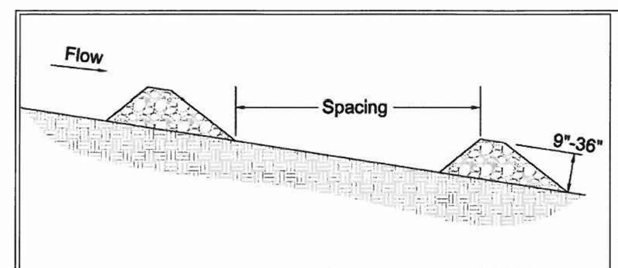
2.0 Erosion Controls

2.1 Check Dam

Erosion Control



Description: Check dams are small barriers consisting of loose rock, rock bags, or organic filter tubes placed across a drainage swale or ditch. They reduce the velocity of small concentrated flows, provide a limited barrier for sediment and reduce the potential for erosion of the swale or ditch.

KEY CONSIDERATIONS

DESIGN CRITERIA:
- Heights between 9 inches and 36 inches
- Top of the downstream dam should be at the same elevation as the toe of the upstream dam

ADVANTAGES / BENEFITS:
- Reduced velocities in long drainage swales or ditches
- May be used with other channel protection measures
- Provides some sediment removal

DISADVANTAGES / LIMITATIONS:
- Cannot be used in live stream channels
- Minor ponding upstream of the check dams
- Extensive maintenance or replacement of the dams required after heavy flows or high velocity flows
- Mowing hazard from loose rocks if all rock is not removed at end of construction

MAINTENANCE REQUIREMENTS:
- Inspect regularly
- Remove silt when it reaches approximately ⅓ the height of the dam or 12 inches, whichever is less

APPLICATIONS

Perimeter Control
Slope Protection
Sediment Barrier
Channel Protection
Temporary Stabilization
Final Stabilization
Waste Management
Housekeeping Practices

Fe=0.30-0.50
(*Depends on soil type*)

IMPLEMENTATION CONSIDERATIONS

◒ Capital Costs
● Maintenance
○ Training
◒ Suitability for Slopes > 5%

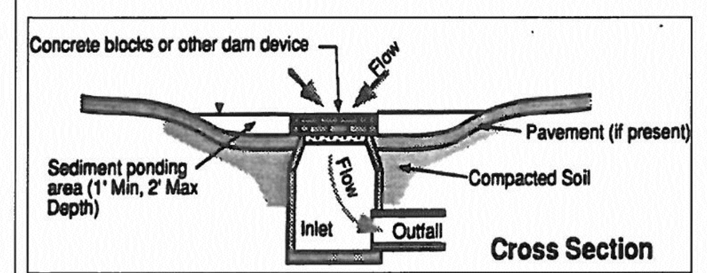
Other Considerations:
- *None*

TARGETED POLLUTANTS

◒ Sediment
○ Nutrients & Toxic Materials
○ Oil & Grease
◒ Floatable Materials
○ Other Construction Wastes

3.4 Inlet Protection

Sediment Control



Description: Inlet protection consists of a variety of methods to intercept sediment at low point inlets through the use of depressed grading, filter stone, filter fabric, inlet inserts, organic filter tubes and other materials. The protection devices are placed around or across the inlet openings to provide localized detention or filtration of sediment and floatable materials in stormwater. Protection devices may be assembled onsite or purchased as manufactured assemblies.

KEY CONSIDERATIONS

DESIGN CRITERIA:
- Evaluate drainage patterns to ensure inlet protection will not cause flooding of roadway, property or structures
- Never block entire inlet opening
- Size according to drainage area and flow rates
- Include flow bypass for clogged controls and large storm events

ADVANTAGES / BENEFITS:
- May be the only feasible sediment control when all construction is located within rights-of-way

DISADVANTAGES / LIMITATIONS:
- Limited effectiveness and reliability
- High maintenance requirements
- Has potential to flood roadways or adjacent properties

MAINTENANCE REQUIREMENTS:
- Inspect regularly
- Check for and remove blockage of inlet after every storm event
- Remove sediment before it reaches half the design height or volume of the inlet protection, more frequently for curb inlets
- Repair or replace damaged materials
- Clean or replace filter stone and organic filter tubes is when clogged with sediment

