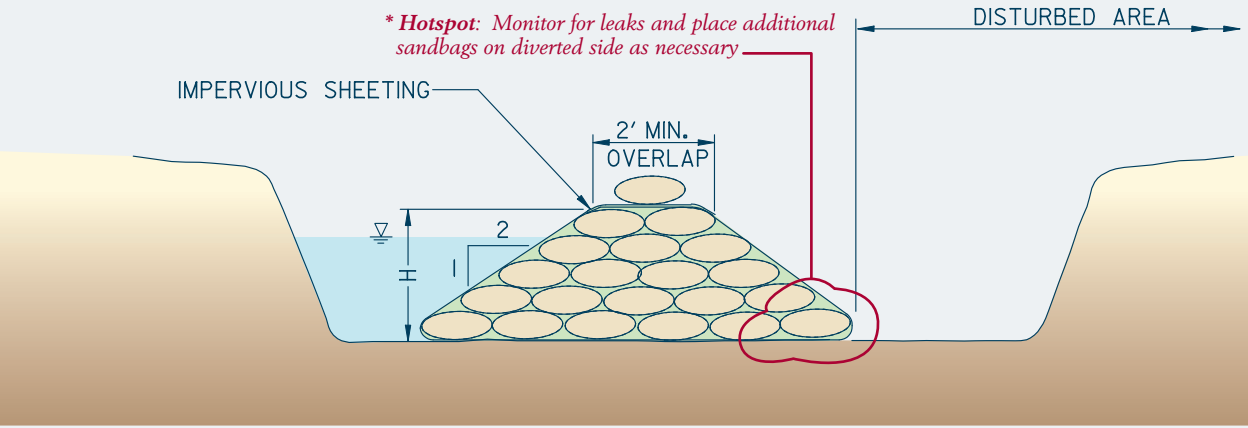
A. Geotextile-lined Diversion Channel



NOTES

1. THE WORK SHALL CONSIST OF INSTALLING FLOW DIVERSIONS FOR THE PURPOSE OF EROSION CONTROL WHEN CONSTRUCTION ACTIVITIES TAKE PLACE WITHIN THE STREAM CHANNEL SUCH AS BANK STABILIZATION OR BRIDGE ABUTMENT CONSTRUCTION.
2. THE DIVERSION STRUCTURE SHALL BE INSTALLED FROM UPSTREAM TO DOWNSTREAM.
3. THE EFFECTIVE CHANNEL WIDTH SHALL BE SIZED TO PASS A ONE YERA STORM EVENT PEAK FLOW, OR 1/3 OF STREAM WIDTH, WHICHEVER IS GREATER.
4. THE SANDBAG DIVERSION HEIGHT (H) SHALL BE IN ACCORDANCE WITH THE PLANS OR AS SPECIFIED BY THE ENGINEER.

B. Sandbag Diversion

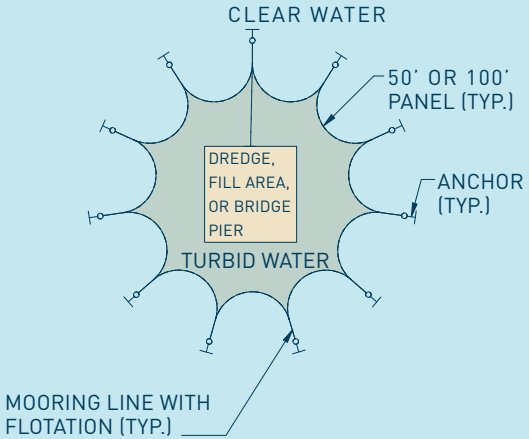

* Hotspot: Monitor for leaks and place additional sandbags on diverted side as necessary
DISTURBED AREA
IMPERVIOUS SHEETING
2' MIN.
OVERLAP
2
1
H

