CITY OF FARGO SPECIFICATIONS
EROSION AND SEDIMENT CONTROL

PART 1
DESCRIPTION OF WORK

The work to be completed under this section of the Specifications and the accompanying plans shall include all labor, materials, and equipment necessary to provide for Erosion and Sediment control on City of Fargo projects that involve ground disturbing activity. This shall also include the preparation and maintenance of a Storm Water Pollution Prevention Plan (SWPPP) and all necessary storm water permitting and documentation.

Erosion and sediment control will include such items as temporary construction entrances, silt fence, fiber rolls, inlet protection, dewatering structures, concrete washout areas, turf establishment, and/or other items as shown on the plans. The Contractor shall be required to install erosion and sediment control measures prior to disturbing the site, where possible and to implement the remaining measures as early as practicable in accordance with the phasing of construction operations. Once installed, the Contractor shall maintain erosion and sediment control measures until they are no longer needed, or until his ND Pollutant Discharge Elimination System (NDPDES) permit responsibilities are terminated or transferred to another party.

In addition to the erosion and sediment control measures included in the plans and Specifications, the Contractor shall take measures, as appropriate, to prevent pollution resulting from work outside of the right-of-way or project area. This may include, but is not limited to such things as delivery and storage of equipment and materials, waste disposal, borrow operations, construction, and/or use of haul roads. The cost for this work or work required to rectify conditions that result from carelessness or failure to properly coordinate implementation of erosion control measures with the phasing of construction shall be the Contractor's expense.

Typical Best Management Practices are provided for in this document. The Contractor may propose to use practices that are not outlined here. These proposals are subject to approval by the Engineer.

PART 2
MATERIAL

2.1. INLET PROTECTION

Material will vary depending on the type of protection needed.

2.1.1. Inlet Protection Type A-1

Fence Post- shall be metal, a minimum of 5.0" long and shall be free of excessive deformation.

Wire Mesh Reinforcement- shall be free from rust and in good general condition at the time of installation.

Geotextile Fabric shall be a woven monofilament product having a water flow rate of 100-110 gpm/sf (ASTM D-4491), a minimum 70% UV resistance (ASTM D-4355), and a minimum mullen burst rating of 300 psi (ASTM D-3786).

2.1.2. Inlet Protection Type A-2

2"X4" Wood Frame-shall be made from hard wood that is sturdy and free from cracking.

Geotextile Fabric shall conform to Inlet Protection Type A-1 standards.

2.1.3. Inlet Protection Type B

Sediment Control Barrier shall meet the requirements of the following standards: ASTM D 1893, ASTM D 792/1505, ASTM D 968, ASTM D 1248, ASTM D 1308, ASTM D 2152

Frame- shall be as specified by the supplier.

Geotextile fabric around the device shall conform to Inlet Protection Type A-1 standards.

2.1.4. Inlet Protection Type C

A pre-assembled protection device designed for drop inlet protection.

The device shall consist of a reusable, open topped receptacle that rests inside a storm sewer inlet casting allowing the grating to be reinstalled in the casting. If needed a rear deflector plate shall be incorporated into the unit to protect open back castings from sediment. The receptacle shall have a filtration system to filter storm water. The receptacle shall also have an overflow large enough to minimize/eliminate street flooding during rain events. Approved manufacturers shall be Wimco, Lange IPD, Flexstorm, or approved equal.

2.1.5. Inlet Protection Type C-2

Type C-2 inlet protection shall consist of a sediment collection plate meeting H20 loading per OSHA 1910.23. ¼" steel plate shall be painted yellow with a perforated steel lid. A two position HDPE basket shall be provided that is able to be fixed in the up or down position. 400 micron filter bag for basket shall be attached to filter sediment.

2.2. FIBER ROLLS, ROCK LOGS & COMPOST ROLLS

Fiber rolls shall be weed free- wheat straw, rice straw, or coconut fiber- wrapped in tubular plastic netting. Fiber rolls shall be a minimum of nine inches in diameter (+/- one inch), with a minimum length of 10 feet, overlapped 1.0' at joints and approximate weight of 1 ¼ pounds per foot. Wood stakes (2" X 2" X 24") or metal pins may be used to secure the fiber roll.

Rock logs shall be adequately sized for controlling sediment. Aggregate shall vary in size between ¼" – 1-1/2" in a fiber wrapped tube.

Compost rolls shall be comprised of a variety of feedstock including yard trimmings, wood chips, leaves or other biosolids.

2.3. SILT FENCE

Geotextile Fabric shall be a woven monofilament product having a water flow rate of 100-110 gpm/sf (ASTM D-4491), a minimum 70% UV resistance (ASTM D-4355), and a minimum mullen burst rating of 300 psi (ASTM D-3786).

Posts shall be metal, and shall be a minimum of 5.0' in height free from excessive deformation.

2.4. CONCRETE WASHOUT

Barrier Fence- may use snow fence or silt fence. Purpose is to prevent easy access to excavated area.

9" Fiber Rolls (as described in Section 3300 2.2)

2.5. TEMPORARY CONSTRUCTION ENTRANCE

Crushed Rock- average diameter ranging from 1" to 4"or equivalent sized crushed concrete.

Wood Material- shall be coarse grade consisting of shredded bark of wood ground so that 95% of the material passes through a 5-inch sieve and no more than 45% through a ¾-inch sieve. Wood shall not contain material that would be harmful to equipment nor shall it contain compounds in quantities detrimental to animal, plant life or water quality. The material will have a bulk density of less than 22.2 lbs per cubic foot.

2.6. DEWATERING STRUCTURES

Material will vary depending on the Type of protection needed.

2.6.1. Dewatering Structure Type 1

¼ inch average diameter Pea Gravel

Fiber Roll (As described in Section 3300 2.2) or Silt Fence (As described in Section 3300 2.3).

2.6.2. Dewatering Structure Type 2

Geotextile Fabric – shall have a minimum water flow rate of 8 gpm/sf (ASTM D-4491), a minimum 80% UV resistance (ASTM D-4355), and a minimum mullen burst rating of 300 psi (ASTM D-3786).

Rip Rap- 12”-18” inch minimum diameter rock.

Aggregate – 3/16” average diameter rock.

Stakes shall be a minimum of 5’in height and shall be comprised of hard wood that is sturdy and free from cracking.

2.6.3. Dewatering Structure Type 3

Sediment Filter Bag – Non-woven geotextile material of appropriate size and flow characteristics to treat the capacity of water being pumped. To be determined by manufacturer specifications in accordance with the pump being used.

PART 3
CONSTRUCTION

SEASONAL CONSIDERATIONS

All devices that are installed in a street section and are determined to have the potential to cause damage to snow removal equipment shall be removed by November 1st and reinstalled as directed by the Engineer in the spring. This work is considered normal maintenance and the Contractor shall not be entitled to additional compensation.

3.1. INLET PROTECTION

Newly installed storm sewer inlets shall be protected from sediment – laden runoff by installation of an inlet protection device within a maximum of 48 hours after installation. Under no circumstance shall inlets remain unprotected over a weekend. In addition, existing inlets that will receive water from the construction site shall be protected prior to commencing land disturbing activities.

3.1.1. Inlet Protection Type A-1

This shall consist of installing standard preassembled wire mesh reinforced geotextile fabric around inlets. Metal fence posts shall be used to support wire mesh and geotextile fabric. Posts spacing shall not exceed 3 feet. Care must be taken to ensure the assembly provides for the wire mesh and geotextile fabric to be securely in contact with the existing ground to prevent sediment laden water from running under the device. (See Drawing 6.1 Section 3300)

This device is intended primarily to protect inlets within the future paving section and is generally disposable upon removal. It will be the responsibility of the Contractor to remove materials as directed by the Engineer. Disposal shall be the Contractor's responsibility.

3.1.2. Inlet Protection Type A-2

This shall consist of installing geotextile fabric securely fastened to a wooden 2"X4" frame or a prefabricated frame. Care must be taken to ensure that the assembly provides

for the geotextile fabric to be securely in contact with the existing ground to prevent sediment laden water from running under the device. (See Drawing 6.2 Section 3300)

This device is required around all inlets that are not in a street section, such as rear yard inlets. This device remains on site requiring maintenance by the Contractor throughout the project and becomes the responsibility of the developer/property owner to maintain upon final completion of the project.

3.1.3. Inlet Protection Type B

This shall consist of installing a pre formed liner low density polyethylene barrier with a mounting frame. The frame fits into the top of the cone section of a catch basin and supports the sediment control barrier. To further protect the storm sewer from fine materials the sediment control barrier shall be wrapped with a geotextile sock approximately 2 times the circumference of the barrel. (See Drawing 6.3 Section 3300)

This device is intended primarily to protect inlets within the future paving section. The device is re-useable and may remain the property of the Contractor depending on the project. If the project includes the paving operation devices are removed following paving and become the property of the Contractor responsible for the initial installation. However, if the paving is to be done on a separate project devices need to remain until the paving process is done and will then become the property of the City and will be delivered by the Contractor to a location specified by the Engineer.

3.1.4. Inlet Protection Type C

This shall consist of installing a prefabricated drop in inlet protection device. This shall be installed by inserting the device into the casting and replacing the grate into the frame. This device is required in all inlets that receive water from the project area that are in a street section. (See Drawing 6.4 Section 3300)

This device remains on site requiring maintenance by the Contractor throughout the project and becomes the responsibility of the developer/property owner to maintain upon final completion of the project.

3.1.5. Inlet Protection Type C-2

This shall consist of installing a prefabricated plate that will fit into the top of the cone section of a catch basin or manhole. To further protect the storm sewer from fine materials the sediment control plate shall include a 400 micron filter bag around the collection basket.

This device is intended to protect inlets within the future paving section. The device is re-useable and shall remain the property of the Contractor.

3.2. FIBER ROLLS, ROCK LOGS & COMPOST ROLLS

Fiber rolls, rock logs & compost rolls shall be installed as shown on the plans and/or as directed by the Engineer. They shall be placed on contour and staked with 24 inch wood stakes or metal pins, at a maximum spacing of four foot on center. The ends of adjacent rolls shall be overlapped on each other a minimum of 1.0'. (See Drawing 6.5 Section 3300)

Rolls remain on site requiring maintenance by the Contractor throughout the project. Sediment buildup shall be removed when it reaches 1/3 the height of the roll. Any ineffective rolls must be replaced immediately. An ineffective roll is a roll that has flattened out to half its original height. Upon final stabilization it will be the responsibility of the Contractor to remove materials as directed by the Engineer. Disposal shall be the Contractor's responsibility.

3.3. SILT FENCE

Excavate a 6"deep by 4"wide trench. Drive posts into ground on downstream side of fence (posts may be alternated on grades less than 2% to provide additional protection against wind damage). Posts shall have a maximum spacing of eight foot on center. Unroll fabric geotextile fabric one section at a time. Lay fabric flap in trench. Backfill with soil, and tamp the ground. Attach fabric to support posts. (See Silt Fence Detail)

Silt fence remains on site requiring maintenance by the Contractor throughout the project. Sediment buildup shall be removed when it reaches 1/3 the height of the silt fence. Any ineffective (decomposed, torn, collapsed materials) silt fences must be replaced immediately. Upon final stabilization it will be the responsibility of the Contractor to remove materials as directed by the Engineer. Disposal shall be the Contractor's responsibility.

