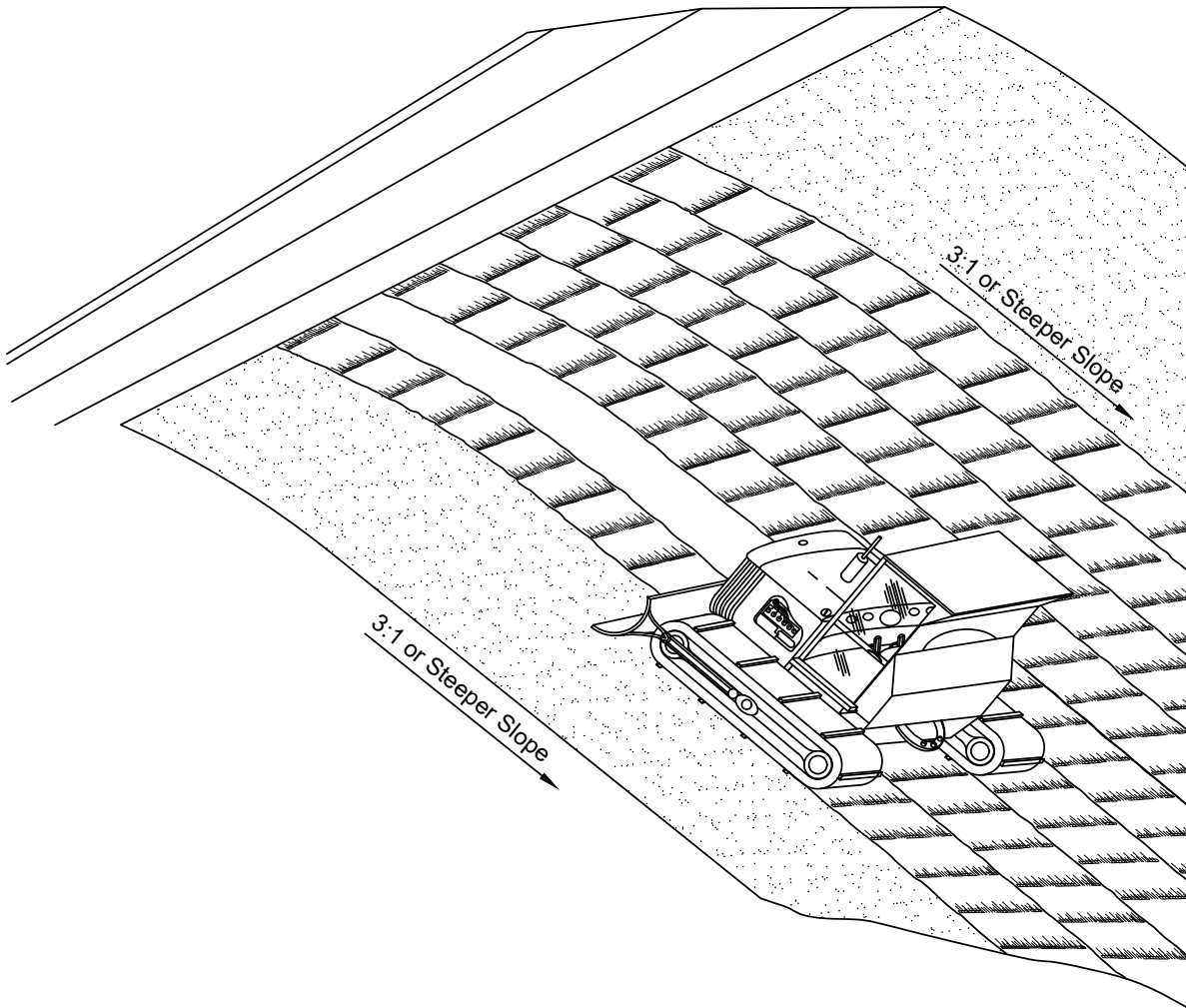
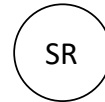


Surface Roughening



Notes:

1. Where practical, surface roughening will be done on slopes 3:1 and steeper and on slopes deemed necessary by the Engineer.
2. The equipment used for surface roughening will be equipped with tracks that are capable of creating ridges in the soil that are perpendicular to the slope. The final condition of the surface roughening will be approved by the Engineer.
3. Measurement for surface roughening will be to the nearest tenth of an acre.
4. All costs associated with surface roughening including labor, equipment, and materials will be incidental to the contract unit price per acre for "Surface Roughening".

N.T.S.

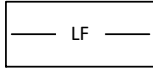
CITY OF RAPID CITY

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SURFACE ROUGHENING

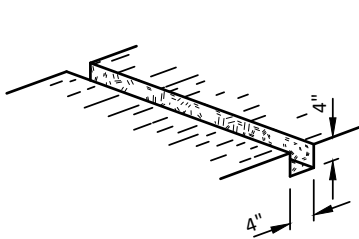
DATE: 8-19-22

Sec. - Sht.
18-1

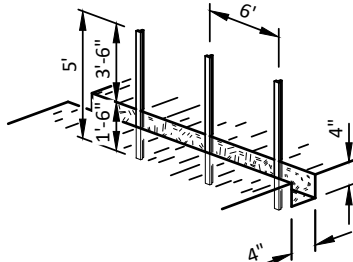


Low Flow Silt Fence

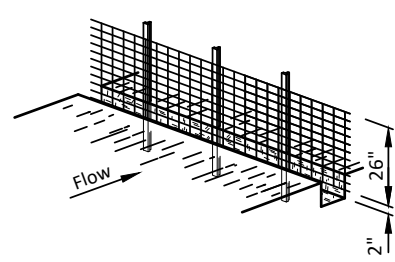
MANUAL LOW FLOW SILT FENCE INSTALLATION



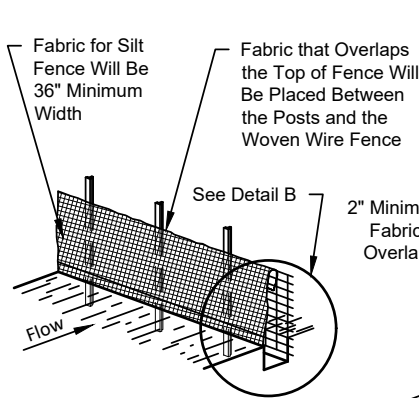
① EXCAVATE TRENCH



② DRIVE STEEL T FENCE POSTS

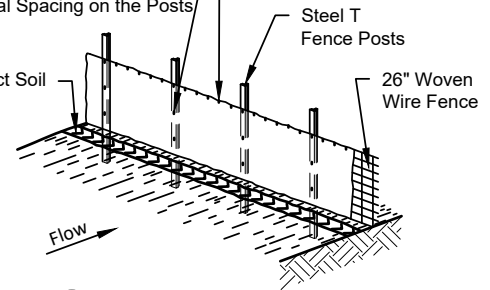
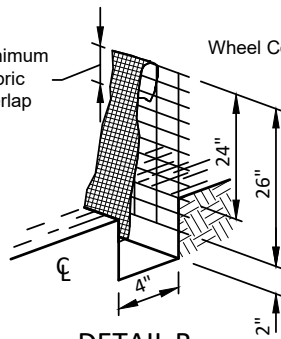


③ ATTACH 26" WOVEN WIRE FENCE TO POSTS



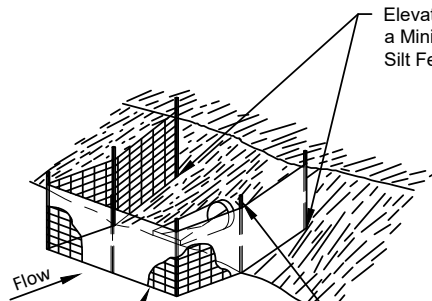
④ ATTACH SILT FENCE FABRIC

Attach Silt Fence Fabric with Plastic Ties, Wire Ties, or Hog Rings at 12" Maximum Horizontal Spacing on the Top and Bottom Wires of the Woven Wire Fence and with Plastic or Wire Ties at 12" Maximum Vertical Spacing on the Posts



⑤ BACKFILL TRENCH AND WHEEL COMPACT SOIL

DETAIL B



Silt Fence Length and Width May Be Adjusted Due to a Larger Pipe, Multiple Pipe, or Other Circumstances During Construction as Determined by the Engineer

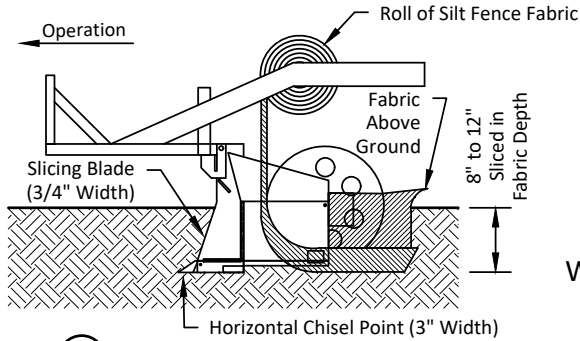
Post Spacing Will Be 3' for These Types of Applications of Silt Fence, All Other Components of the Silt Fence Will Be the Same as Shown Above

N.T.S.