APPLICATIONS

Perimeter Control
Slope Protection
Sediment Barrier
Channel Protection
Temporary Stabilization
Final Stabilization
Waste Management
Housekeeping Practices

Fe=0.35-0.65
(*Depends on soil type*)

IMPLEMENTATION CONSIDERATIONS

◒ Capital Costs
● Maintenance
○ Training
○ Suitability for Slopes > 5%

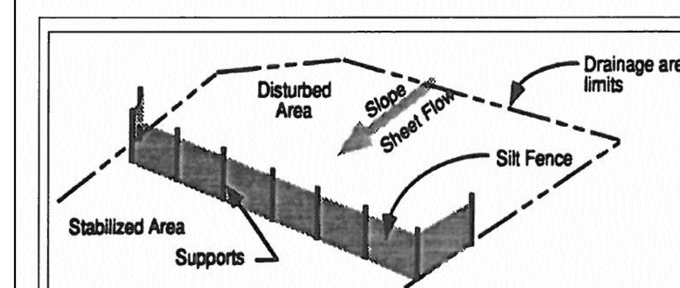
Other Considerations:
- *Traffic hazards*
- *Passage of larger storm events without causing flooding*
- *Flow diversion to other inlets or drainage points*

TARGETED POLLUTANTS

◒ Sediment
○ Nutrients & Toxic Materials
○ Oil & Grease
◒ Floatable Materials
○ Other Construction Wastes

3.10 Silt Fence

Sediment Control



Description: A silt fence consists of geotextile fabric supported by wire mesh netting or other backing stretched between metal posts with the lower edge of the fabric securely embedded six-inches in the soil. The fence is typically located downstream of disturbed areas to intercept runoff in the form of sheet flow. A silt fence provides both filtration and time for sediment settling by reducing the velocity of the runoff.

KEY CONSIDERATIONS

DESIGN CRITERIA:
- Maximum drainage area of 0.25 acre per 100 linear feet of silt fence
- Maximum 200 feet distance of flow to silt fence; 50 feet if slope exceeds 10 percent
- Minimum fabric overlap of 3 feet at abutting ends; join fabric to prevent leakage
- Turn end of silt fence line upslope a minimum of 10 feet
- Install stone overflow structure at low points or spaced at approximately 300 feet if no apparent low point

ADVANTAGES / BENEFITS:
- Economical means to treat sheet flow
- Most effective with coarse to silty soil types

DISADVANTAGES / LIMITATIONS:
- Limited effectiveness with clay soils due to clogging
- Localized flooding due to minor ponding at the upslope side of the silt fence
- Not for use as check dams in swales or low areas subject to concentrated flow
- Not for use where soil conditions prevent a minimum toe-in depth of 6 inches or installation of support posts to a depth of 12 inches
- Can fail structurally under heavy storm flows, creating maintenance problems and reducing effectiveness

MAINTENANCE REQUIREMENTS:
- Inspect regularly
- Repair undercutting, sags and other fence failures
- Remove sediment before it reaches half the height of the fence
- Repair or replace damaged or clogged filter fabric

APPLICATIONS

Perimeter Control
Slope Protection
Sediment Barrier
Channel Protection
Temporary Stabilization
Final Stabilization
Waste Management
Housekeeping Practices

Fe=0.50-0.75
(*Depends on soil type*)

IMPLEMENTATION CONSIDERATIONS

◒ Capital Costs
● Maintenance
○ Training
◒ Suitability for Slopes > 5%

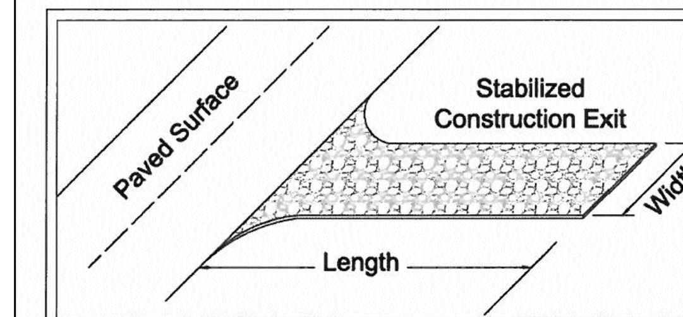
Other Considerations:
- *Effects of ponding or the redirection of flow onto adjacent areas and property*