3.4. CONCRETE WASHOUT

Excavate to required depth (3' to 4' depth). Install a barrier fence around excavated area. Maximum center to center spacing of fence posts for the barrier fence shall be 5'. Install 9" Fiber Roll as directed in Section 3300 3.2. (See Drawing 6.7 Section 3300)

Concrete washouts shall be cleaned by the Contractor when they reach 80% of their capacity. All material removed from the structure shall be the responsibility of the Contractor to dispose of. Under no circumstances will concrete chunks removed from the washout during cleaning be left on site for disposal. As directed by the Engineer the concrete washout shall be removed and the ground restored to a compacted, level, and vegetated state at the completion of the project.

3.5. TEMPORARY CONSTRUCTION ENTRANCE

Prior to placing the Engineering fabric, the areas shall be cleared of all trash and debris. Vegetation shall be removed to the ground level. Trash, debris, and removed vegetation shall be disposed of by the Contractor. The ground shall be graded to a uniform plane. Lay the Engineering fabric over the prepared area. Unrolling the fabric in the direction vehicles will be traveling. Crushed rock, crushed concrete, or wood material to be placed directly over the fabric shall be spread in the direction of traffic, longitudinally and along the alignment of the temporary construction entrance. A layer of crushed rock, crushed concrete, or wood material a minimum 6" thick shall be placed. Fabric damaged during rock placement shall be repaired by placing a new piece of fabric over the damaged area. The piece of fabric shall be large enough to cover the damaged area and provide a minimum 12"overlap on all edges. (See Drawing 6.8 Section 3300)

If buildup of soil and sediment deter the function of the temporary construction entrance, the Contractor shall immediately remove and dispose of the soil and sediment, and install additional crushed rock, crushed concrete, or wood material at the Contractor's expense. The Contractor shall maintain temporary construction entrances throughout the contract or until removed. The Contractor shall prevent displacement or migration of the surfacing. Significant depressions resulting from settlement or heavy equipment shall be repaired by the Contractor, as directed by the Engineer. Temporary construction entrances shall be repaired or replaced on the same day the damage occurs.

When no longer required as determined by the Engineer, temporary construction entrances shall be removed and disposed of by the Contractor. While the temporary construction entrance is in use, pavement shall be cleaned and sediment removed at least once a day, and as often as necessary

when directed by the Engineer. Soil and sediment or other extraneous material tracked onto existing pavement shall not be allowed to enter drainage facilities by any means, including precipitation events.

3.6. DEWATERING STRUCTURES

3.6.1. Dewatering Structure Type 1

Determine the appropriate size of the dewatering structure based on the discharge capacity of the pump to be used for dewatering. Find an area of established grass or prepare an area for use by removing all trash and debris. Lay Engineering fabric of appropriate size to cover the entire area to be used for dewatering. Fill the area with ¼" pea rock to a minimum depth of 6". Surround the perimeter of the drainage area with Silt Fence or Fiber Roll. (See Drawing 6.9 Section 3300)

The dewatering structure shall be monitored during pumping activities. Should the Fiber Roll (if used) be overtopped by pumped water, all further pumping activities must cease until the dewatering area has discharged the water pumped into it. If buildup of soil and sediment deter the function of the dewatering structure, the Contractor shall immediately remove and dispose of the soil and sediment, and install additional pea rock to restore functionality. This work is considered normal maintenance and the Contractor shall not be entitled to additional compensation.

3.6.2. Dewatering Structure Type 2

Determine the appropriate size of the dewatering structure based on the discharge capacity of the pump to be used for dewatering. Excavate to required dimensions. Install straw bales butted tightly together and staked in place. Geotextile fabric should be placed as the bales are installed. Locate the pump discharge and place Rip Rap of sufficient size and depth to resist movement and prevent erosion where pumped water will enter the structure. Build a spillway out of 12"-18" diameter rocks, with a minimum of 6" depth from the top of the structure. Place a 6" thick layer of 3/16" aggregate on the inside of the spillway. (See Drawing 6.10 Section 3300)

The dewatering structure shall be monitored during pumping activities. Once the water nears the spillway pumping activities must cease until the dewatering area has discharged to the level of the excavated area. When the excavated area is filled to ½ its depth the

buildup of soil and sediment shall be removed and disposed of by the Contractor. Any decomposed, torn, or collapsed materials must be replaced immediately. This work is considered normal maintenance and the Contractor shall not be entitled to additional compensation.

3.6.3. Dewatering Structure Type 3

A prefabricated Sediment Containment Filter Bag made of non-woven geotextile material may be used to filter pumped water. The bag should be placed on an area of established grass or on a prepared 6" minimum depth aggregate base. The bag should be oriented in such a manner as to divert flow away from construction area and discharge filtered water into a swale, grass field, or secondary sediment containment system. (See Drawing 6.11 Section 3300)

The sediment containment bag shall be monitored during pumping activities. When the bag is filled (as per the manufacturers' specifications) all further pumping activities must cease until the bag has discharged the water pumped into it. If buildup of soil and sediment deter the function of the bag, the Contractor shall immediately remove and dispose of the soil and sediment, to restore functionality. This work is considered normal maintenance and the Contractor shall not be entitled to additional compensation.

3.7. SURFACE ROUGHENING

Using large tired equipment or tracked equipment slopes shall be roughened, as directed by the Engineer, prior to seeding and mulching. Roughening shall be achieved by driving equipment up and down the slope. (See Drawing 6.13 Section 3300)

3.8. EMERGENCY OPERATIONS – FLOOD FIGHT

Reasonable measures shall be taken to minimize sediment/pollution transfer to the Storm Sewer System during the emergency and post event phases.

3.8.1 Inlet Protection – Under Levees

In all instances where storm inlets are buried for flood fight activities, the Contractor must protect the inlets by removing the inlet grate and wrapping the grate with plastic and inserting the grate into the casting.

3.8.2 Inlet Protection – General

Where practical, minimize sediment runoff potential to inlets not in the levee alignment with appropriate inlet protection devices.

3.9. STREETS TO BE KEPT CLEAN

Streets and highways that are being used by the Contractor and his forces to and from, as well as in the project site, shall be kept clean and dust-free at all times for the duration of the project and at project completion. A pick-up type or vacuum sweeper shall be used to sweep when necessary to comply with applicable permit requirements, and shall be made available at the request of the project inspector and/or Engineer to clean up material that is tracked onto city streets.

3.10. TEMPORARY MULCHING

Where required by the NDPDES permit, the Contractor shall mulch disturbed areas at his sole expense. Mulching shall be in accordance with the requirements for Type 2 mulching outlined in Section 3100 of these Specifications.

PART 4
PERMITTING

The North Dakota Department of Health (NDDH) is the permitting authority for North Dakota. City storm water permits will not be required on City projects. The NDDH has divided the permit requirement into two general categories; Construction activity with land disturbance of one or more acres including those projects that disturb less than one acre but are part of a larger common plan of development that disturbs one or more acres & construction activity with land disturbance under an acre. There is a significant difference in permitting requirements between the two categories**.** Applications must be submitted to the NDDH 7 days in advance of the commencement of work.

4.1. PERMIT REQUIREMENTS

A. NDPDES Permit Requirements for Construction Activity With Land Disturbance Under An Acre

If the project will result in a land disturbance or total amount of exposed erodible surface of less than 1 acre, no NDPDES Permit is required unless the project is part of a larger common plan of development that disturbs one or more acres. If the Contractor feels that a disturbance of 1 acre or greater will be necessary to facilitate construction of the project, he must notify the Engineer prior to commencing work, so that appropriate procedures may be followed.

B. NDPDES Permit Requirements for Construction Activity With Land Disturbance of One Acre or More or Part of a Larger Common Plan of Development

1) *Notice of Intent* – The Contractor shall sign the Notice of Intent in conjunction with the City and be co applicant for permit coverage. By signing the proposal and completing the permit, the Contractor is a "co-permittee" with the city to ensure compliance with the terms and conditions of the NPDES general permit to discharge storm water associated with construction activity.

2) *Storm Water Pollution Prevention Plan (SWPPP*) - The Contractor with assistance from the Engineer, will prepare the SWPPP for this project. Erosion and sediment controls included in the plans and Specifications will be incorporated into the SWPPP.

The Engineer shall provide the Contractor with any additional information needed to complete the SWPPP guidance forms available from the North Dakota Department of Health. The completed SWPPP shall be provided within three (3) calendar days following the Notice of Award. Failure to do so may result in a delay issuing the Notice to Proceed without a corresponding extension of the contract completion date.

The Contractor shall include the following information in the completed SWPPP:

a) Any proposed modifications or alterations required to facilitate the Contractor's means or methods of operation. The Engineer will have final say as to whether or not the proposed changes are acceptable.
b) When alternatives for various storm water protection measures are provided for, the Contractor shall indicate the alternatives intended for use on the project.
c) Spill prevention and response procedures.
d) Procedures for site inspection and maintenance
e) Description of sediment tracking reduction and recovery methods.
f) Significant materials inventory.
g) Locations and procedures for storage of materials, waste handling, temporary sanitary facilities, concrete washout, and debris disposal unless such information is already included in the plans and Specifications.
h) Signatures of all subcontractors and suppliers performing work or delivering materials to the project site.

3) *Responsibility for compliance*-The Contractor shall be responsible for all inspections, documentation, record keeping, maintenance, remedial actions and repairs of storm water protection measures required to maintain compliance with the NDPDES general permit for storm water discharge associated with construction activity by the North Dakota Department of Health. The Contractor shall be solely responsible and hold the City harmless for any fines or enforcement action levied by other agencies having jurisdiction, which result from the Contractor's actions, inactions, or negligence regarding compliance with the permit or erosion control provisions of the contract documents.

In addition, it shall be the Contractor's responsibility to ensure that all subcontractors and suppliers are aware of and comply with the terms and conditions of the permit.

4) *Documentation-* The Contractor shall have a copy of the SWPPP available on site for viewing at all times during the construction operations. Inspections and maintenance forms shall be kept current and submitted to the Engineer every two weeks. Failure to provide inspection forms shall result in delaying of the processing of pay estimates.

5) *Termination of Permit Responsibilities-* The Contractor shall be relieved of his permit responsibilities when the project is substantially complete, all required storm water protection measures are in place, and the permit responsibilities have been transferred to another Contractor or owner, or the site has undergone final stabilization.

PART 5
MEASUREMENT AND PAYMENT

5.1. GUARANTEE

The Guarantee does not apply.

5.2. MEASUREMENT AND PAYMENT

Payment for all erosion/sediment control bid items shall include all equipment, material, labor necessary for installation, inspection, maintenance and removal.

5.2.1. INLET PROTECTION

Inlet protection will be paid by the number of inlets protected. Existing inlets on the project site or along a haul route located on or off the project site will be paid for as "Inlet Protection – Existing Inlet". New inlets installed under the contract will be paid for as "Inlet Protection – New Inlet". Inlet Protection will only be paid for once for each inlet protected, regardless of whether multiple types of devices are used on an inlet over the course of the project.

