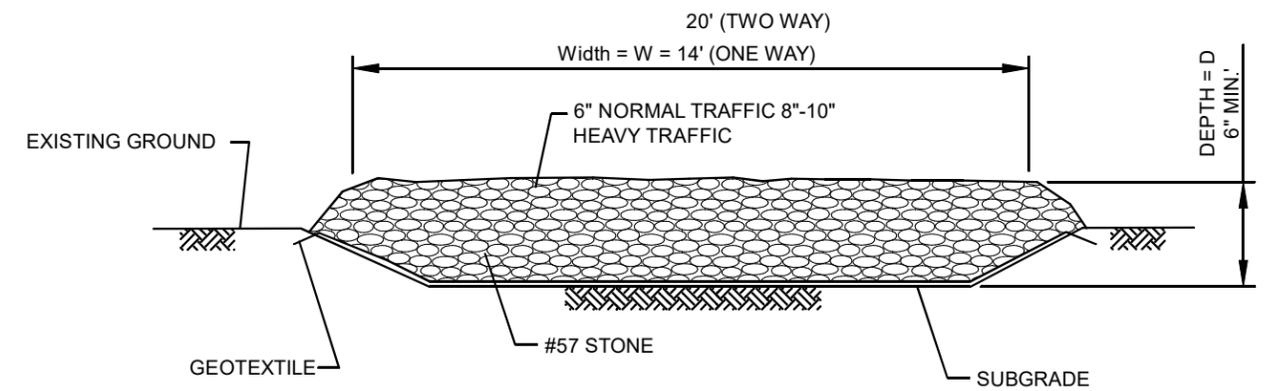


PLAN VIEW

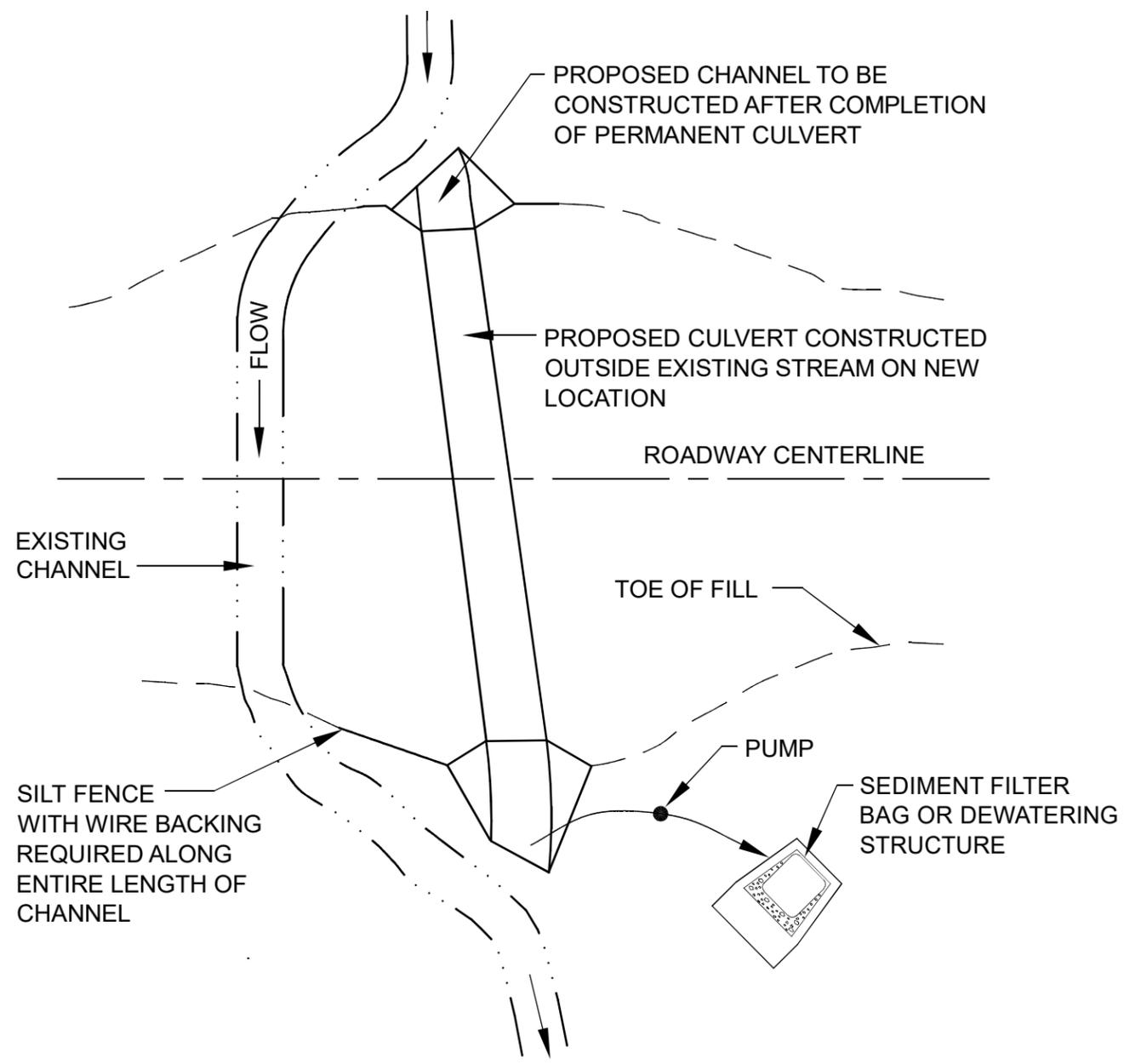


SECTION A-A

ADAPTED FROM VIRGINIA STORMWATER MANAGEMENT HANDBOOK, DEPARTMENT OF ENVIRONMENTAL QUALITY, 2024

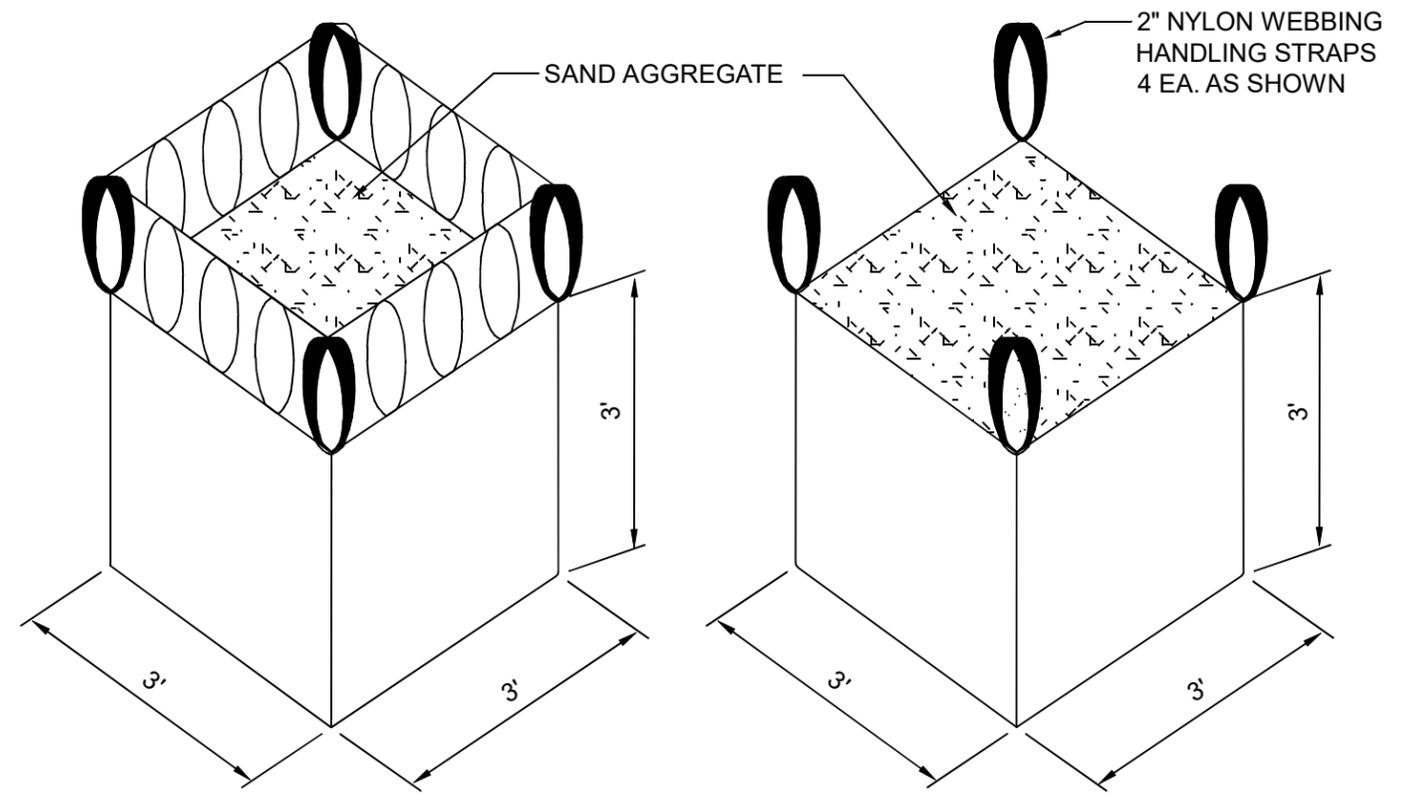
ACCESS ROAD

NOT TO SCALE



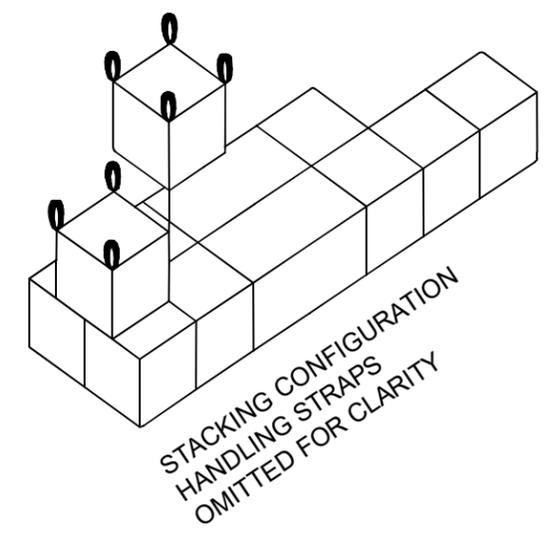
PLAN VIEW

CULVERT CONSTRUCTED
OUTSIDE EXISTING STREAM

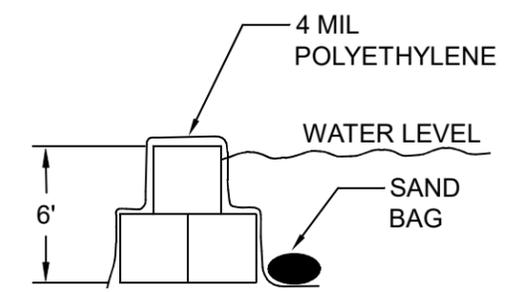


MODULAR DAM
DUFFLE TOP STYLE

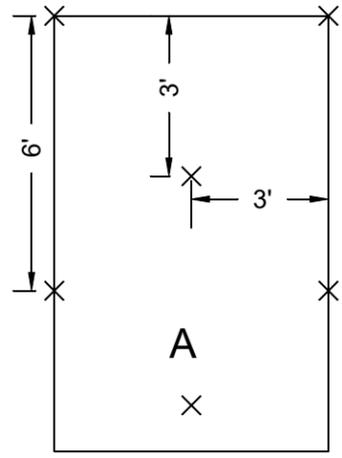
MODULAR DAM
DUFFLE TOP STYLE



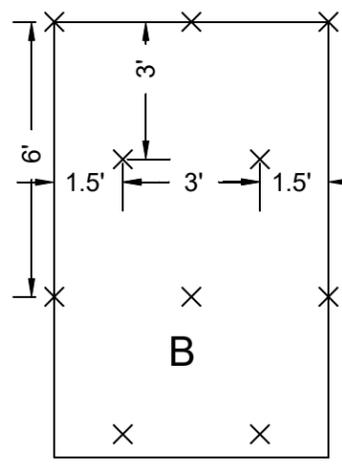
MODULAR DAM/BARRIER
SAND BAG TOTE DAM



ADDITIONAL
STREAM
DIVERSION
DETAILS



1 STAPLE PER SQ. YD.

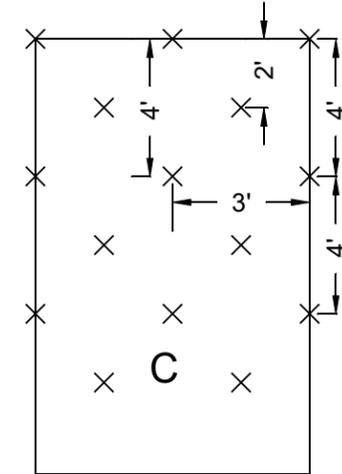


1 1/2 STAPLES PER SQ. YD.

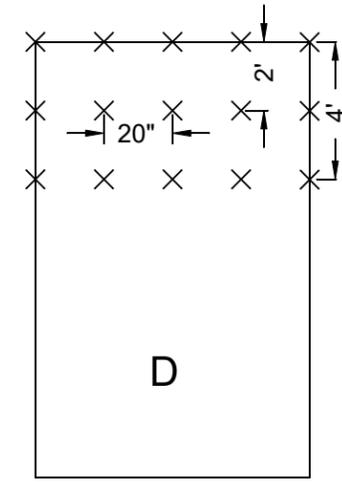
300
275
250
225
200
175
150
125
100
75
50
25
FT

B	C				
A	B	C	C	C	D
4:1	3:1	2:1	1:1	LOW FLOW CHANNEL	MED. / HIGH FLOW CHANNEL AND SHORELINE

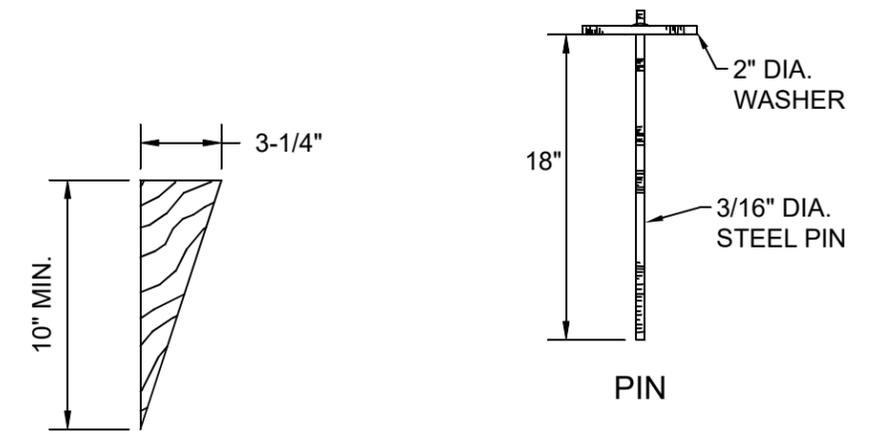
NOTE: FOR OPTIMUM RESULTS, THESE RECOMMENDED STAPLE PATTERN GUIDES MUST BE FOLLOWED. SUGGESTED ANCHORING METHODS VARY ACCORDING TO THE MANUFACTURER. THIS CHART SHOWS HOW SLOPE LENGTHS AND GRADIENTS AFFECT STAPLING PATTERNS.



2 STAPLES PER SQ. YD.

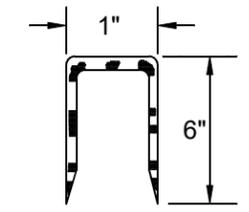


3 1/2 STAPLES PER SQ. YD.



STAKE

PIN



11 GAUGE STEEL 6"x1"x6" STAPLE
STAPLE

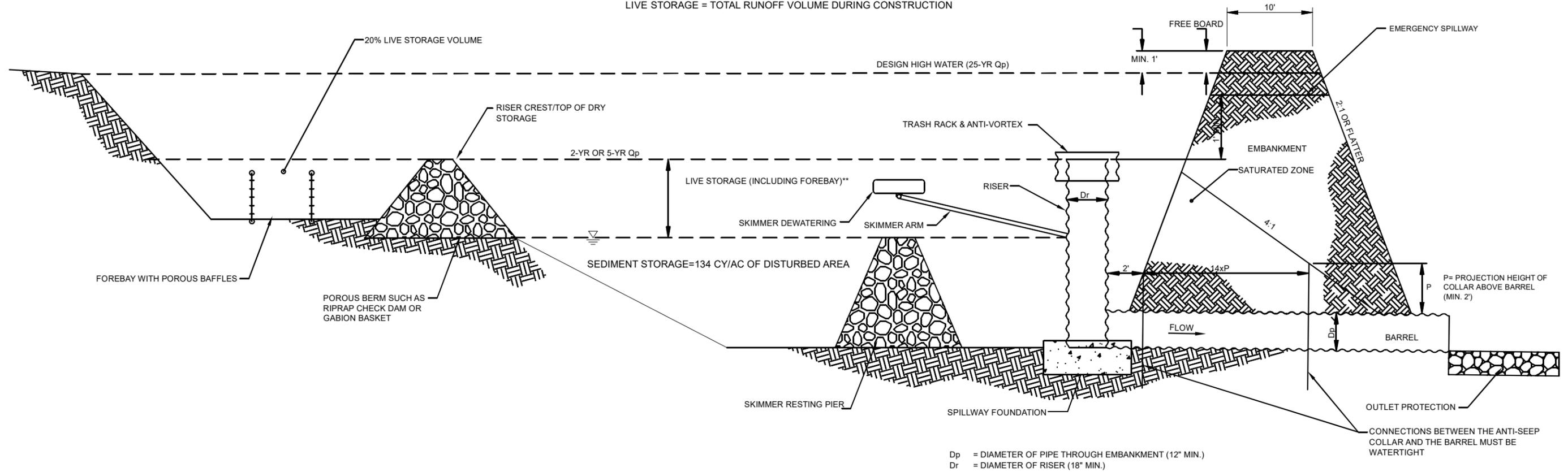
- 1) 1x4 TRIANGULAR SURVEY STAKE - MINIMUM 10" IN LENGTH. PLACEMENT OF THE STAKE ACROSS THE FLOW OF THE WATER IS THOUGHT TO PROVIDE A "PINBALL EFFECT" TO HELP SLOW THE VELOCITY.
- 2) 11 GAUGE STEEL - MINIMUM 1" WIDE BY 6" IN LENGTH STEEL STAPLE - 2"x8" STAPLE MAYBE REQUIRED IN CERTAIN SOIL CONDITIONS.
- 3) STEEL PINS - 3/16 DIAMETER STEEL PIN BY 18" IN LENGTH WITH A 2" DIAMETER WASHER ON TOP. (SEE ILLUSTRATION)

GENERAL STAPLE PATTERN GUIDE AND RECOMMENDATIONS

TYPICAL STAKES, STAPLES, & PINS

ANCHORS FOR ROLLED EROSION CONTROL PRODUCTS

**LIVE STORAGE IS CALCULATED BY THE DESIGN STORM FOR THE ENTIRE DRAINAGE AREA.
 LIVE STORAGE = TOTAL RUNOFF VOLUME DURING CONSTRUCTION

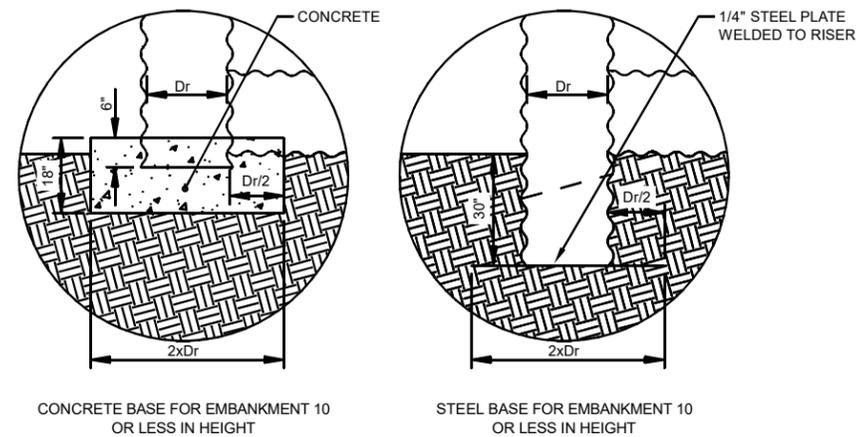


D_p = DIAMETER OF PIPE THROUGH EMBANKMENT (12" MIN.)
 D_r = DIAMETER OF RISER (18" MIN.)

NOTES:

1. DEWATERING MECHANISMS CAN VARY AS LONG AS DEWATERING OCCURS NEAR THE SURFACE. SEE SECTIONS ON SKIMMER AND PERFORATED RISER PIPE.