TARGETED POLLUTANTS

● Sediment
○ Nutrients & Toxic Materials
○ Oil & Grease
◒ Floatable Materials
○ Other Construction Wastes

3.11 Stabilized Construction Exit

Sediment Control



Description: A stabilized construction exit is a pad of crushed stone, recycled concrete or other rock material placed on geotextile filter cloth to dislodge soil and other debris from construction equipment and vehicle tires prior to exiting the construction site. The object is to minimize the tracking of soil onto public roadways where it will be suspended by stormwater runoff.

KEY CONSIDERATIONS

DESIGN CRITERIA:
- Slope exit away from offsite paved surface
- Minimum width and length dependent on size of disturbed area, which correlates to traffic volume
- 12 inches minimum thickness of stone layer
- Stone of 4 to 6 inches in size (no crushed/recycled concrete allowed)
- Add a wheel cleaning system when inspections reveal the stabilized exit does not prevent tracking

ADVANTAGES / BENEFITS:
- Reduces tracking of soil onto public streets
- Directs traffic to a controlled access point
- Protects other sediment controls by limiting the area disturbed

DISADVANTAGES / LIMITATIONS:
- Effectiveness dependent on limiting ingress and egress to the stabilized exit
- A wheel washing system may also be required to remove clay soil from tires, particularly in wet conditions

MAINTENANCE REQUIREMENTS:
- Inspect regularly
- Replace rock when sediment in the void area between the rocks is visible on the surface
- Periodically re-grade and top dress with additional stone to maintain efficiency

APPLICATIONS

Perimeter Control
Slope Protection
Sediment Barrier
Channel Protection
Temporary Stabilization
Final Stabilization
Waste Management
Housekeeping Practices

