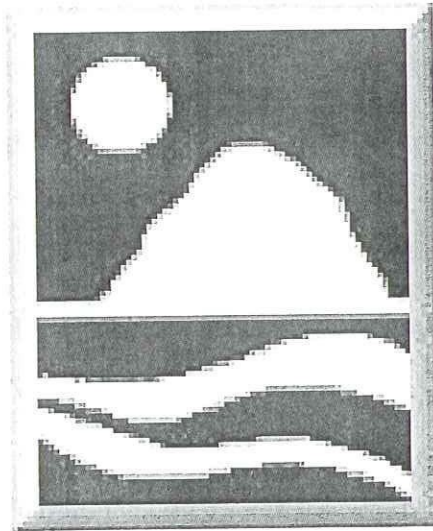




City of Morro Bay

**Public Services Department
955 Shasta Ave.
Morro Bay, CA 93442**

EROSION AND SEDIMENTATION CONTROL PLAN MANUAL

Effective October 31, 2005
Revised October 8, 2007

EROSION AND SEDIMENT CONTROL PLANS

This policy identifies standards for erosion prevention, sediment control and stormwater management during construction, and long-term post-construction site stabilization. The provisions of this section are intended to prevent and reduce adverse impacts to the drainage system and water courses in the City of Morro Bay watersheds.

- **Erosion prevention techniques** are designed to protect soil particles from the force of rain and wind so that they will not erode. These techniques include, but are not limited to such things as construction scheduling, ground cover and planting and installation of erosion control matting.
- **Sediment control measures** are designed to capture soil particles after they have been dislodged and attempt to retain the soil particles on-site. These measures include, but are not limited to silt fences, sediment barriers, and settling or sediment detention basins.

Standard Erosion Control Plan is required for any grading or land clearing for a development project where the project area is less than or equal to ½ acre or on slopes less than 15% and where the disturbed areas do not occur within 100 feet of a blue-line stream, as shown on the most recent version of a U.S. Geological Survey issued 7.5' topographic map. A listing of the Standard Erosion Control Measures to be utilized shall appear either attached to the grading plan or on a plot plan, as part of the Building Permit application. The site may be field checked to verify that there are no critical (unstable, blue-line streams or highly erosive) areas on the site and the Standard Erosion Control Measures proposed are adequate. The guidelines for the Standard Erosion and Sediment Control Plan are contained in this handout.

Detailed Erosion Control Plan is required for project areas greater than ½ acre, or on slopes greater than 15%, or other critical areas (unstable, blue-line streams or highly erosive) as determined on a case-by-case basis. The guidelines for the detailed erosion control plan are contained in this handout.

Stormwater Pollution Prevention Plan (SWPPP) is required for all projects over 1 acre. Projects over 1 acre are subject to the Construction General Permit. A Notice of Intent must be submitted to the State Water Resources Control Board. The requirements for the General Permit and guidelines for the SWPPP can be found at http://www.swrcb.ca.gov/stormwtr/gen_const.html

Slope Determination: For a standard erosion control measures to be applied the project must not exceed 15% slope. Percent slope of the building development area is measured perpendicular to the contours across the building pad and driveway when the driveway is less than 50 ft in length. The slope determination will be made by evaluating a plot plan having contour intervals of 1 ft to 5 ft with a minimum scale of 1" equals 10'. The City

may require topographic contour mapping prepared by a licensed professional in order to determine slope.

Erosion Control and Stormwater Management Manuals

The *California Stormwater Best Management Practices Handbooks* available from the California Stormwater Quality Association, January 2003, are adopted for use in preparing Stormwater Pollution Prevention (SWPPP). Separate handbooks are available for: 1.) Construction Activity 2.) Industrial/Commercial and 3.) Municipal work areas.

The *Erosion and Sediment Control Field Manual* available from the California Regional Water Control Board is adopted as the field manual for use by contractors and City and County inspectors in the field review of projects.

Standard Erosion Control Plan Guidelines

The submittal for the proposed use of **Standard Erosion Control Plan** can be brief and shall include a plot plan or grading plan, providing the following information:

- Site location; assessor parcel number and address
- Property owner's name, address and phone number, including emergency number.
- Building contractors name, address and phone number.
- General locations where BMPs will be installed.
- Installation details shall be attached to the plot plan or referenced.

Review and Field Check of Standard Erosion Control Plan

The City will review the submitted grading and plot plan with Standard Erosion Control Measures; it is reviewed to make sure that all information requested is on the plans. If the project is to be completed less than 2 months before the rainy season (August 1st) the measures must be shown on the plans to avoid any problems in the future if the schedule should stop for some unforeseen circumstance.

Plans are reviewed to determine if the project is located in a geologically sensitive and unstable area or along a stream course. If the project is located in such area, then a Detailed Erosion Control Plan is required.

The site may be field checked to verify that there are no observable sensitive areas on the site and the standard measures proposed are adequate. If found in adequate, a Detailed Erosion Control Plan may be required.

Depending upon the timing of the project, there will be one to four field inspections. If the project is completed over the summer (by August 15) and includes landscaping, the regular final building inspection will include the standard Erosion Control Measures inspection. If the project is not completed by the onset of the rainy season, then the first inspection will be between September 1st and October 15th. All temporary erosion and sediment control measures are to be installed by October 15th. Other field inspections will be made to assure that revegetation has occurred and is growing (sometime in October through April)

Erosion Protection Measure Removal

The erosion prevention and sediment control measures shall remain in place and **be maintained in good condition** until all disturbed soil areas are permanently stabilized by installation and establishment of landscaping, grass, mulching, or are otherwise covered and protected from erosion.

Detailed Erosion Control Plan Guidelines

A Detailed Erosion Control Plan submittal will be required for sites greater than ½ acre, or for buildings or other site disturbance proposed for slopes over 15%, or projects located within critical areas, as determined on a case-by-case basis. The Detailed Erosion Control Plan submittal must comply with all of the requirements for the Standard Erosion Control Measures and also include a written narrative and detailed site plan and typical drawings and details.

Persons authorized to prepare the Detailed Erosion Control Plans include:

- A Certified Professional in Erosion and Sediment Control,
- A California Registered Civil Engineer,
- A California Registered Geologist, certified as an Engineering Geologist,
- A California Licensed Architect
- A California Licensed Landscape Architect.