SPILLWAY FOUNDATIONS FOR RISER HEIGHTS <10'



CONCRETE BASE FOR EMBANKMENT 10 OR LESS IN HEIGHT

STEEL BASE FOR EMBANKMENT 10 OR LESS IN HEIGHT

*DESIGN ELEVATIONS AND VOLUMES SHOULD BE INCLUDED ON DRAWINGS TO PROVIDE A SITE SPECIFIC DESIGN

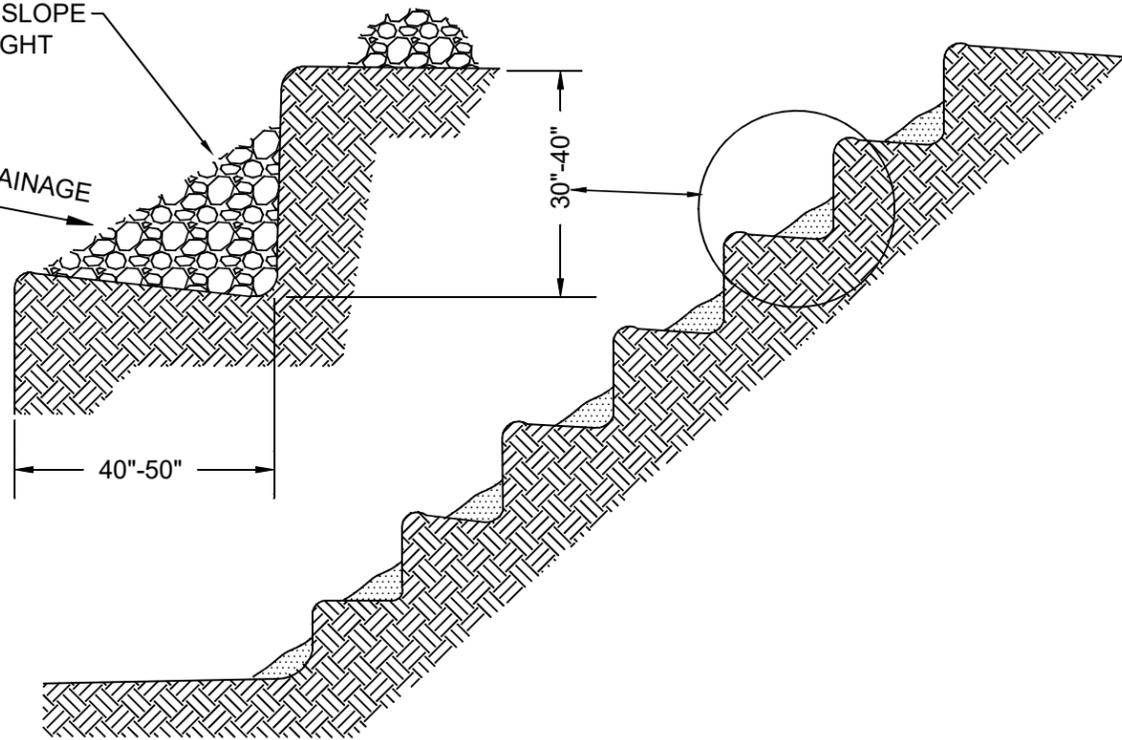
BATCH TREATMENT SEDIMENT BASIN

DEBRIS FROM SLOPE ABOVE IS CAUGHT BY STEPS

DRAINAGE

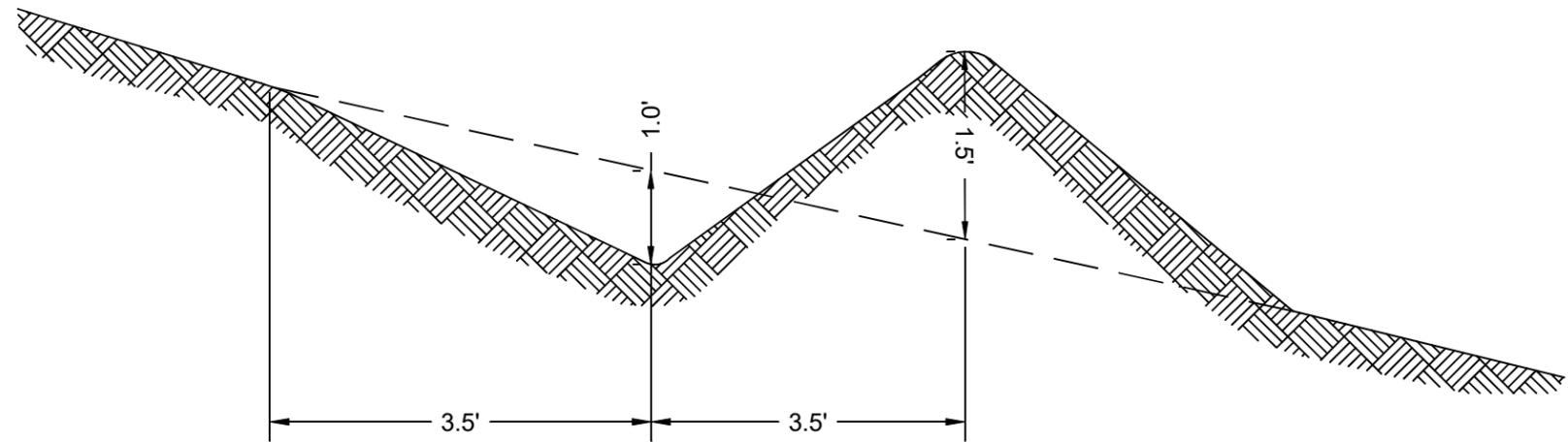
30"-40"

40"-50"



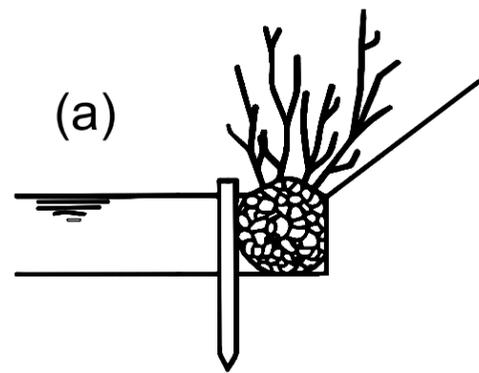
WATER, SOIL AND FERTILIZER ARE HELD BY STEPS - PLANTS CAN BECOME ESTABLISHED ON THE STEPS.

BENCHING



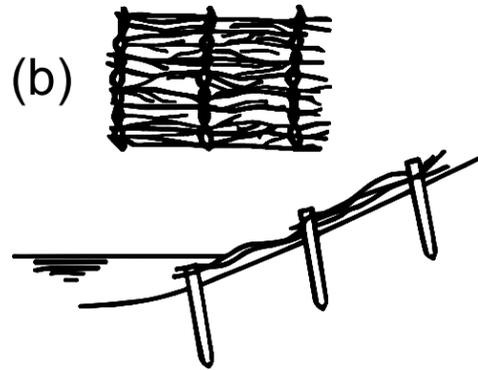
TERRACING

BENCHING
AND
TERRACING



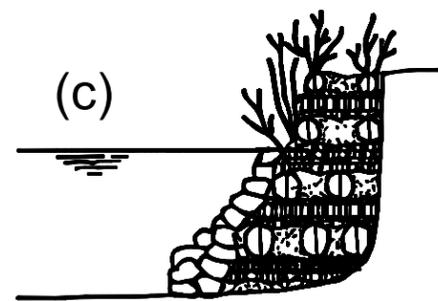
(a)

FASCINE ROLL



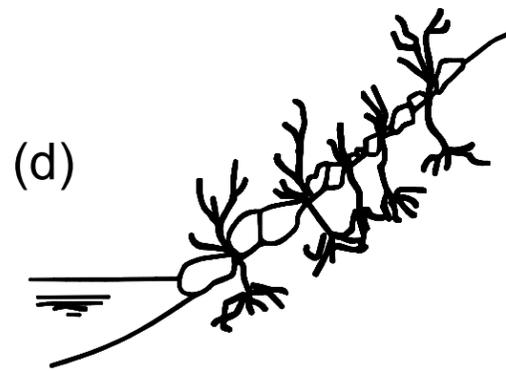
(b)

WILLOW MATTRESS



(c)

PACKED FASCINE WORK

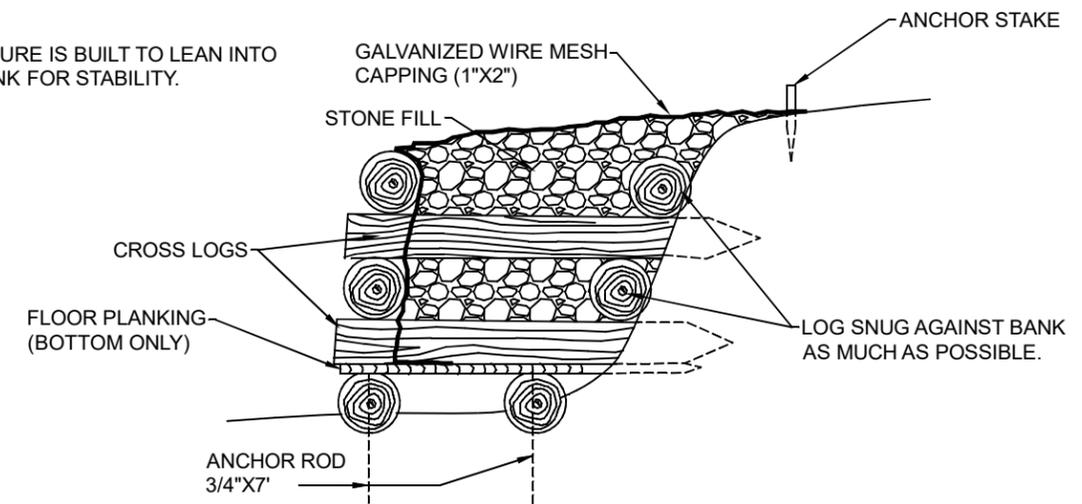


(d)

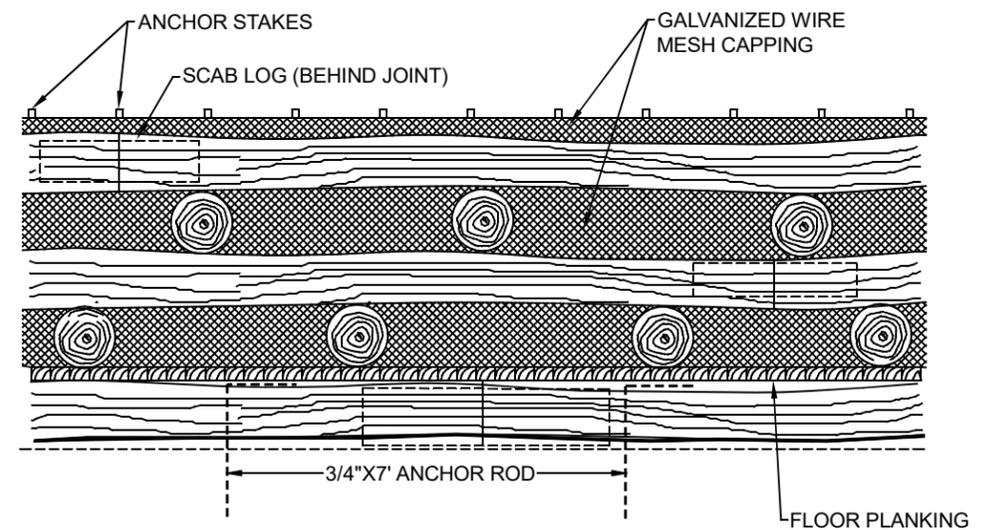
CUTTINGS BETWEEN RIPRAP

METHODS OF ESTABLISHING SHRUB ZONE VEGETATION

NOTE: STRUCTURE IS BUILT TO LEAN INTO THE BANK FOR STABILITY.



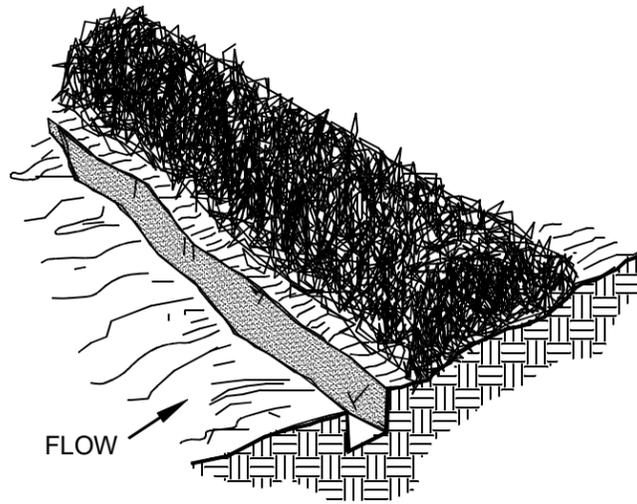
SIDE VIEW



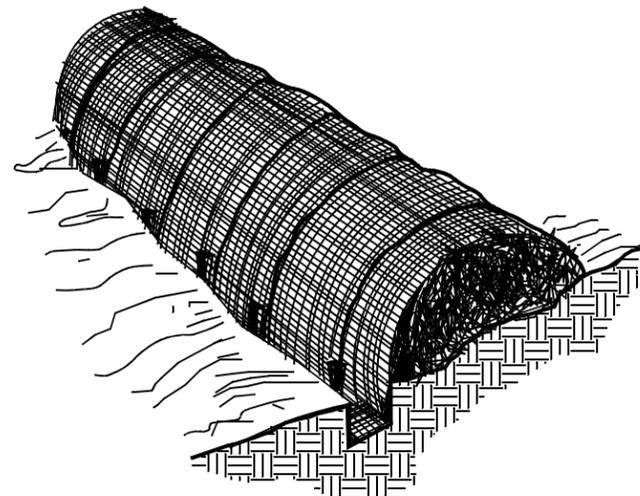
FRONT VIEW

LOG CRIBBING

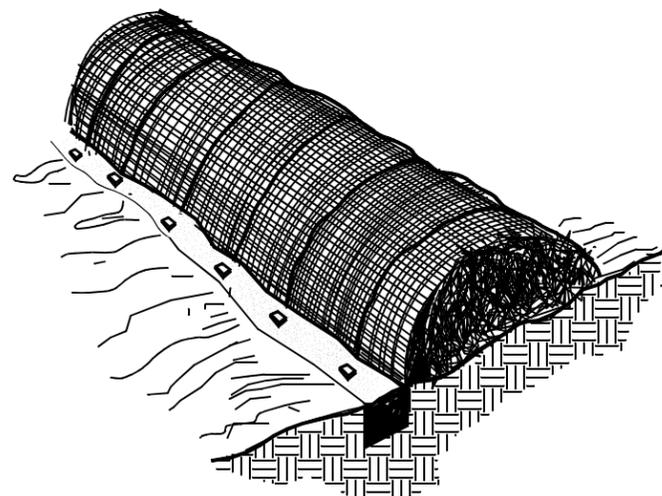
BIOENGINEERED BANK STABILIZATION



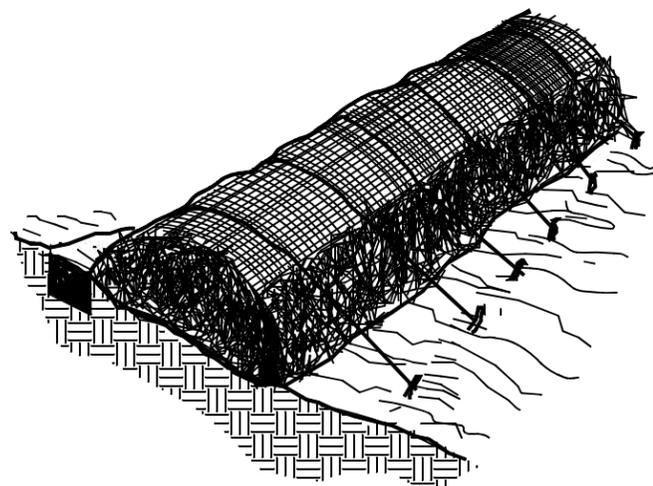
1. EXCAVATE A 6" DEEP TRENCH ALONG THE UPHILL EDGE OF THE BRUSH BARRIER.



2. DRAPE FILTER FABRIC OVER THE BRUSH BARRIER AND INTO THE TRENCH. FABRIC SHOULD BE SECURED IN THE TRENCH WITH 18" WOODEN STAKES AT 3' INTERVALS.



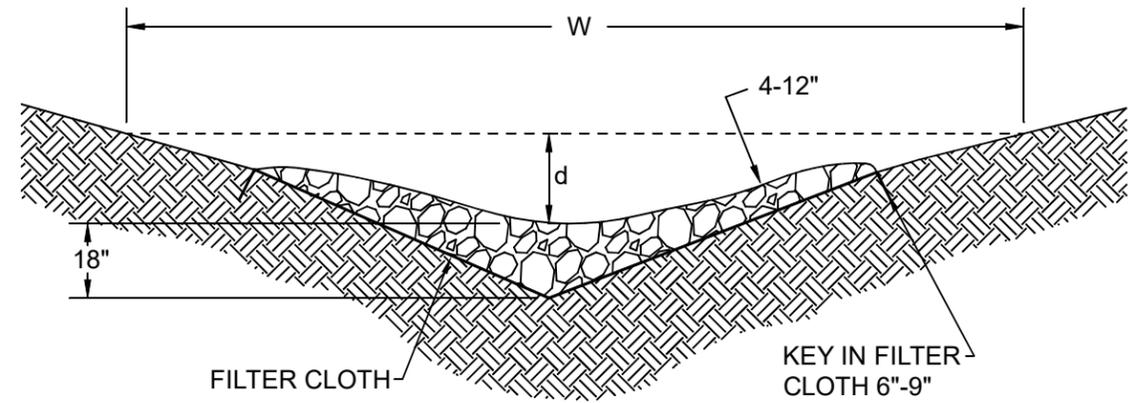
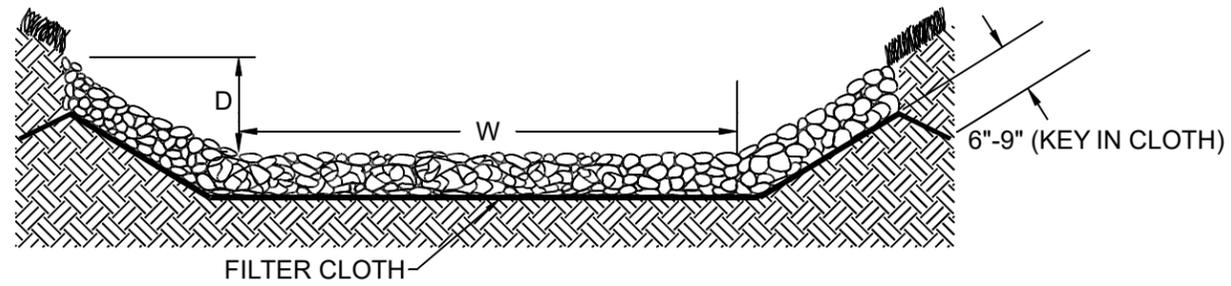
3. BACKFILL AND COMPACT THE EXCAVATED SOIL.



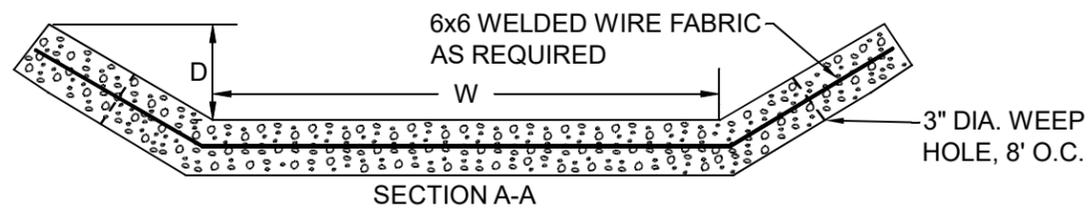
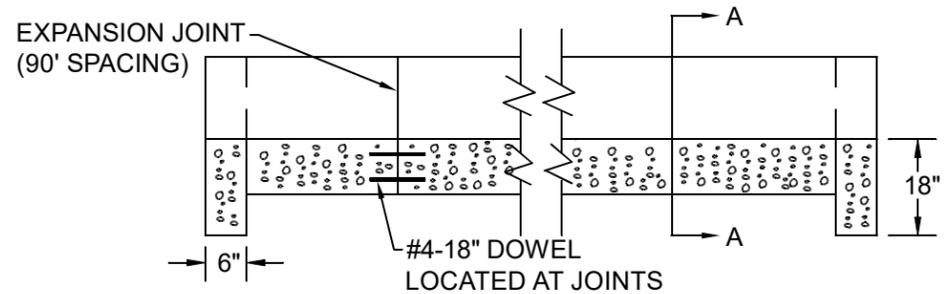
4. SET STAKES ALONG THE DOWN-HILL EDGE OF THE BRUSH BARRIER, AND ANCHOR BY TYING TWINE FROM THE FABRIC TO THE STAKES.

CONSTRUCTION OF A BRUSH BARRIER COVERED BY FILTER FABRIC

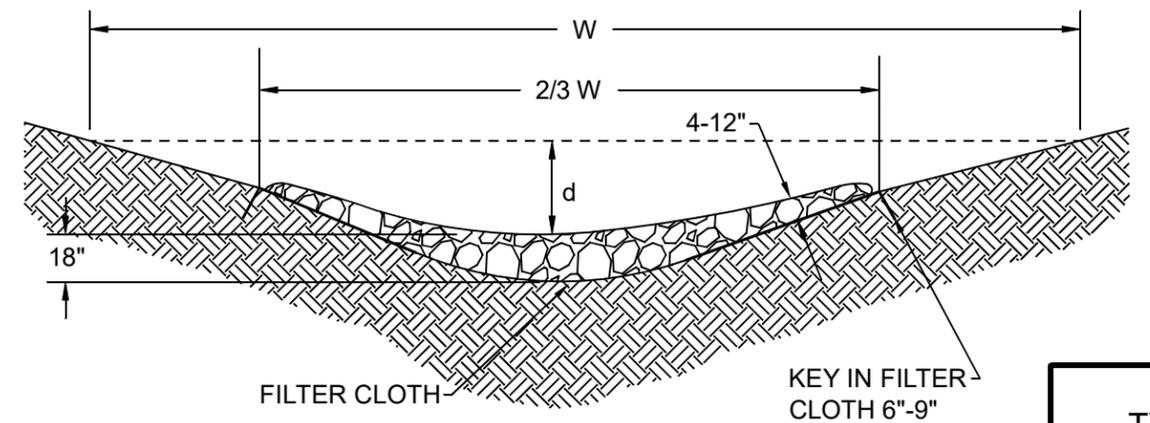
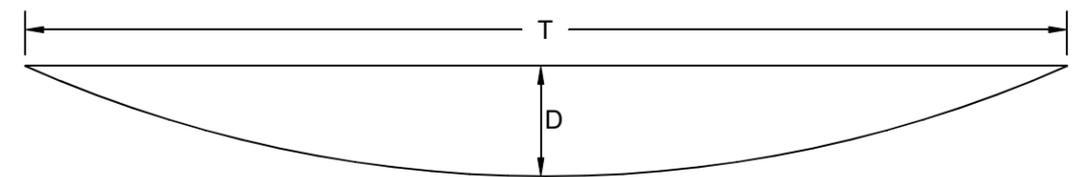
BRUSH
FABRIC
BARRIER