Fe=N/A

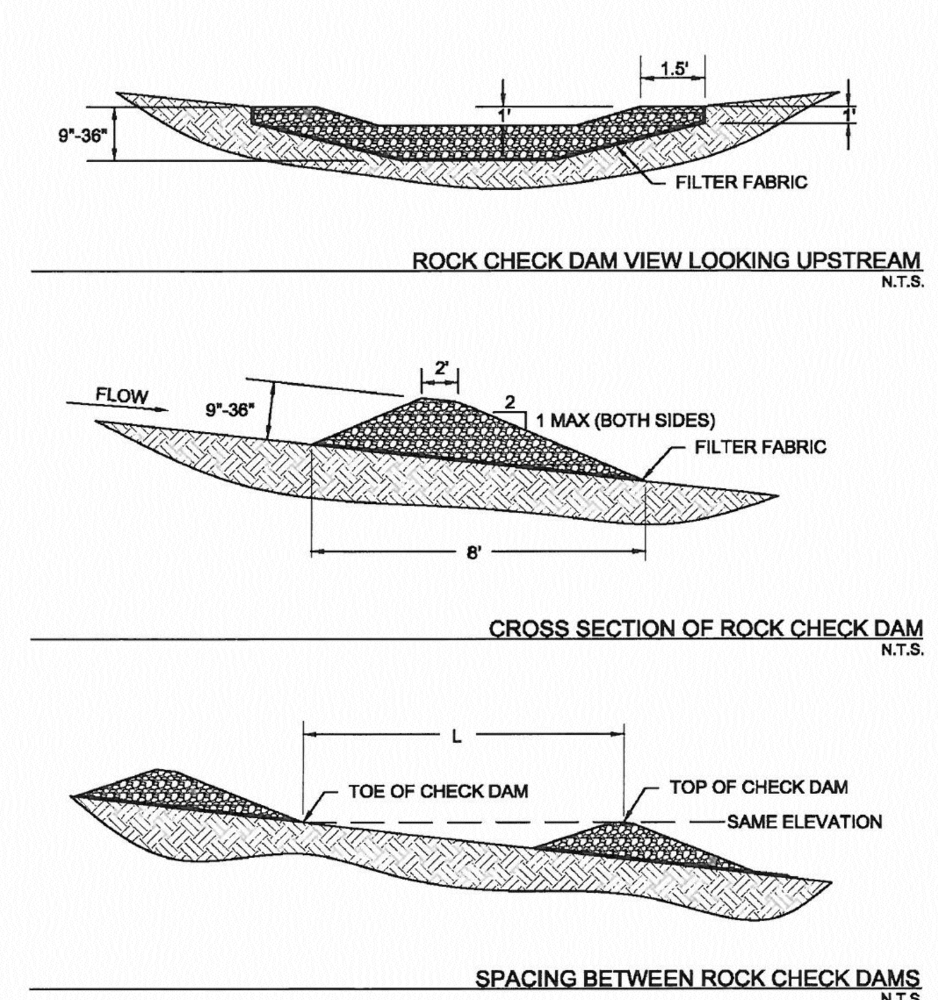
IMPLEMENTATION CONSIDERATIONS

◒ Capital Costs
◒ Maintenance
○ Training
○ Suitability for Slopes > 5%

Other Considerations:
- *None*

TARGETED POLLUTANTS

◒ Sediment
○ Nutrients & Toxic Materials
○ Oil & Grease
○ Floatable Materials
○ Other Construction Wastes



NOTES: ACTUAL DIMENSIONS OF THE CHECK DAMS SHALL BE DESIGNED BASED ON FLOW CONDITIONS IN THE DRAINAGE SWALE OR DITCH. PROVIDE CALCULATIONS THAT DOCUMENT THE FOLLOWING PARAMETERS USED TO DESIGN THE CHECK DAMS.

- HEIGHT OF CHECK DAMS BASED ON SWALE OR DITCH DIMENSIONS AND FLOW CONDITIONS.
- SPACING OF CHECK DAMS BASED ON GRADE OF THE SWALE OR DITCH. TOP OF DOWNSTREAM DAM SHALL BE AT SAME ELEVATION AS TOE OF UPSTREAM DAM

Figure 2.1 Schematics of Rock Check Dams
(Source: Modified from Stormwater Management Manual for Western Washington)