Example: 22 new inlets are installed on the project. 4 of the new inlets have Type A2 protection for the duration of the project, and the remaining 18 have Type C2 protection, then Type C protection. There are another 6 inlets located in the gutter along a haul route, so Type C protection is installed in those. On this example project, 46 devices were used, pay quantities would be:

Inlet Protection – Existing Inlet	6 EA
Inlet Protection – New Inlet	22 EA

Additional inlet protection needed due to Contractor carelessness or modifications to the anticipated phasing of construction, by the Contractor for shall not be compensated.

5.2.2. FIBER ROLLS, ROCK LOGS & COMPOST ROLLS

Rolls shall be paid per linear foot.

5.2.3. SILT FENCE

Silt Fence shall be paid per linear foot.

5.2.4. CONCRETE WASHOUT

Providing a concrete washout area shall be incidental to other concrete work. No additional compensation shall be provided for installing, maintaining or restoring a concrete washout area.

5.2.5. TEMPORARY CONSTRUCTION ENTRANCE

Temporary Construction Entrance shall be paid at the contract unit price per each and shall include full compensation for constructing temporary construction entrance, complete in place, including excavation, fabric and backfill, as shown on the plans, and as directed by the Engineer. Cleanup, repair, removal, disposal, or replacement due to improper installation or the Contractor's negligence will not be considered as included in the cost for performing maintenance.

5.2.6. DEWATERING STRUCTURES

No additional compensation shall be provided for installing, or maintaining a dewatering structure. Nor will any compensation be given for restoring the area where the dewatering structure is installed.

5.2.7. SURFACE ROUGHENING

No additional compensation shall be provided for surface roughening activities.

5.2.8. STORMWATER MANAGEMENT

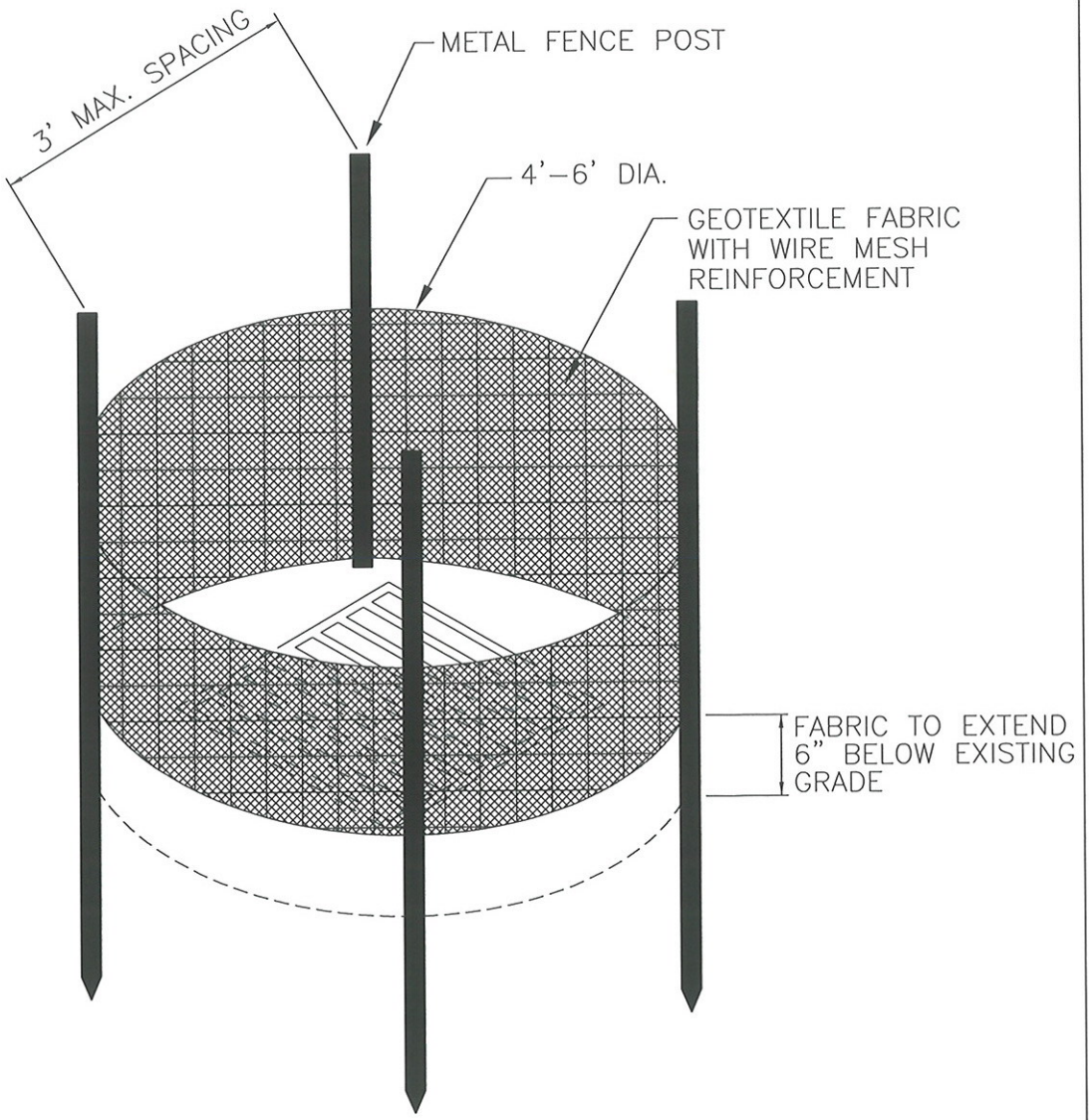
Stormwater Management shall include all labor, materials, equipment, and administrative effort required to comply with the NDPDES permit requirements, including obtaining the permit, documentation, reporting, preparation of the Storm Water Pollution Prevention Plan, and implementing of any erosion and sedimentation controls not specifically identified on the plans, but required for permit compliance.

5.2.9. SWEEPING

Sweeping shall be considered incidental to other bid items.

5.2.10. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES

In the event that the Engineer orders additional temporary or permanent erosion control measures to be implemented, due to changes in the scope of the project, or conditions that were unforeseen during design, the Contractor shall be paid for this work at the respective unit bid prices. If there is no comparable item of work, the Contractor shall be compensated in accordance with the provisions established for extra work.



NOTES:

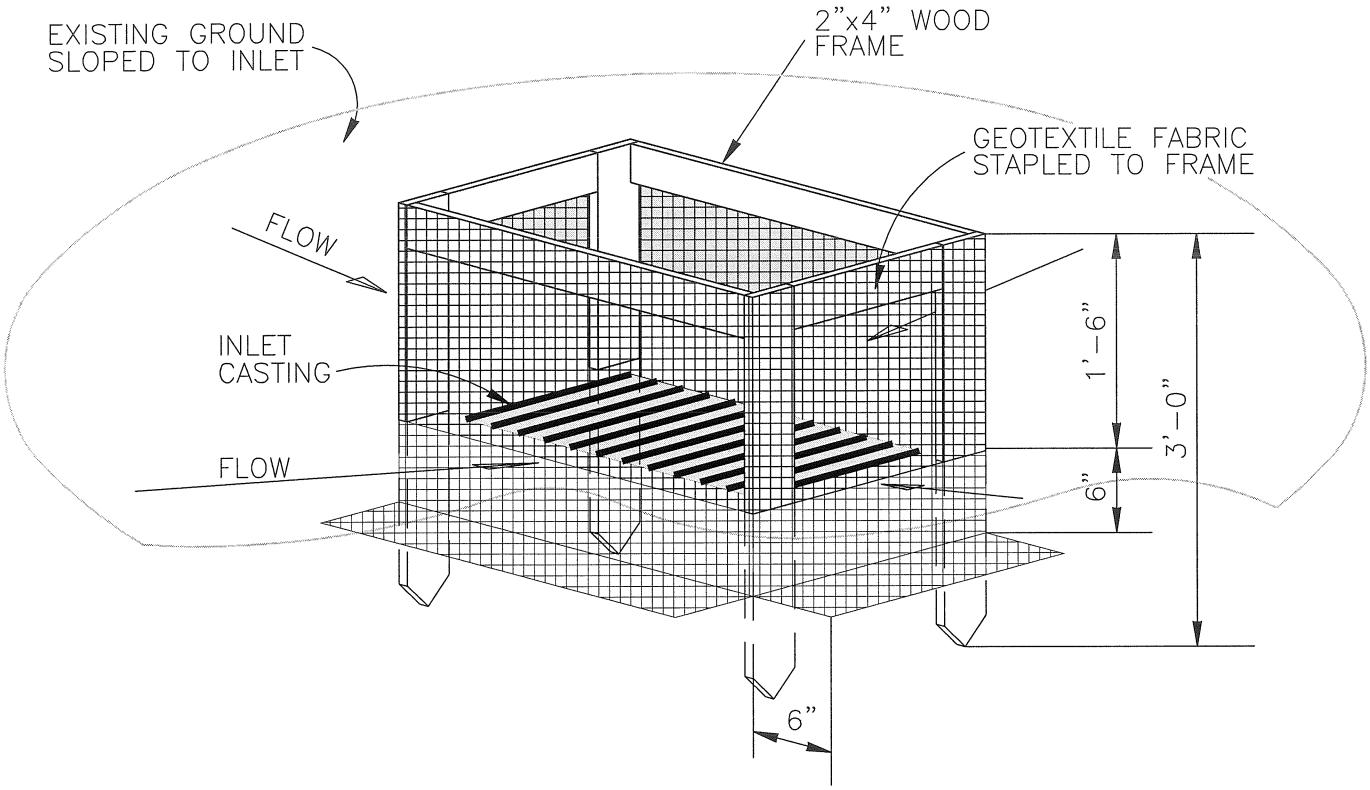
1. INLET PROTECTION DEVICES SHALL BE MAINTAINED OR REPLACED AT THE DIRECTION OF THE ENGINEER.

2. MANUFACTURED ALTERNATIVES MAY BE SUBSTITUTED, SUBJECT TO THE ENGINEER'S APPROVAL

3. WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

4. FABRIC SHALL BE INSTALLED IN ONE CONTINUOUS PIECE WRAPPED AROUND POSTS, OVERLAPPED ACROSS THE LAST GAP, ITS ENDS SECURELY FASTENED TO SEPARATE POSTS.