V-SHAPED WATERWAY

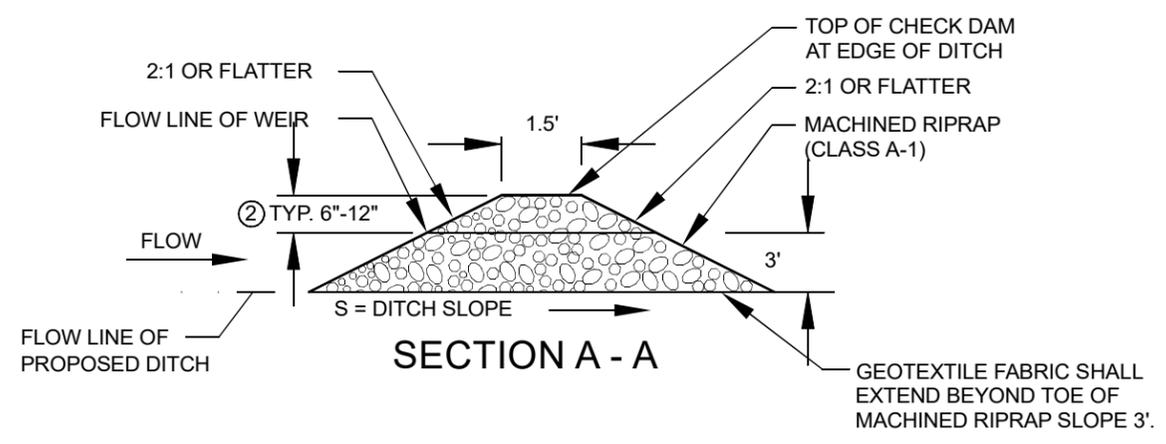


TRAPEZOIDAL WATERWAY



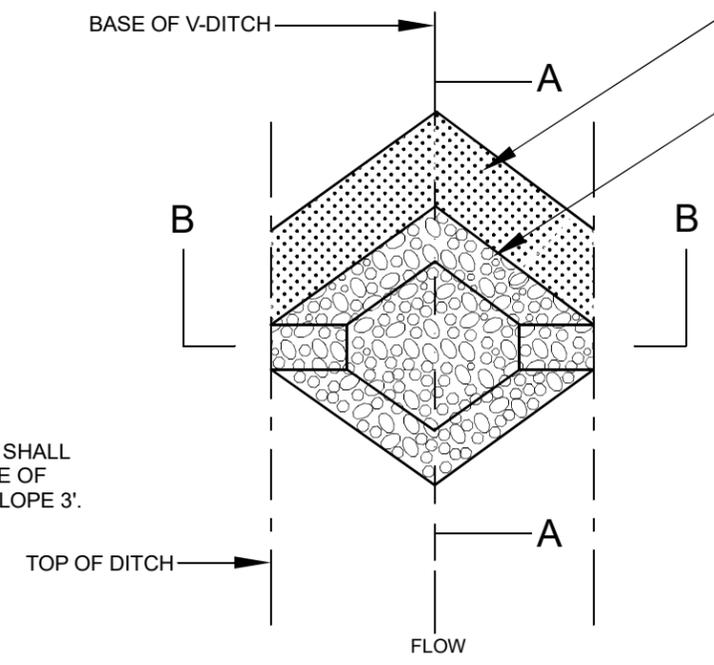
PARABOLIC WATERWAY

TYPICAL SECTIONS OF CHANNELS



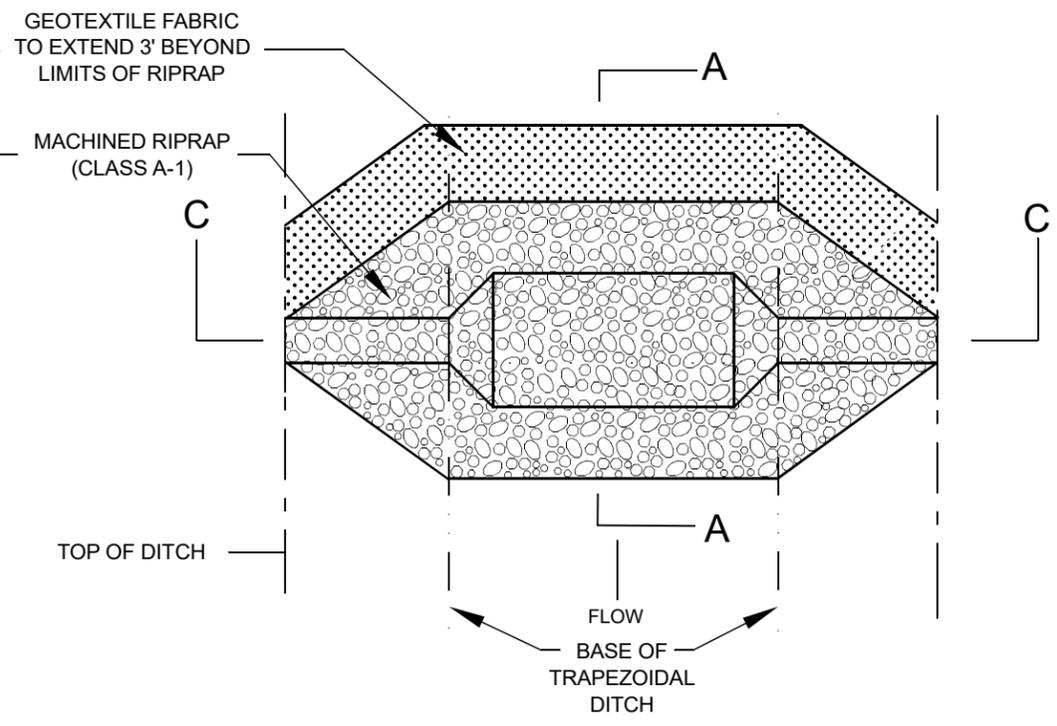
SECTION A - A

DETAIL FOR V-DITCH

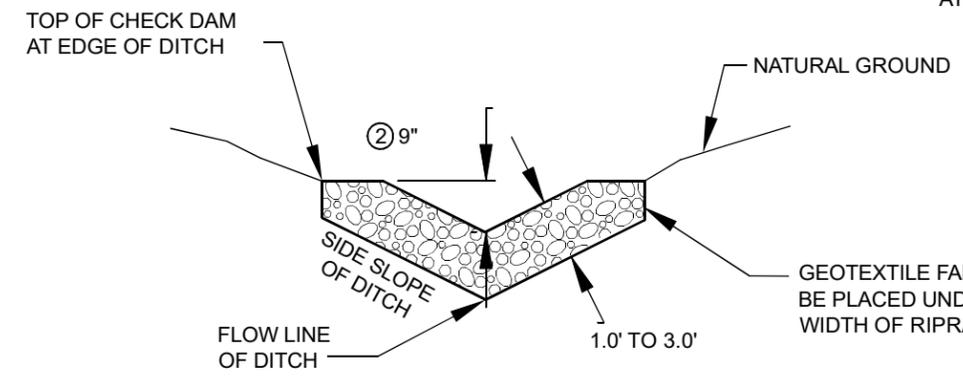


PLAN VIEW

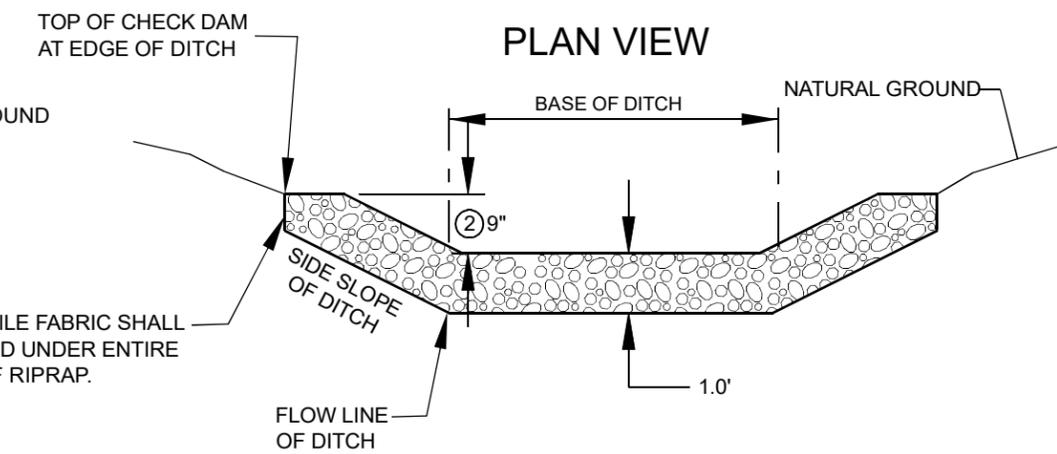
DETAIL FOR TRAPEZOIDAL DITCH



PLAN VIEW

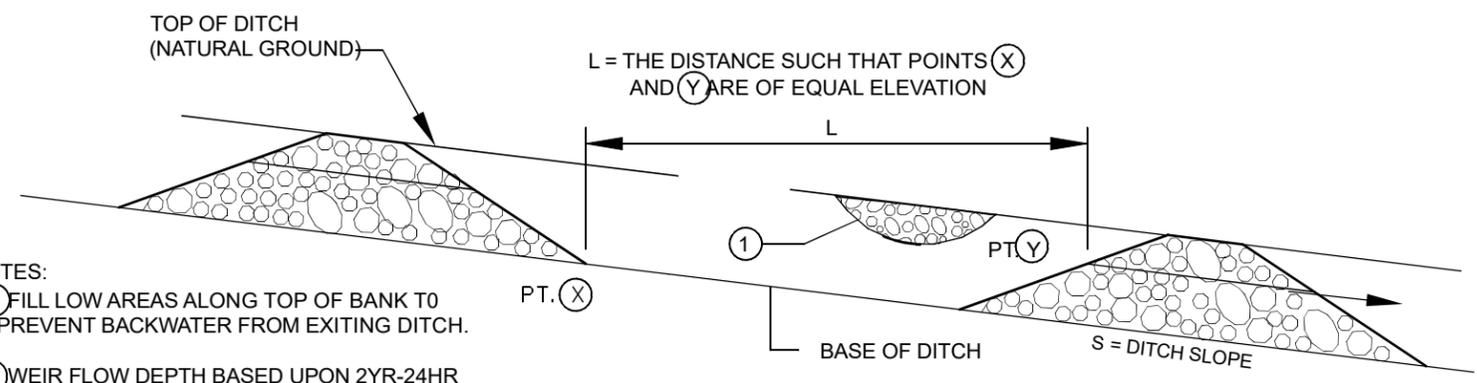


SECTION B - B



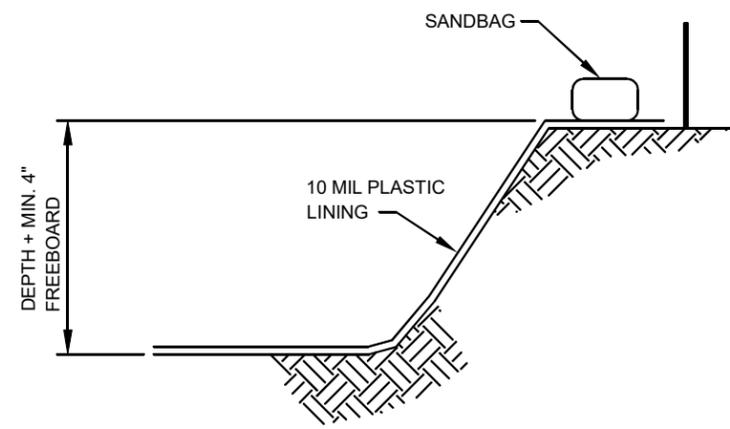
SECTION C - C

DETAIL FOR SPACING BETWEEN CHECK DAMS

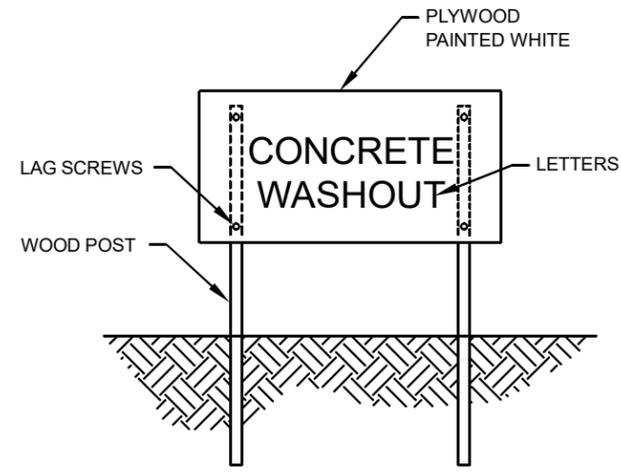


- NOTES:
① FILL LOW AREAS ALONG TOP OF BANK TO PREVENT BACKWATER FROM EXITING DITCH.
② WEIR FLOW DEPTH BASED UPON 2YR-24HR STORM EVENT OR 5YR-24HR STORM EVENT.

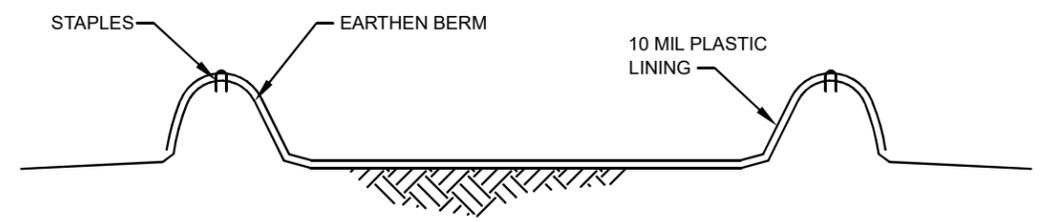
CHECK DAM



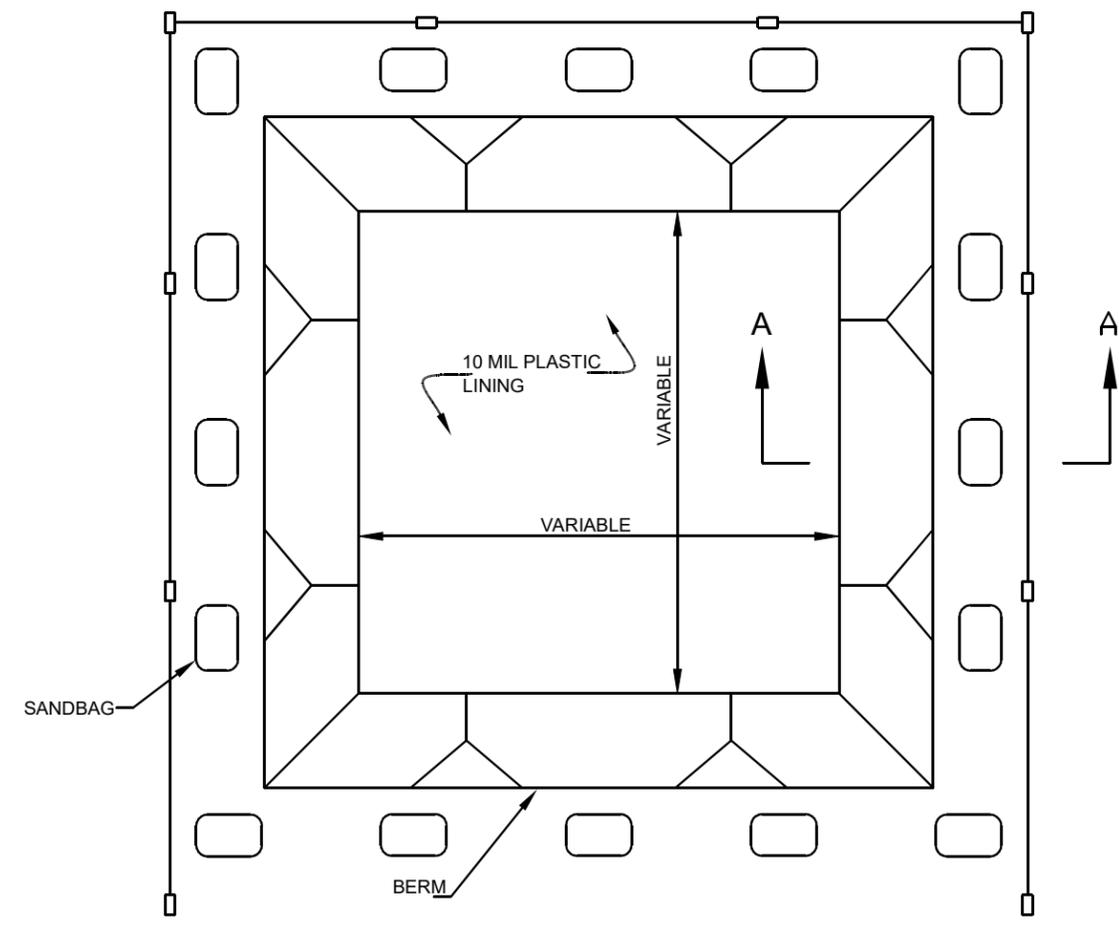
SECTION A-A



CONCRETE WASHOUT SIGN (OR EQUIVALENT)

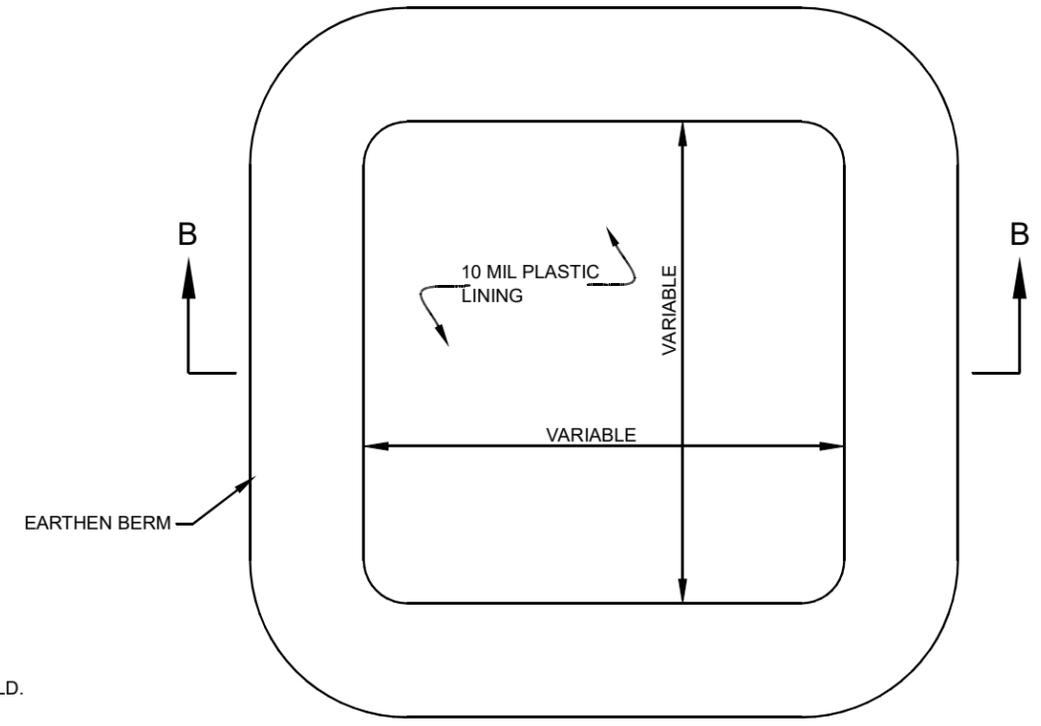


SECTION B-B



PLAN VIEW

TYPE "BELOW GRADE"



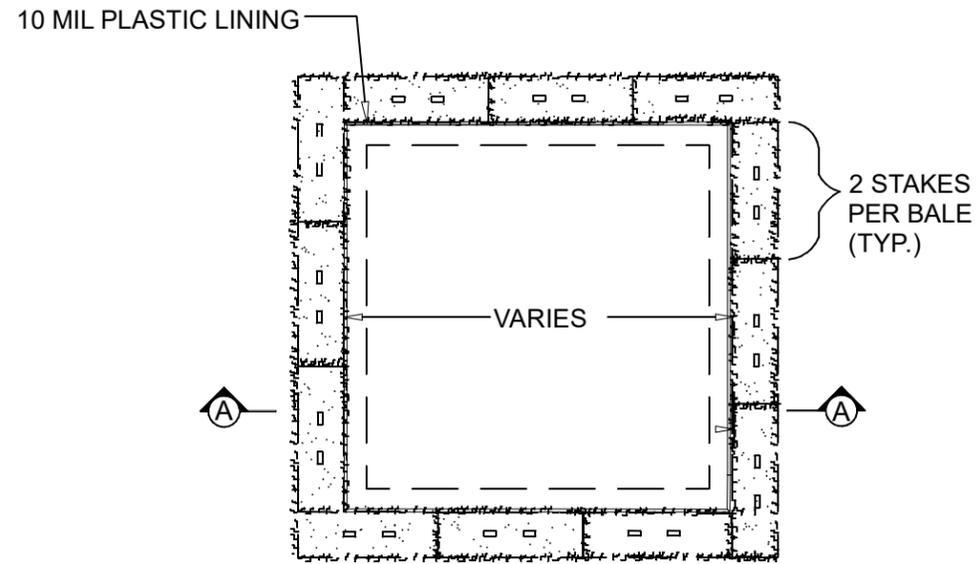
PLAN VIEW

TYPE "ABOVE GRADE" WITH EARTHEN BERMS

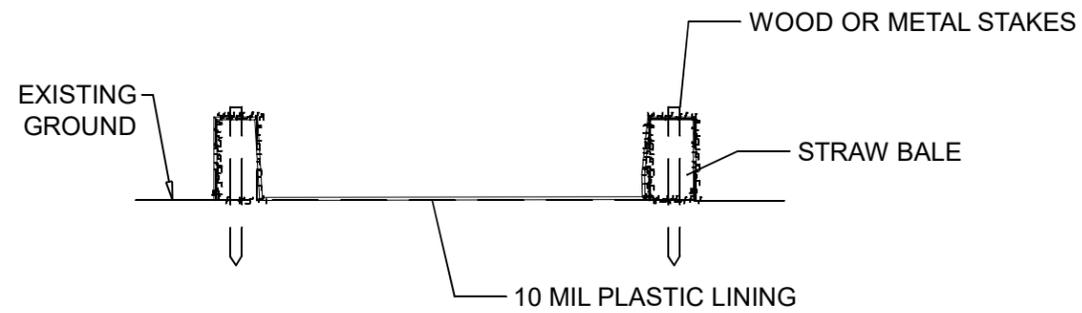
NOTES:

1. ACTUAL LAYOUT DETERMINED IN THE FIELD.
2. SIGNAGE IDENTIFYING THE CONCRETE WASHOUT AREA BE INSTALLED NEAR THE WASHOUT FACILITY.
3. LOCATE CONCRETE WASHOUT AWAY FROM STREAMS AND WETLANDS.
4. ONCE CONCRETE WASTES ARE WASHED INTO THE DESIGNATED AREA AND ALLOWED TO HARDEN THE CONCRETE SHALL BE BROKEN UP, REMOVED, AND DISPOSED OF PROPERLY.