Narrative

Written narrative (to be included with Plan) on letterhead or signed plan sheet of person responsible for Plan preparation should include:

- Proposed schedule of grading activities and infrastructure milestones in a chronological format, including dates for beginning of phased grading areas and dates that areas will be stabilized. For example, easterly slope rough grading complete, streets graded, storm sewers and inlets installed, paving complete on Street X, creek outfall structure complete, etc.
- Description of potentially affected areas adjacent to site.
- Description of soils, geology, vegetation and nearby creeks.
- Description of critical areas of high erodibility potential; unstable slopes.
- Description of erosion control measures on slopes, lots, streets, etc.
- Description of sediment detention basins, including design assumption and calculations.
- Description of emergency erosion and sediment control measures to be implemented for storms with 48 hours.
- Name and 24 hour telephone number of person responsible for erosion and sediment control.
- A signed acknowledgement of developer and general contractor that they are familiar with and signed to implement abide by the plan, including routine inspection and maintenance, SWPPP documentation and emergency erosion control measures.

Site Plan

The site plan shall include the following information:

- Scale, north arrow and legend.
- Vicinity map.
- Contours and spot elevations indicating runoff patterns before and after grading.
- Critical areas within or near the project (creeks, wetlands, landslides, steep slopes, etc.).
- Limits of clearing and grading.
- Location and types of temporary and permanent erosion and sediment control measures.
- Site access locations.
- Signature block for plan preparer.
- Additional plans that may be needed to illustrate narrative addressing stages of construction such as street graded-no storm drains, storm system installed; streets paved; etc.

General Erosion and Sediment Control Notes to be included on Site Plan

The following notes and information should be included on the plan sheets of the Detailed Erosion Control Plan:

- Contractor/Owner: name, address, phone number. It shall be the owner's responsibility to maintain control of the entire construction operations and to keep the entire site in compliance with the soil Erosion Control Plan.
- Plan preparer: name, address, and phone number.
- Construction Superintendent: name, address, and 24-hour phone number.
- This Plan is intended to be used for interim erosion and sediment control only and is not to be used for final elevations or permanent improvements.
- Owner/contractor shall be responsible for monitoring erosion and sediment control measures prior, during, and after storm events. Monitoring includes maintaining a file documenting on-site inspections, problems encountered, corrective actions, and notes and a map of remedial implementation measures.
- Reasonable care shall be taken when hauling any earth, sand, gravel, stone, debris or any hazardous substance over any public street, alley or other public place. Should any blow, spill, or track over and upon said public or adjacent private property, immediate clean-up shall occur.
- Construction entrances shall be installed prior to commencement of grading. All construction traffic entering onto the paved roads must cross the stabilized construction entranceway.

- Sanitary facilities shall be maintained on-site as appropriate and away from the street in the case of a spill.
- During the rainy season, all paved areas shall be kept clear of earth material and debris. All earth stockpiles over 2.0 yd³ shall be covered by a tarp and ringed with straw bales or silt fencing. The site shall be maintained so as to minimize sediment-laden runoff to any storm drainage system including existing drainage swales and watercourses.
- Construction operations shall be carried out in such a manner that erosion and water pollution will be minimized. State and local laws concerning pollution abatement shall be complied with.
- The facilities shown on this plan are designed to control erosion and sediment during the rainy season, October 15th to April 30th. Facilities are to be operable prior to October 15th of any year. Grading operations during the rainy season which leave denuded slopes shall be protected with erosion control measures immediately following grading on the slopes.

Procedures for Review and Inspection of Detailed Erosion Control Plans

Submission of a **Detailed Erosion Control Plan** must accompany any applicable Public Services or Building Permit application. The Public Services/Engineering Division will review the submittal in conjunction with the Building Division for compliance with their Procedures for the Control of Runoff into Storm Drains and Watercourses for Public Services construction polluted discharge control requirements.

On the ground compliance inspection will be coordinated among the City Engineering and Building inspection. Following the plan approval the City will (1) make an pre-winter inspection (by October 15th) to verify that all temporary Erosion Control Measures have been installed according to the approved plan, (2) make at least one interim inspection during the winter rainy period to insure adequacy and (3) make a final inspection at project construction completion to verify that all required permanent erosion control measures according to the plan. The documentation of all ongoing Erosion Control Plan site inspection (SWPPP before and after inspection/repair documentation) maintenance and repair before and following significant rainfall events will also be checked during these visits.

Erosion Protection Measure Removal

The erosion prevention and sediment control measures shall remain in place and **be maintained in good condition** until all disturbed soil areas are permanently stabilized by installation and establishment of landscaping, grass, mulching, or are otherwise covered and protected from erosion.

Initial Inspection

On a site development or any other type of project, the erosion prevention and sediment control measures shall be installed prior to the start of any rain event or October 15th which ever is first.

Owner Inspections and Inspection Logs

The owner shall be required to inspect erosion prevention and sediment control measures and provide information on log forms. Inspections shall be completed as required by the Detailed Erosion Control Plan. Logs are to be maintained on-site and available to City inspectors upon request.

Final Inspection

A final erosion control inspection shall be required prior to the sale or conveyance to new property owner, prior to granting of certificate of occupancy, prior to the removal of erosion control prevention and sediment control measures, and to verify that all proposed permanent measures have been correctly installed

Copies of Inspection conducted by others shall be submitted to the City's Building Division in a timely manner following the conclusion of each inspection.

Maintenance

The permittee shall maintain the facilities and techniques contained in the approved Detailed Erosion Control Plan so as to continue to be effective during the construction phase, post construction phase, establishment of permanent vegetation, or any other permitted activity. If the facilities and techniques approved in a Detailed Erosion Control Plan are not effective or sufficient as determined by the City site inspection, the permittee shall submit a revised plan within three working days of written notification by the City. Upon approval of the revised plan by the City, the permittee shall immediately implement the additional facilities and techniques included in the revised plan. In cases where erosion is likely to occur, the City may require that the applicant install interim control measures prior to submittal of the revised Erosion Control Plan.

Best Management Practices (BMPs)

For an erosion and sediment control plan to be effective it is essential that effective BMPs be implemented for the life of the project. Once implemented controls should be monitored, maintained and immediately repaired to ensure their effectiveness.