SECTION NO. 3300	DRAWING NO. 6.1
REV,D. 2013	
STORM SEWER INLET PROTECTION: TYPE A–1	
CITY OF FARGO ENGINEERING DEPARTMENT	
APPROVED CME	DATE 1-2-13

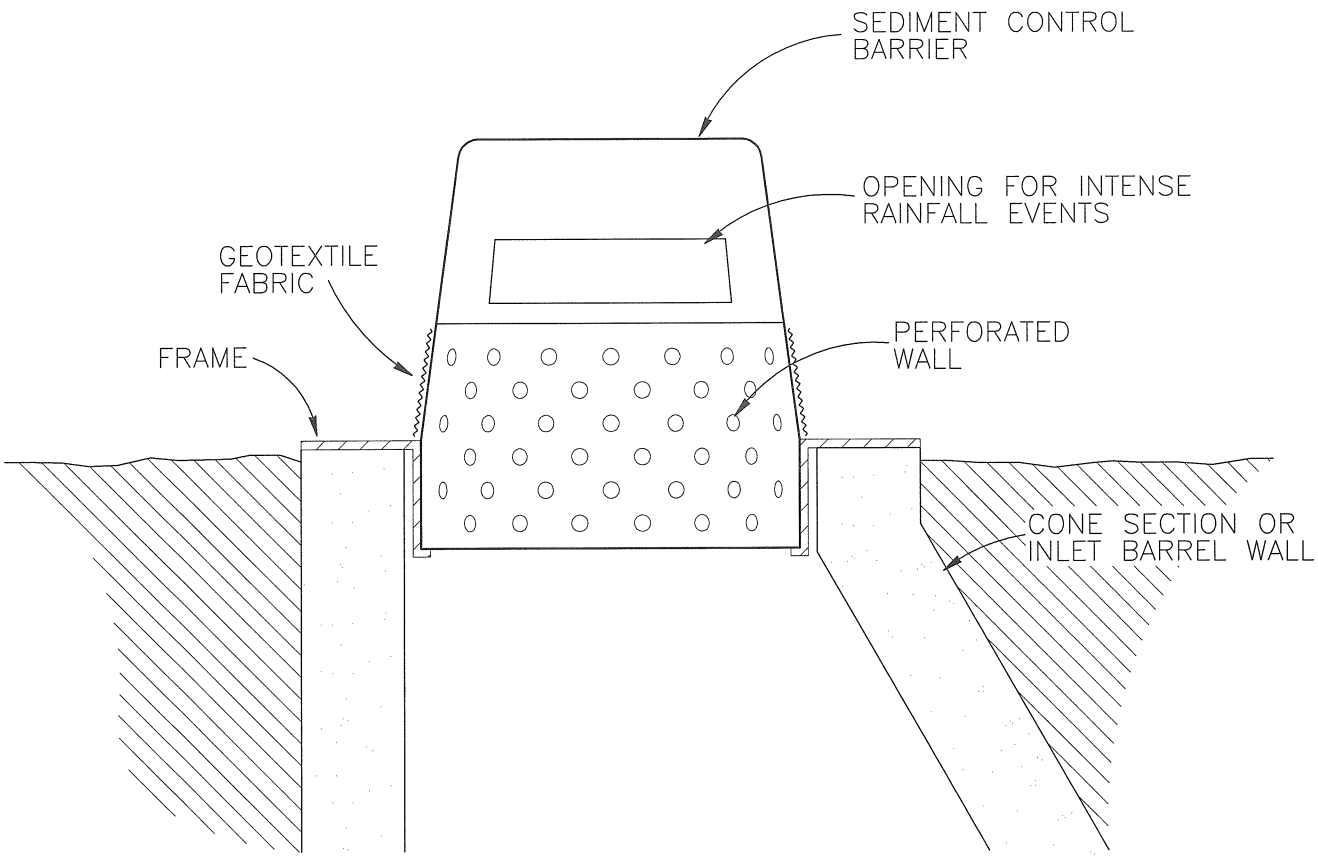


NOTES:

1. PREMANUFACTURED FRAMES MAY BE USED INSTEAD OF CONSTRUCTING WOOD FRAMES, PROVIDING THAT ADEQUATE SUPPORT FOR THE GEOTEXTILE FABRIC IS PROVIDED.

2. FABRIC SHALL BE INSTALLED IN ONE CONTINUOUS PIECE WRAPPED AROUND POSTS, OVERLAPPED ACROSS THE LAST GAP, ITS ENDS SECURELY SECURELY FASTENED TO SEPARATE POSTS.

SECTION NO. 3300	DRAWING NO. 6.2
REV,D. 2012	
STORM SEWER INLET PROTECTION: TYPE A-2	
CITY OF FARGO ENGINEERING DEPARTMENT	
APPROVED BED	DATE 2-21-2012



NOTE:

ALTERNATIVE INLET PROTECTION DEVICES MAY BE ALLOWED SUBJECT TO ENGINEERS APPROVAL.

WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN TO INSURE THAT SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO INLET. ANY MATERIAL FALLING INTO INLET SHALL BE IMMEDIATELY REMOVED.

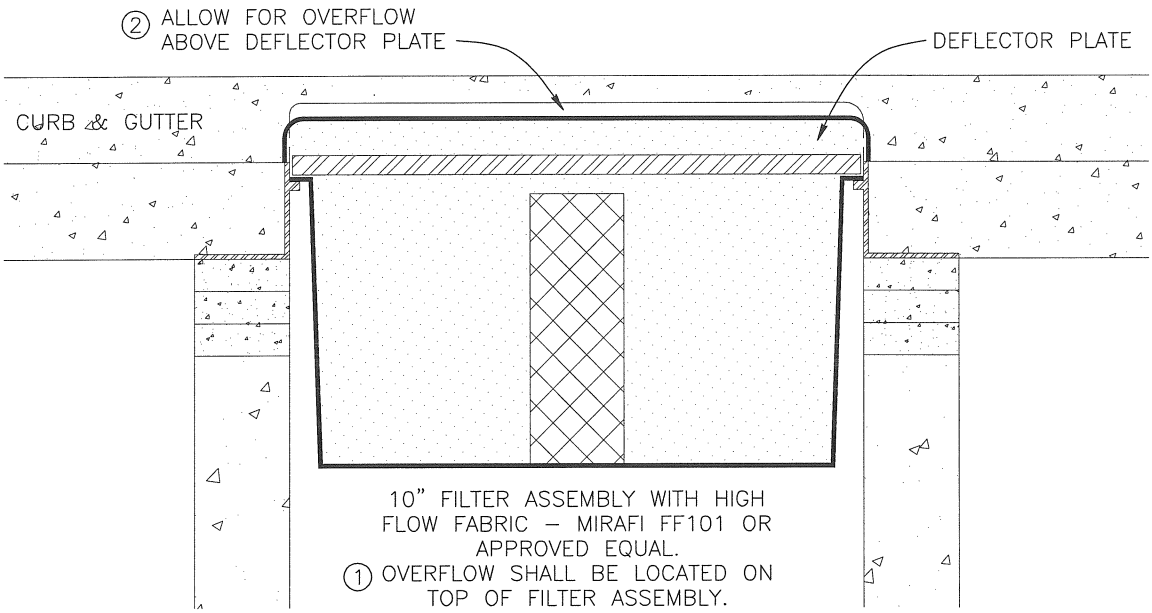
ANY INLET PROTECTION USED SHALL BE EQUIPPED WITH AN EMERGENCY OVERFLOW TO MINIMIZE THE THREAT OF STREET FLOODING DURING AN INTENSE RAINFALL EVENT.

SECTION NO. 3300	DRAWING NO. 6.3
REV,D. 2012	

STORM SEWER INLET PROTECTION: TYPE B

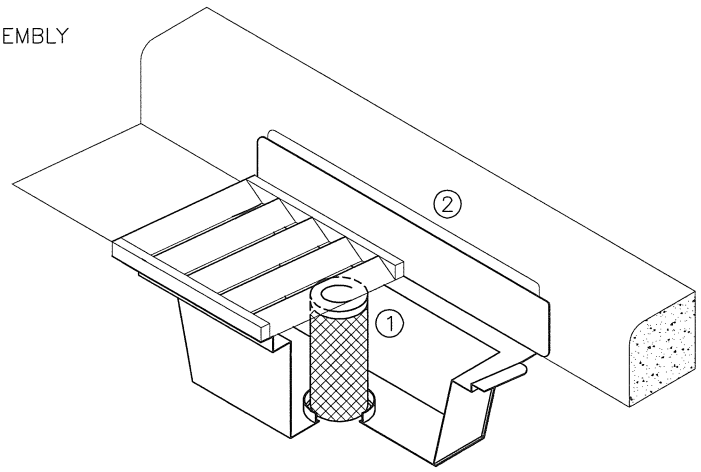
CITY OF FARGO
ENGINEERING DEPARTMENT

APPROVED BED	DATE 2-21-2012



OVERFLOW ① – CENTER OF FILTER ASSEMBLY

OVERFLOW ② – TOP OF CURB BOX



INSTALLATION:

- REMOVE THE INLET GRATE
- INSERT THE DEVICE INTO THE CASTING FRAME
- INSTALL GRATE INTO CASTING FRAME OVER TOP OF DEVICE

MAINTENANCE:

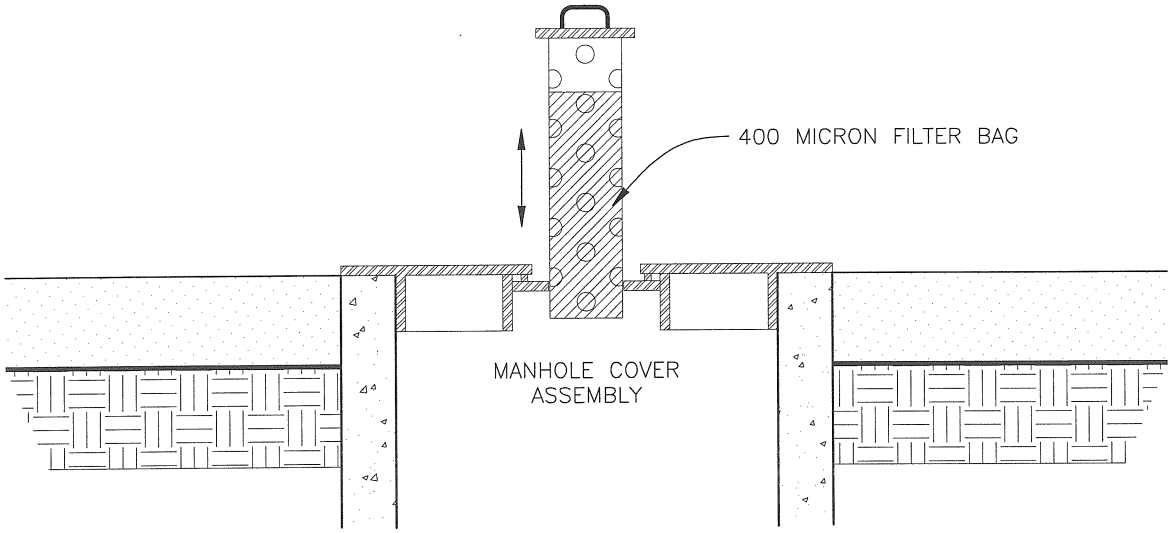
- CHECK REGULARLY & AFTER RAIN EVENTS. IF THE DEVICE IS FILLED WITH 1/3 OF ITS CAPACITY WITH SEDIMENT, EMPTY THE DEVICE.
- REMOVE DEBRIS AROUND THE INLET GRATE PRIOR TO REMOVING DEVICE