SECTION A-A

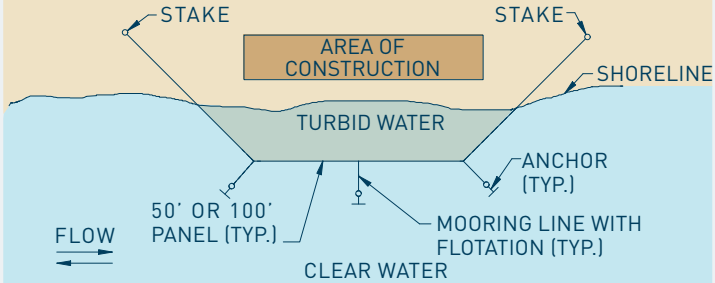
VII.B - Maintenance

- The Contractor shall maintain the original dimensions of the accepted sandbag dikes and sandbag diversions.

B. Sandbag Diversion

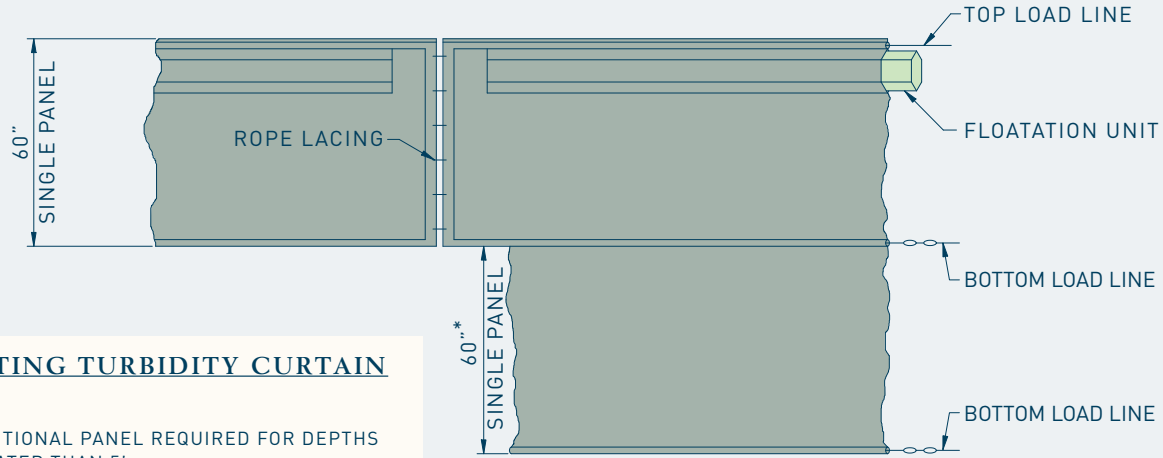


PLAN VIEW
OPEN WATER APPLICATION



PLAN VIEW
SHORELINE APPLICATION

C. Turbidity Curtain



ELEVTAION

FLOATING TURBIDITY CURTAIN

NOTES

1. ADDITIONAL PANEL REQUIRED FOR DEPTHS GREATER THAN 5'.
2. FLOATING TURBIDITY CURTAIN SHALL REACH BOTTOM UP TO DEPTHS OF 10' BY USING TWO PANELS. DEPTHS GREATER THAN 10' SHALL REQUIRE SPECIAL DEPTH CURTAINS SPECIFICALLY CALLED FOR IN THE PLANS OR AS DIRECTED BY THE ENGINEER.