Gravel Construction Entrance A gravel construction entrance is generally required where vehicle traffic is anticipated off of existing paved or graveled roads. If there is more than one vehicle access point, a gravel construction entrance should be installed at each entrance. The responsibility for field design to meet site conditions, and maintenance of the construction entrances remains with the property owner or construction contractor. The owner/contractor shall remain responsible for the clean-up of any mud or dirt that is tracked onto streets or paved areas, even with the installation of gravel construction entrances. (Figure TC-1)

Sediment Filters/Barriers For all projects, a silt fence or straw wattle dike shall be installed along the down slope edge of the disturbed area, prior to the commencement of grading. The sediment filter structures will be located so that all runoff from the construction site is filtered, or passes through a sediment detention basin prior to crossing a property line, entering a creek or entering the City storm drain system. Sediment filter structures are to be inspected regularly by City inspection staff during inspections scheduled by the Contractor or Engineer of Record, and sediment removed when the depth of sediment is no more than one half the height of the structure. Silt fences and straw wattles shall be installed according to the standard detail in the cited references. (Figure SE-1 and SE-5)

Catch Basin Protection A filter system shall be used on catch basins/drop inlets in public streets as a means of sediment control. The installation shall conform to the standard detail in the cited references. (Figure SE-10)

Straw wattles can be used as dikes to stabilize temporary channel flow lines or as a perimeter filter barrier. Straw wattles must be installed in a trench, staked and backfilled if they are to be effective in reducing flow velocity and filtering sediment from runoff. When used as a perimeter filter, sediment should be removed when material is within 3 inches of the top of any wattle. (Figure SE-5)

Silt fences should be installed where sediment from sheet flow or hill and gully eroding will enter directly onto adjacent property. When installing, it is important the fabric material be anchored into a trench and backfilled. (Figure SE-1)

Maintenance of filter fences is similar to that of straw wattles in that the fabric must be inspected and needed repairs implemented after every storm event. Sediment deposits should be removed when material reaches no more than a depth of one-half the fence height.

Plastic Sheeting may be used to protect small, highly erodible areas, or temporary stockpiles of materials. If plastic sheeting is used, the path of concentrated flow from the plastic must be protected. Plastic sheeting may **not** be used as an erosion or sediment control measure over large areas. For larger areas of exposed soil Geotextiles and Mats should be used. (Figure EC-7)

Existing Vegetation and Revegetation As far as is practicable, existing vegetation shall be protected and left in place, in place, in accordance with the clearing limits on the approved Grading and Erosion Control Plans. Work areas shall be carefully located and marked to reduce potential damage. Where existing vegetation has been removed, or the original land contours disturbed, the site shall be revegetated, and the vegetation established, as soon as practicable, but no later than **October 15th**.

Wet Weather Measures On sites where vegetation and ground cover have been removed from more than ½ acre of land; vegetative ground cover shall be planted on or before September 1st with the ground cover established by October 15th. As an alternative, if protective ground cover is not established by October 15th, the open areas shall be protected through the winter with straw mulch, erosion blankets, or other method(s) approved by the City.

Seeding shall be as follows, or as recommended by a California Licensed Architect or a Certified Professional Soil Erosion and Sediment Control Specialist, or a City approved biologist.

SEED MIX ONE

(Application rate = 35 lbs/ac)

Blando brome	40%
Zorro annual fescue	8%
Lana vetch	12%
Rose clover	15%
Crimson clover	15%
Sub clover	<u>10%</u>
Total	100%

SEED MIX TWO

(Application rate = 35 lbs/ac)

Blando brome	35%
Rose clover	20%
Annual ryegrass	15%
Creeping red fescue	5%
Crimson clover	10%
Zorro annual fescue	<u>5%</u>
Total	100%

Fertilizer

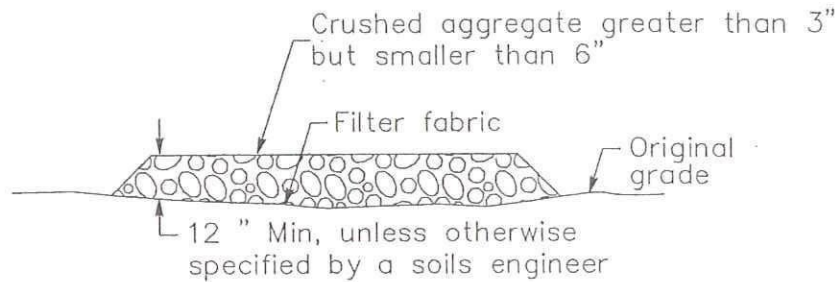
(when necessary, as determined by soil tests)