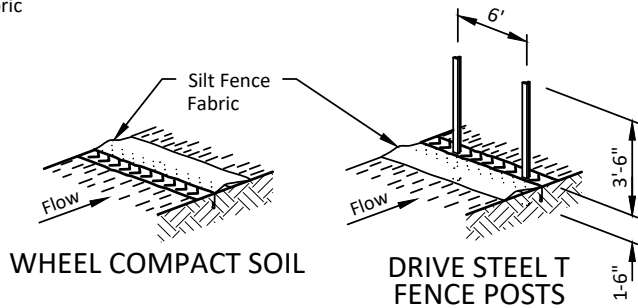
— LF —

Low Flow Silt Fence

MACHINE SLICED LOW FLOW SILT FENCE INSTALLATION

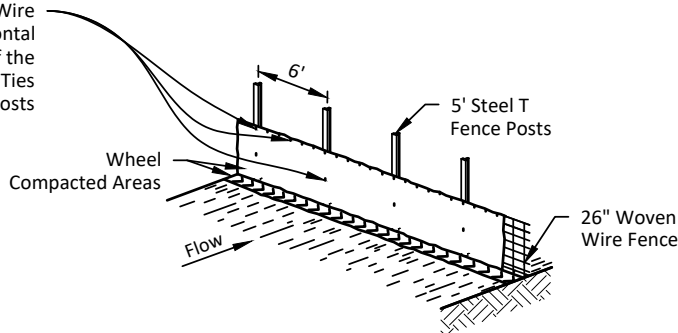


1 INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD

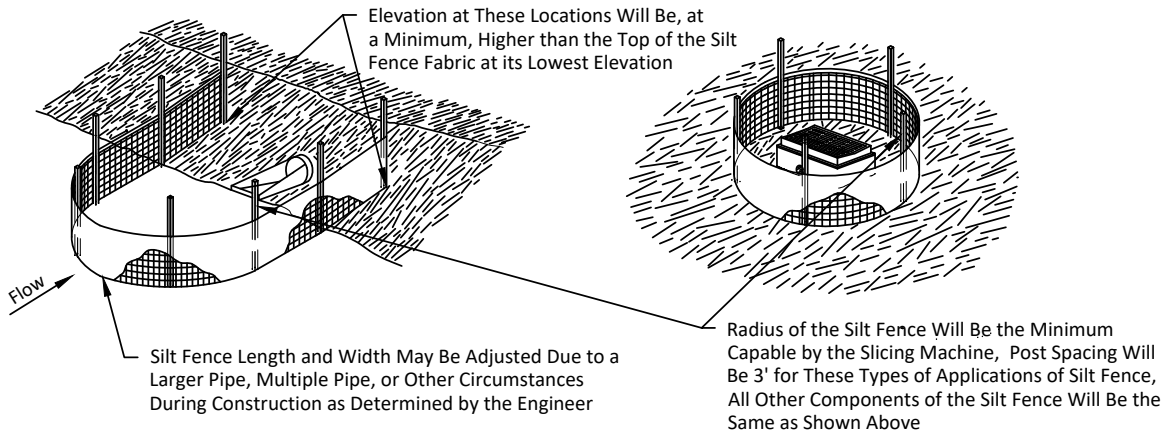


2 WHEEL COMPACT SOIL ABOVE SLICED IN PORTION OF FABRIC AND THEN DRIVE STEEL T FENCE POSTS

Attach Silt Fence Fabric with Plastic Ties, Wire Ties, or Hog Rings at 12" Maximum Horizontal Spacing on the Top and Bottom Wires of the Woven Wire Fence and with Plastic or Wire Ties at 12" Maximum Vertical Spacing on the Posts

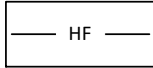


3 ATTACH 26" WOVEN WIRE FENCE TO POSTS AND ATTACH SILT FENCE FABRIC



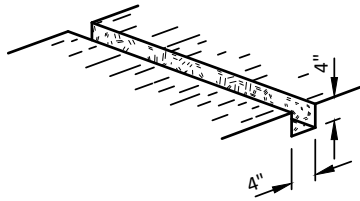
Note:
If a trench can not be dug or the silt fence fabric can not be sliced in due to the type of earthen material (such as rock), then a row of 30 to 40 pound sandbags butted end to end will be provided on top of the extra length of silt fence fabric to prevent underflow.

N.T.S.

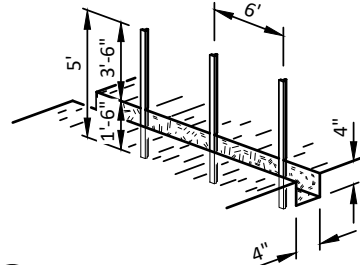


High Flow Silt Fence

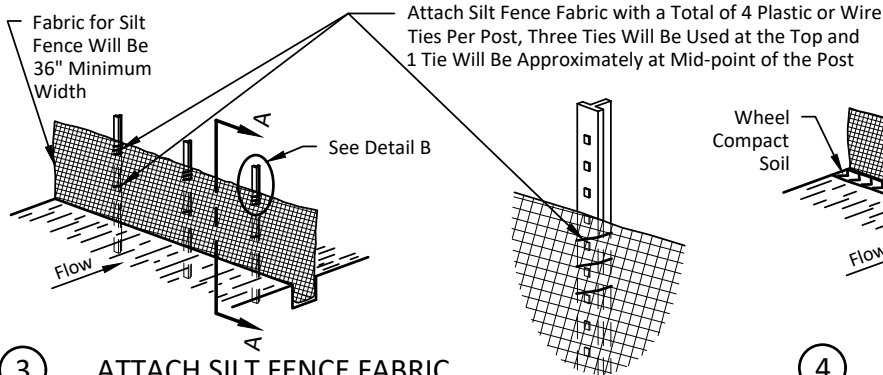
MANUAL HIGH FLOW SILT FENCE INSTALLATION



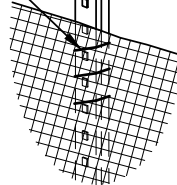
1 EXCAVATE TRENCH



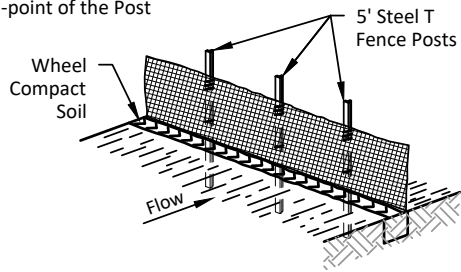
2 DRIVE STEEL T FENCE POSTS



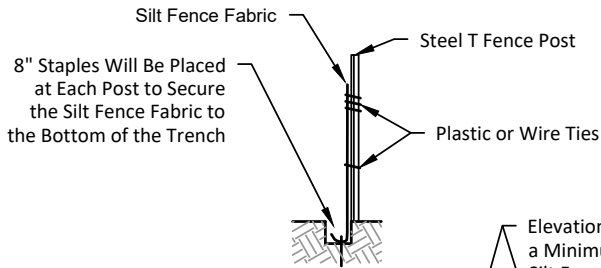
3 ATTACH SILT FENCE FABRIC



DETAIL B



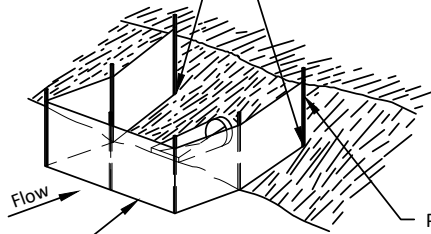
4 BACKFILL TRENCH AND WHEEL COMPACT SOIL