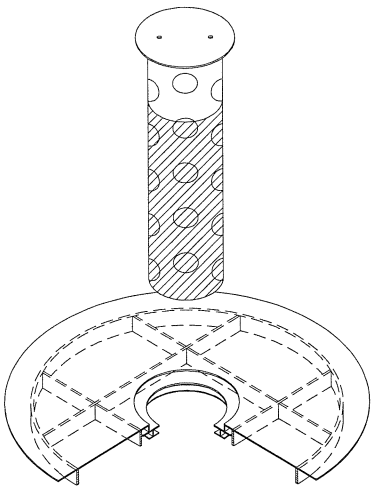
SECTION NO. 3300	DRAWING NO. 6.4
REV,D. 2012	

STORM SEWER INLET PROTECTION: TYPE C

CITY OF FARGO
ENGINEERING DEPARTMENT

APPROVED BED	DATE 2-21-2012





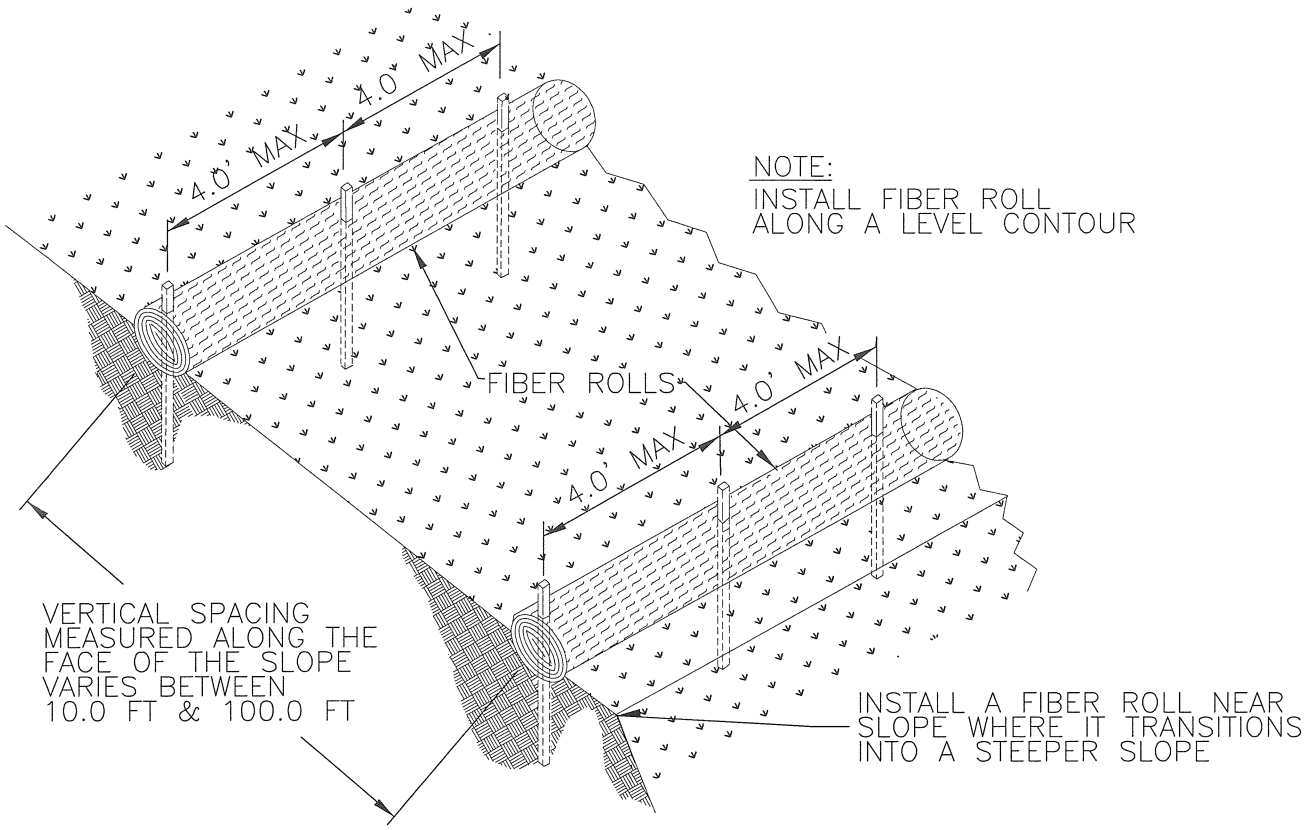
INSTALLATION:

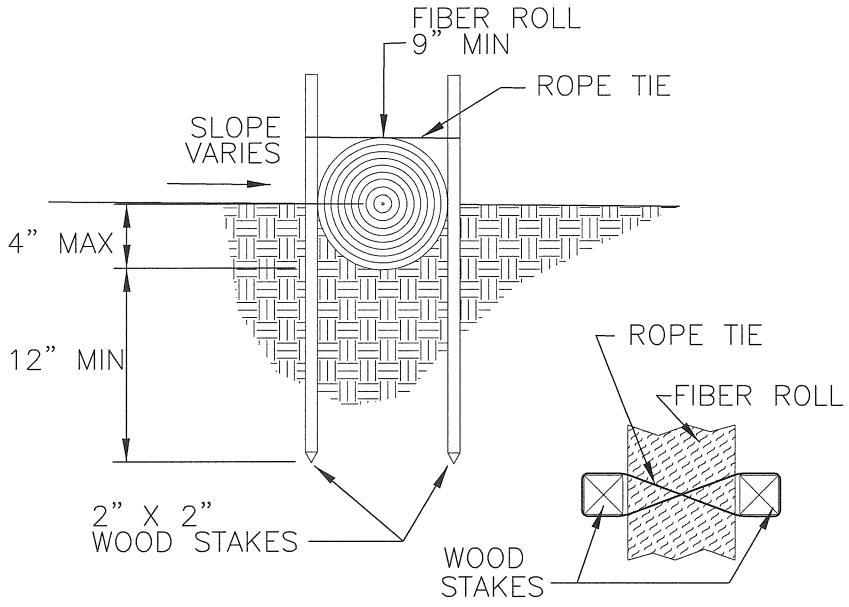
- REMOVE THE INLET CASTING
- INSERT THE DEVICE INTO THE MANHOLE BARREL

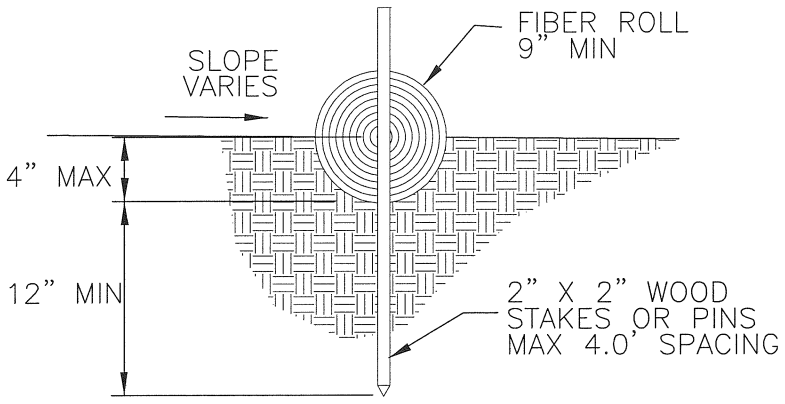
MAINTENANCE:

- CHECK REGULARLY & AFTER RAIN EVENTS. IF THE FILTER IS PLUGGED REMOVE AND CLEAN THE FILTER.

SECTION NO. 3300	DRAWING NO. 6.5
REV,D. 2012	
STORM SEWER INLET PROTECTION: TYPE C-2	
CITY OF FARGO ENGINEERING DEPARTMENT	
APPROVED BED	DATE 2-21-2012