CONCRETE WASHOUT



PLAN VIEW

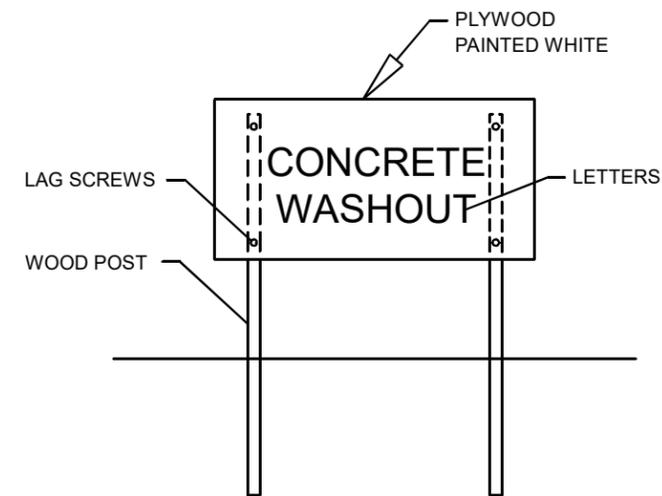


CROSS-SECTION A-A

ABOVE GRADE STRAW BALE
CONCRETE WASHOUT

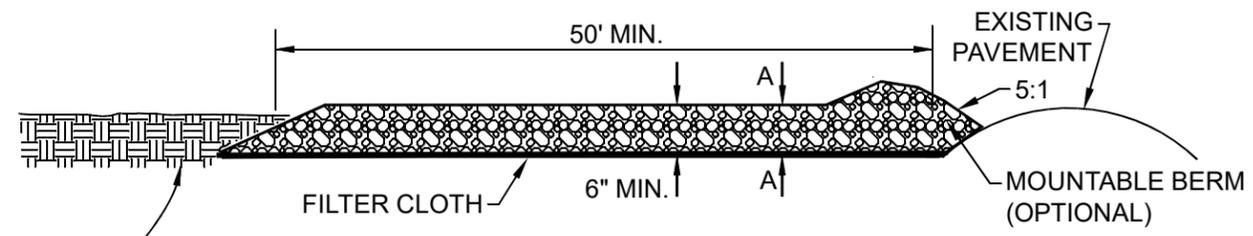
NOTES:

1. ACTUAL LAYOUT DETERMINED IN THE FIELD.
2. SIGNAGE IDENTIFYING THE CONCRETE WASHOUT AREA BE INSTALLED NEAR THE WASHOUT FACILITY.
3. LOCATE CONCRETE WASHOUT AWAY FROM STREAMS AND WETLANDS.
4. ONCE CONCRETE WASTES ARE WASHED INTO THE DESIGNATED AREA AND ALLOWED TO HARDEN THE CONCRETE SHALL BE BROKEN UP, REMOVED, AND DISPOSED OF PROPERLY.

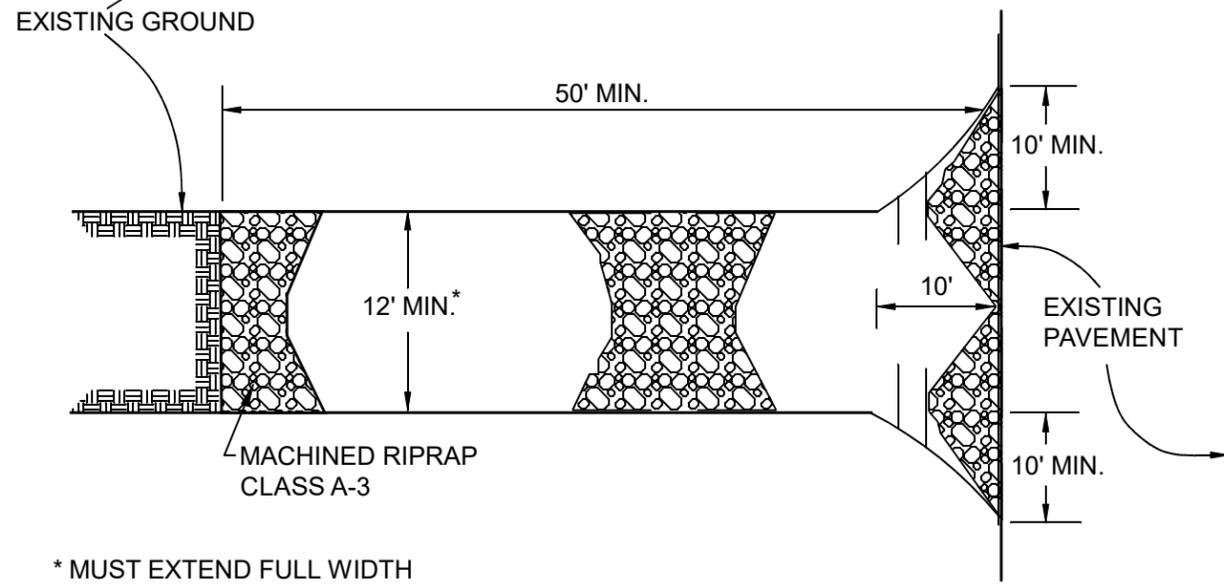


CONCRETE WASHOUT
SIGN (OR EQUIVALENT)

CONCRETE
WASHOUT

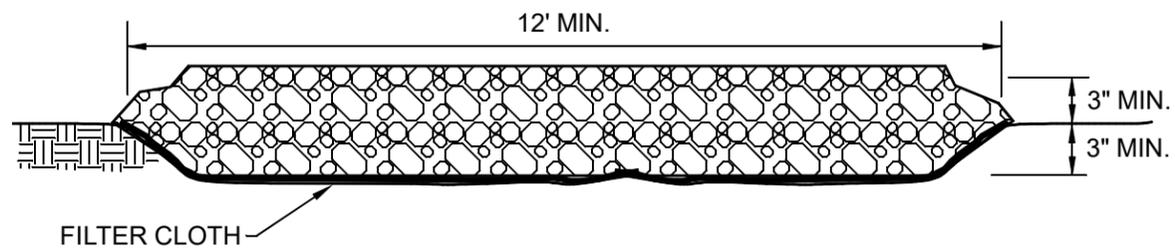


SIDE ELEVATION



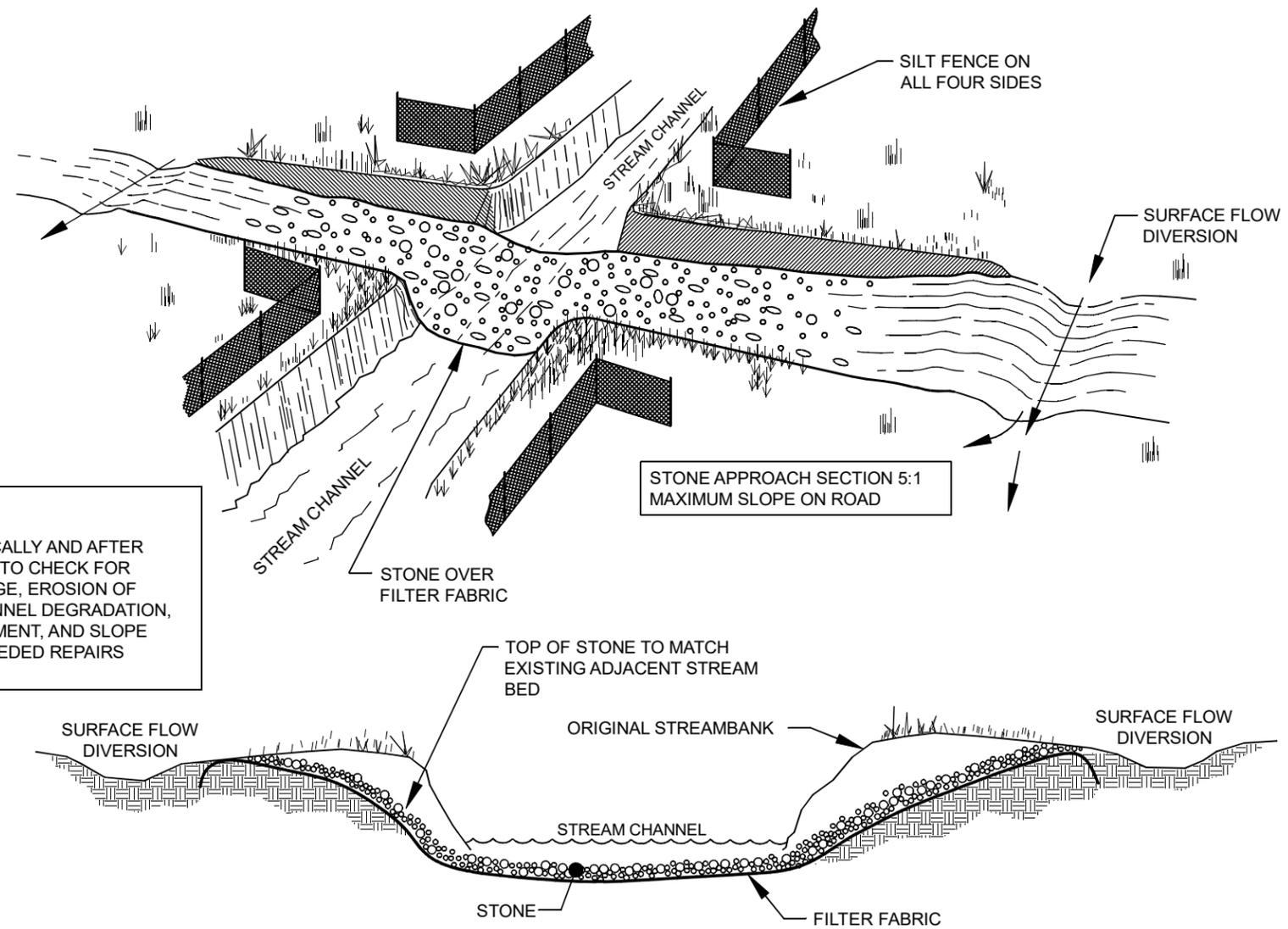
PLAN VIEW

* MUST EXTEND FULL WIDTH OF INGRESS AND EGRESS OPERATION



SECTION A-A

CONSTRUCTION EXIT

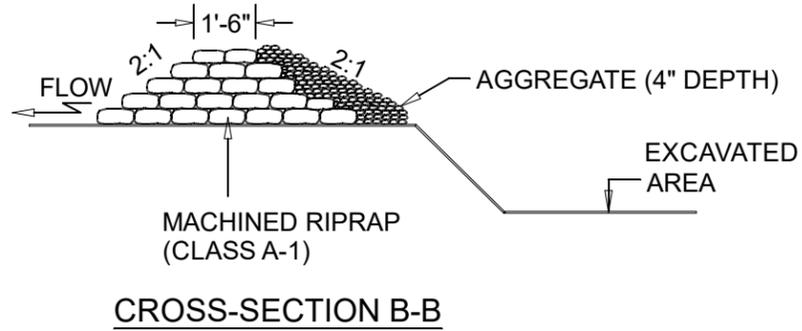
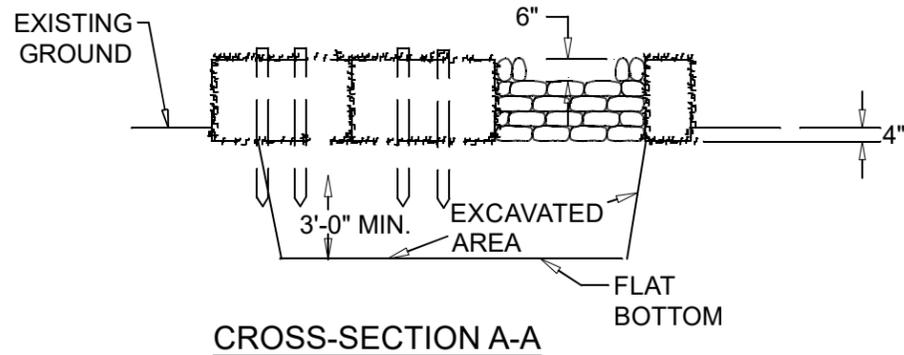
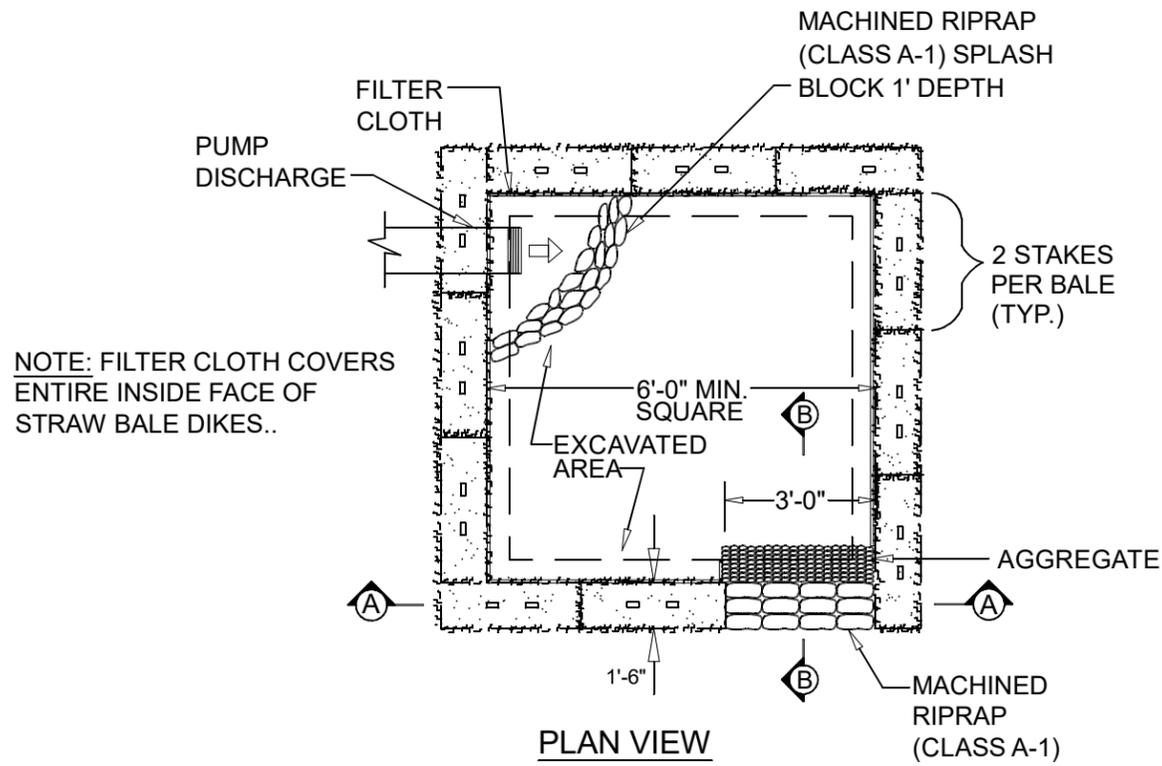


MAINTENANCE:

INSPECT PERIODICALLY AND AFTER MAJOR RAINFALLS TO CHECK FOR CHANNEL BLOCKAGE, EROSION OF ABUTMENTS, CHANNEL DEGRADATION, RIPRAP DISPLACEMENT, AND SLOPE FAILURE. MAKE NEEDED REPAIRS IMMEDIATELY.

STONE APPROACH SECTION 5:1
MAXIMUM SLOPE ON ROAD

TEMPORARY
CONSTRUCTION
FORD

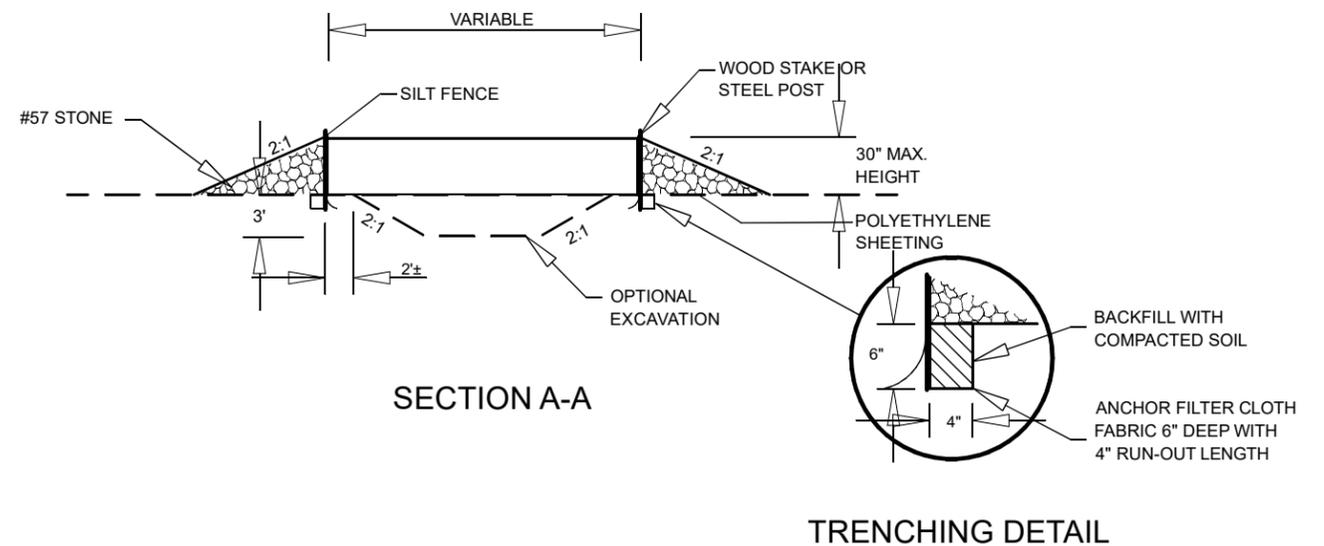
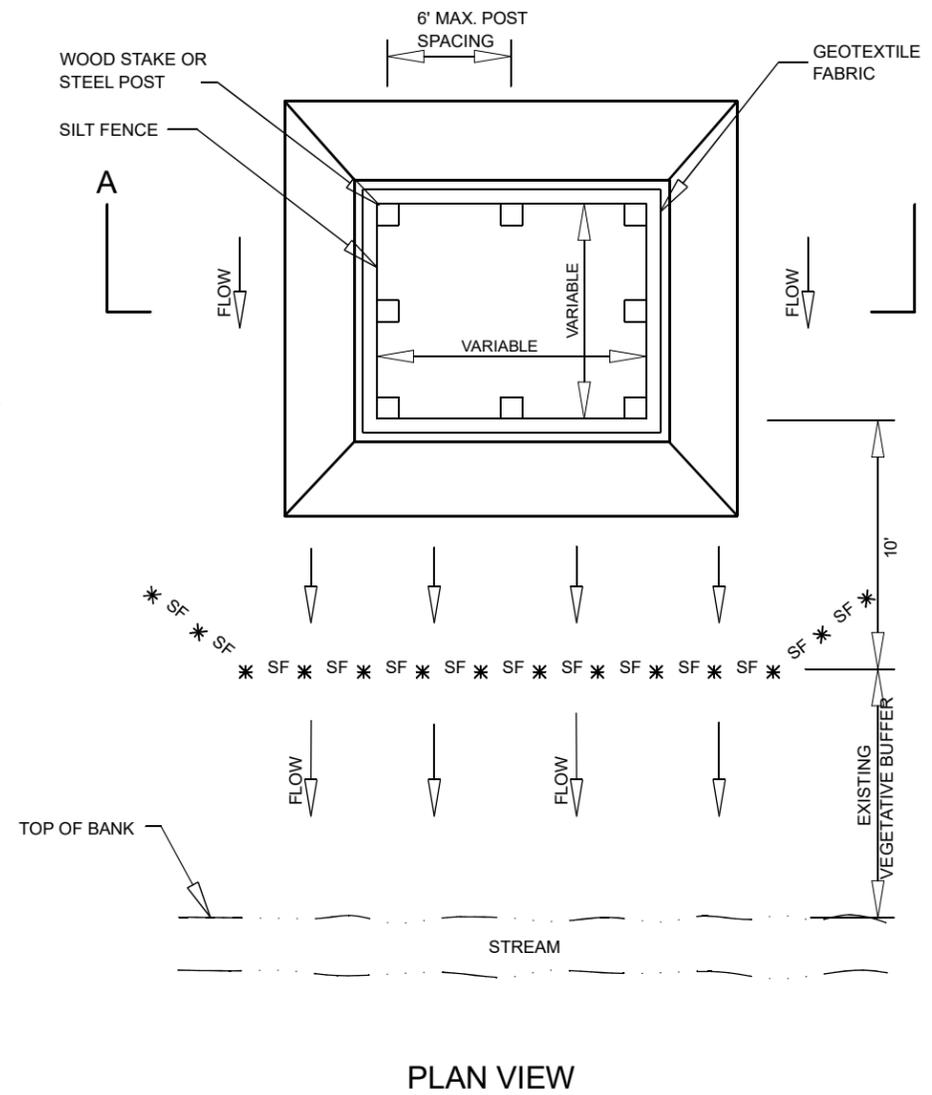


STRAW BALE DEWATERING STRUCTURE

ADAPTED FROM VIRGINIA STORMWATER MANAGEMENT HANDBOOK, DEPARTMENT OF ENVIRONMENTAL QUALITY, 2024

DEWATERING STRUCTURE VOLUMES AND DIMENSIONS			
PUMP DIAMETER (INCHES)	PUMP RATE (GALLONS PER MINUTE)	STORAGE VOLUME REQD (CUBIC YARDS)	INTERIOR DIMENSIONS
2	140	83	30' X 30'
3	260	154	41' X 41'
4	500	296	57' X 57'
6	1,100	652	85' X 85'

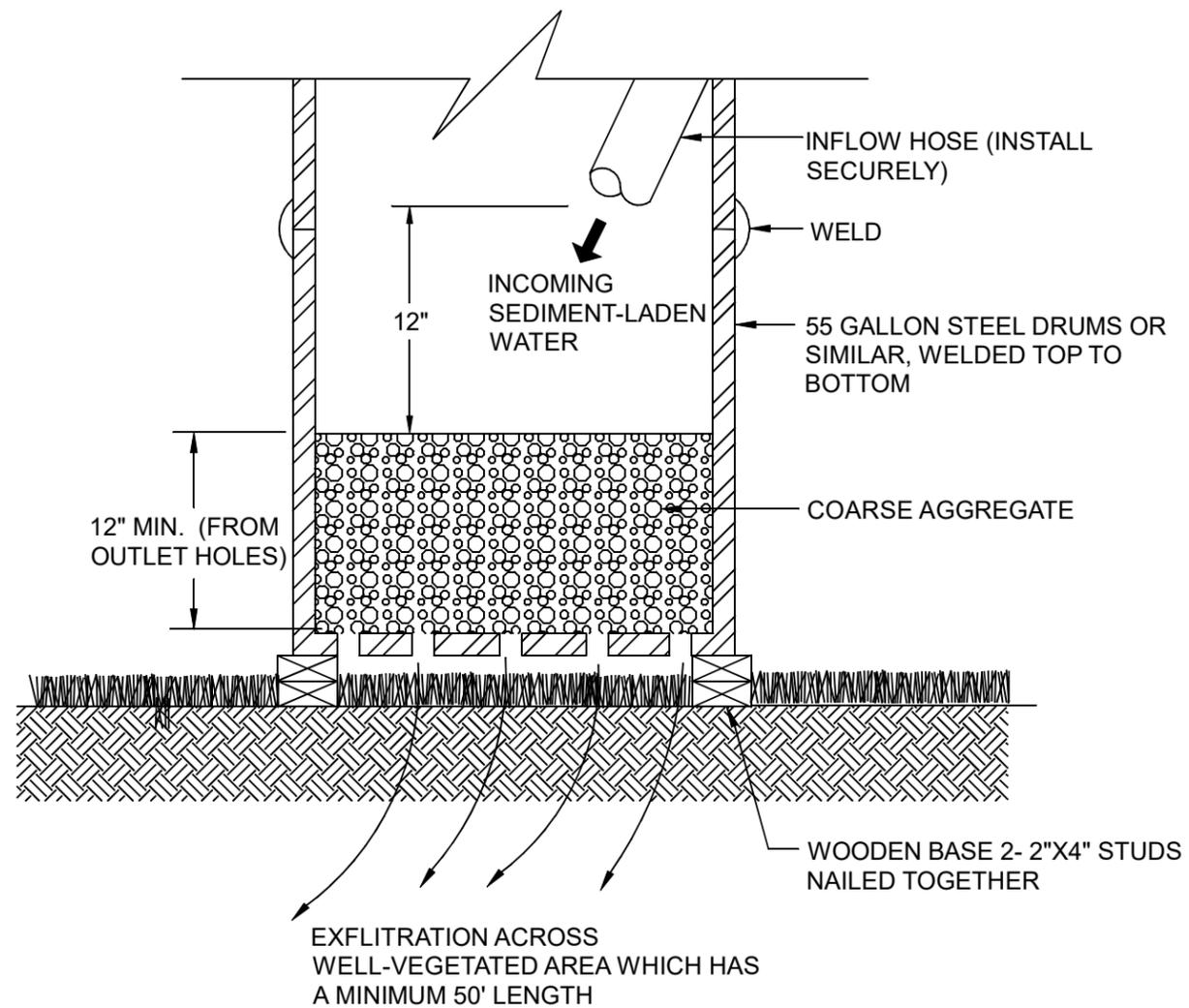
1. DIMENSIONS BASED ON THE MAXIMUM STRUCTURE HEIGHT OF 30" AND THE LENGTH BEING EQUAL TO THE WIDTH. OPTIONAL EXCAVATION IS NOT INCLUDED.
2. ADJUSTMENTS SHOULD BE MADE TO THE DIMENSIONS TO OBTAIN THE BEST CONFIGURATION FOR THE PROJECT SITE. DIMENSIONS ARE BASED ON THE DEWATERING STRUCTURE BEING HORIZONTAL.