12-12-12	400 lb/ac or
15-15-15	300 lb/ac or
16-20-0	300 lb/ac

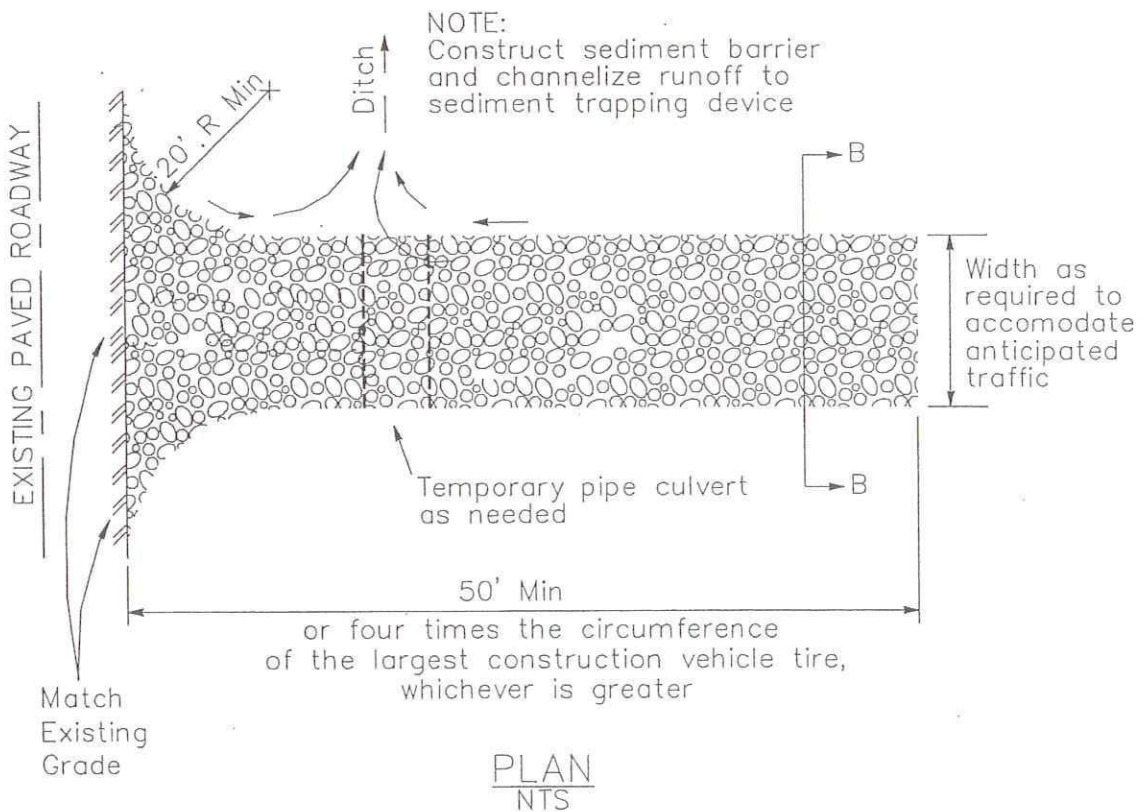
Mulch

Straw 3,000 lb/ac or
Wood fiber (if hydroseeded) 2,000 lb/ac

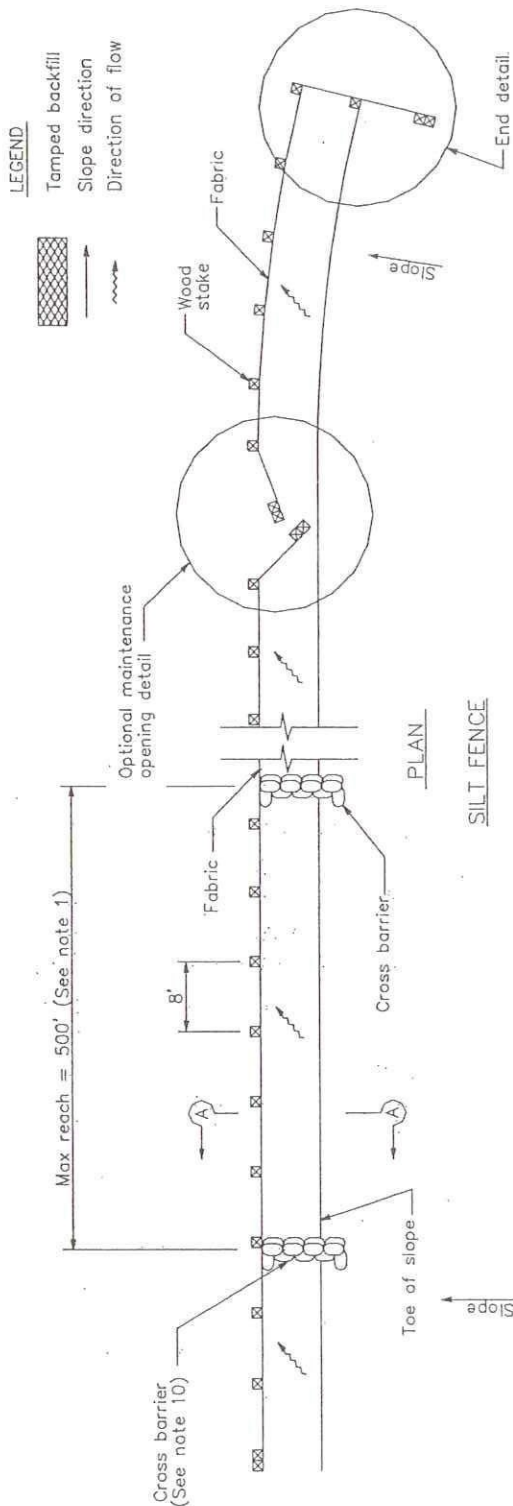
Stabilized Construction Entrance/Exit TC-1



SECTION B-B
NTS

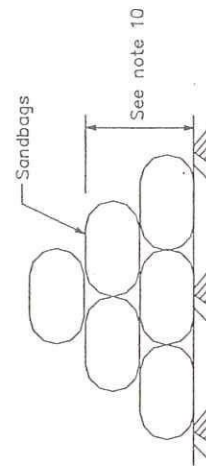
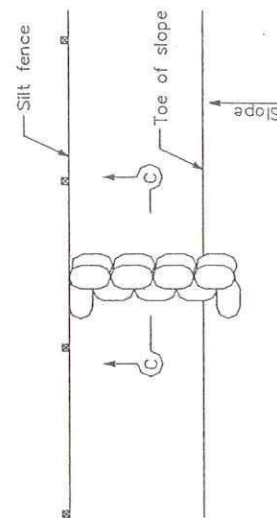