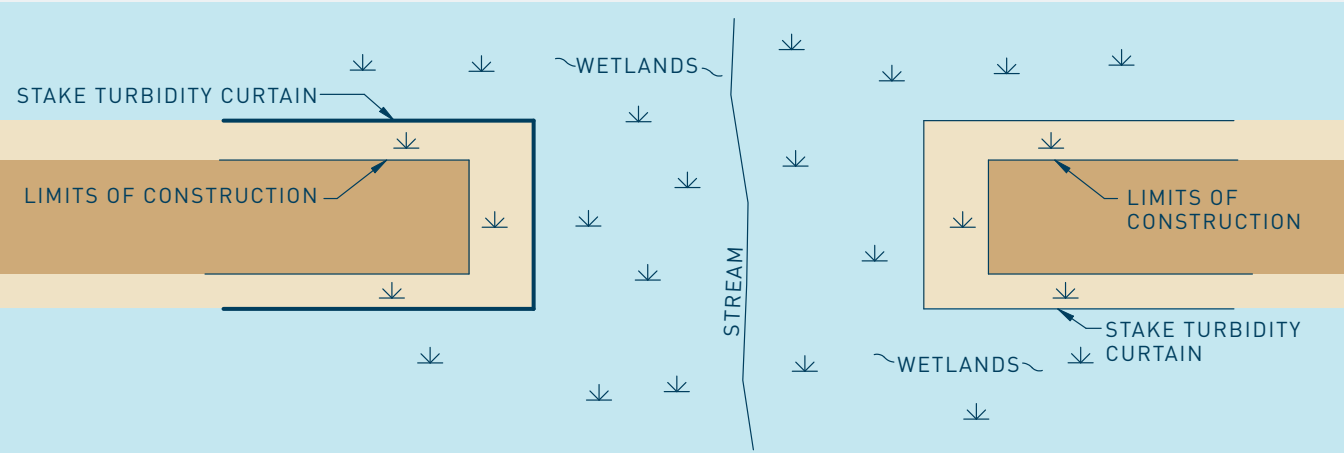
VII.C - Maintenance

- Throughout the Project construction period, the Contractor shall maintain the turbidity curtain so that no sediment caused by the Project enters the waterway beyond the turbidity curtain.
- All turbidity curtain damaged prior to installation, during installation, or during the life of the Contract shall be repaired or replaced to the satisfaction of the Engineer.

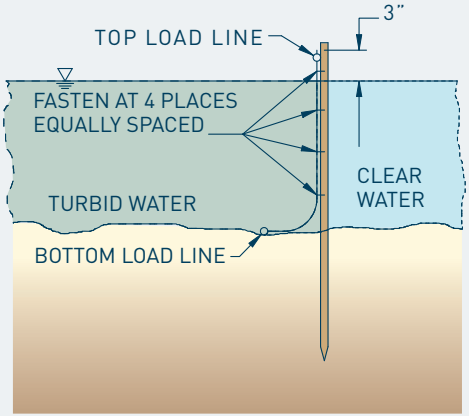
Curtain effectively trapping sediment/debris at surface

Curtain floating. Not anchored properly at bottom

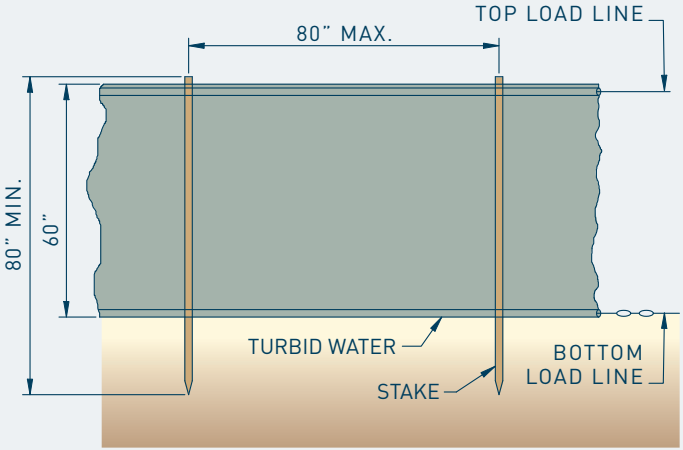
C. Turbidity Curtain



PLAN VIEW
SHALLOW WATER/MARSH APPLICATION



SECTION



ELEVTAION

STAKED TURBIDITY CURTAIN

C. Turbidity Curtain

C. Turbidity Curtain