SILT FENCE DEWATERING STRUCTURE

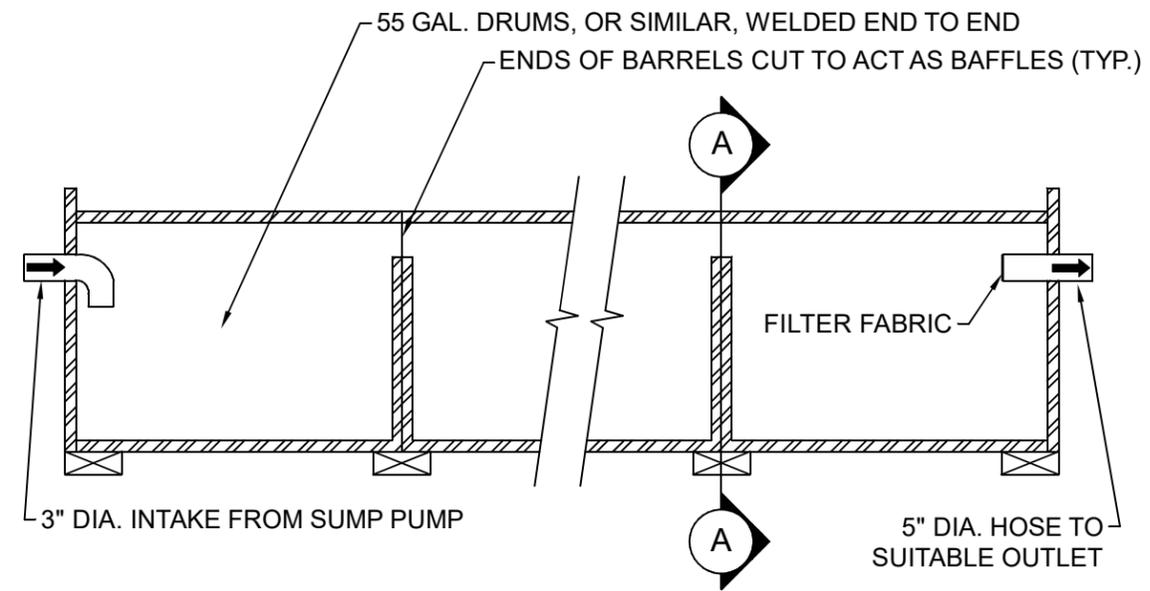
TRENCHING DETAIL

DEWATERING STRUCTURE

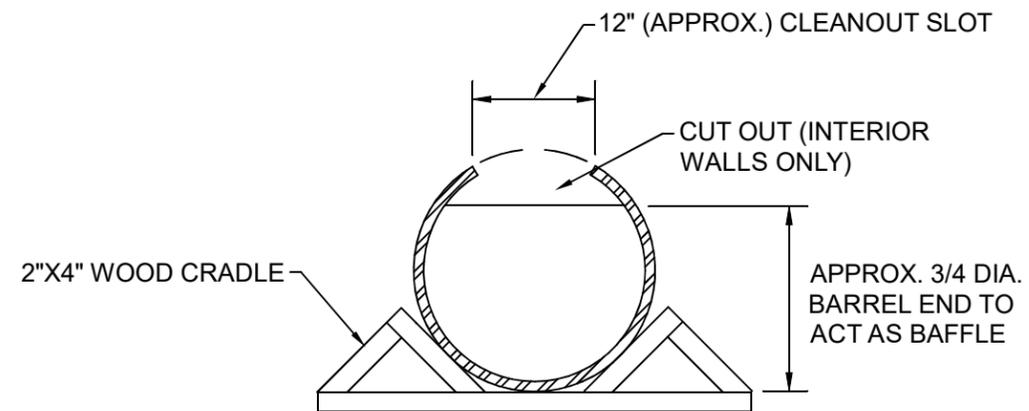


ELEVATION VIEW

FILTER BOX



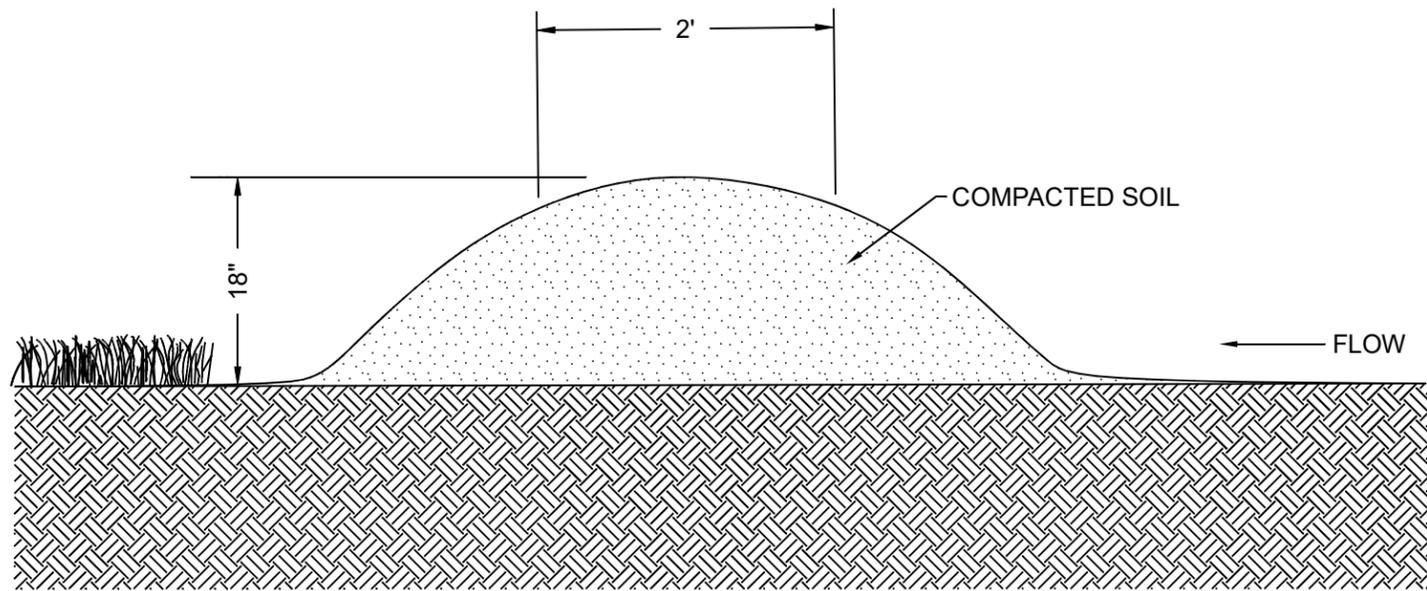
ELEVATION



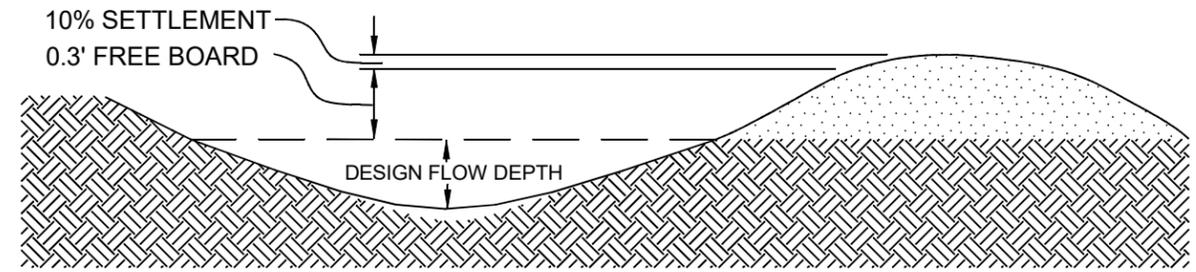
CROSS-SECTION A-A

PORTABLE SEDIMENT TANK

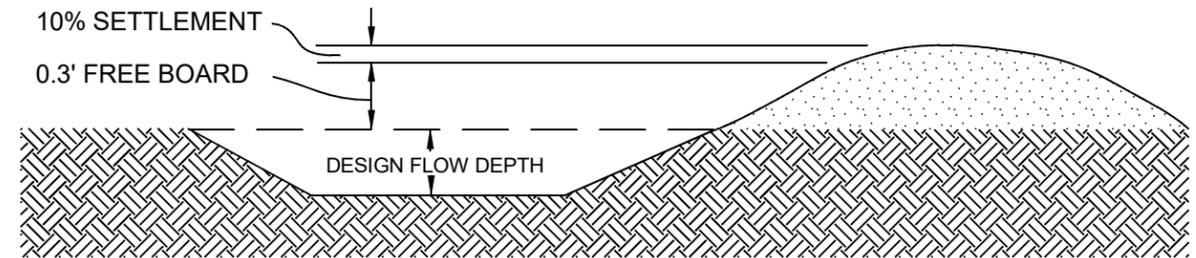
DEWATERING
STRUCTURE



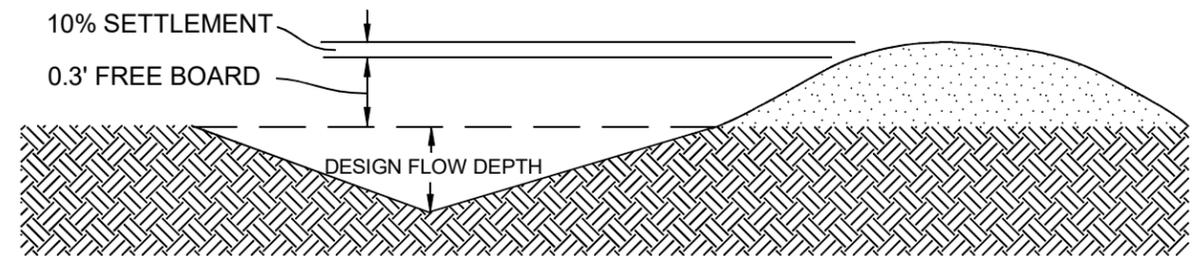
DIVERSION BERM



TYPICAL PARABOLIC DIVERSION

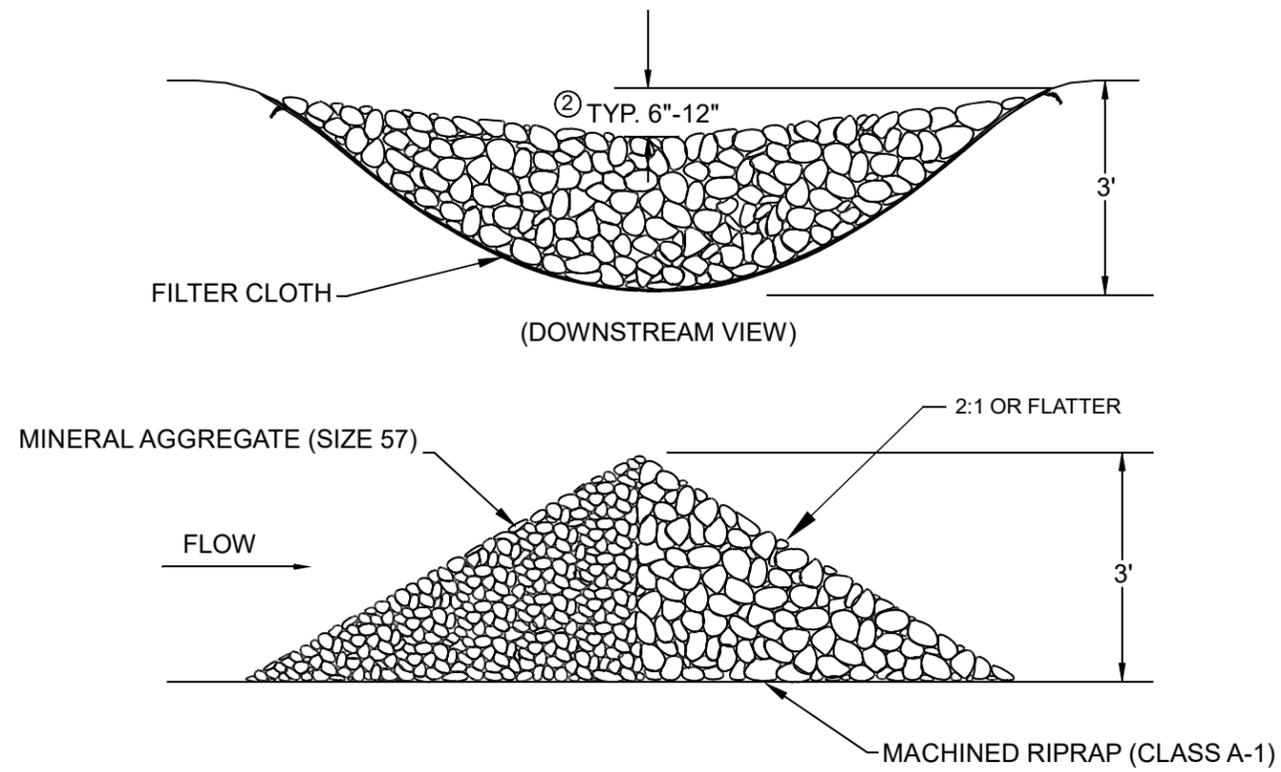


TYPICAL TRAPEZOIDAL DIVERSION



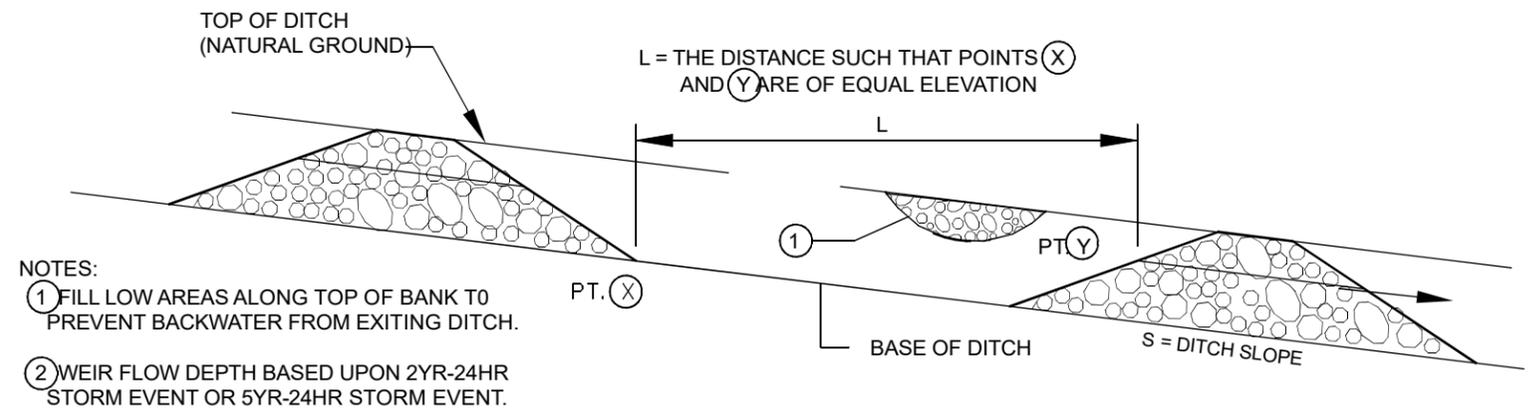
TYPICAL VEE-SHAPED DIVERSION

DIVERSION
BERM OR
DIKE



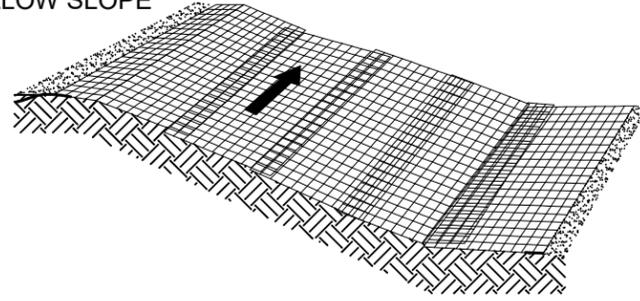
ENHANCED ROCK CHECK DAM

DETAIL FOR SPACING BETWEEN CHECK DAMS



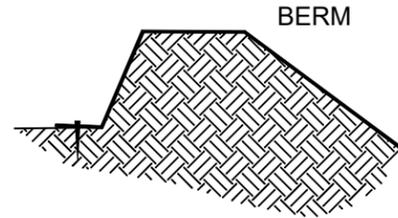
ENHANCED CHECK DAM

SHALLOW SLOPE

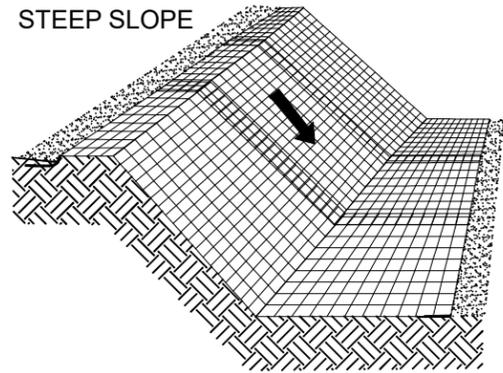


ON SHALLOW SLOPES, STRIPS OF NETTING PROTECTIVE COVERINGS MAY BE APPLIED ACROSS THE SLOPE.

WHERE THERE IS A BERM AT THE TOP OF THE SLOPE, BRING THE MATERIAL OVER THE BERM AND ANCHOR IT BEHIND THE BERM.

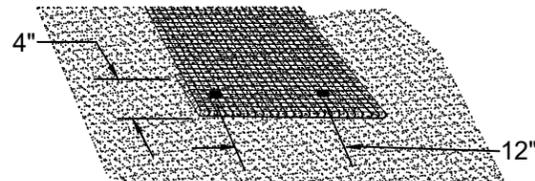


STEEP SLOPE

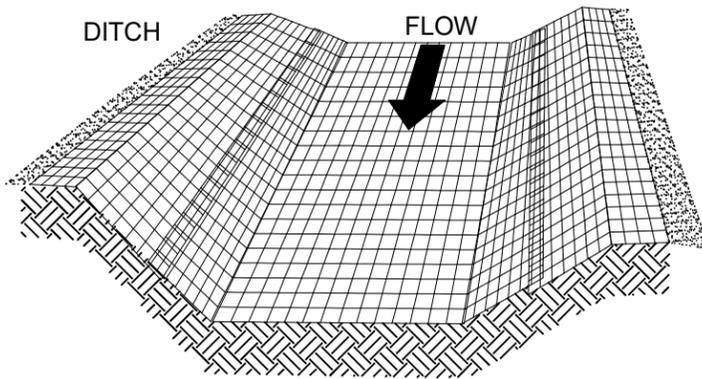


ON STEEP SLOPES, APPLY PROTECTIVE COVERING PARALLEL TO THE DIRECTION OF FLOW AND ANCHOR SECURELY.

BRING MATERIAL DOWN TO A LEVEL AREA BEFORE TERMINATING THE INSTALLATION. TURN THE END UNDER 4" AND STAPLE AT 12" INTERVALS.