SECTION A-A

Elevation at These Locations Will Be, at a Minimum, Higher than the Top of the Silt Fence Fabric at its Lowest Elevation

Silt Fence Length and Width May Be Adjusted Due to a Larger Pipe, Multiple Pipe, or Other Circumstances During Construction as Determined by the Engineer



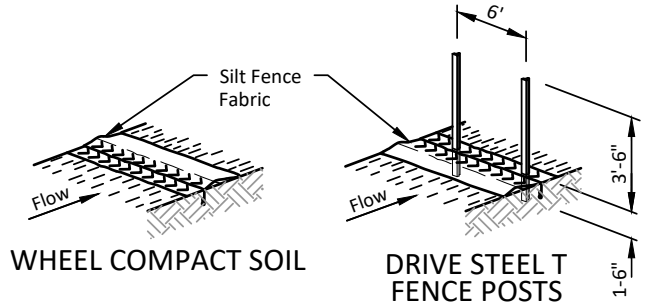
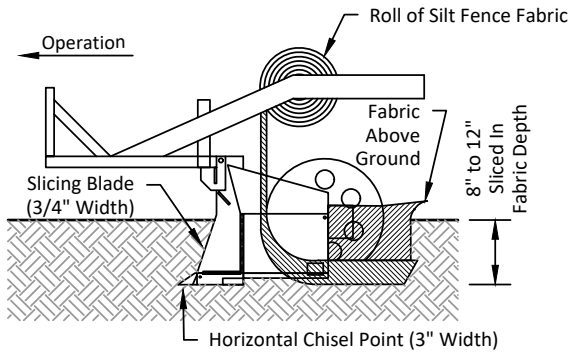
Post Spacing Will Be 3' for These Types of Applications of Silt Fence, All Other Components of the Silt Fence Will Be the Same as Shown Above

N.T.S.

— HF —

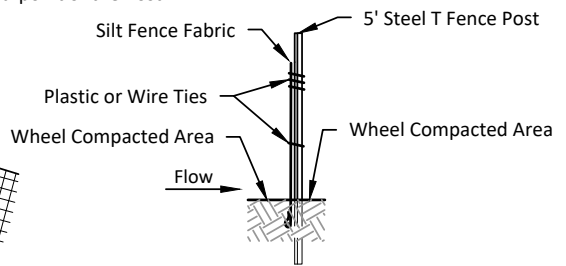
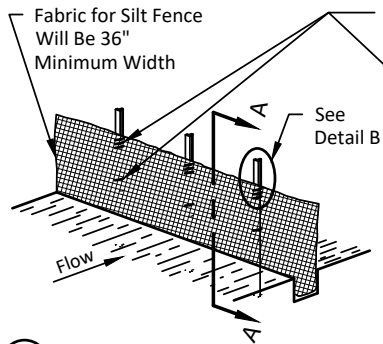
High Flow Silt Fence

MACHINE SLICED HIGH FLOW SILT FENCE INSTALLATION



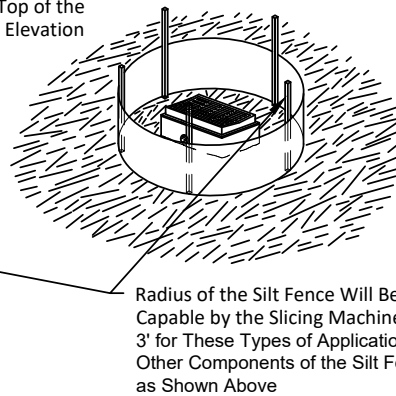
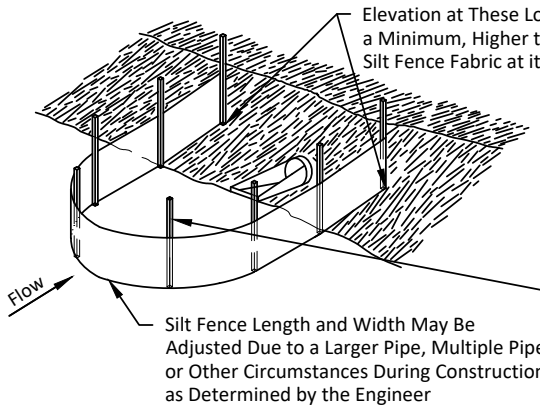
1 INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.

2 WHEEL COMPACT SOIL ABOVE SLICED IN PORTION OF FABRIC AND THEN DRIVE STEEL T FENCE POSTS.



3 ATTACH SILT FENCE FABRIC

DETAIL B



Note:

If a trench can not be dug or the silt fence fabric can not be sliced in due to the type of earthen material (such as rock), then a row of 30 to 40 pound sandbags butted end to end will be provided on top of the extra length of silt fence fabric to prevent underflow.

N.T.S.

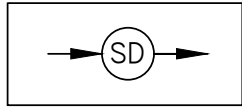
CITY OF RAPID CITY

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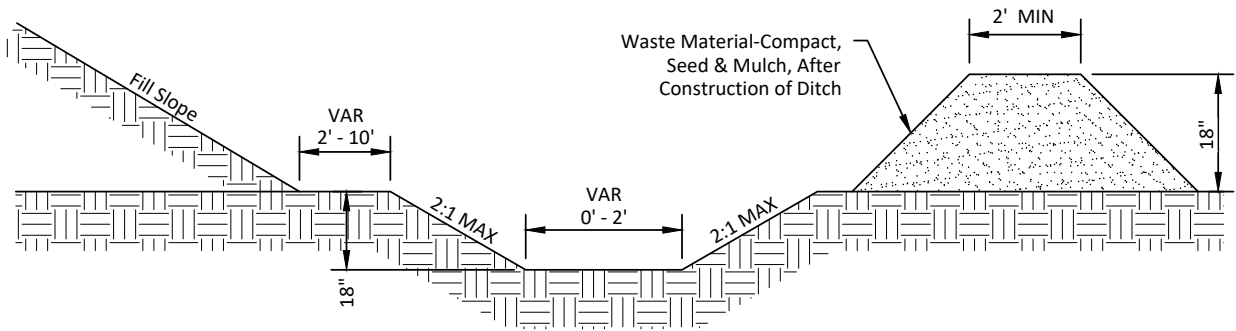
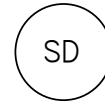
HIGH FLOW SILT FENCE

DATE: 8-19-22

Sec. - Sht.
18-3b



Silt Ditch



CROSS SECTION VIEW

Notes:

1. Silt shall be removed when silt ditch is one-half full.
2. Ditch shall be reconstructed when damaged by equipment or covered by fill.

N.T.S.

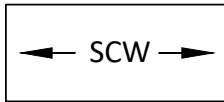
CITY OF RAPID CITY

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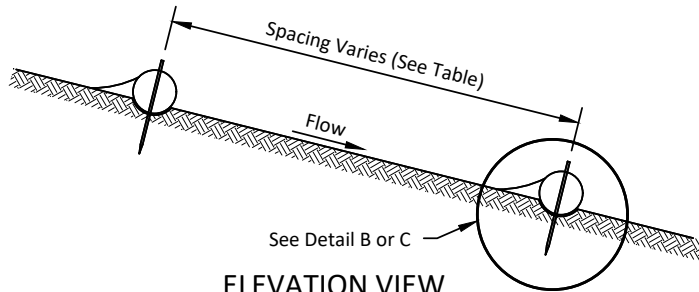
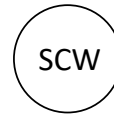
SILT DITCH

DATE: 8-19-22

Sec. - Sht.
18-4

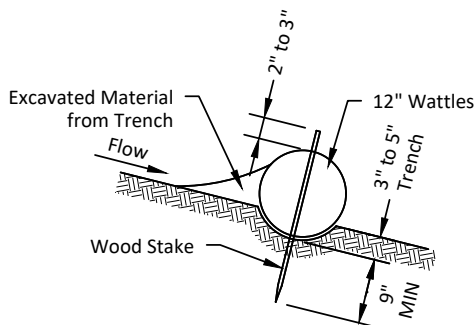


Sediment Control Wattle

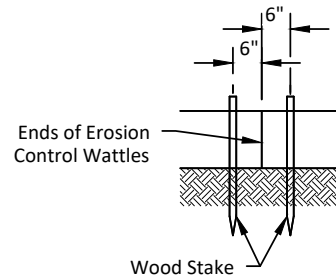


ELEVATION VIEW
(Cut or Fill Slope Installation)