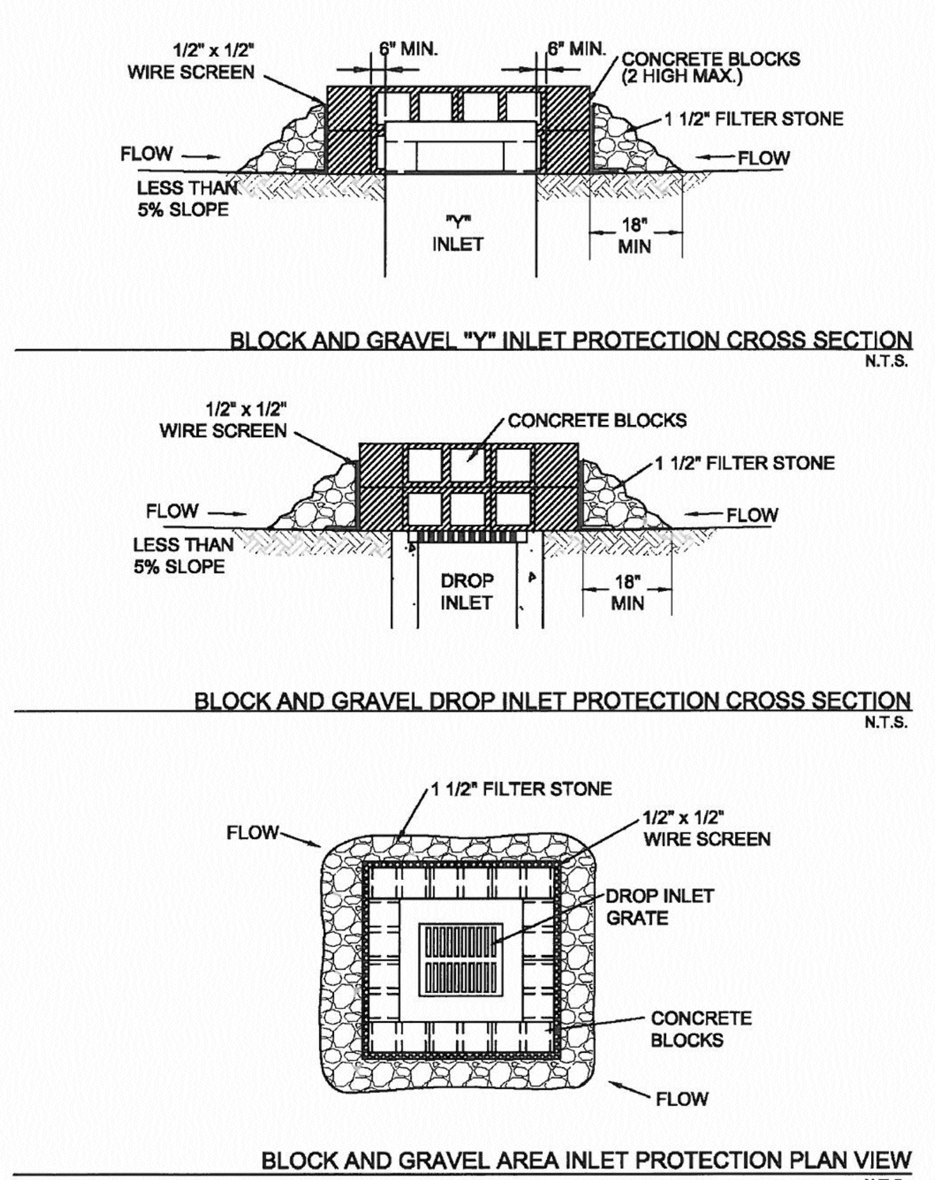
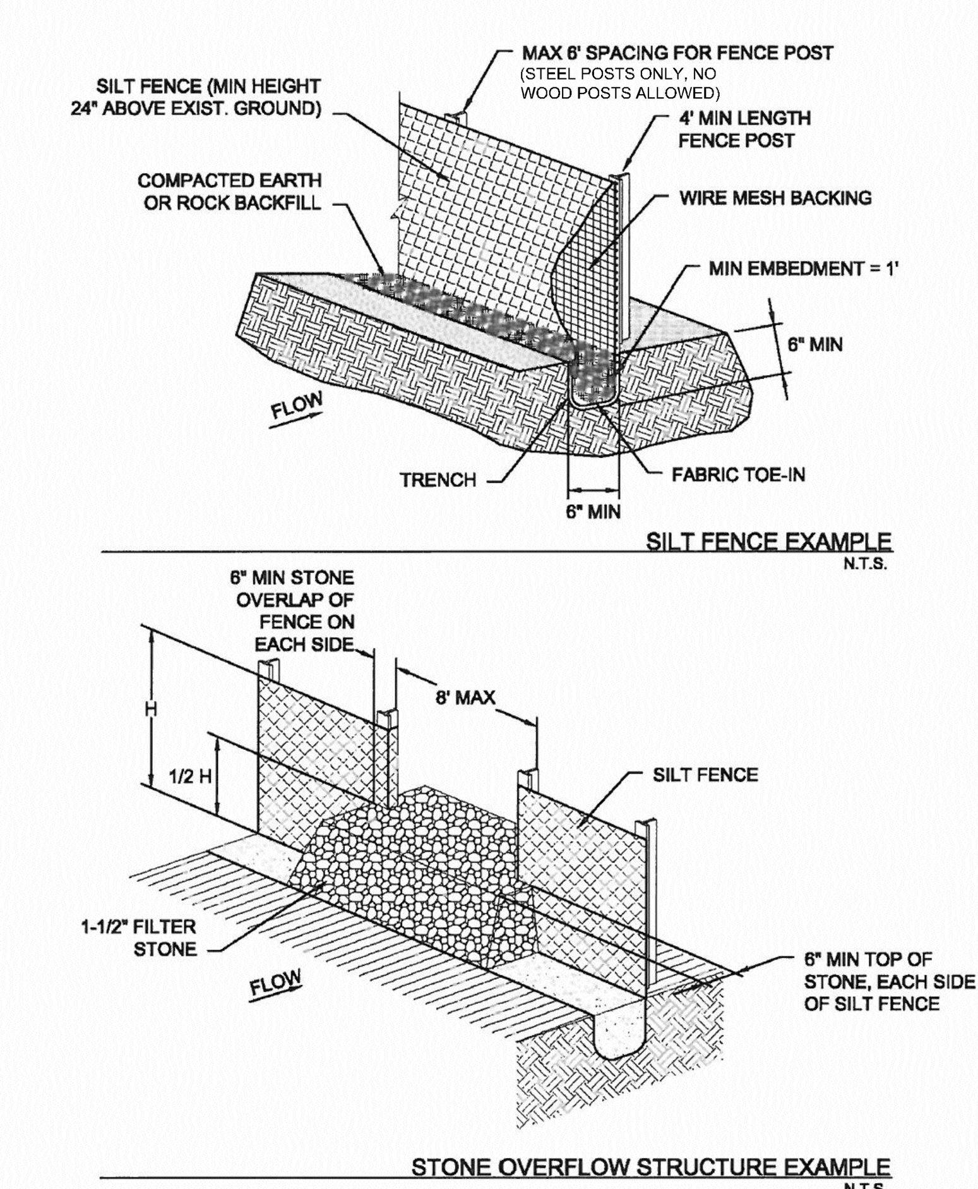