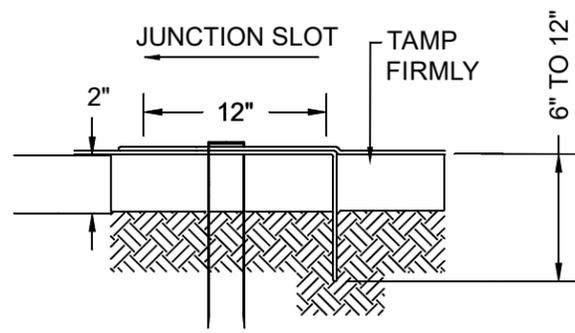
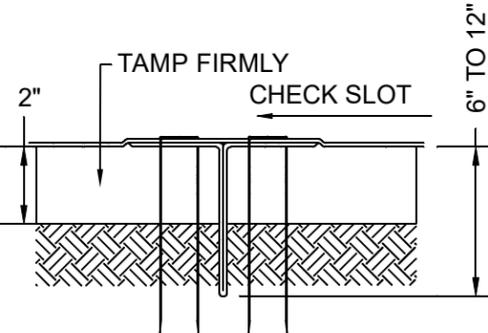
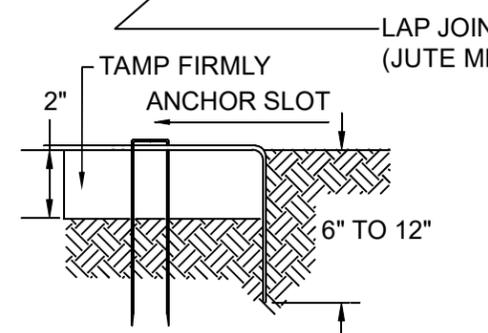
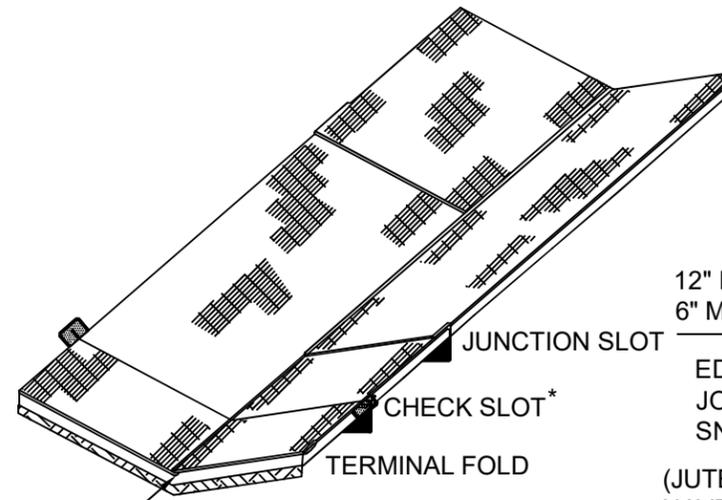


DITCH



IN DITCHES, APPLY PROTECTIVE COVERING PARALLEL TO THE DIRECTION OF FLOW. USE CHECK SLOTS AS REQUIRED. AVOID JOINING MATERIAL IN THE CENTER OF THE DITCH IF AT ALL POSSIBLE.

TYPICAL ORIENTATION OF EROSION CONTROL BLANKET



ANCHOR SLOT

NOTES

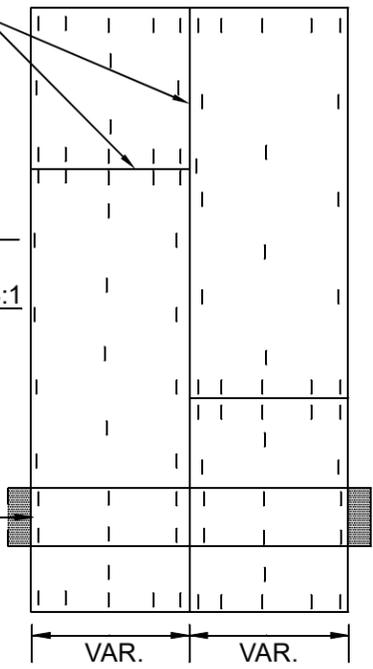
APPROXIMATELY 200 STAPLES RECOMMENDED PER 100 SQ. YDS. OF MATERIAL ROLL. ANCHOR SLOTS, JUNCTION SLOTS & CHECK SLOTS TO BE BURIED 6" TO 12".

12" MAX. 4:1 OR FLATTER
6" MAX. STEEPER THAN 4:1

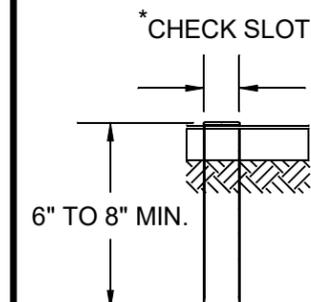
EDGE AND END JOINTS TO BE SNUGLY ABUTTED

(JUTE MESH WILL HAVE STAPLED LAP JOINT IN) LIEU OF EDGE JOINT

5' MAX. 4:1 OR FLATTER
3' MAX. STEEPER THAN 4:1



PLAN VIEW STAPLING DIAGRAM

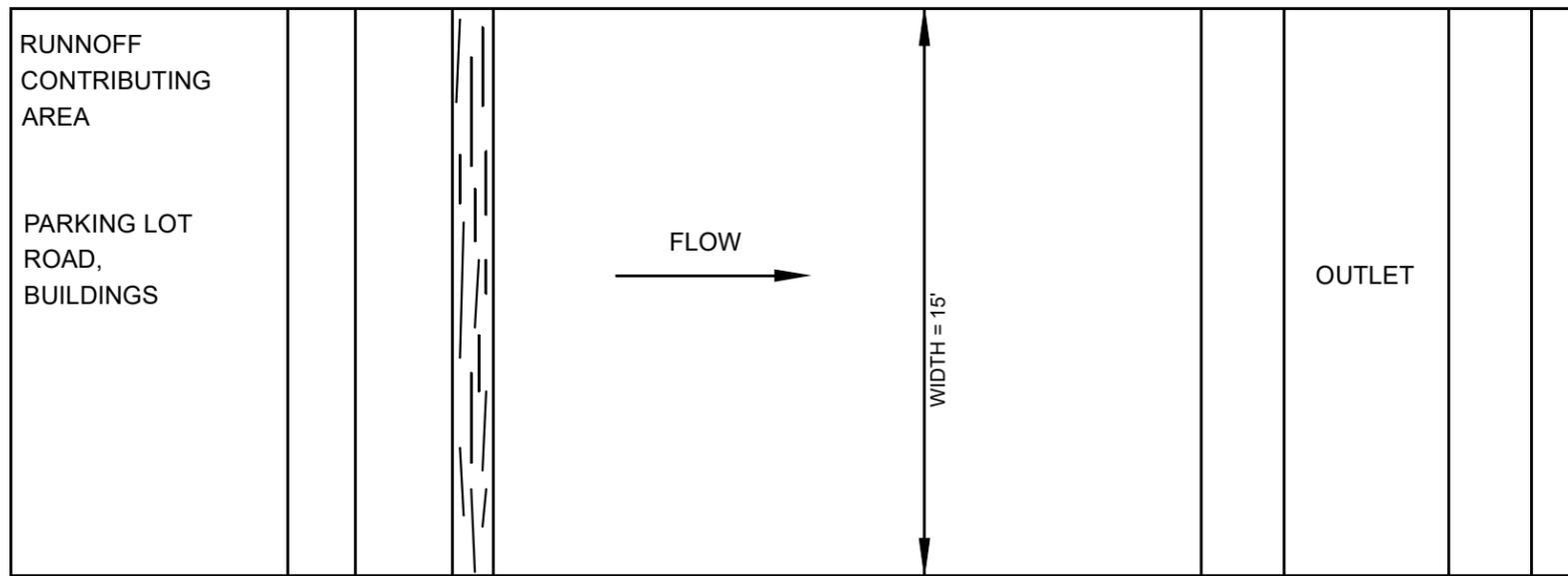


STAPLE FORMED FROM NO.11 STEEL WIRE. 8" STAPLE MIN. LENGTH FOR SANDY SOIL. 6" STAPLE MIN. LENGTH FOR OTHER SOIL.

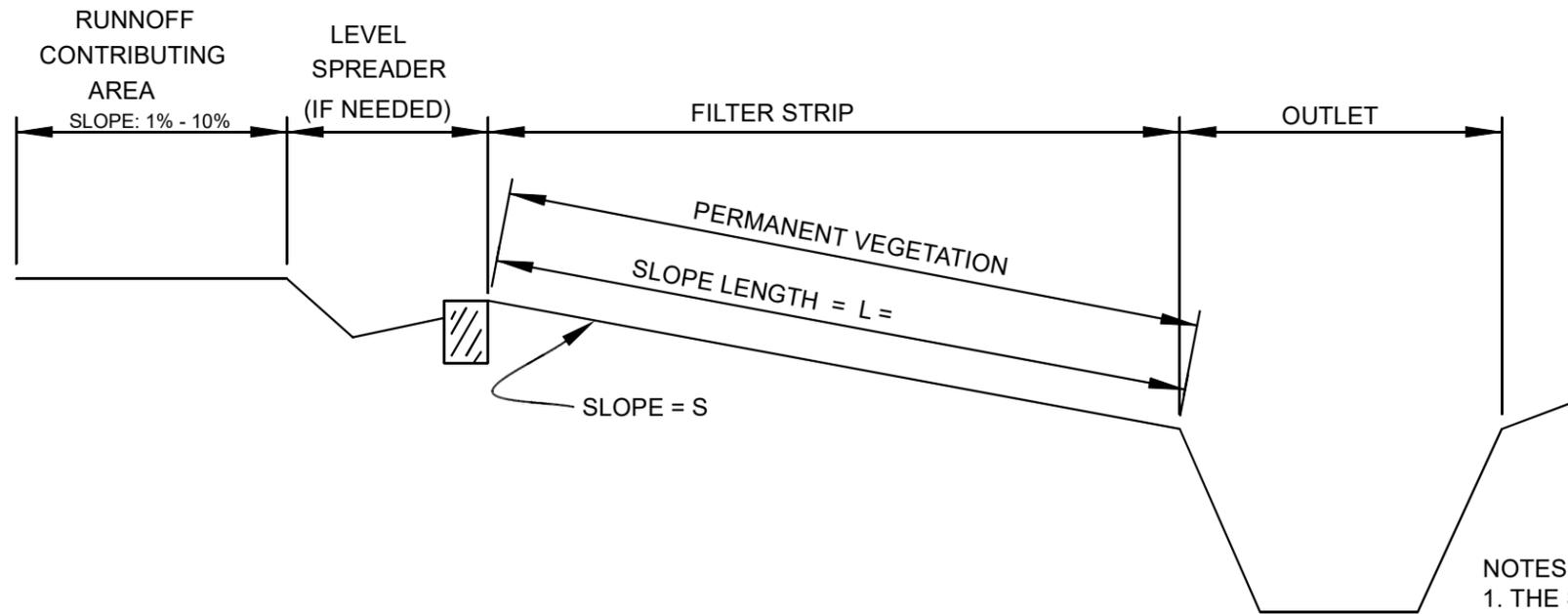
* CHECK SLOTS AT MIN. 50' C-C INTERVALS; NOT REQ'D WITH ALL "COMBINATION" BLANKETS

INSTALLATION OF EROSION CONTROL BLANKET

EROSION CONTROL BLANKET



PLAN VIEW

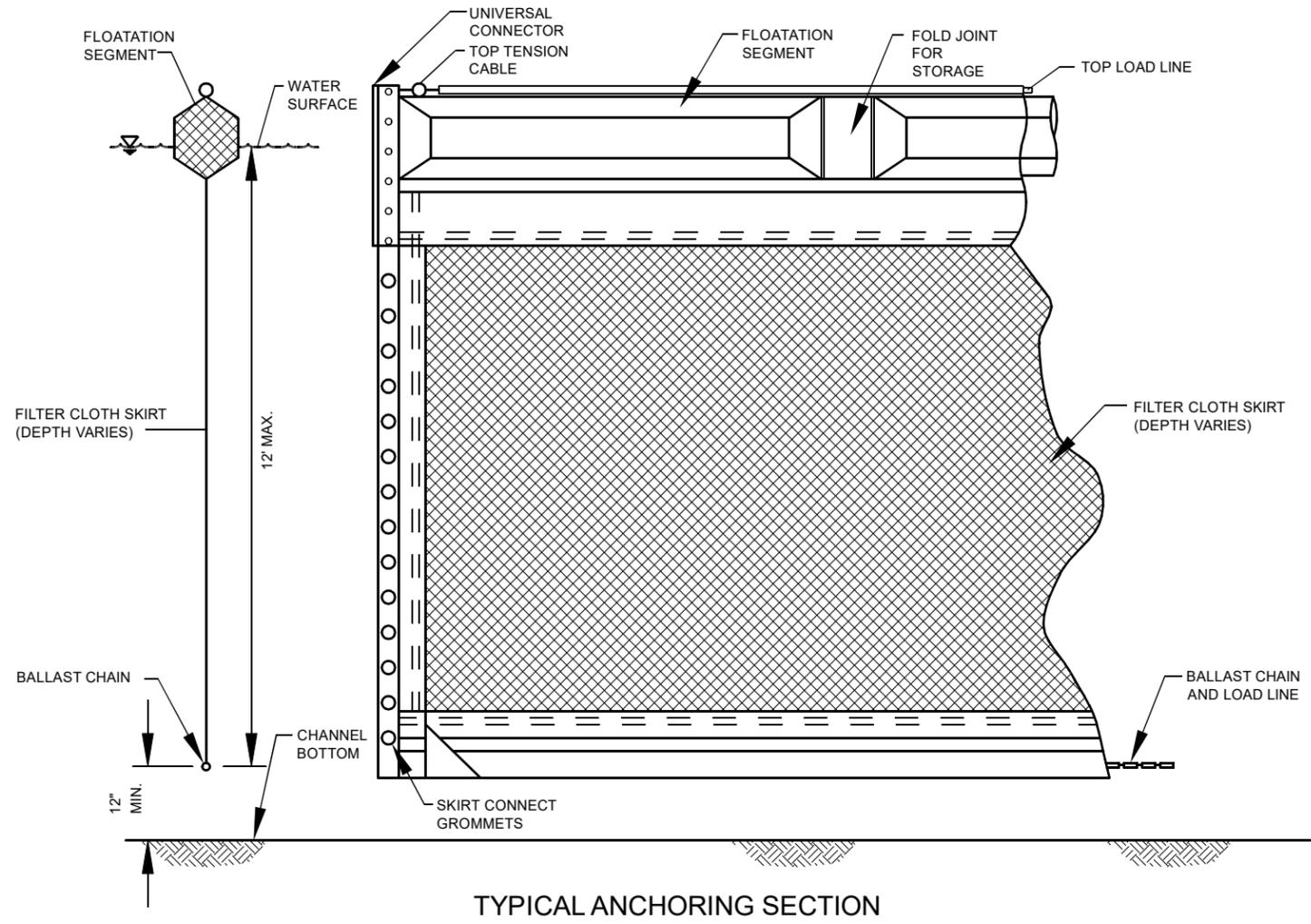


SECTION VIEW

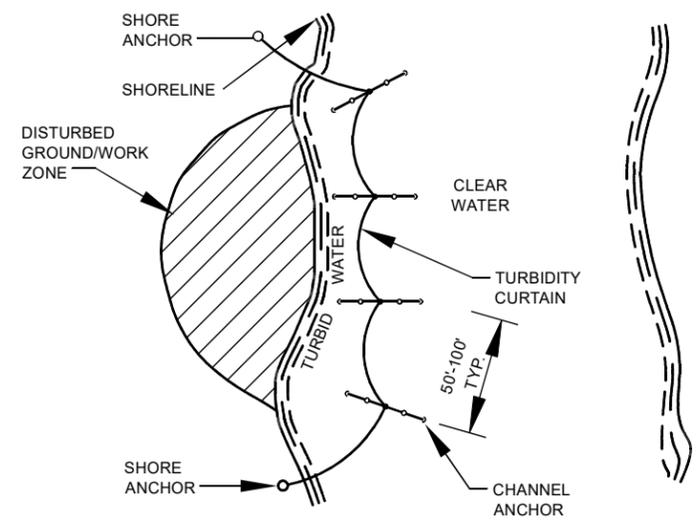
NOTES:

1. THE SLOPE OF THE DRAINAGE AREA ABOVE A FILTER STRIP SHOULD BE GREATER THAN 1% BUT LESS THAN 10%.
2. PERMANENT GRASSES ARE TO BE PROJECT SPECIFIC. COVERAGE SHOULD BE 90% VEGETATION.