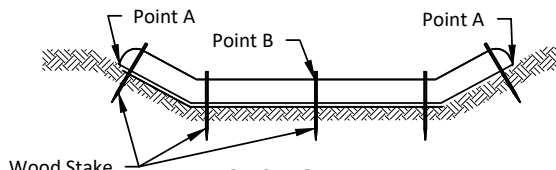
CUT OR FILL SLOPE * INSTALLATION	
Slope	Spacing (Ft)
1:1	10
2:1	20
3:1	30
4:1	40



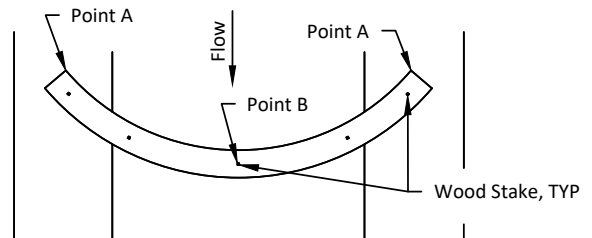
DETAIL B
(Typical of all Installations)



DETAIL C



SECTION A-A



PLAN VIEW
DITCH INSTALLATION

Notes:

1. At cut or fill slope installations, wattles shall be installed along the contour and perpendicular to the water flow.
2. At ditch installations, Point A must be higher than Point B to ensure that water flows over the wattle and not around the ends.
3. The Contractor shall dig a 3" to 5" trench, install the wattle tightly in the trench so that daylight can not be seen under the wattle, and then compact the soil excavated from the trench against the wattle on the uphill side, see Detail B.
4. The stakes shall be 1"x2" or 2"x2" wood stakes, the stakes shall be placed 6" from the ends of the wattles and the spacing of the stakes along the wattles shall be 3' to 4' or per manufacturer spacing.
5. Where installing running lengths of wattles, the contractor shall butt the second wattle tightly against the first and shall not overlap the ends, see Detail C.
6. The Contractor and Engineer will inspect the erosion control wattles in accordance with the permit the Contractor will remove, dispose, or reshape the accumulated sediment when necessary as determined by the Engineer.

DITCH INSTALLATION	
Grade	Spacing (Ft)
2%	150
3%	100
4%	75
5%	50

N.T.S.

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SEDIMENT CONTROL WATTLE

DATE: 8-19-22

Sec. - Sht.
18-5

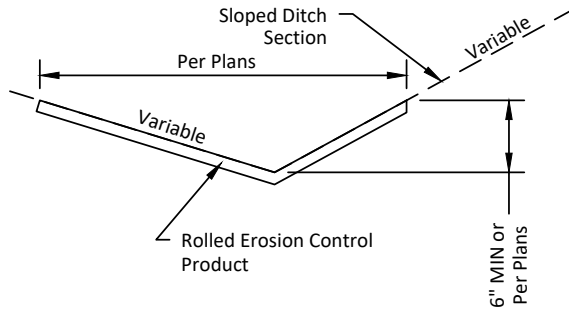
Rolled Erosion Control Products



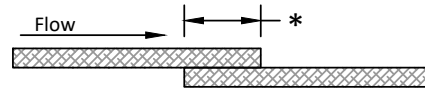
Erosion Control Blanket



Turf Reinforcement Mat



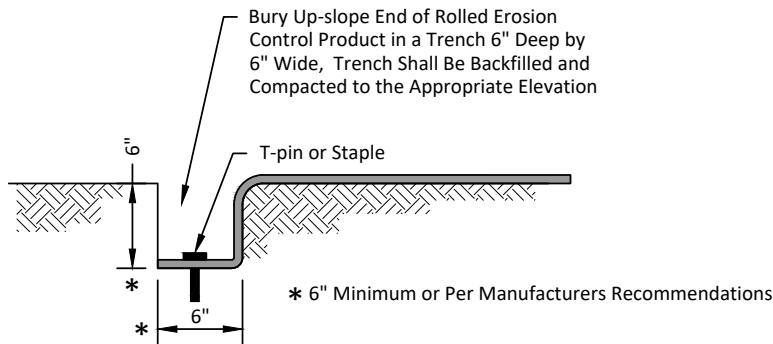
DITCH SECTION



* Use a 4" minimum overlap or per manufacturers recommendations wherever two widths of rolled erosion control products are applied side by side.

* Use a 6" minimum overlap or per manufacturers recommendations wherever one roll of rolled erosion control product ends and another begins.

OVERLAP DETAIL



KEYWAY/ANCHOR DETAIL

Notes:

1. Prior to placement of the rolled erosion control products, the areas shall be properly prepared, shaped, seeded, and fertilized.
2. Rolled erosion control products shall be unrolled in the direction of the flow of water when placed in ditches and on slopes. The up-slope end of the rolled erosion control product shall be anchored in a trench a minimum of 6" wide by 6" deep. There shall be at least a 6" overlap wherever one roll of rolled erosion control product ends and another begins, with the up-slope rolled erosion control product placed on top of the downslope erosion control blanket.
3. The rolled erosion control products shall be stapled according to the manufacturer's installation recommendations.
4. After the placement of the rolled erosion control products, the contractor shall fine grade along all edges of the blanket to maintain a uniform slope adjacent to the blanket and level any low spots which might prevent uniform and unrestricted flow to side drainage directly onto the erosion control blanket.
5. All slopes greater than 3:1 shall receive at a minimum erosion control blanket.

N.T.S.

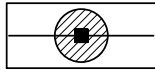
CITY OF RAPID CITY

PUBLIC WORKS DEPARTMENT

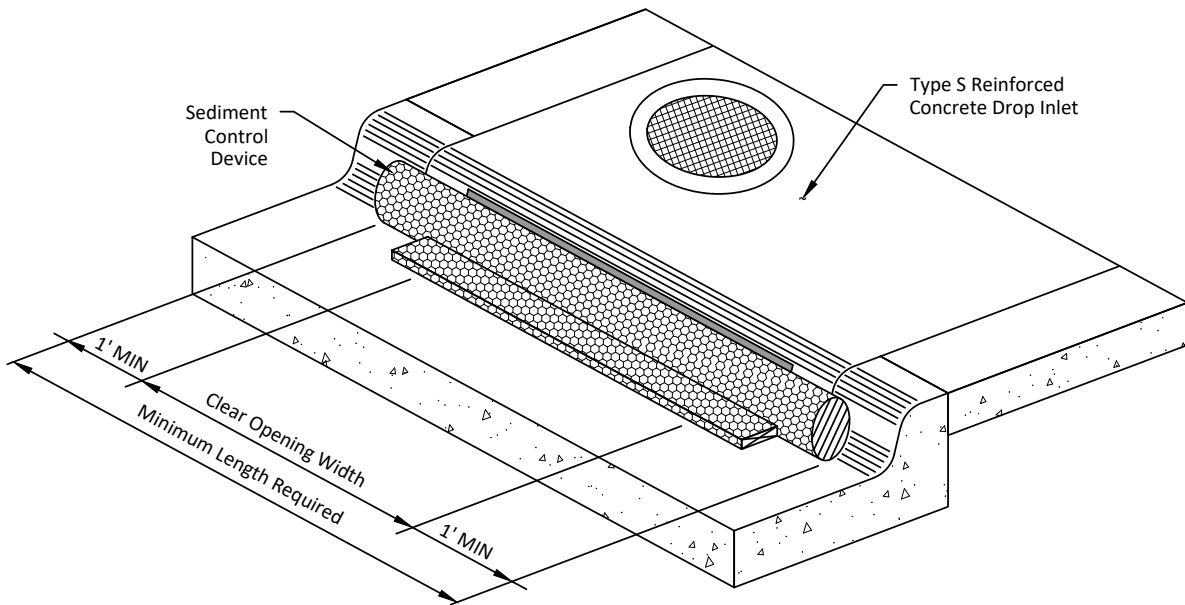
ROLLED EROSION CONTROL PRODUCTS

DATE: 8-19-22

Sec. - Sht.
18-6



Inlet Protection Device



ISOMETRIC VIEW

Notes:

1. The type of sediment control device shown is for illustrative purposes only.
2. The type of sediment control device used shall be one of the types as specified in the plans.
3. The sediment control device shall be placed at the drop inlets according to the manufactures' installation instructions.
4. The sediment control device shall be secured so that it remains in the inlet opening.
5. The sediment control at inlet for Type S reinforced concrete drop inlet shall be placed at locations stated in the plans or at locations determined by the Engineer.
6. The Contractor will maintain the sediment control device by removing the device, removing accumulated sediment, and resetting the device. The removed sediment will be placed at a location away from the drop inlet where the sediment will not be washed back into the drop inlet or other storm sewer system.