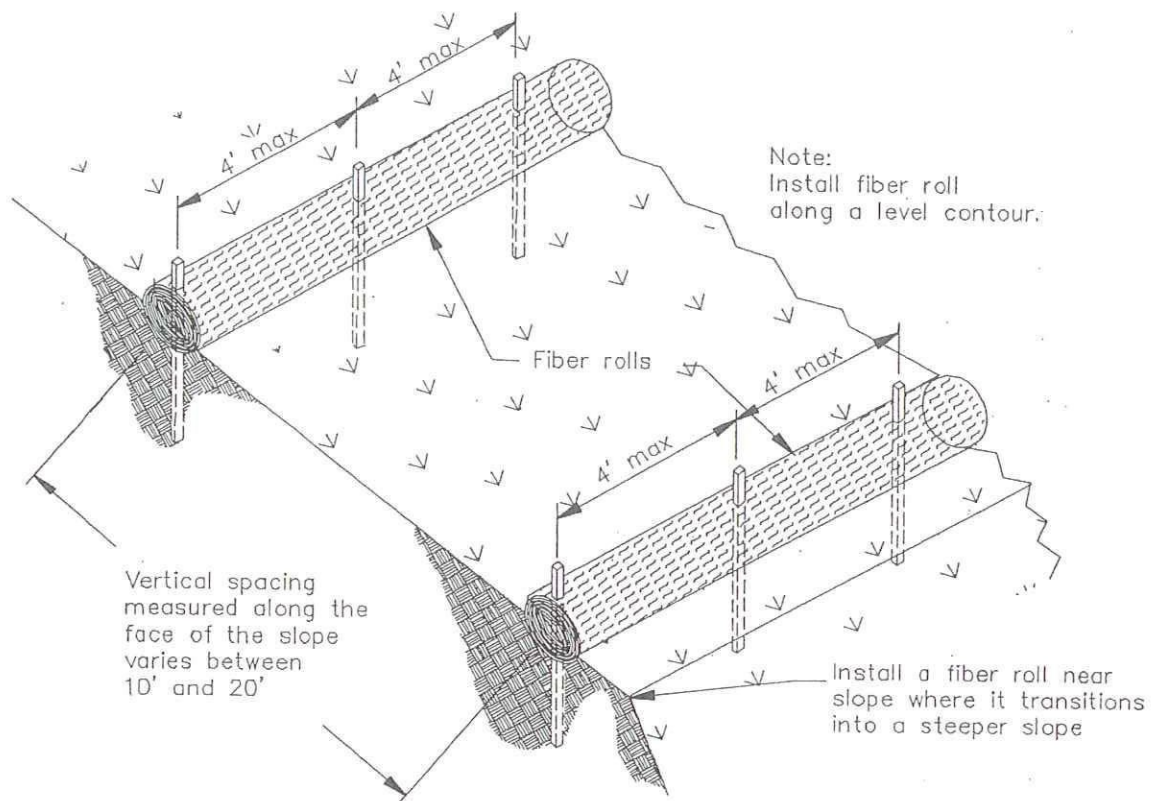




NOTES

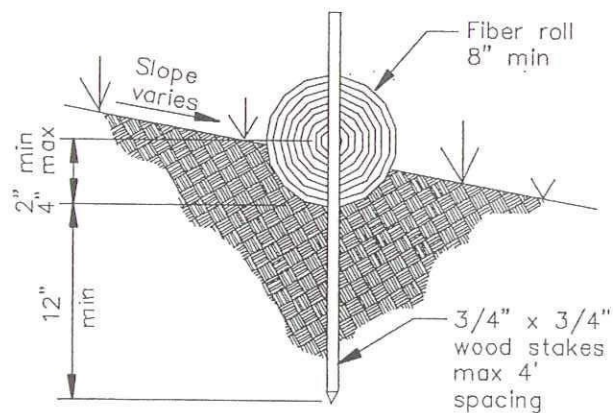
- Construct the length of each reach so that the change in base elevation along the reach does not exceed $\frac{1}{3}$ the height of the linear barrier, in no case shall the reach length exceed 500'.
- The last 8'-0" of fence shall be turned up slope.
- Stake dimensions are nominal.
- Dimension may vary to fit field condition.
- Stakes shall be spaced at 8'-0" maximum and shall be positioned on downstream side of fence.
- Stakes to overlap and fence fabric to fold around each stake one full turn. Secure fabric to stake with 4 staples.
- Stakes shall be driven tightly together to prevent potential flow-through of sediment at joint. The tops of the stakes shall be secured with wire.
- For end stake, fence fabric shall be folded around two stakes one full turn and secured with 4 staples.
- Minimum 4 staples per stake. Dimensions shown are typical.
- Cross barriers shall be a minimum of $\frac{1}{3}$ and a maximum of $\frac{1}{2}$ the height of the linear barrier.
- Maintenance openings shall be constructed in a manner to ensure sediment remains behind silt fence.
- Joining sections shall not be placed at sump locations.
- Sandbag rows and layers shall be offset to eliminate gaps.





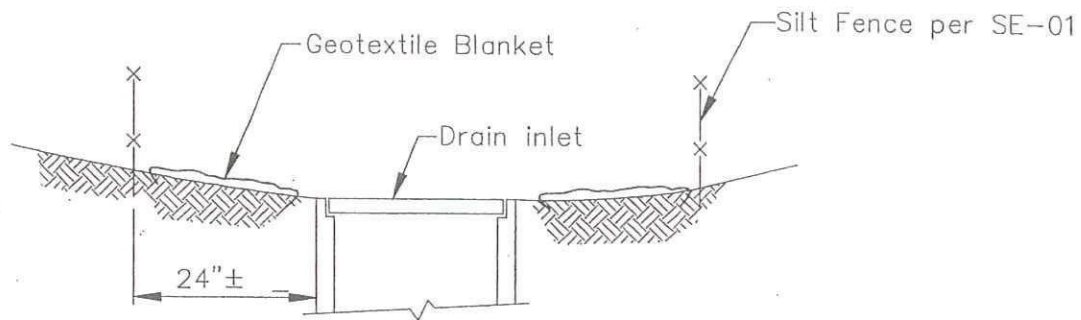
TYPICAL FIBER ROLL INSTALLATION

N.T.S.

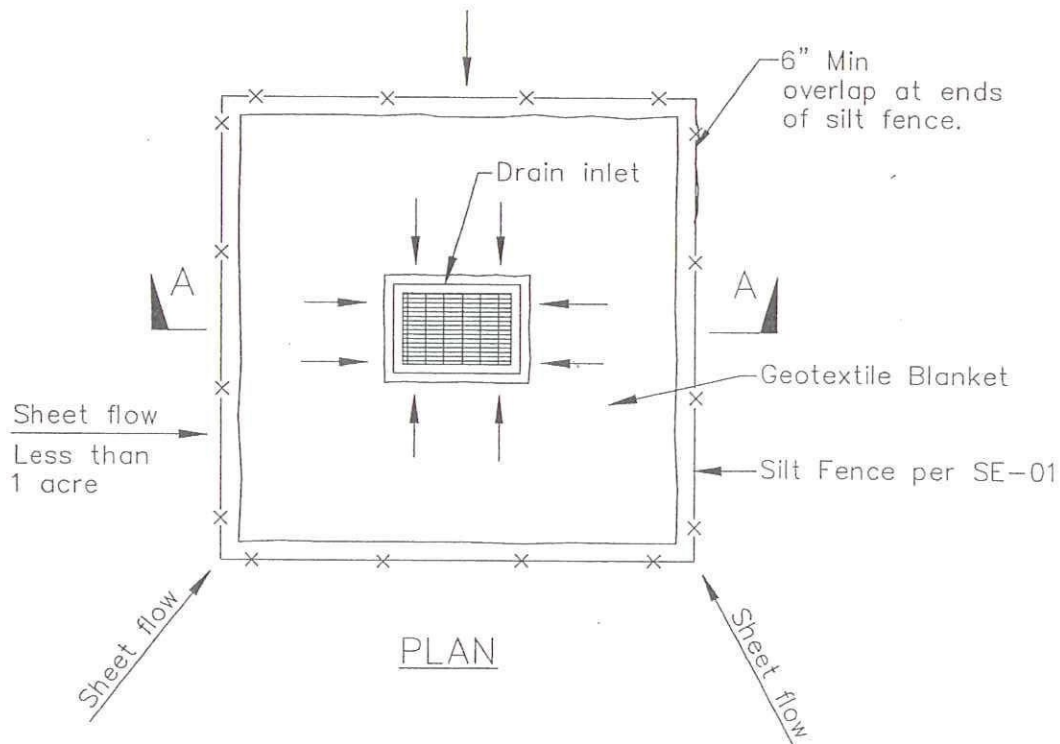


ENTRENCHMENT DETAIL

N.T.S.