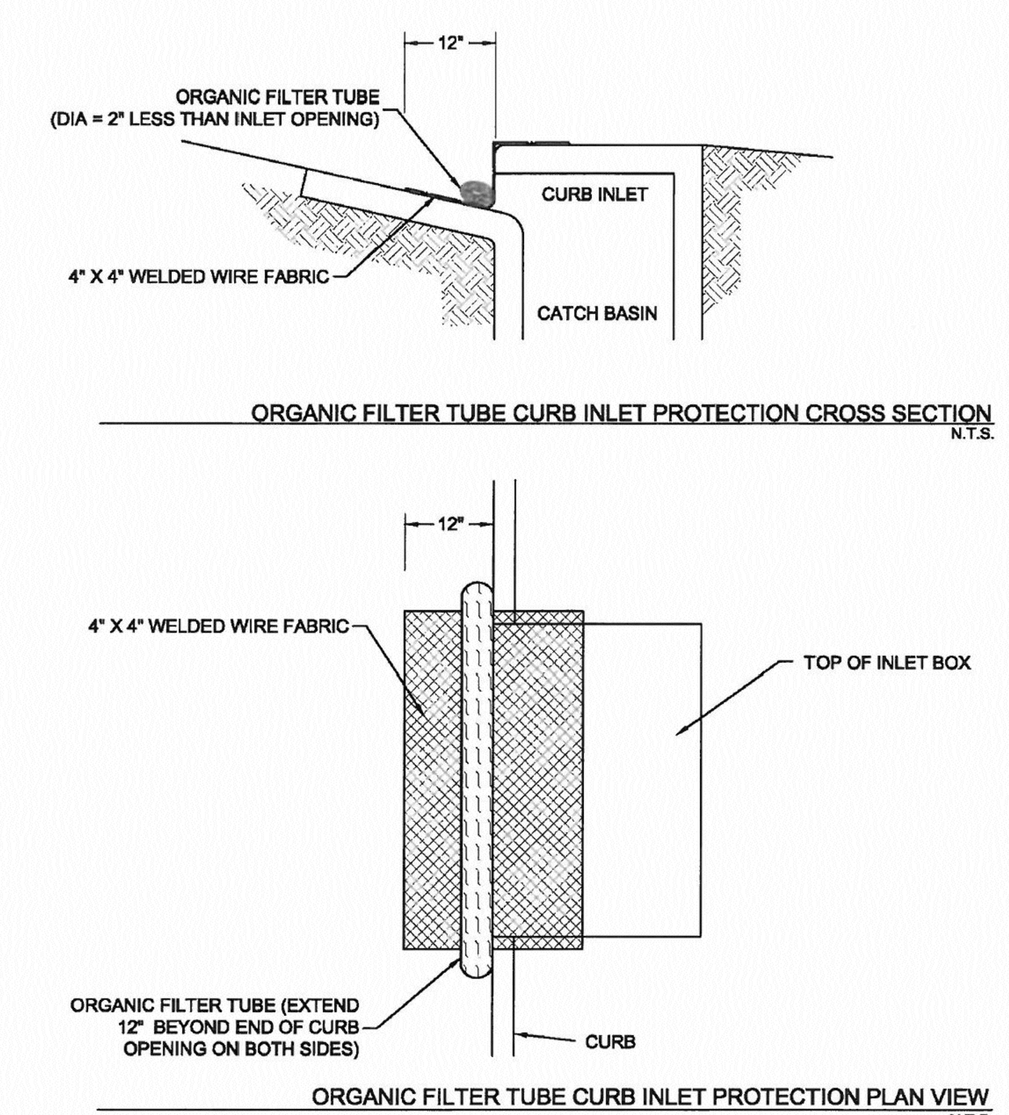