N.T.S.

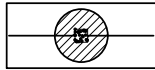
CITY OF RAPID CITY

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SEDIMENT CONTROL FOR TYPE S INLETS

DATE: 8-19-22

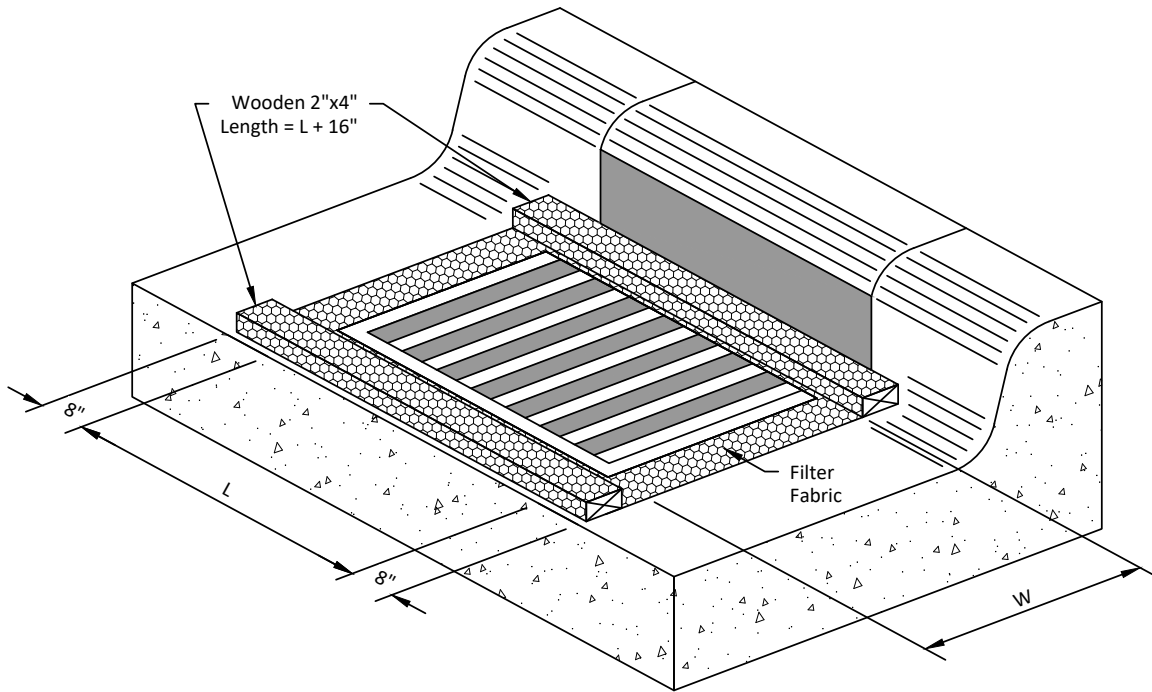
Sec. - Sht.
18-7



Inlet Protection Device



L=Length Of Grate
W=Width Of Grate



ISOMETRIC VIEW

Notes:

1. The grate and curb and gutter shown are for illustrative purposes only.
2. The sediment control at inlet with frame and grate shall be placed at locations stated in the plans or at locations determined by the Engineer.
3. The filter fabric shall be Class 2 non-woven specified per Standard Specifications, Section 202.
4. The filter fabric shall be placed in the inlet opening prior to placing the grate. Approximately 18" of excess filter fabric shall be wrapped around the 2"x4" and stapled securely to the 2"x4" after the grate has been placed.
5. The Contractor shall maintain the sediment control device by removing the accumulated sediment and replacing torn or damaged fabric with new fabric. The removed sediment will be placed at a location away from the drop inlet where the sediment will not be washed back into the drop inlet or storm sewer system.

N.T.S.

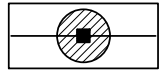
CITY OF RAPID CITY

PUBLIC WORKS DEPARTMENT

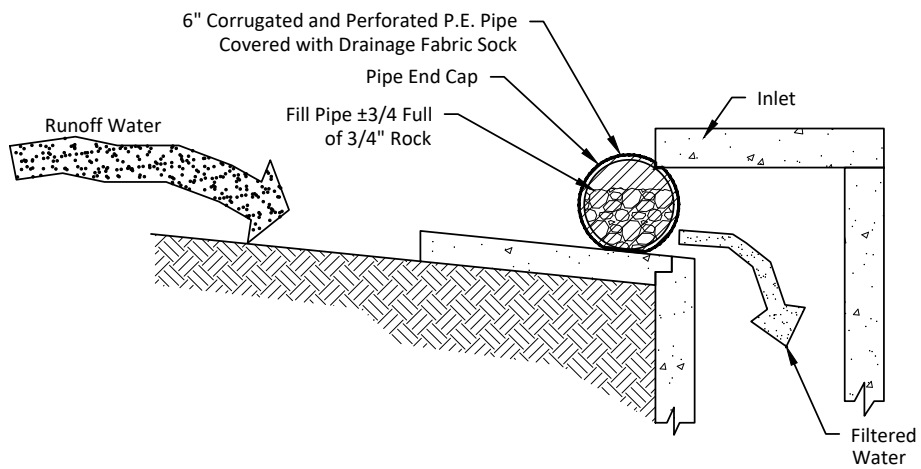
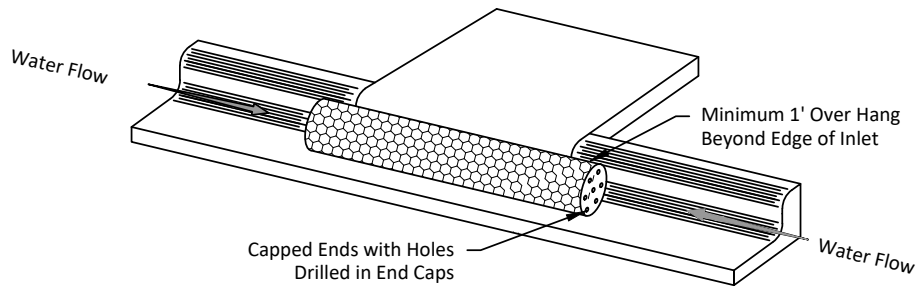
SEDIMENT CONTROL AT TYPE B INLETS

DATE: 8-19-22

Sec. - Sht.
18-8



Inlet Protection



Notes:

1. This method of inlet protection is applicable at curb inlets where ponding in front of the structure is not likely to cause inconvenience or damage to adjacent structures an unprotected areas.
2. Clean out as necessary to prevent blockage of runoff conveyance.

N.T.S.

CITY OF RAPID CITY

PUBLIC WORKS DEPARTMENT

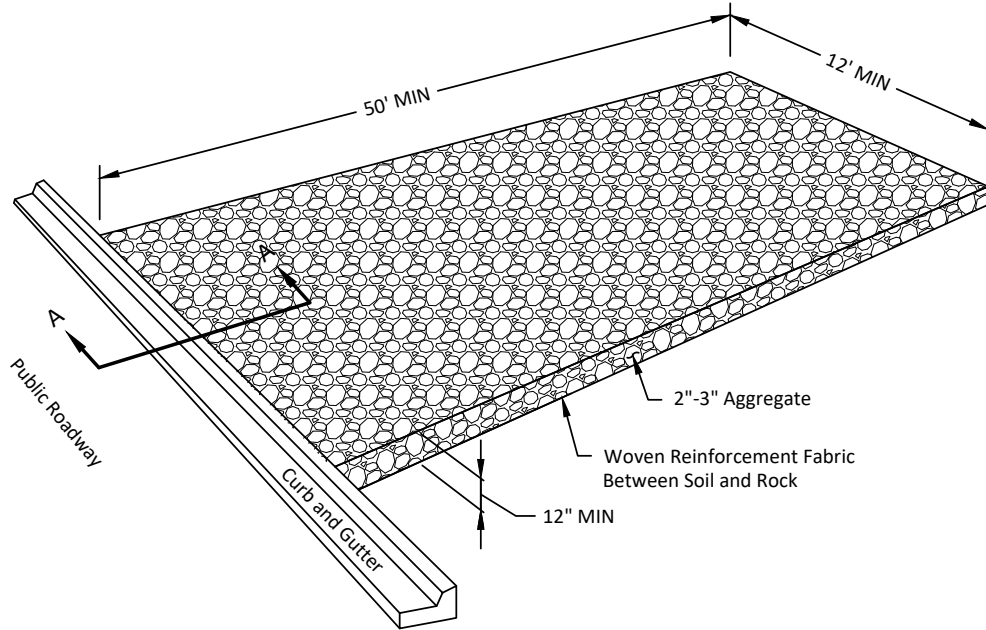
CORRUGATED PIPE AND FABRIC INLET PROTECTION