SECTION A-A

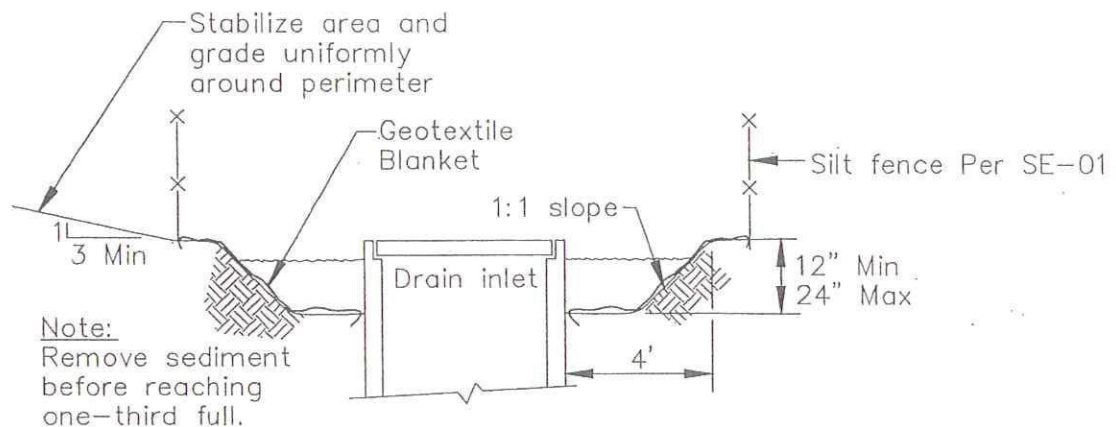


PLAN

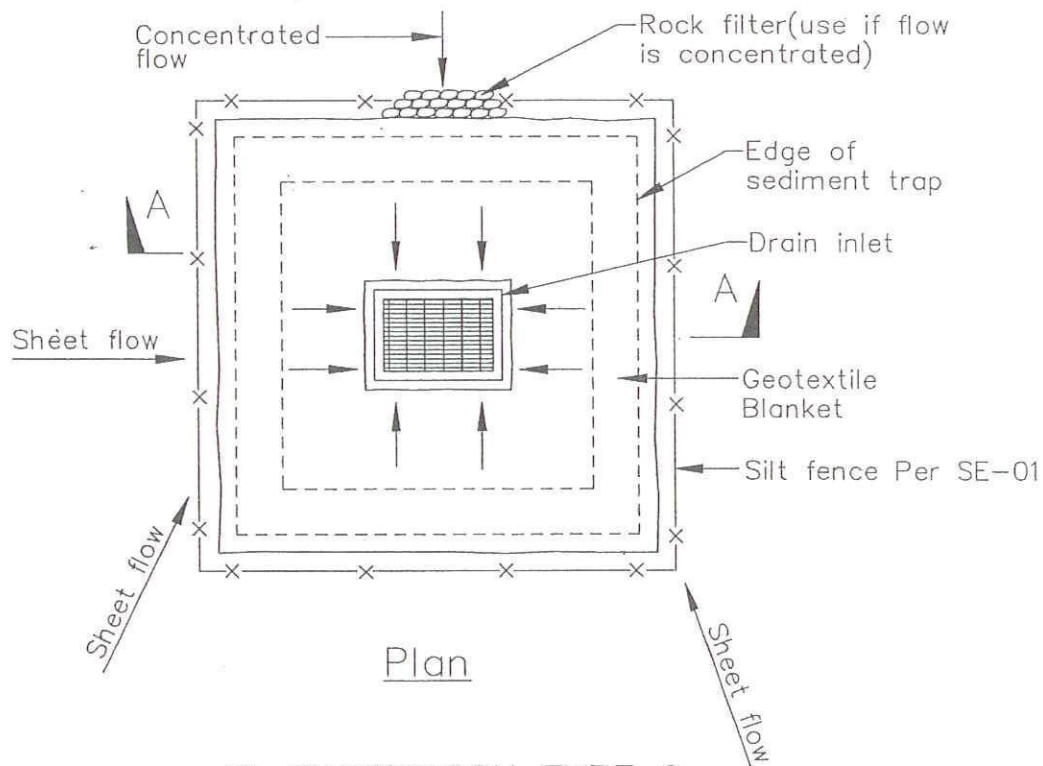
DI PROTECTION TYPE 1
NOT TO SCALE

NOTES:

1. For use in areas where grading has been completed and final soil stabilization and seeding are pending.
2. Not applicable in paved areas.
3. Not applicable with concentrated flows.



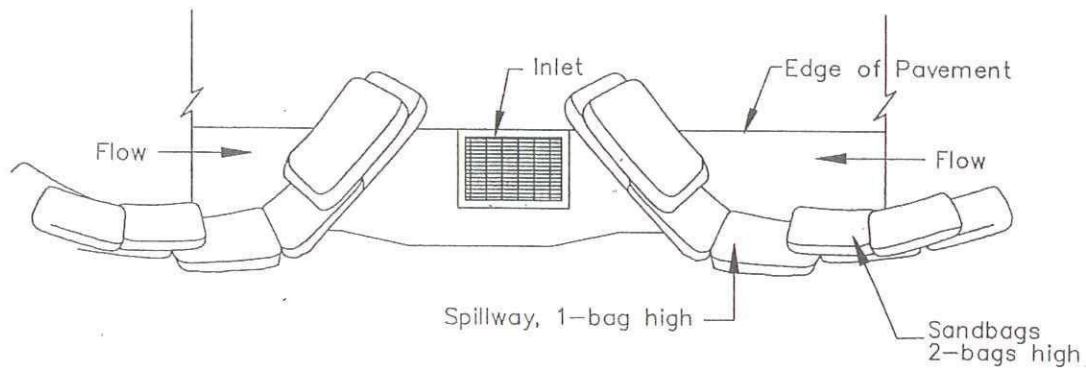
Section A-A



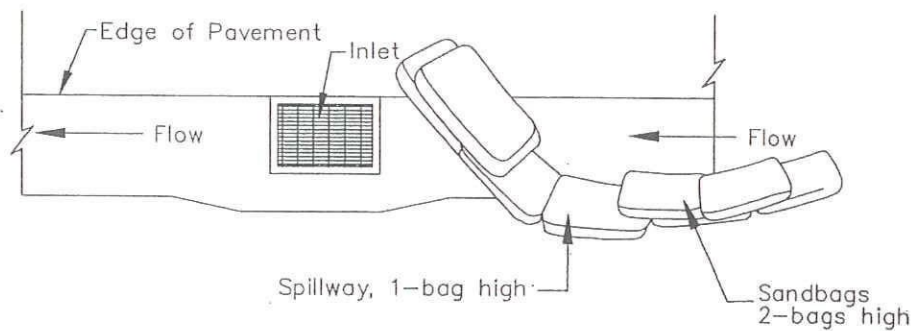
DI PROTECTION TYPE 2
NOT TO SCALE

Notes

1. For use in cleared and grubbed and in graded areas.
2. Shape basin so that longest inflow area faces longest length of trap.
3. For concentrated flows, shape basin in 2:1 ratio with length oriented towards direction of flow.