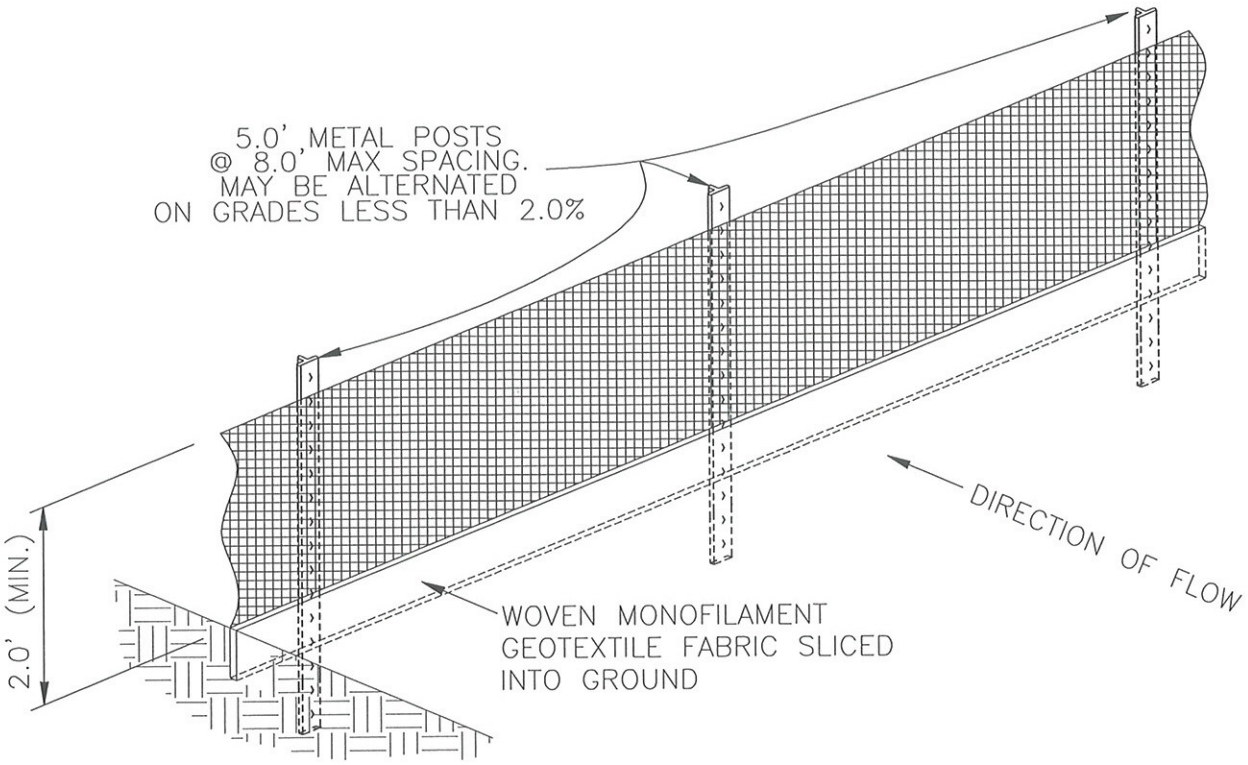


SECTION NO. 3300	DRAWING NO. 6.6
REV,D. 2012	

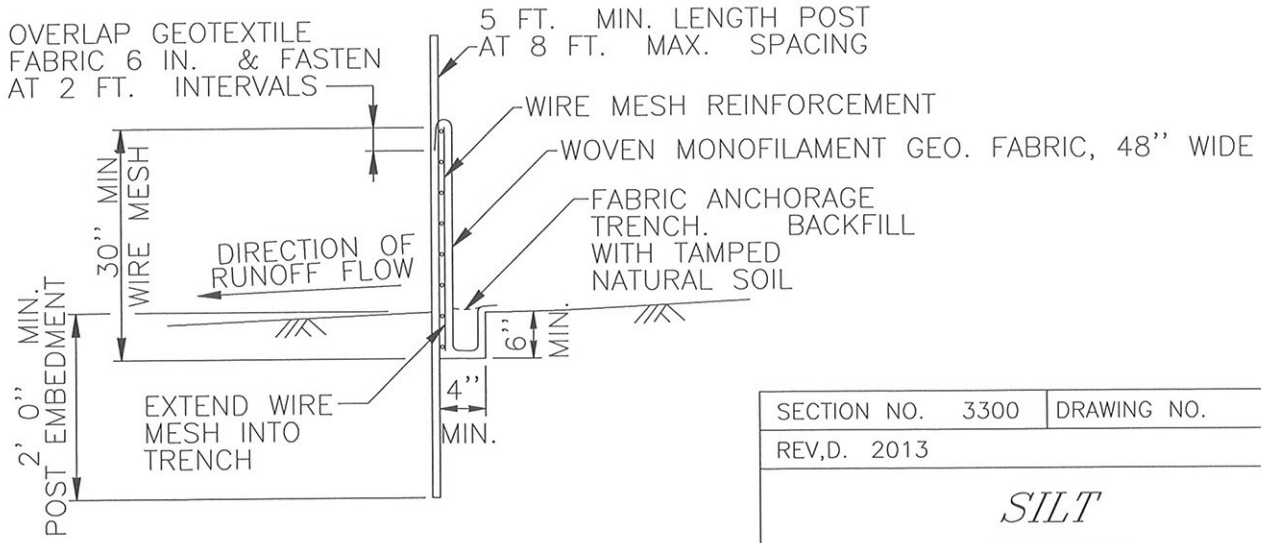
FIBER ROLL INSTALLATION

CITY OF FARGO
ENGINEERING DEPARTMENT

APPROVED BED	DATE 2-21-2012



STANDARD



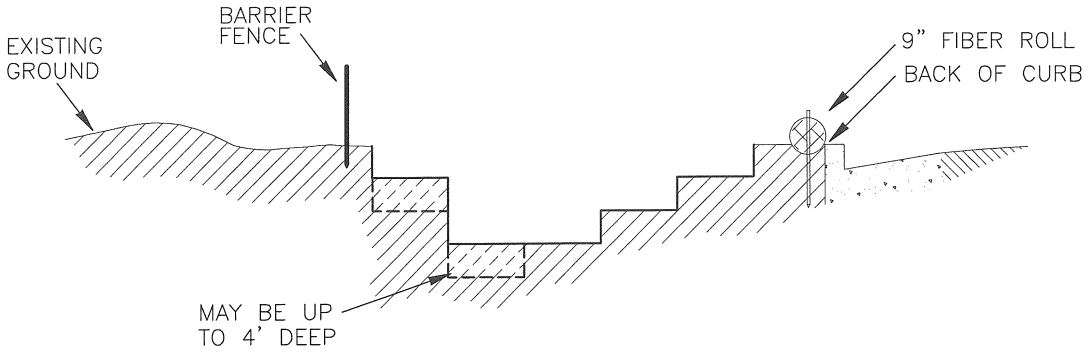
HEAVY DUTY

SECTION NO. 3300	DRAWING NO. 6.7
REV,D. 2013	

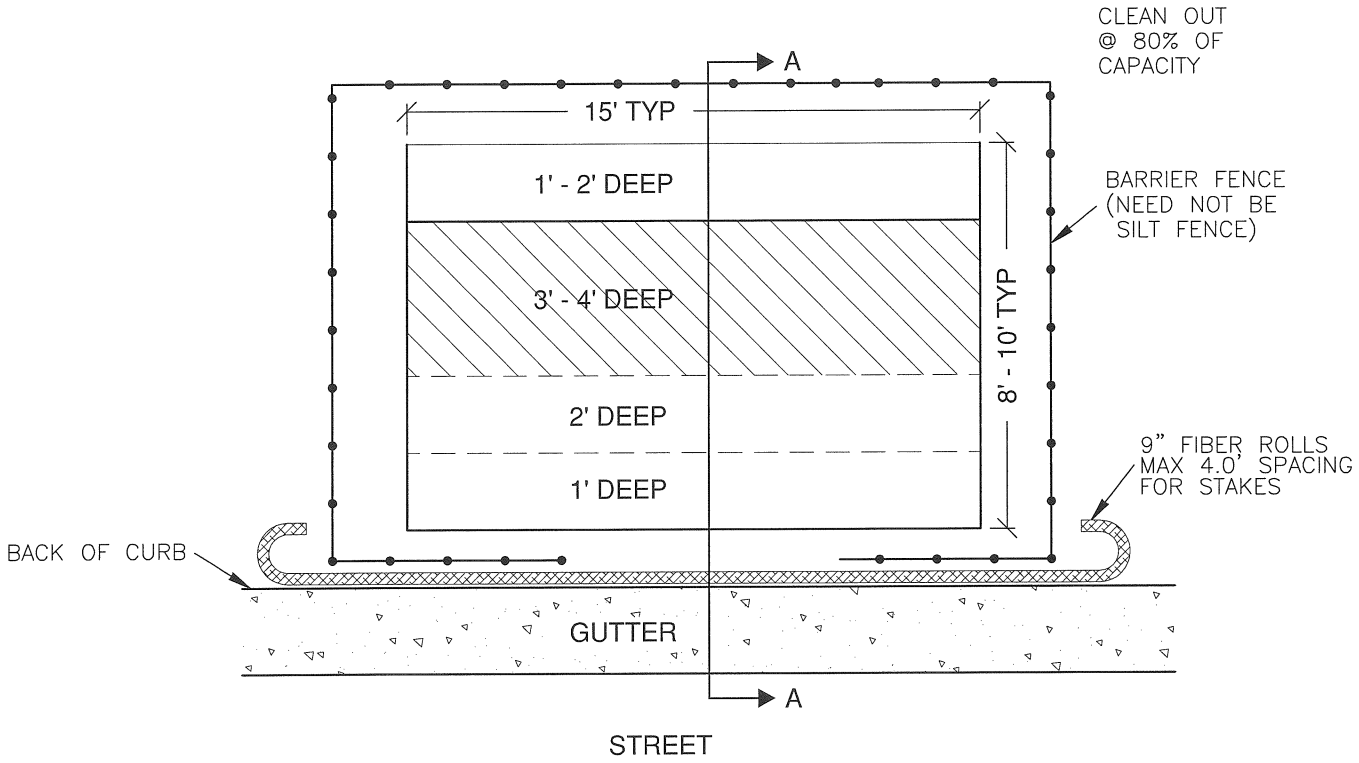
SILT FENCE

CITY OF FARGO
ENGINEERING DEPARTMENT

APPROVED CME	DATE 1-2-13

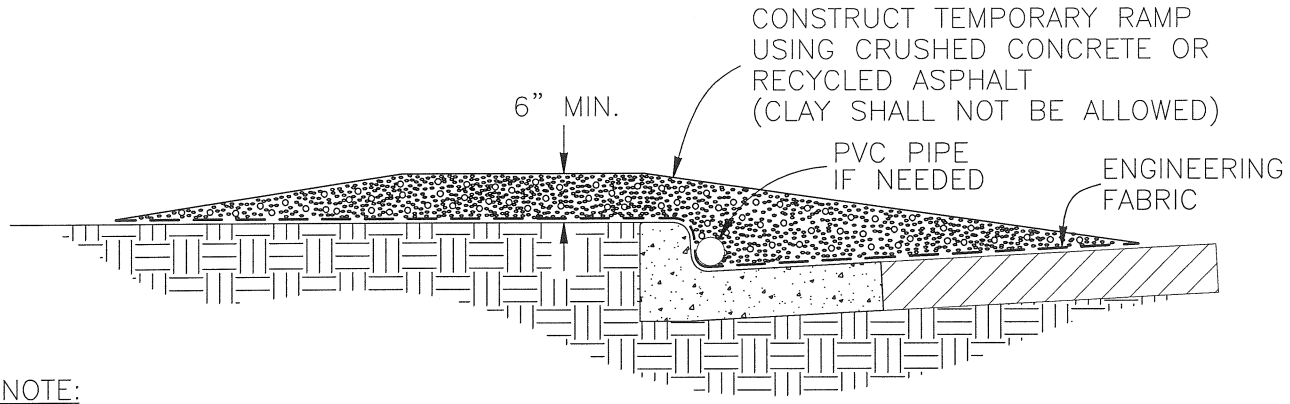


SECTION A–A



PLAN VIEW

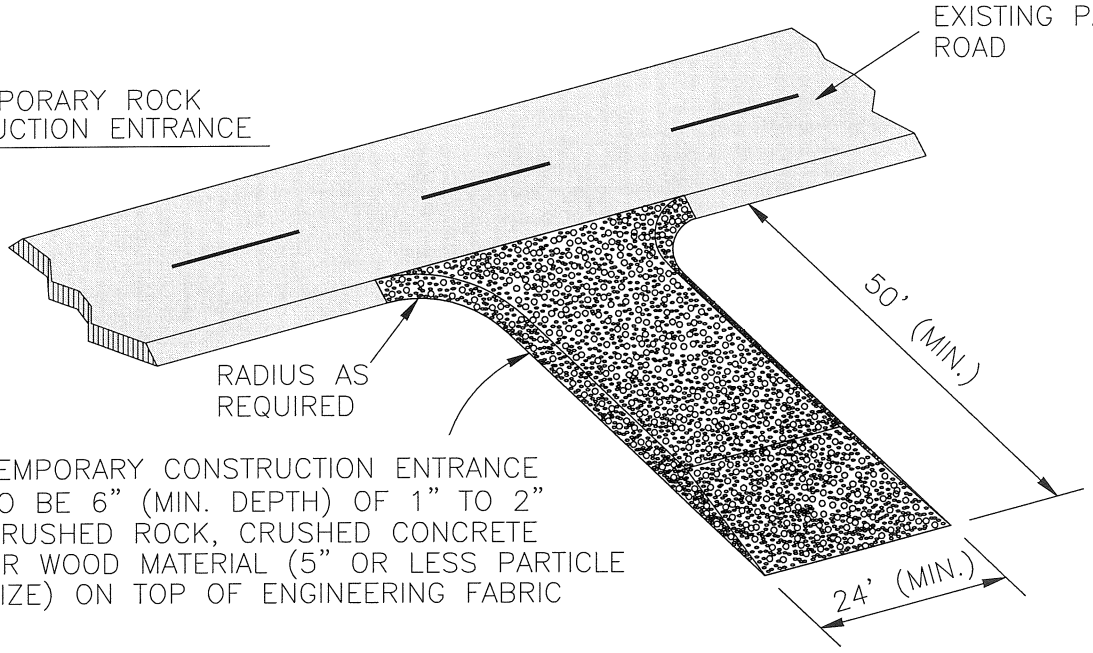
SECTION NO. 3300	DRAWING NO. 6.8
REV,D. 2012	
CONCRETE WASHOUT	
CITY OF FARGO ENGINEERING DEPARTMENT	
APPROVED BED	DATE 2-21-2012



NOTE:

TEMPORARY ACCESS OVER EXISTING CURB & GUTTER SHOULD BE LOCATED AT HIGH POINTS IN THE STREET (IF POSSIBLE) TO MAINTAIN STREET DRAINAGE

TEMPORARY ACCESS OVER CURB & GUTTER



TEMPORARY ROCK CONSTRUCTION ENTRANCE

TEMPORARY CONSTRUCTION ENTRANCE TO BE 6" (MIN. DEPTH) OF 1" TO 2" CRUSHED ROCK, CRUSHED CONCRETE OR WOOD MATERIAL (5" OR LESS PARTICLE SIZE) ON TOP OF ENGINEERING FABRIC

NOTES:

1. A TEMPORARY CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED AT ALL LOCATIONS WHERE CONSTRUCTION VEHICLES OR EQUIPMENT ENTER OR EXIT THE CONSTRUCTION SITES THAT ARE OVER 5 ACRES AND MAY BE REQUIRED BETWEEN 1 AND 5 ACRES AS DIRECTED BY THE ENIGNEER.

2. UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL REMOVE THE TEMPORARY CONSTRUCTION ENTRANCE UNLESS NOTED OTHERWISE, AND THE SITE SHALL BE RESTORED TO IT'S PREVIOUS CONDITION.

3. ENTRANCES SHALL BE MAINTAINED IN A MANNER TO MINIMIZE THE TRACKING OF SEDIMENT ONTO PAVED SURFACES.

4. THE LOCATION OF TEMPORARY ENTRANCES SHALL BE AS SHOWN ON THE PLANS. IF NOT SHOWN ON THE PLANS, THE CONTRACTOR SHALL COORDINATE THE LOCATIONS WITH THE ENGINEER.

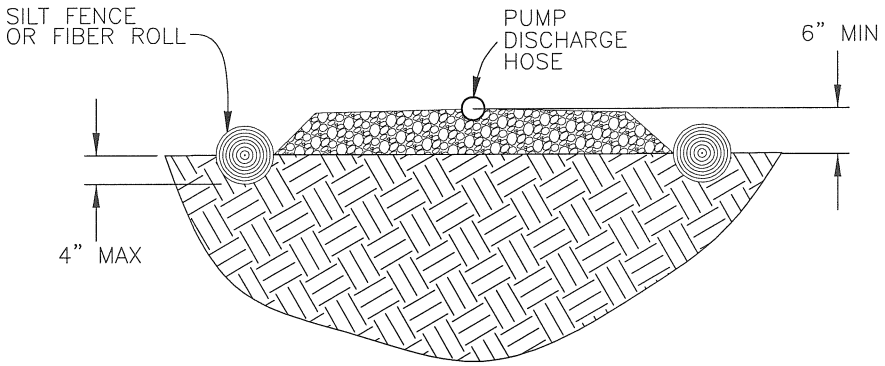
5. COSTS ASSOCIATED WITH CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ENTRANCES SHALL BE INCLUDED IN THE BID ITEM "TEMPORARY CONSTRUCTION ENTRANCE"

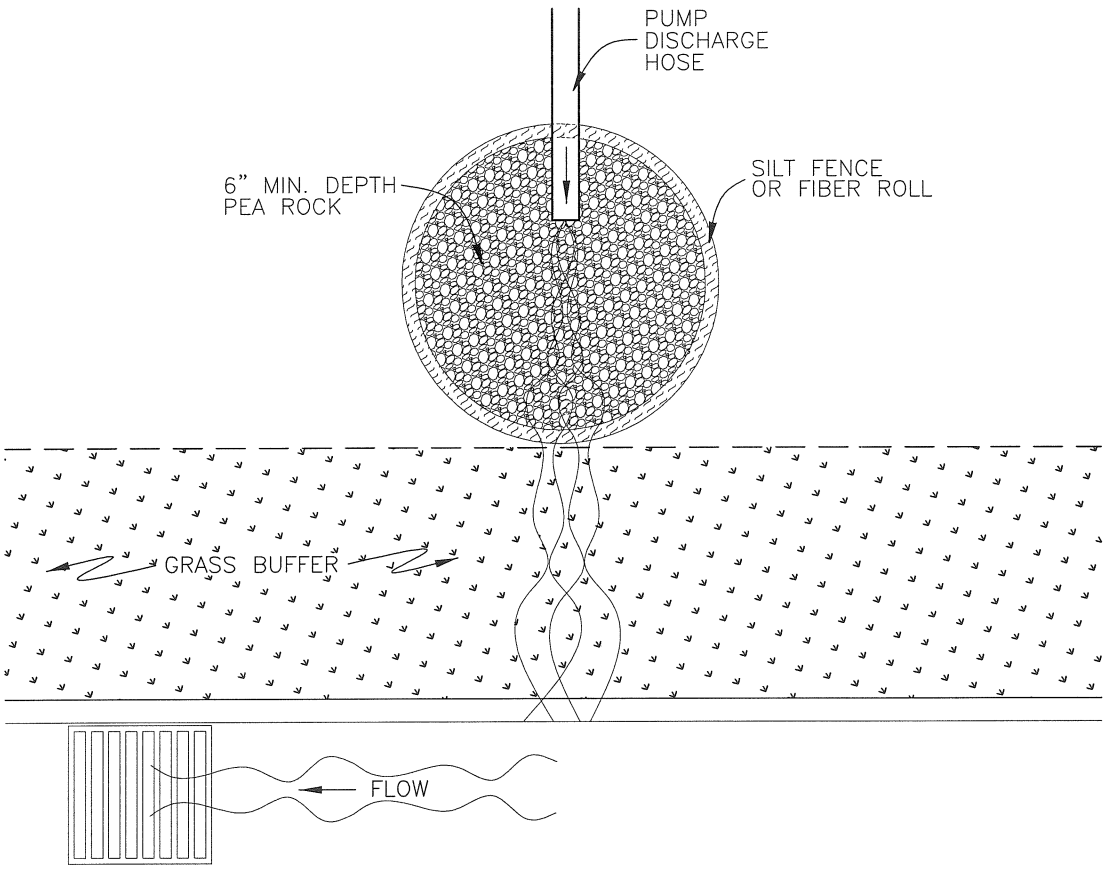
SECTION NO. 3300	DRAWING NO. 6.9
REV,D. 2012	

TEMP. CONSTRUCTION ENTRANCE

CITY OF FARGO
ENGINEERING DEPARTMENT

APPROVED BED	DATE 2-21-2012





NOTES:

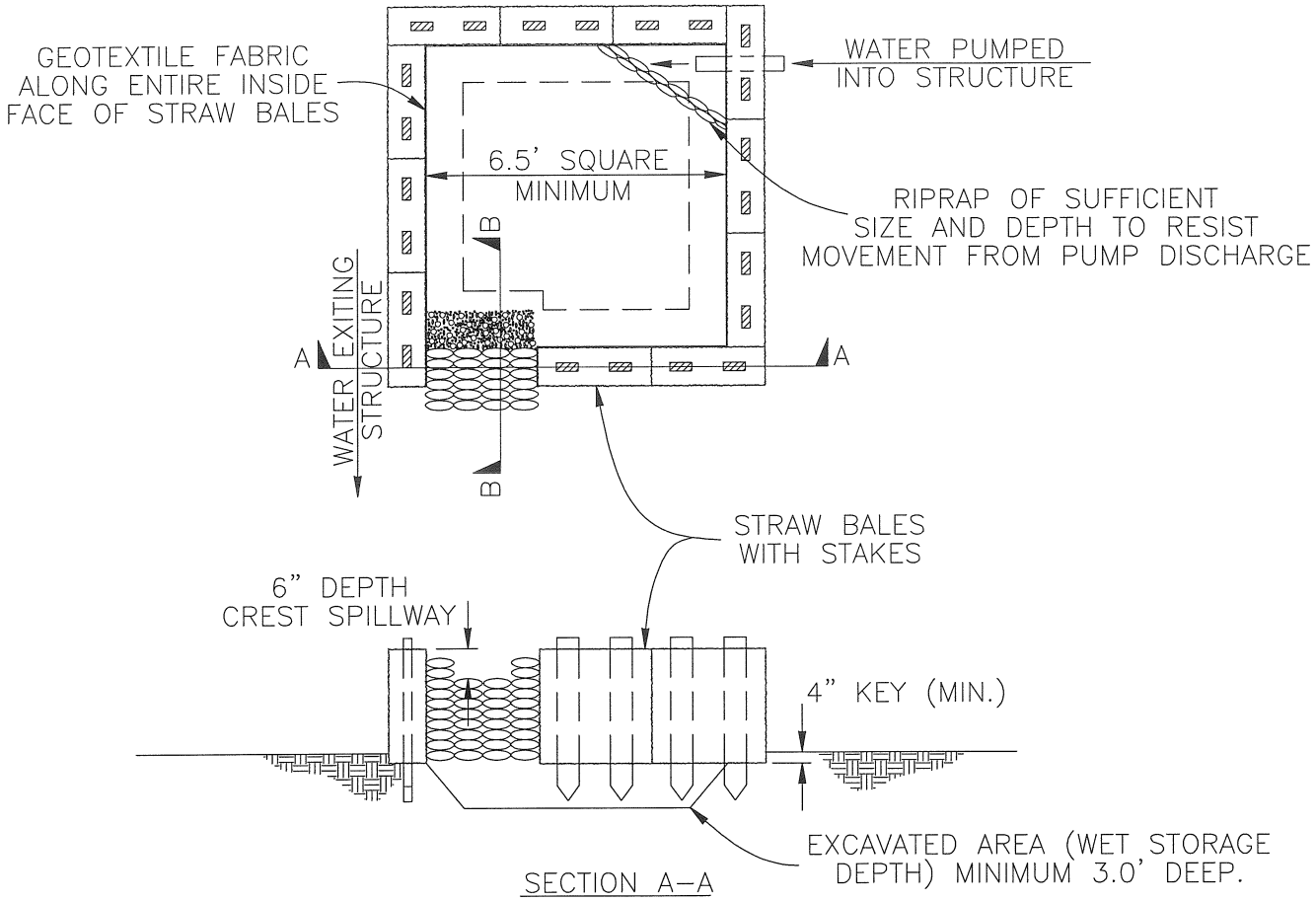
1. DISCHARGE WATER ONTO A GRASS LINE SWALE, GRASS FIELD, OR INTO A SECONDARY SEDIMENT CONTAINMENT SYSTEM.
2. DISCHARGE WATER MUST FLOW AWAY FROM THE CONSTRUCTION AREA.
3. THE PEA ROCK MAY BE PLACED ON GRASS OR ENGINEERING FABRIC MAY BE USED: DEWATERING STRUCTURE SHALL NOT BE PLACED ON BARE SOIL.
4. THE CAPACITY OF THE STRUCTURE SHALL BE ADEQUATE TO HANDLE THE DEWATERING PUMP DISCHARGE.