DATE: 8-19-22

Sec. - Sht.
18-9

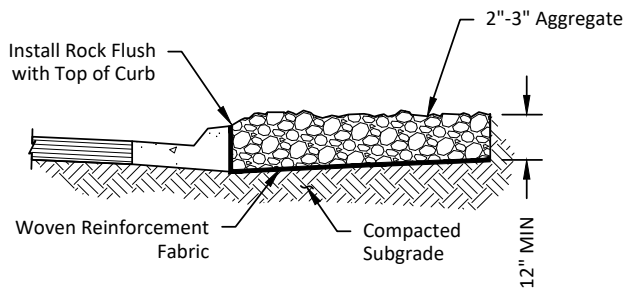


Vehicle Tracking Control



Notes:

1. All rock to be removed upon completion of construction.
2. Sediment control measures shall be maintained at all times.
3. Public roadway to be kept clean and free of mud, dirt and debris at all times.
4. Woven reinforcement fabric shall comply with Section 18, per Standard Specifications.
5. 2\"-3\" Aggregate shall be per Standard Specifications, Section 18.



SECTION A-A

N.T.S.

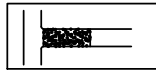
CITY OF RAPID CITY

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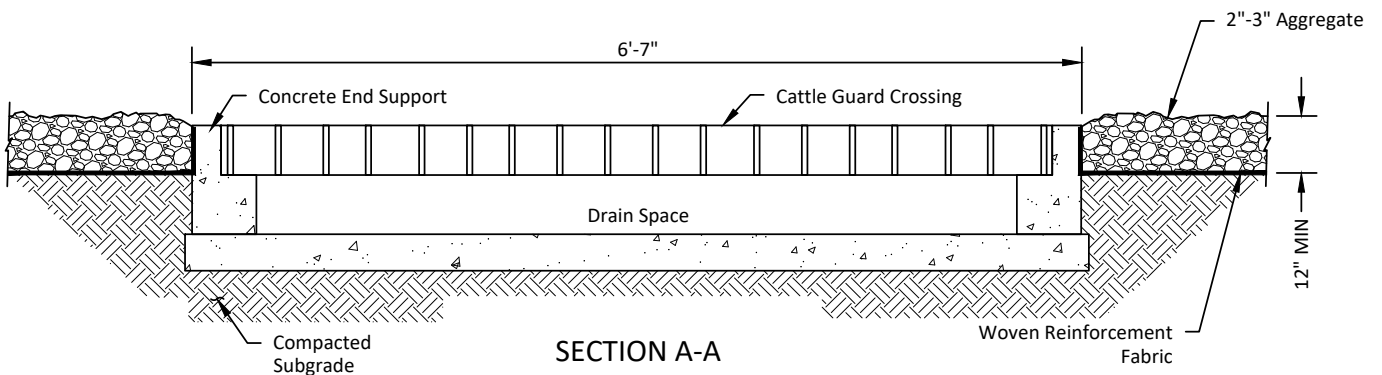
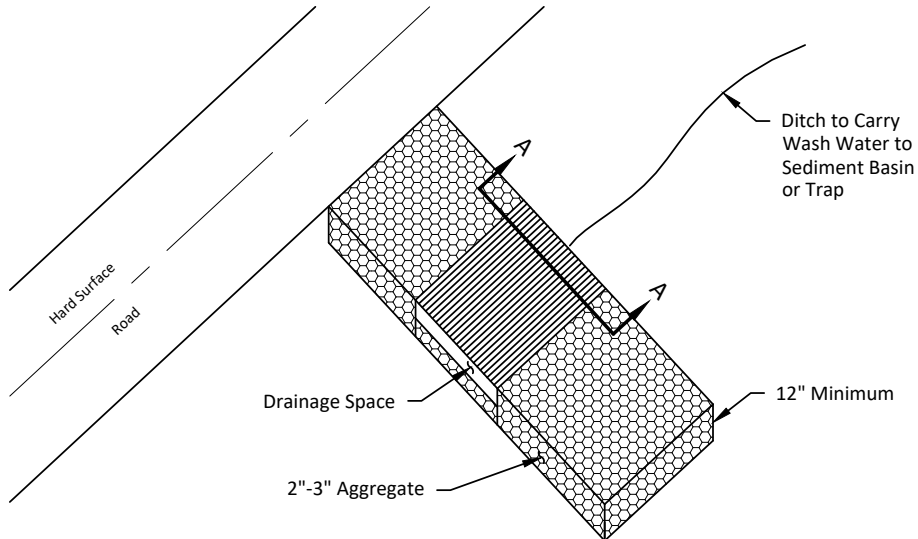
ROCK CONSTRUCTION ENTRANCE

DATE: 8-19-22

Sec. - Sht.
18-10



Vehicle Tracking Control



Notes:

1. All rock to be removed upon completion of construction.
2. Sediment control measures shall be maintained at all times.
3. Public roadway to be kept clean and free of mud, dirt and debris at all times.
4. Woven reinforcement fabric shall comply with Section 18, per Standard Specifications.
5. 2"-3" Aggregate shall be per Standard Specifications, Section 18.

N.T.S.

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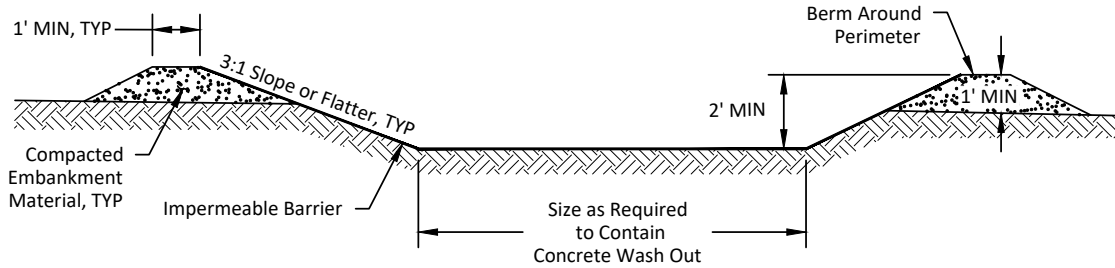
**TEMPORARY VEHICLE TRACKING
CONTROL WITH WASH RACK**

DATE: 8-19-22

Sec. - Sht.
18-11

Concrete Washout Area

CWA



CROSS SECTIONAL VIEW

Notes:

1. Concrete washout area shall be installed prior to any concrete placement on site. The concrete washout area must be self-contained and not connected to any storm water outlet of the site.
2. The concrete washout area shall be sized as necessary to adequately contain the concrete washout from the project. The concrete washout area shall be maintained during the entire project.
3. At the end of construction, all concrete shall be removed from the site and disposed of at an approved waste site.
4. When the concrete washout area is removed, the disturbed area shall be restored to original grade, seeded and mulched or otherwise stabilized as approved by the Engineer.

N.T.S.