TYPICAL PROTECTION FOR INLET ON SUMP

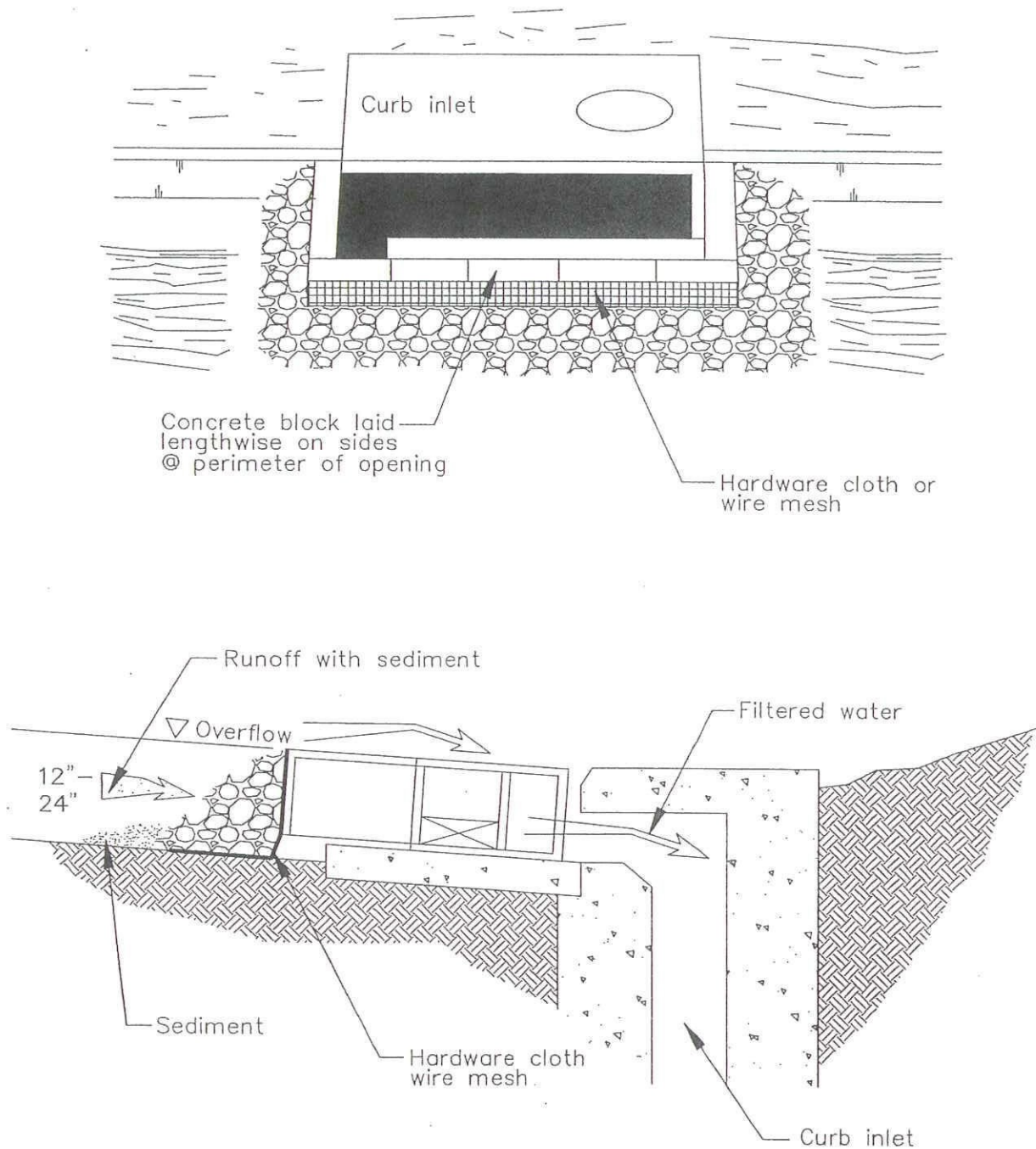


TYPICAL PROTECTION FOR INLET ON GRADE

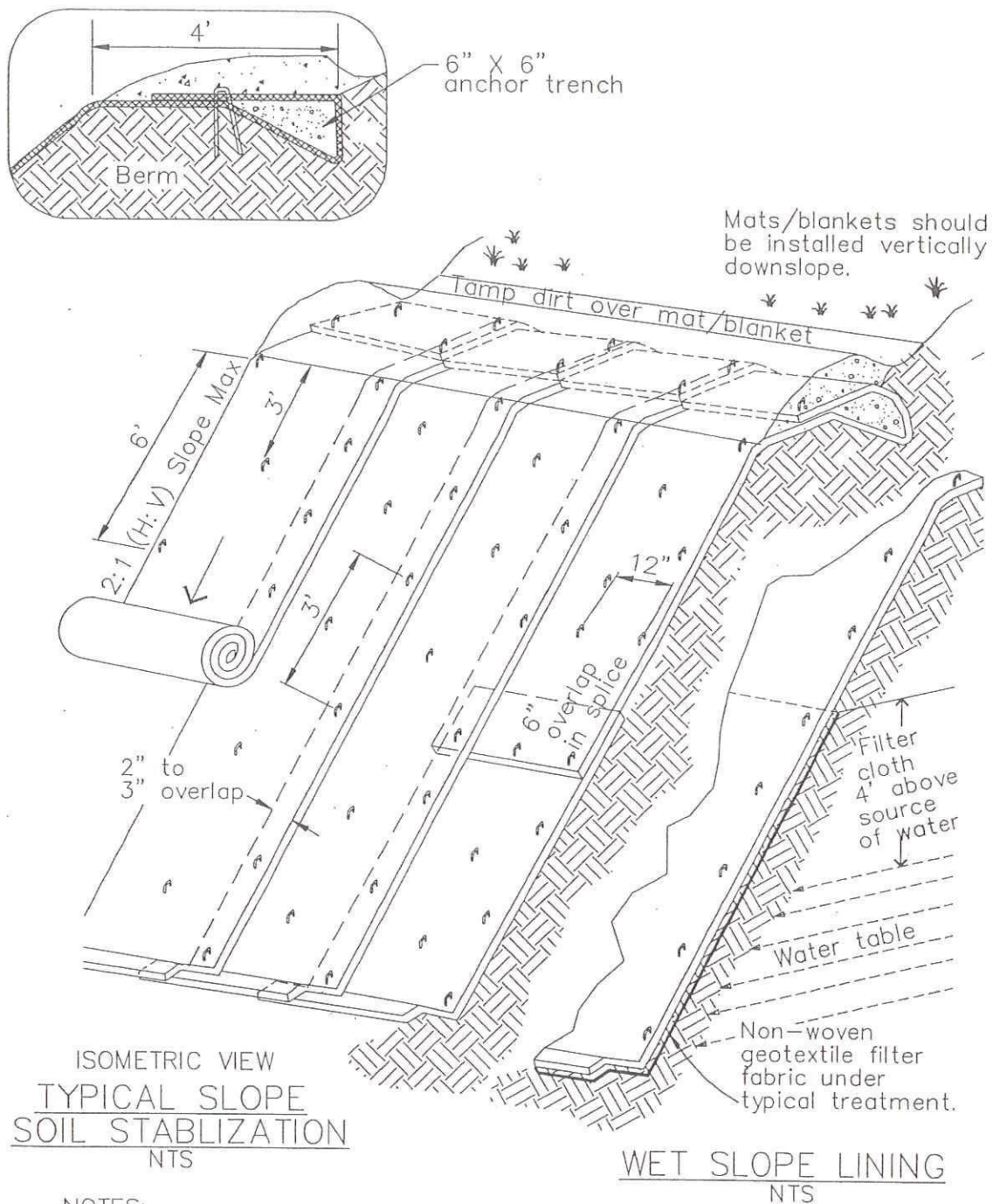
NOTES:

1. Intended for short-term use.
2. Use to inhibit non-storm water flow.
3. Allow for proper maintenance and cleanup.
4. Bags must be removed after adjacent operation is completed.
5. Not applicable in areas with high silts and clays without filter fabric.

DI PROTECTION TYPE 3
NOT TO SCALE



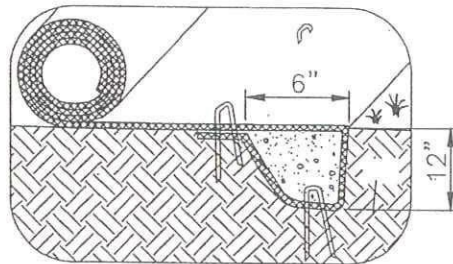
DI PROTECTION – TYPE 4
NOT TO SCALE



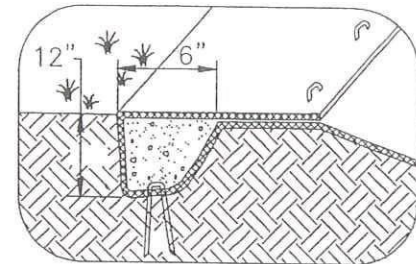
NOTES:

1. Slope surface shall be free of rocks, clods, sticks and grass. Mats/blankets shall have good soil contact.
2. Lay blankets loosely and stake or staple to maintain direct contact with the soil. Do not stretch.
3. Install per manufacturer's recommendations

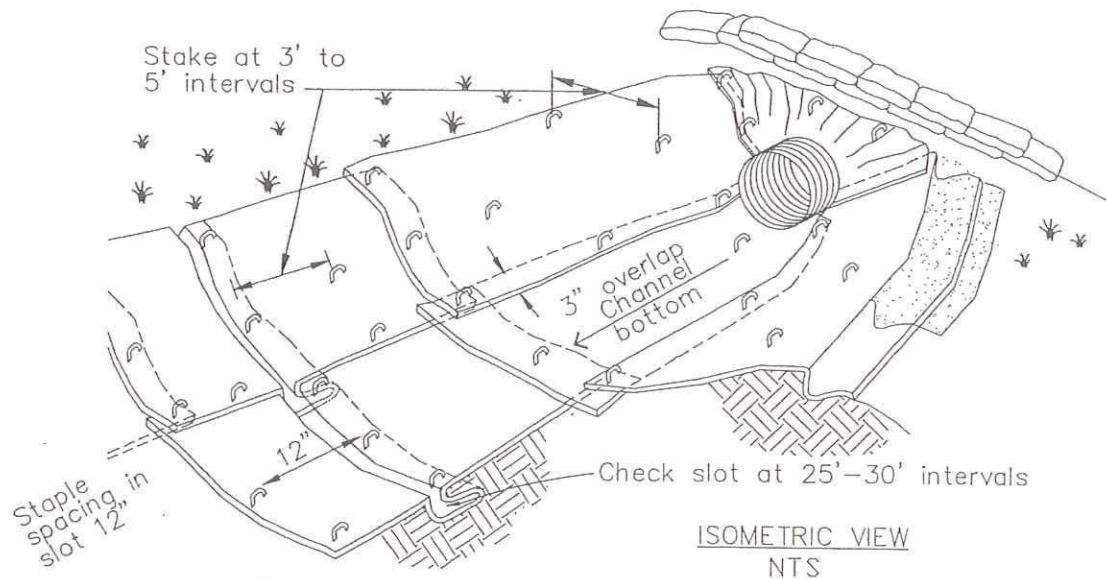
TYPICAL INSTALLATION DETAIL



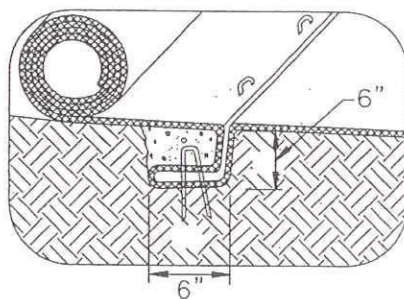
INITIAL CHANNEL ANCHOR TRENCH
NTS



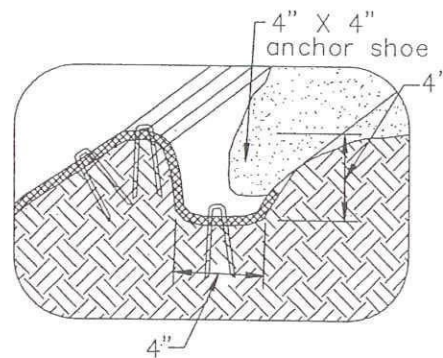
TERMINAL SLOPE AND CHANNEL
ANCHOR TRENCH
NTS



ISOMETRIC VIEW
NTS



INTERMITTENT CHECK SLOT
NTS



LONGITUDINAL ANCHOR TRENCH
NTS

NOTES:

1. Check slots to be constructed per manufacturers specifications.
2. Staking or stapling layout per manufacturers specifications.
3. Install per manufacturer's recommendations

TYPICAL INSTALLATION DETAIL