Figure 3.12 Schematics of Block and Gravel Area Inlet Protection
(Source: Modified from City of Plano BMP SP-4)



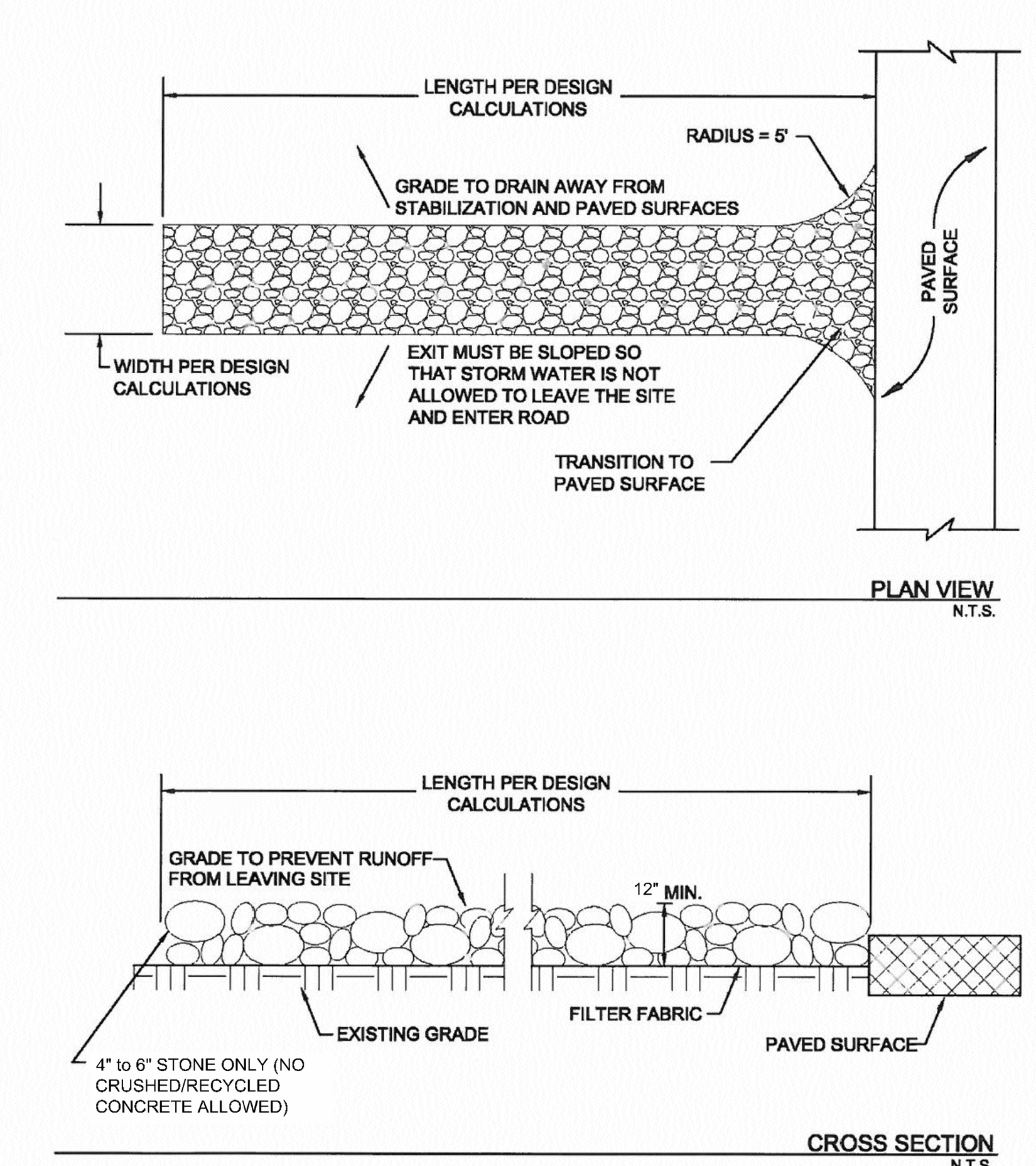
NOTES:
1. DESIGN SHALL SHOW ON THE DRAWINGS THE LOCATIONS WHERE OVERFLOW STRUCTURES SHALL BE INSTALLED. OVERFLOW STRUCTURES ARE REQUIRED AT ALL LOW POINTS AND AT A SPACING OF APPROXIMATELY 300 FT WHERE NO LOW POINT IS APPARENT.
2. DESIGNER SHALL ON THE DRAWINGS THE LOCATIONS WHERE SILT FENCE IS TO BE TURNED UPSLOPE. UPSLOPE LENGTHS SHALL BE A MINIMUM OF 10 FEET.