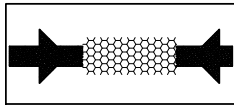
CITY OF RAPID CITY

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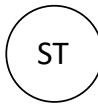
CONCRETE WASHOUT AREA

DATE: 8-19-22

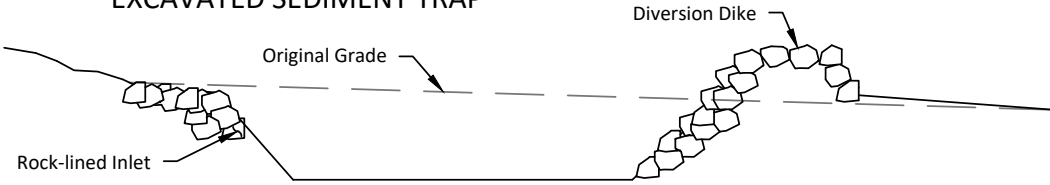
Sec. - Sht.
18-12



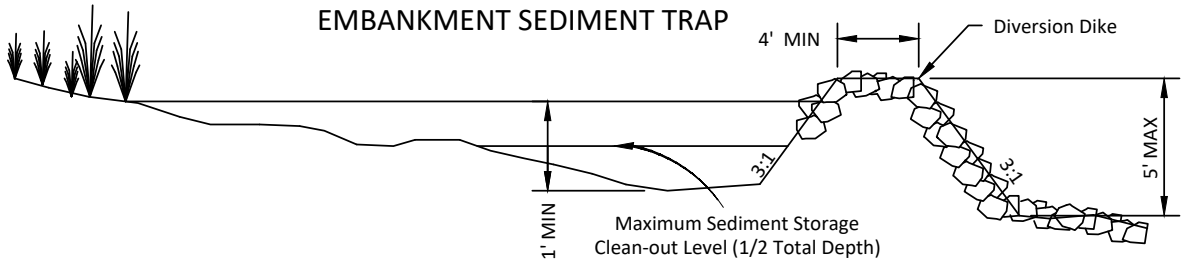
Temporary Sediment Trap



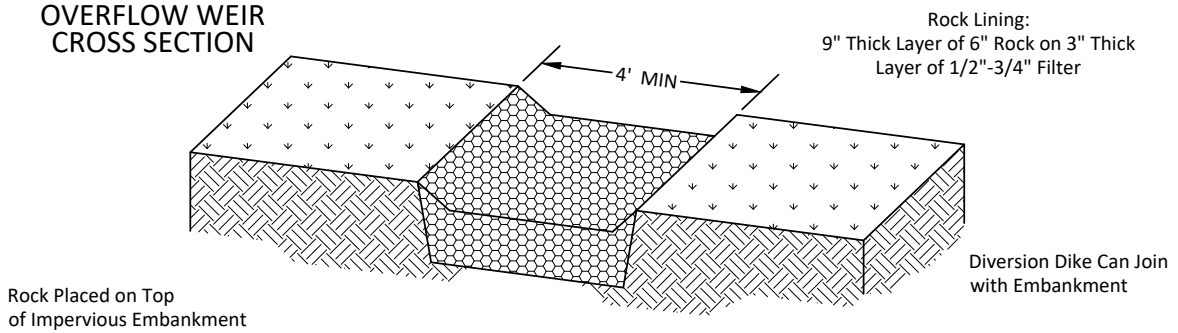
EXCAVATED SEDIMENT TRAP



EMBANKMENT SEDIMENT TRAP

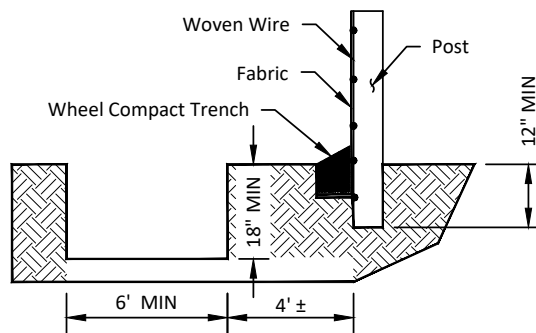


OVERFLOW WEIR CROSS SECTION



Rock Placed on Top of Impervious Embankment

Diversion Dike Can Join with Embankment



Silt Trap:
Width, Length and Depth are Variable

SEDIMENT TRAP WITH SILT FENCE

Note:

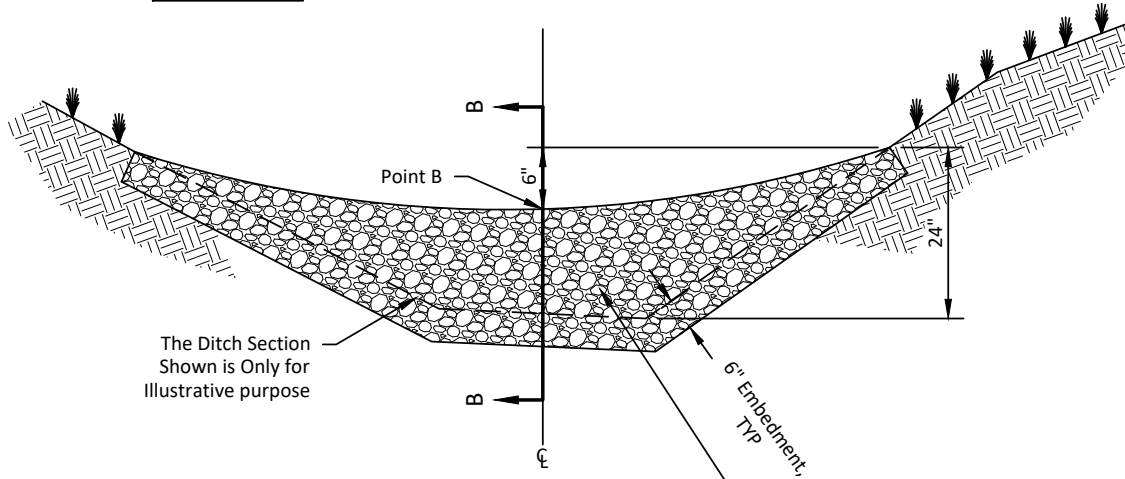
A temporary ponding area, formed by constructing an earthen embankment with a rock-covered outlet across a drainage swale, or by excavation of a depression below original grade, relative elevations should contain all runoff within the trap area.

N.T.S.



Check Dam

CD

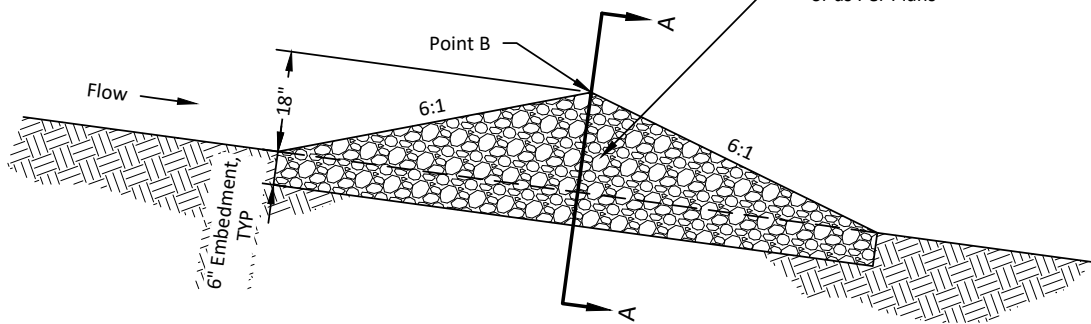


The Ditch Section Shown is Only for Illustrative purpose

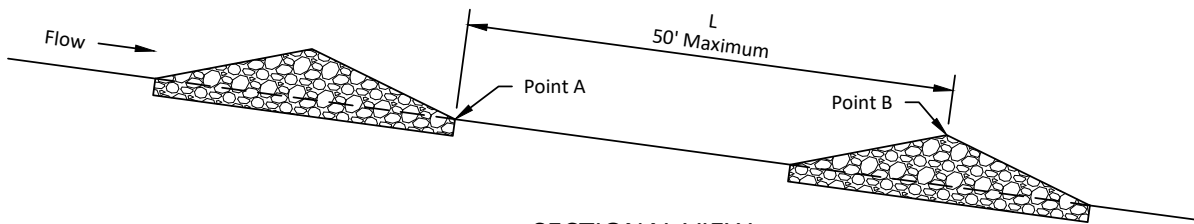
SECTION A-A

6" Embedment, TYP

4" to 6" Rock or as Per Plans



SECTION B-B



SECTIONAL VIEW

Note:

The elevation of Point A and Point B will be the same. The distance L is the distance required such that Point A and Point B are at the same elevation.

N.T.S.