SECTION NO. 3300	DRAWING NO. 6.10
REV,D. 2012	

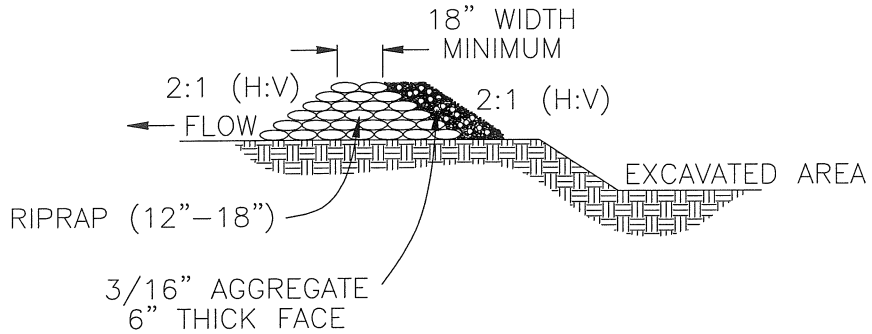
DEWATERING STRUCTURE OPTION #1

CITY OF FARGO
ENGINEERING DEPARTMENT

APPROVED BED	DATE 2-21-2012



SECTION A–A



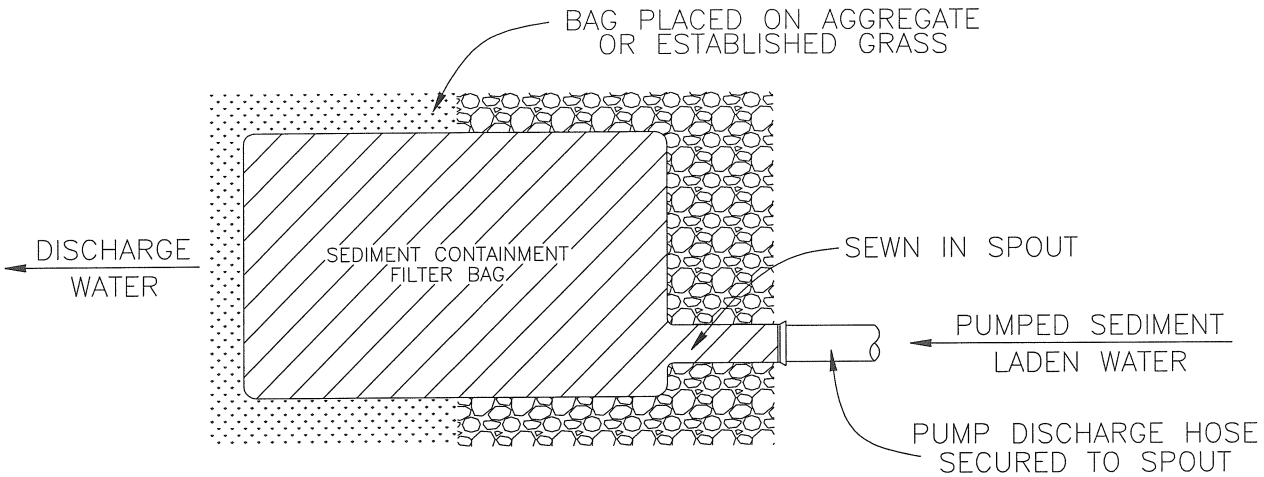
SECTION B–B

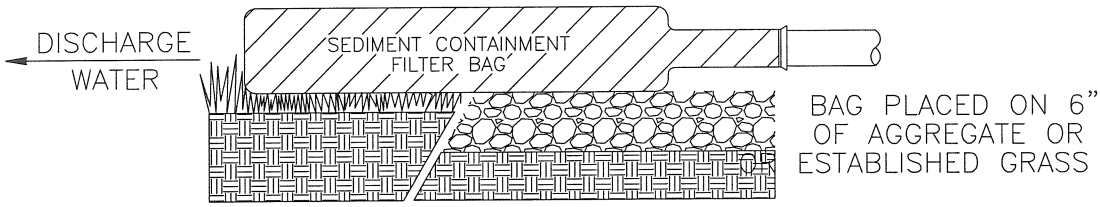
NOTES:

1. STORAGE VOLUME OF PIT : PUMP DISCHARGE X 16 = CUBIC FEET OF STORAGE REQUIRED. IN CALCULATING THE CAPACITY, INCLUDE THE VOLUME AVAILABLE FROM THE FLOOR OF THE EXCAVATION TO THE CREST OF THE STONE WEIR.

2. ONCE THE WATER LEVEL NEARS THE CREST OF THE STONE WEIR (EMERGENCY OVERFLOW), THE PUMP MUST BE SHUT OFF WHILE THE STRUCTURE DRAINS DOWN TO THE ELEVATION OF THE EXCAVATED AREA. THE REMAINING WATER MAY BE REMOVED ONLY AFTER A MINIMUM OF 6 HOURS OF SEDIMENT SETTLING TIME. THIS EFFLUENT SHOULD BE PUMPED ACROSS AN AREA WITH ESTABLISHED VEGETATION OR THROUGH A SILT FENCE PRIOR TO ENTERING A STORM SEWER SYSTEM. WHEN THE EXCAVATED AREA BECOMES FILLED TO 1/2 OF THE EXCAVATED DEPTH, ACCUMULATED SEDIMENT SHOULD BE REMOVED AND PROPERLY DISPOSED OF.

SECTION NO. 3300	DRAWING NO. 6.11
REV,D. 2012	
DEWATERING STRUCTURE OPTION #2	
CITY OF FARGO ENGINEERING DEPARTMENT	
APPROVED BED	DATE 2-21-2012



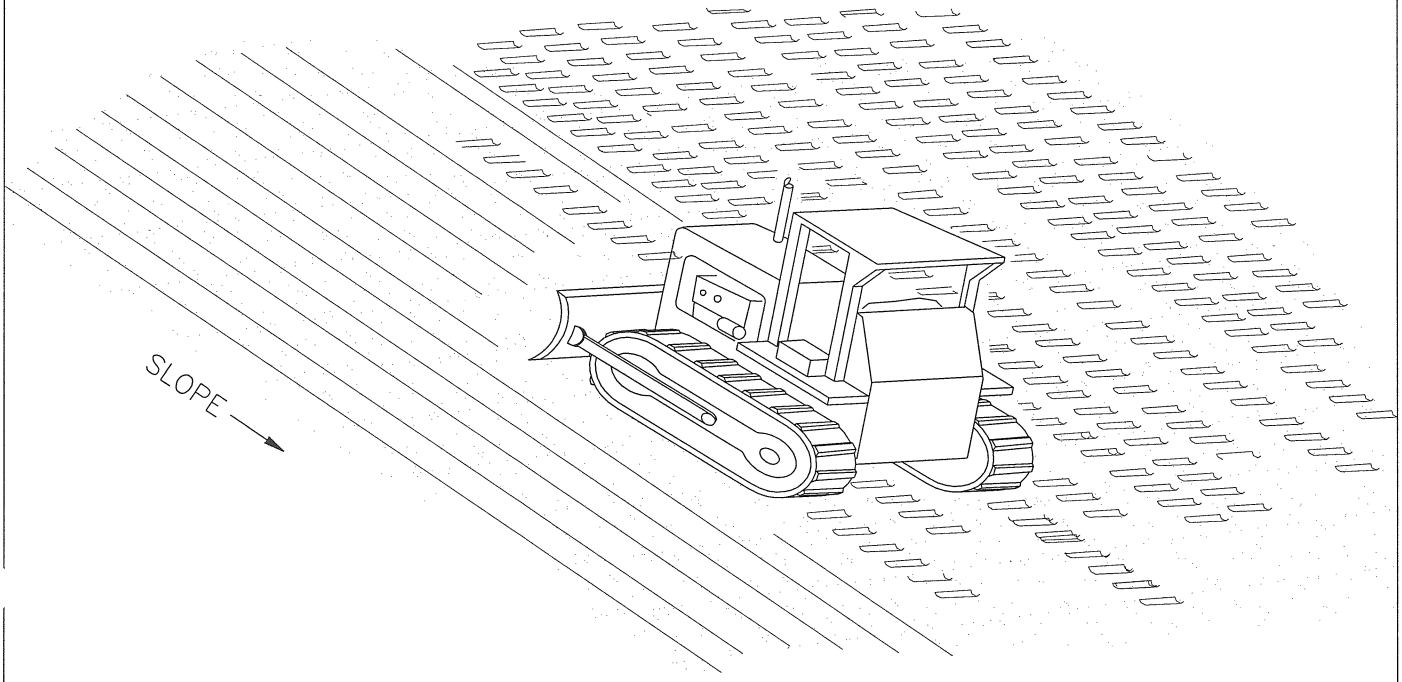


SEDIMENT FILTER BAG

NOTES:

1. DISCHARGE WATER ONTO A GRASS LINE SWALE, GRASS FIELD, OR INTO A SECONDARY SEDIMENT CONTAINMENT SYSTEM.
2. DISCHARGE WATER MUST FLOW AWAY FROM THE CONSTRUCTION AREA.
3. SEDIMENT CAPTURED BY THE FILTER BAG MUST BE REMOVED AND STABILIZED.
4. THE FILTER BAG SHOULD BE CONSTRUCTED OF NON-WOVEN GEOTEXTILE MATERIAL THAT WILL PROVIDE ADEQUATE FILTERING ABILITY TO CAPTURE THE LARGER SOIL PARTICLES FROM THE PUMPED WATER.
5. THE BAG MAY BE PLACED ON WELL ESTABLISHED GRASS OR 6" MINIMUM OF AGGREGATE. FILTER BAG SHALL NOT BE PLACED ON BARE SOIL.
6. THE CAPACITY OF THE FILTER BAG SHALL BE ADEQUATE TO HANDLE THE DEWATERING PUMP DISCHARGE, AND SHOULD BE BASED ON THE BAG MFG.'S RECOMMENDATION.
7. WHEN USED IN CONJUNCTION WITH A STRAW BALE/SILT FENCE PIT, A FILTER BAG MAY BE OPERATED UNTIL THE WATER IN THE PIT REACHES THE CREST OF THE EMERGENCY OVERFLOW. THE PUMP MUST BE SHUT OFF AT THIS POINT.
8. REMOVE SEDIMENT FROM FILTER BAG, REGRADE IN PLACE, AND IMMEDIATELY STABILIZE.

SECTION NO. 3300	DRAWING NO. 6.12
REV,D. 2012	
DEWATERING STRUCTURE OPTION #3	
CITY OF FARGO ENGINEERING DEPARTMENT	
APPROVED BED	DATE 2-21-2012



NOTE

'TRACKING' WITH MACHINERY UP AND DOWN THE SLOPE PROVIDES GROOVES THAT WILL CATCH SEED, FERTILIZER, MULCH, RAINFALL AND REDUCE RUNOFF.

ALL DISTURBED SLOPES TO BE TRACKED AS SHOWN BETWEEN TIME OF EMBANKMENT AND SEEDING.

SECTION NO. 3300	DRAWING NO. 6.13
REV,D. 2012	

SURFACE ROUGHENING

CITY OF FARGO
ENGINEERING DEPARTMENT

APPROVED BEO	DATE 2-21-2012