FILTER STRIP

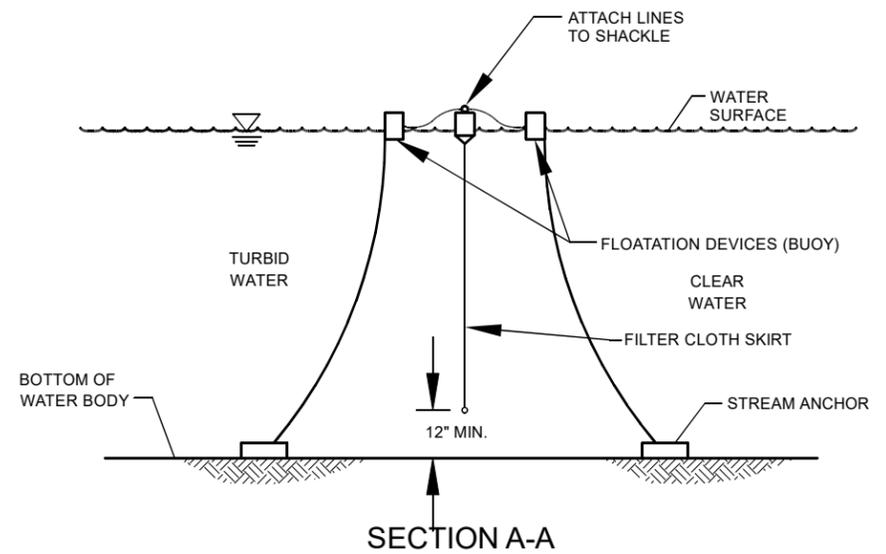


TYPICAL ANCHORING SECTION

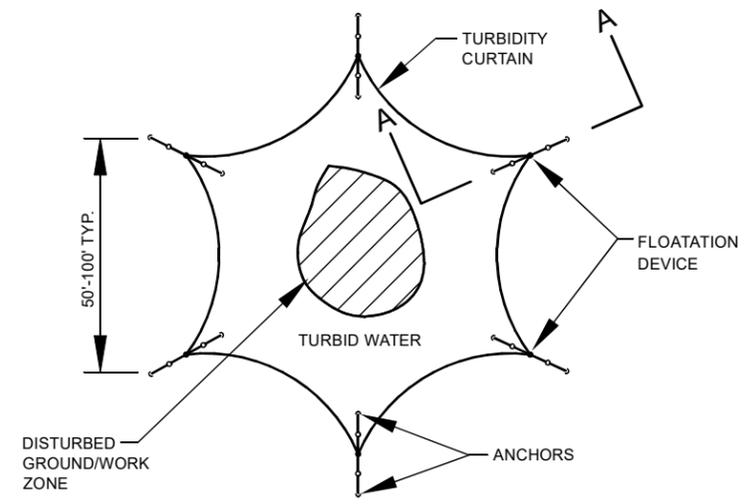


PLAN VIEW

TYPICAL ANCHORING PLAN FOR SHORELINE WORK



SECTION A-A

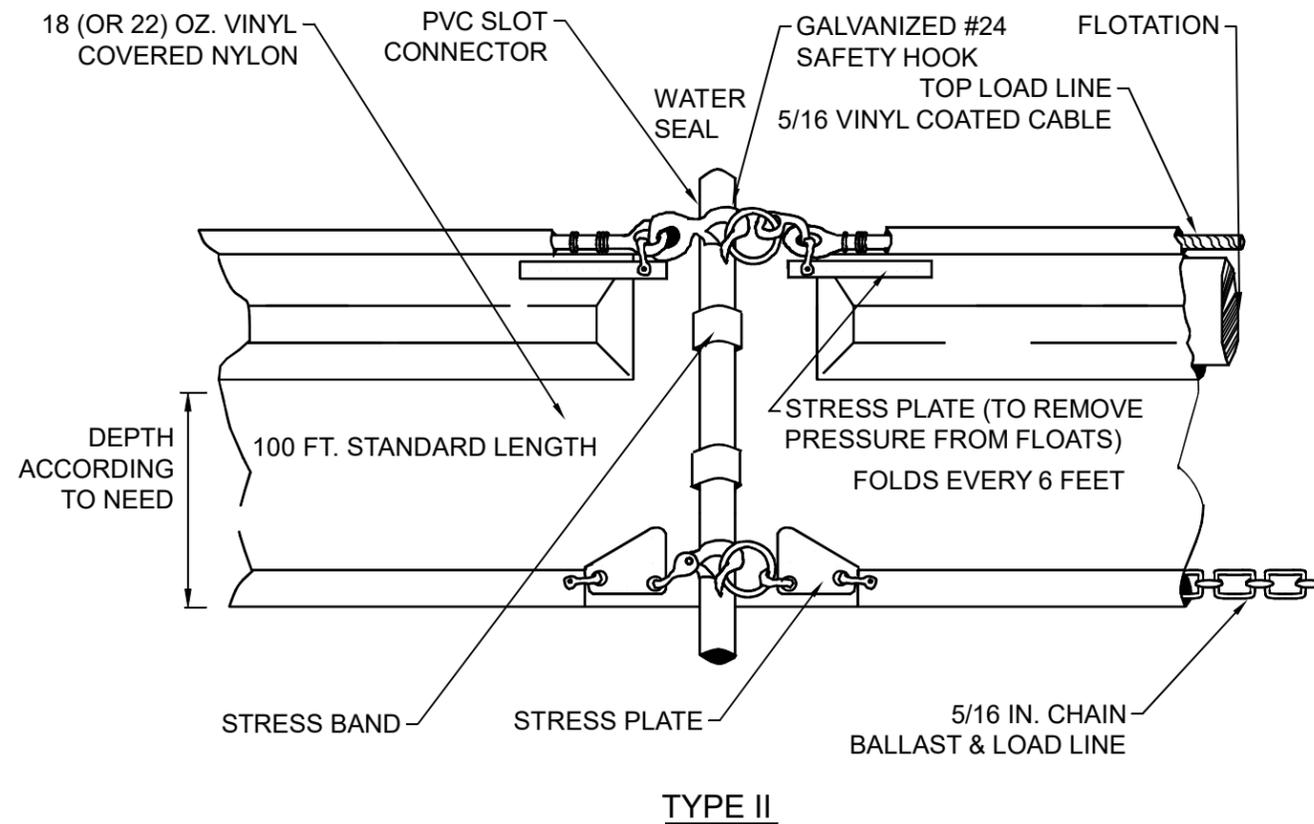
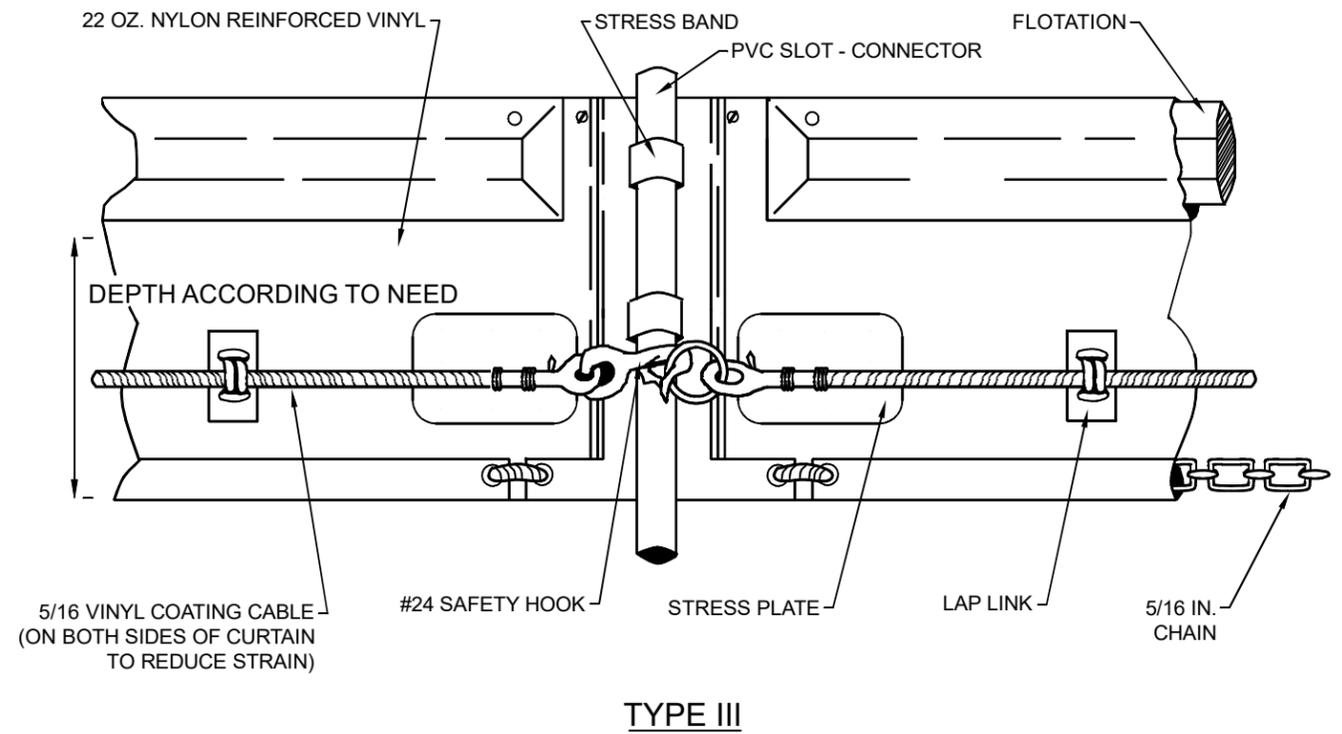
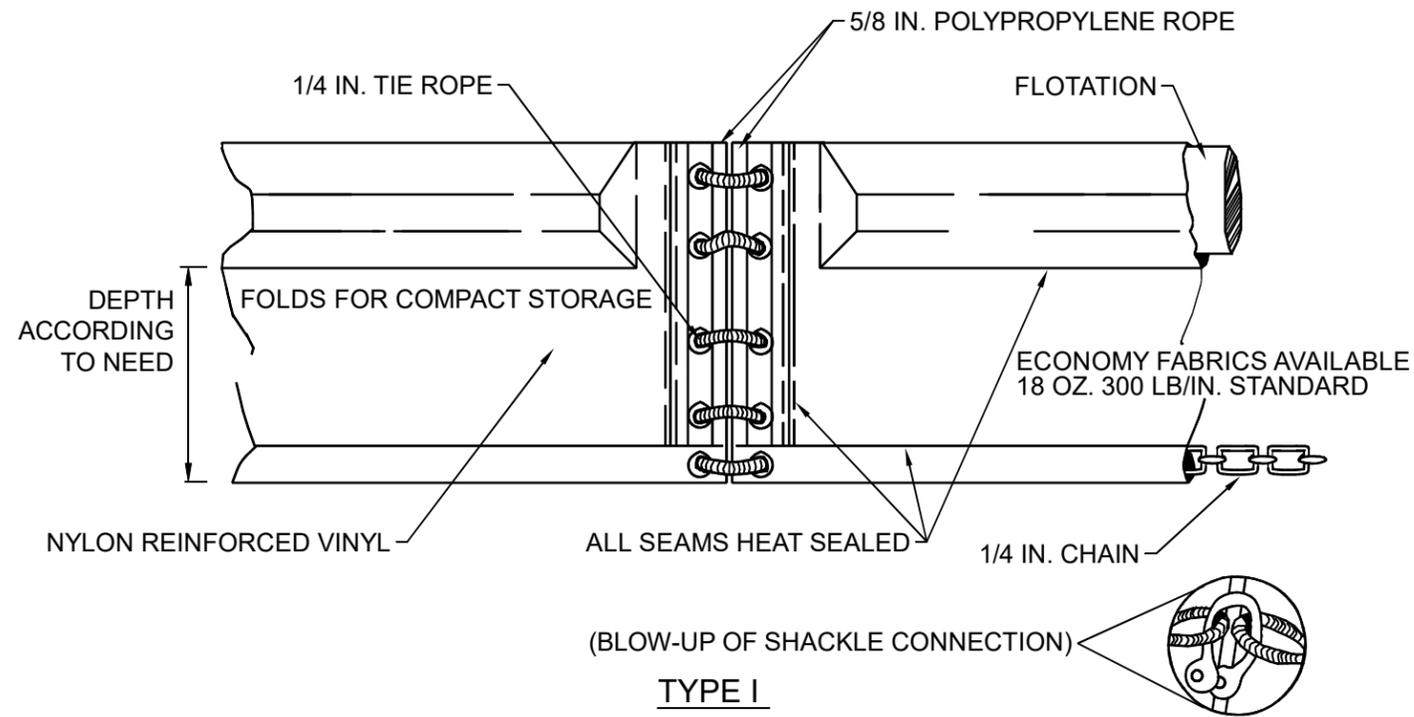


PLAN VIEW

TYPICAL ANCHORING PLAN FOR MID CHANNEL WORK (BRIDGE PIER, CAISSON, ETC.)

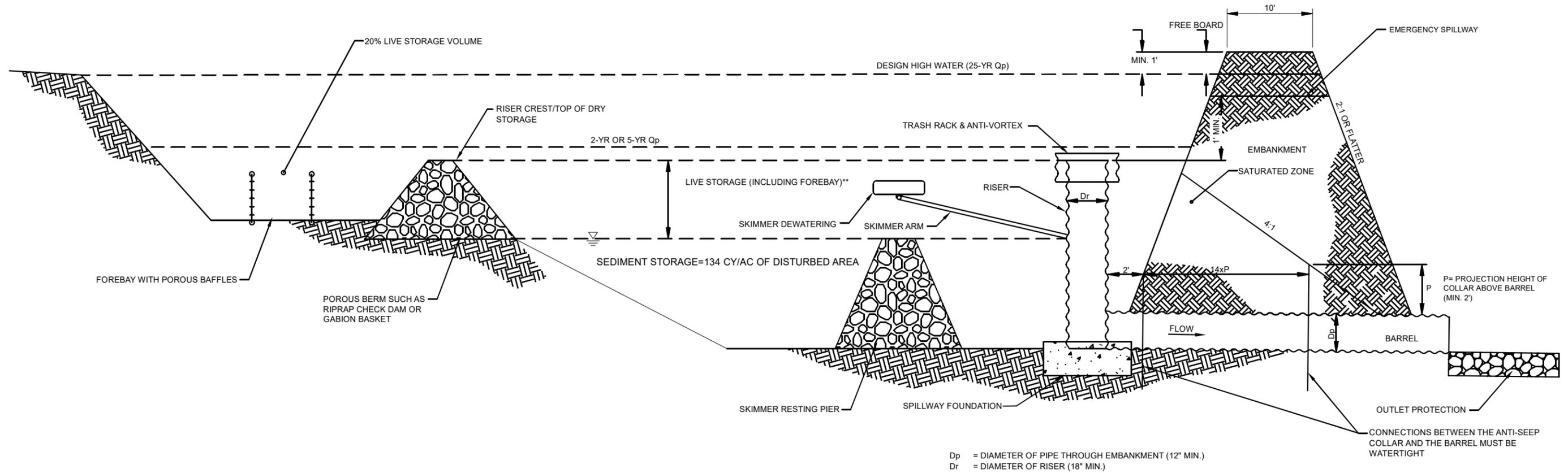
NOT TO SCALE

FLOATING TURBIDITY CURTAIN INSTALLATION



FLOATING
TURBIDITY
CURTAIN
TYPES

**LIVE STORAGE IS CALCULATED BY THE DESIGN STORM FOR THE ENTIRE DRAINAGE AREA.
 LIVE STORAGE = RUNOFF VOLUME FROM DURING CONSTRUCTION - RUNOFF VOLUME FROM PRE CONSTRUCTION

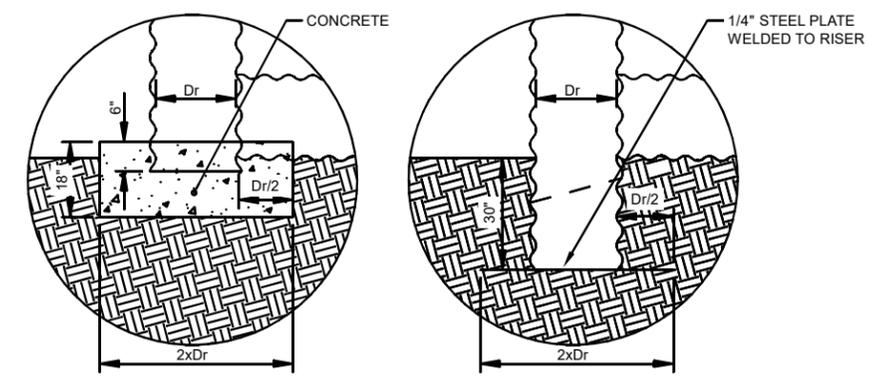


D_p = DIAMETER OF PIPE THROUGH EMBANKMENT (12" MIN.)
 D_r = DIAMETER OF RISER (18" MIN.)

NOTES:

1. DEWATERING MECHANISMS CAN VARY AS LONG AS DEWATERING OCCURS NEAR THE SURFACE. SEE SECTIONS ON SKIMMER AND PERFORATED RISER PIPE.

SPILLWAY FOUNDATIONS FOR RISER HEIGHTS <10'

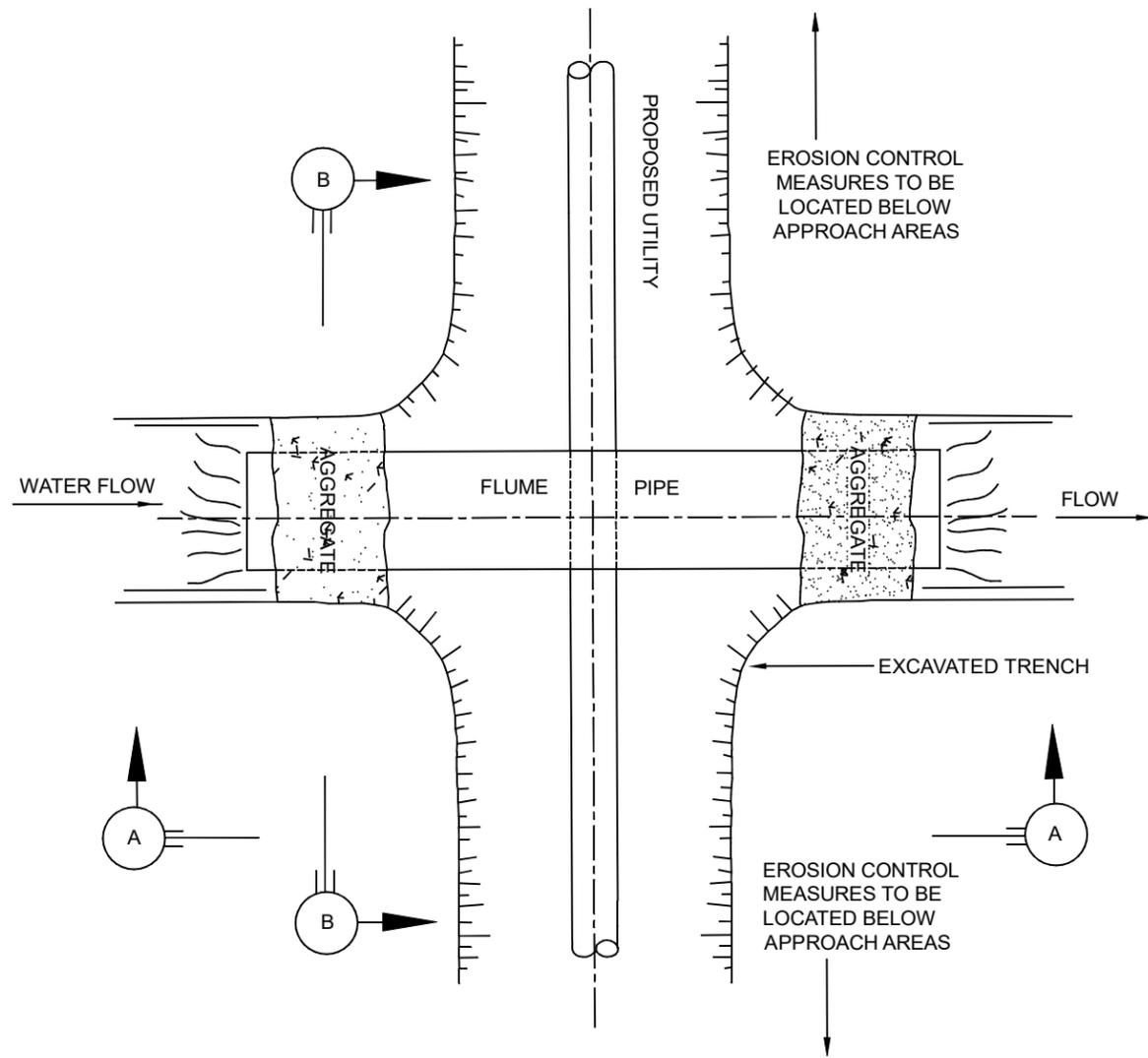


CONCRETE BASE FOR EMBANKMENT 10 OR LESS IN HEIGHT

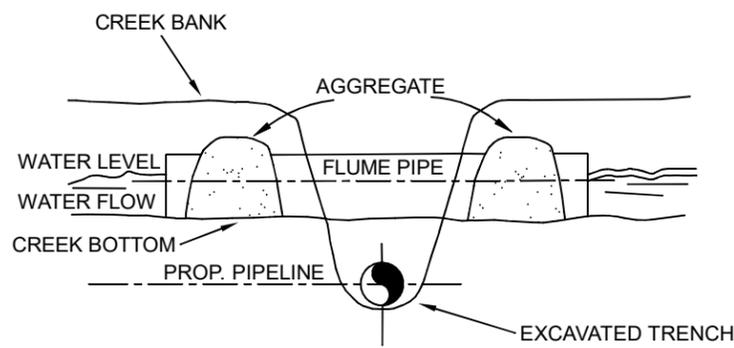
STEEL BASE FOR EMBANKMENT 10 OR LESS IN HEIGHT

FLOW THROUGH
 SEDIMENT
 BASIN

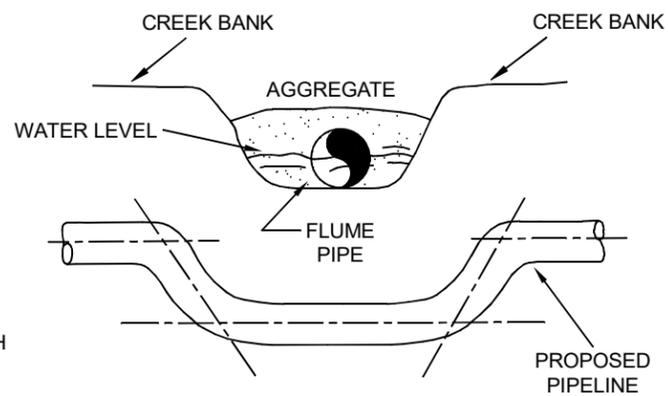
*DESIGN ELEVATIONS AND VOLUMES SHOULD BE INCLUDED ON DRAWINGS TO PROVIDE A SITE SPECIFIC DESIGN



PLAN VIEW



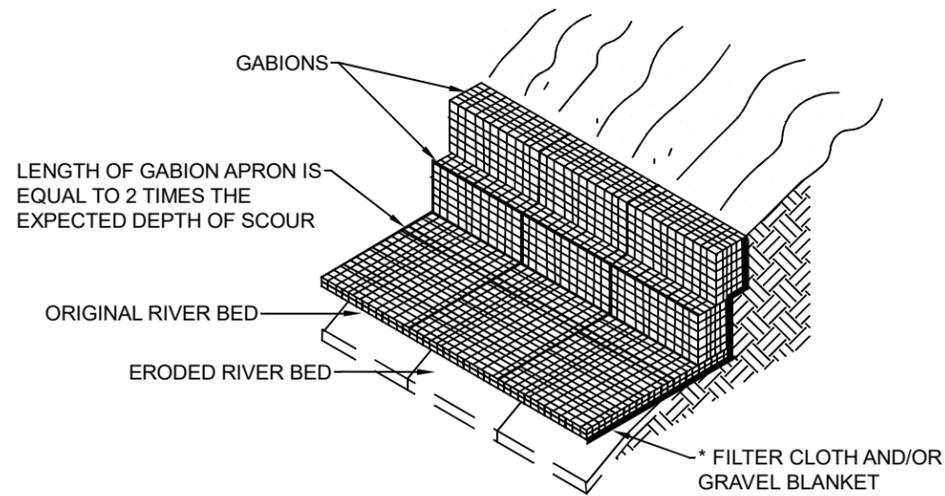
SECTION "A-A"



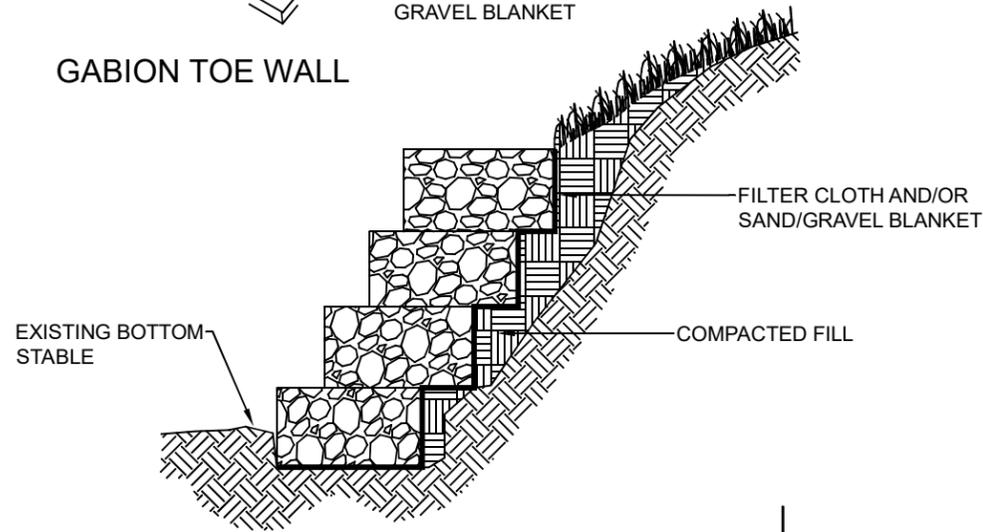
SECTION "B-B"