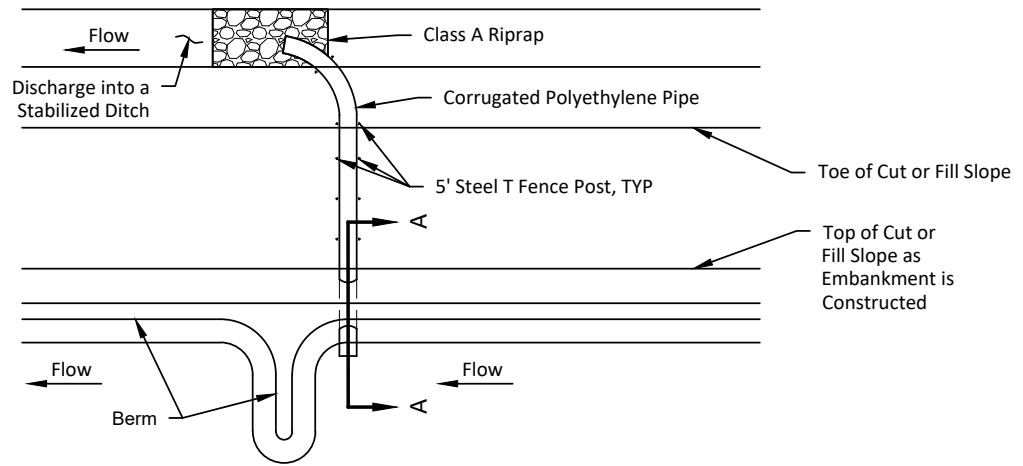
CITY OF RAPID CITY

PUBLIC WORKS DEPARTMENT

ROCK CHECK DAM

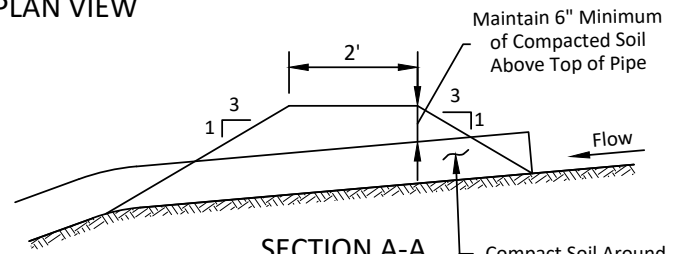
DATE: 8-19-22

Sec. - Sht.
18-14

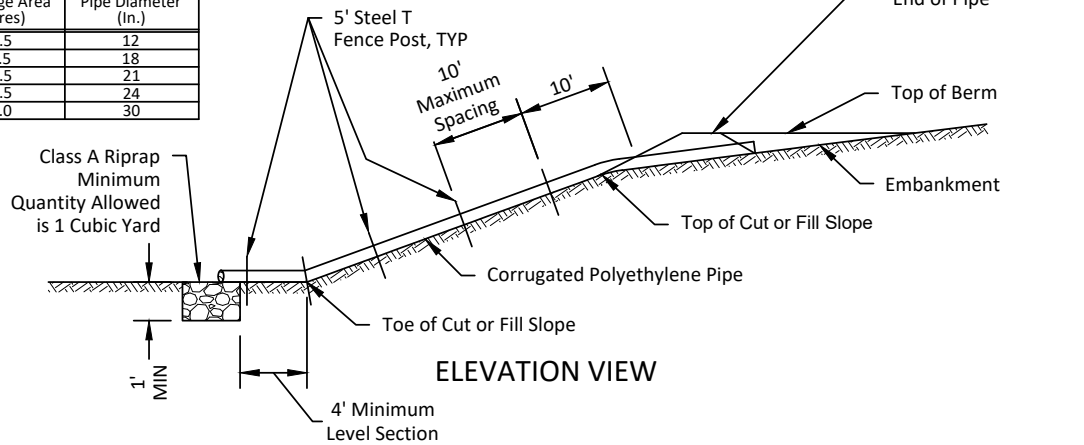


PLAN VIEW

TEMPORARY SLOPE DRAIN PIPE SIZE REQUIREMENTS	
Drainage Area (Acres)	Pipe Diameter (In.)
0.5	12
1.5	18
2.5	21
3.5	24
5.0	30



SECTION A-A

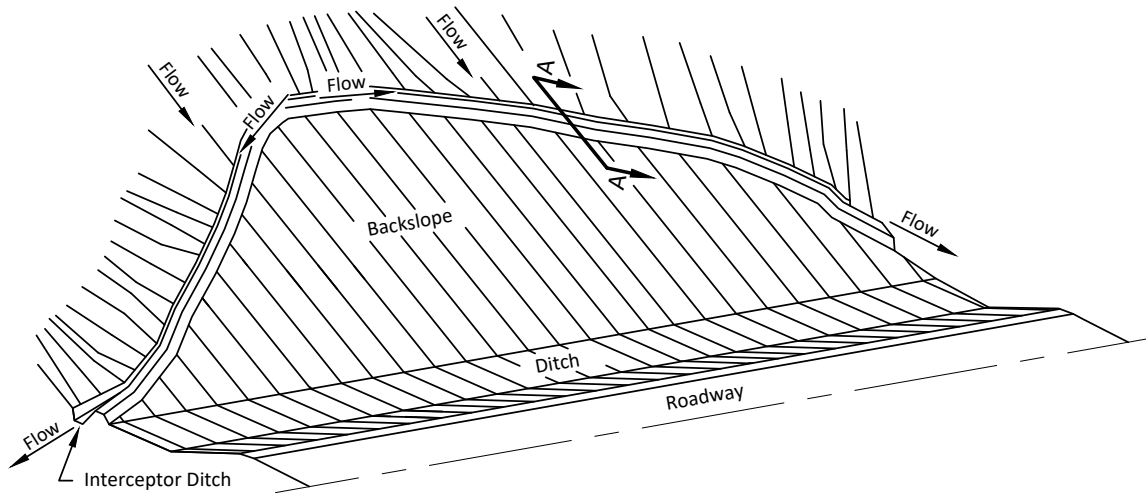


ELEVATION VIEW

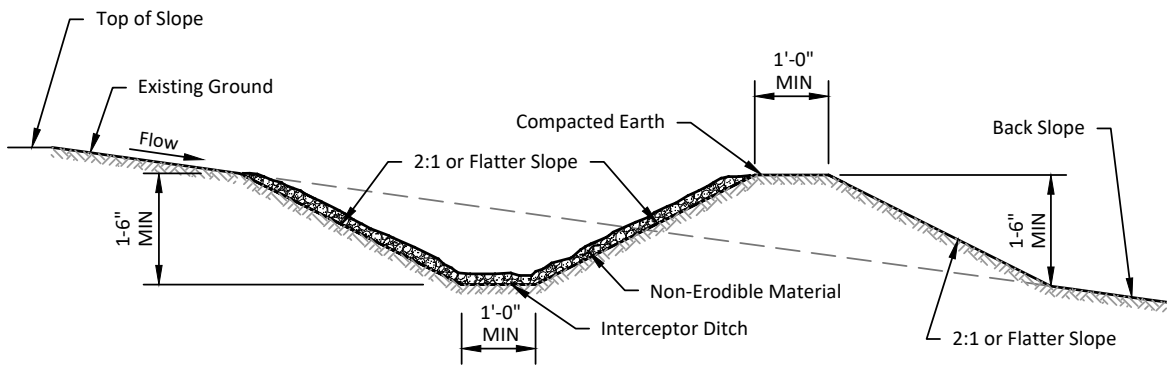
Notes:

1. Temporary slope drains will be placed at locations stated in the plans or at locations deemed necessary by the Engineer.
2. The extra length of berm shown in the left side of the plan view illustrates an extension of the berm to alleviate erosion of the cut or fill slope. The length and locations of the berms will be approved by the Engineer.
3. The corrugated polyethylene pipe will be secured in place by wrapping 16 Ga. wire around the pipe and steel T fence posts multiple times as necessary and will be approved by the Engineer.
4. The quantity of Class A riprap will be determined by the Engineer, however, the minimum quantity allowed is 1 cubic yard.

N.T.S.



ISOMETRIC VIEW



SECTION A-A

Notes:

1. The Contractor and Engineer will inspect the interceptor ditch in accordance with the storm water permit. The Contractor will maintain the interceptor ditch by removing accumulated sediment once it has reached a depth of 1'.
2. The non-erodible material used will be an erosion control blanket or a 2" thickness of shot rock, base course, or gravel cushion material.
3. The Engineer will determine when or if the interceptor ditch will be removed.

N.T.S.

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PUBLIC WORKS DEPARTMENT

CUT INTERCEPTOR DITCH

DATE: 8-19-22

Sec. - Sht.
18-16