Figure 3.28 Schematics of Silt Fence



NOTE: THIS CONTROL WILL DECREASE THE CAPACITY OF THE INLET. IT SHALL ONLY BE USED WHEN AN ENGINEER HAS DETERMINED THERE IS ADEQUATE STORAGE OR POSITIVE OVERFLOW.

Figure 3.6 Schematics of Organic Filter Tube Curb Inlet Protection
(Source: Modified from City of Plano BMP SP-4)



NOTE: INSTALL SILT FENCE, CONSTRUCTION SAFETY FENCING, OR SIMILAR BARRIER ALONG THE EXIT TO DIRECT TRAFFIC INTO THE EXIT.

Figure 3.29 Schematics of Stabilized Construction Exit

RECORD DRAWING

THIS RECORD DRAWING TO THE BEST OF OUR KNOWLEDGED BURGESS AND NIPLE, INC. 3 SUGAR CREEK CENTER BOULEVARD, SUITE 610 SUGAR LAND, TEXAS 77478, HEREBY STATES THIS PLAN IS AS=BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYIGN AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

THOMAS A. LUNZMAN P.E. — DATE 02/08/2021

BURGESS & NIPLE
10701 CORPORATE DR., SUITE 118
STAFFORD, TEXAS 77477
PHONE: (281) 980-7705
TBPE FIRM REGISTRATION NO. F-10834

BENCHMARK
CITY BM:

SITE BM ONE: CROSS CUT ON TOP OF CURB AT THE NORTHEAST END OF THE SOUTH HEAD-IN PARKING FOR THE APPRAISAL DISTRICT BUILDING, 95' SOUTHWESTERLY FROM THE CENTER OF TOWNSHEND BLVD. & 340' SOUTHEASTERLY FROM THE CENTER OF JUSTIN DRIVE.
N: 7023100.573 E: 2596909.421 ELEV. = 583.32'

SITE BM TWO: CROSS CUT IN SIDEWALK, 41' SOUTHWESTERLY FROM THE CENTER OF TOWNSHEND BLVD. & 895' SOUTHEASTERLY FROM THE CENTER OF JUSTIN DRIVE.
N: 7022744.440 E: 2597331.250 ELEV. = 585.72'

NCTCOG EROSION CONTROL DETAILS

ALDERS AT ROCKWALL SENIOR INDEPENDENT LIVING COMMUNITY

NO.	REVISIONS	DATE	BY	CHK
1	UPDATE WATERLINE LAYOUT	02/21/19	TAL	TAL
2	MINOR HUD/OWNER COMMENTS	05/17/19	TAL	TAL
3	REV. TO SIDEWALKS & COURTYARD (STORM) PER LANDSCAPE	07/17/19	KTM	TAL

△3 7/17/19
△2 5/17/19
1/29/19
STATE OF TEXAS
THOMAS A. LUNZMAN
122259
LICENSED
PROFESSIONAL ENGINEER

JOB NUMBER:	56211
DESIGNED BY:	TAL
DRAWN BY:	NRM/TAL
APPROVED BY:	TAL
CHECKED BY:	JTR
DATE:	01/29/2019
SCALE:	NONE
SHEET NUMBER:	C.22
OF	23