FLUME PIPE CROSSING

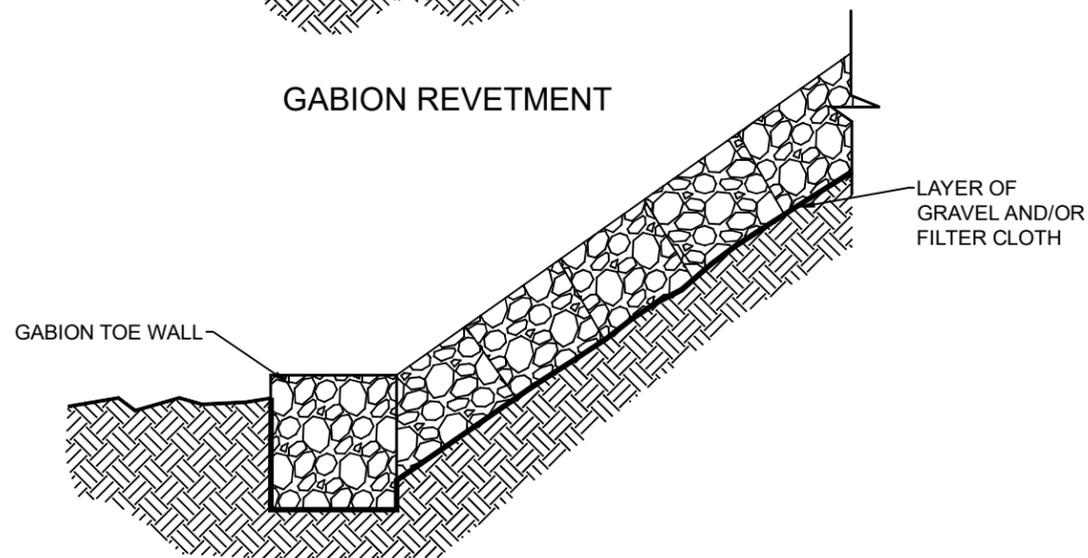
FLUME
STREAM
DIVERSION



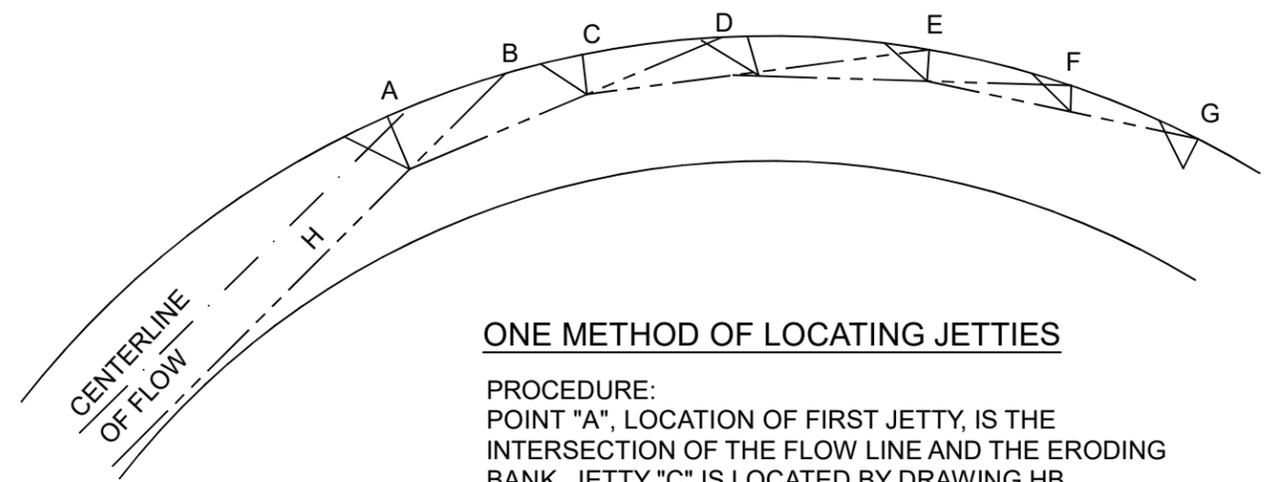
GABION TOE WALL



GABION REVETMENT

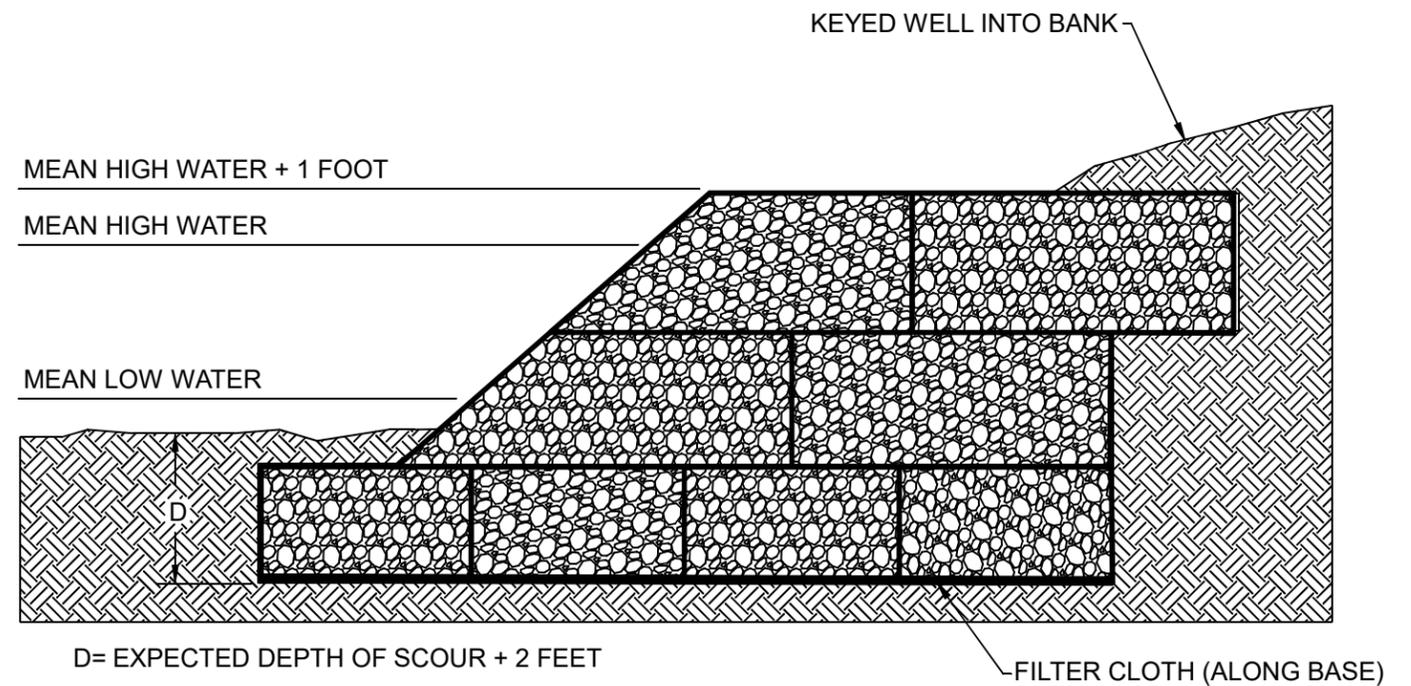


REVETMATTRESS/RENOMATTRESS



ONE METHOD OF LOCATING JETTIES

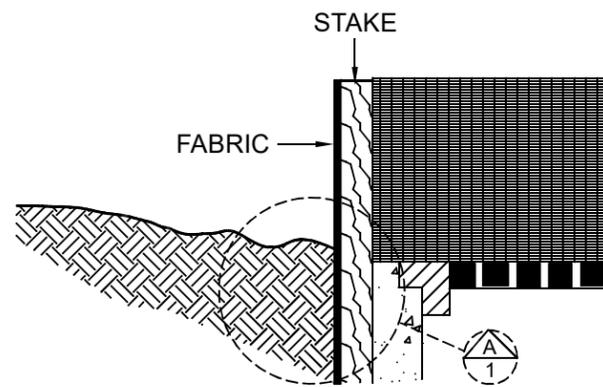
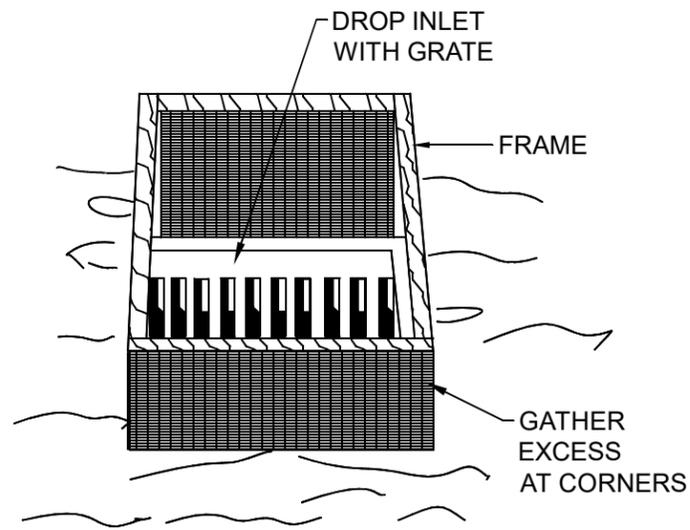
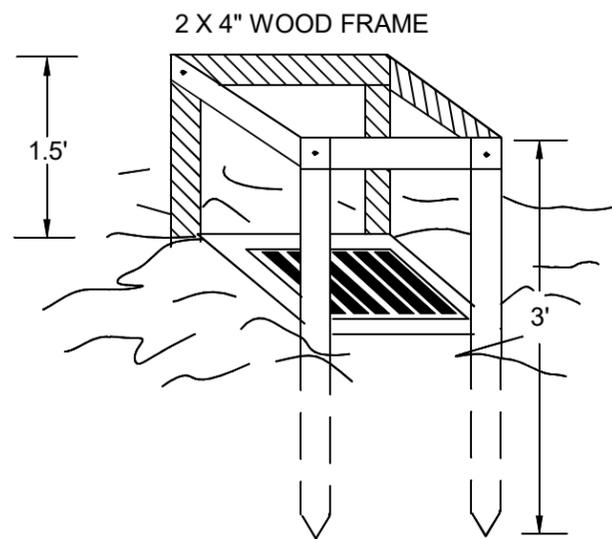
PROCEDURE:
 POINT "A", LOCATION OF FIRST JETTY, IS THE INTERSECTION OF THE FLOW LINE AND THE ERODING BANK. JETTY "C" IS LOCATED BY DRAWING HB PARALLEL TO THE FLOW LINE AND ACROSS THE TOE OF JETTY "A". AC IS TWICE AB. JETTY "D" IS LOCATED BY PROJECTING A LINE ACROSS THE TOE OF JETTIES "A" AND "C" THE REMAINING JETTIES ARE LOCATED THE SAME AS "D". SUPPLEMENTARY JETTY "K" IS LOCATED AC DISTANCE UPSTREAM FROM "A".



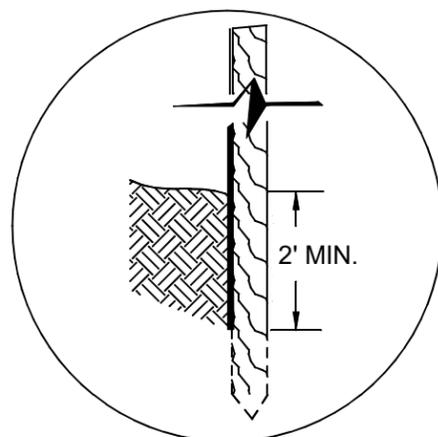
D= EXPECTED DEPTH OF SCOUR + 2 FEET

TYPICAL GABION DEFLECTOR

GABION
 BANK
 STABILIZATION



ELEVATION OF STAKE AND FABRIC ORIENTATION

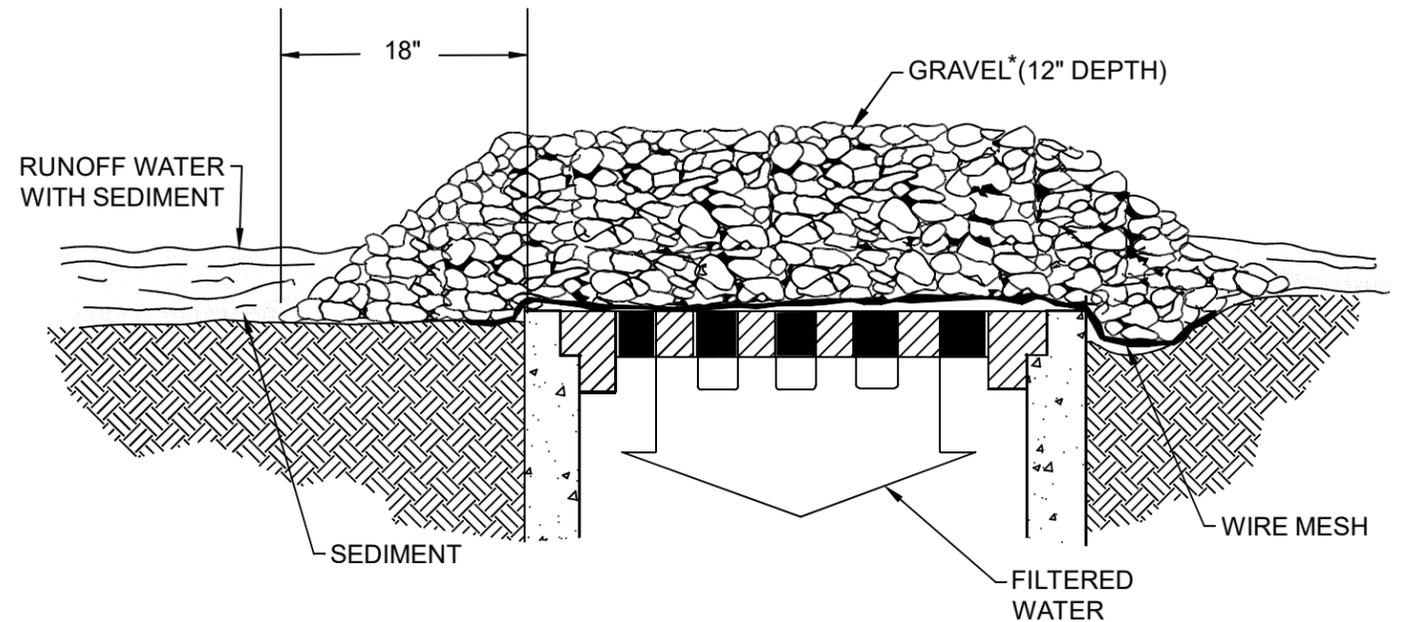


DETAIL A

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NOT GREATER THAN 5%) WHERE THE INLET SHEET OR OVERLAND FLOWS (NOT EXCEEDING 1 C.F.S.) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS IN STREET OR HIGHWAY MEDIANS.

SILT FENCE INLET PROTECTION



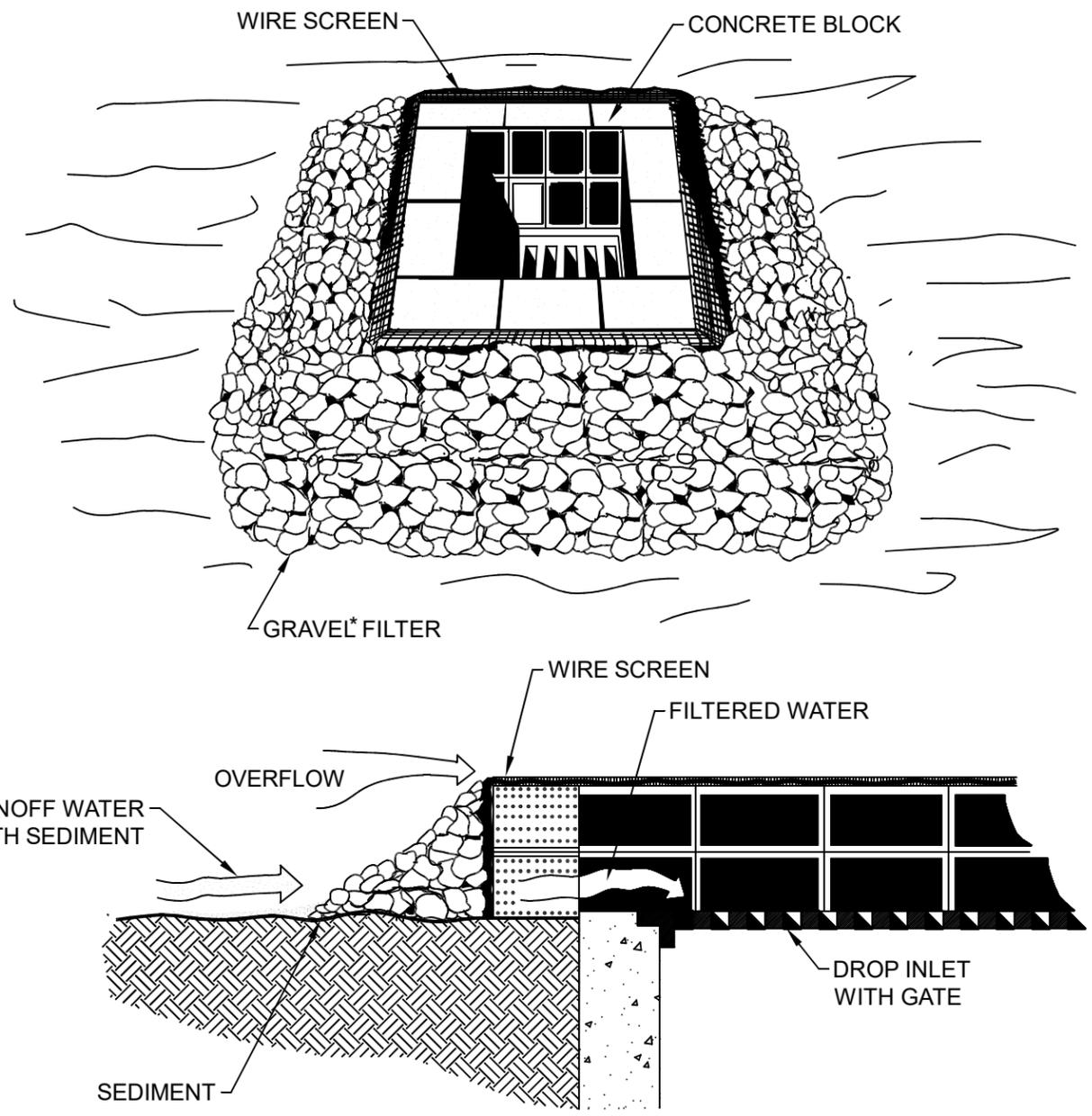
SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY CONCENTRATED FLOWS ARE EXPECTED BUT NOT WHERE PONDING AROUND THE STRUCTURE MIGHT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.

* GRAVEL SHALL BE SIZE 57 MINERAL AGGREGATE.

GRAVEL AND WIRE MESH INLET PROTECTION

INLET PROTECTION AREA

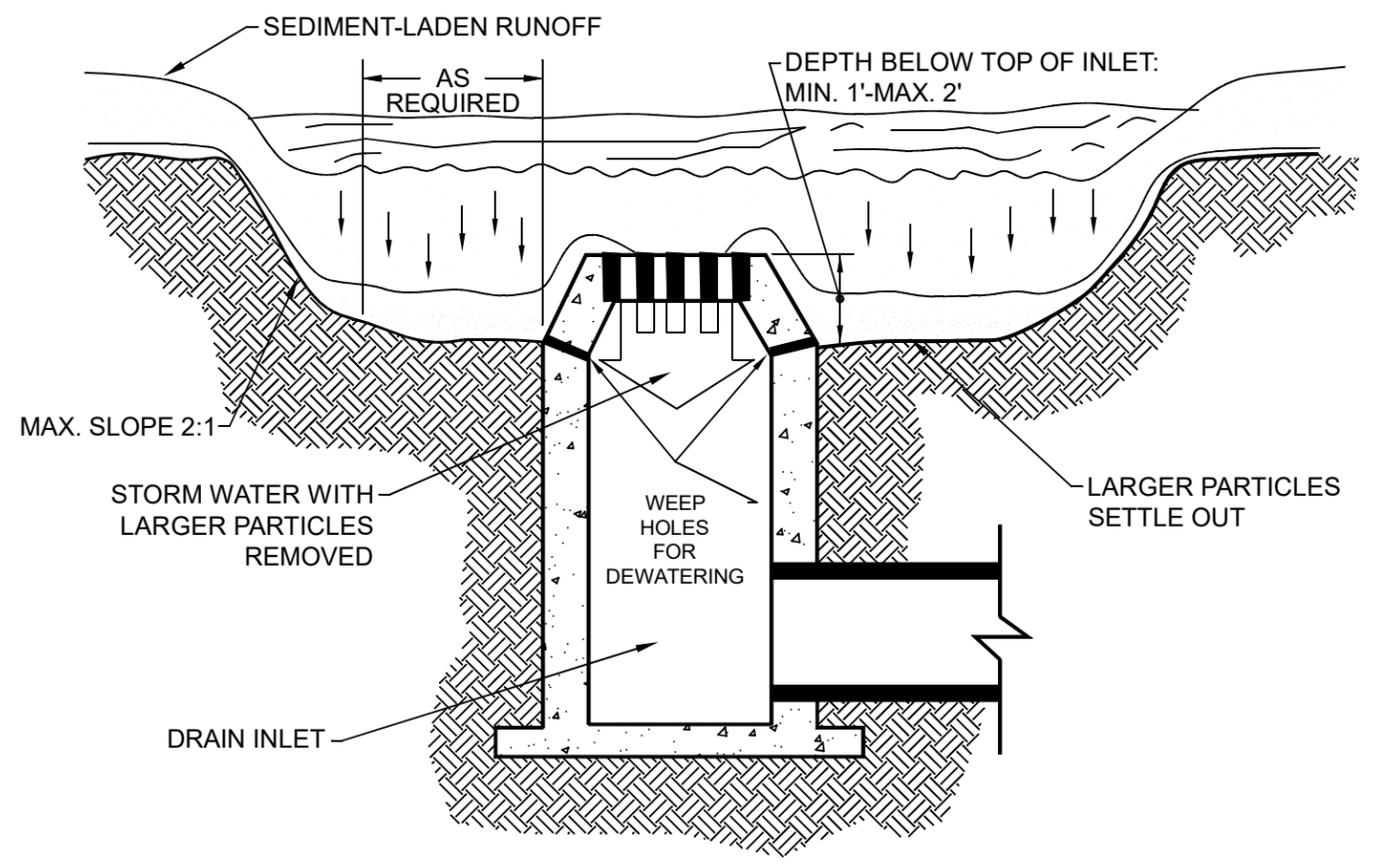
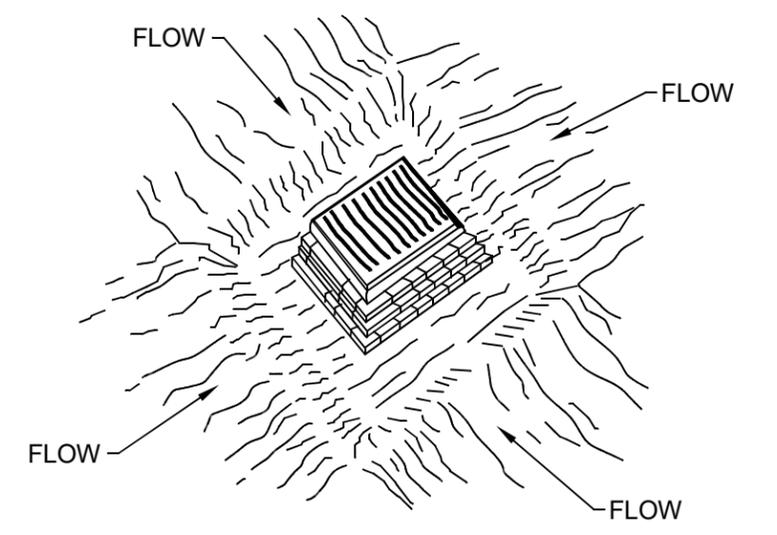


SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPACITY IS NECESSARY TO PREVENT EXCESSIVE PONDING AROUND THE STRUCTURE.

* GRAVEL SHALL BE SIZE 57 MIENRAL AGGREGATE.

BLOCK AND GRAVEL INLET PROTECTION

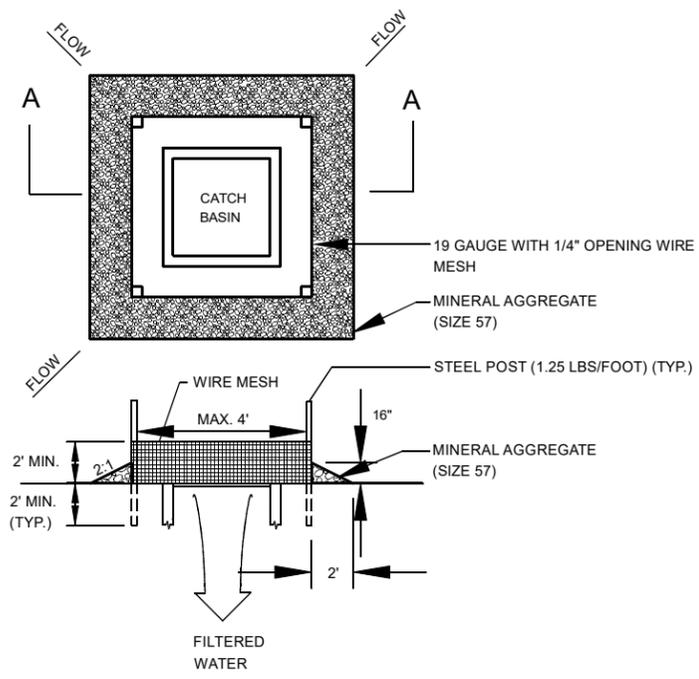


SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPABILITY AND EASE OF MAINTENANCE ARE DESIRABLE.

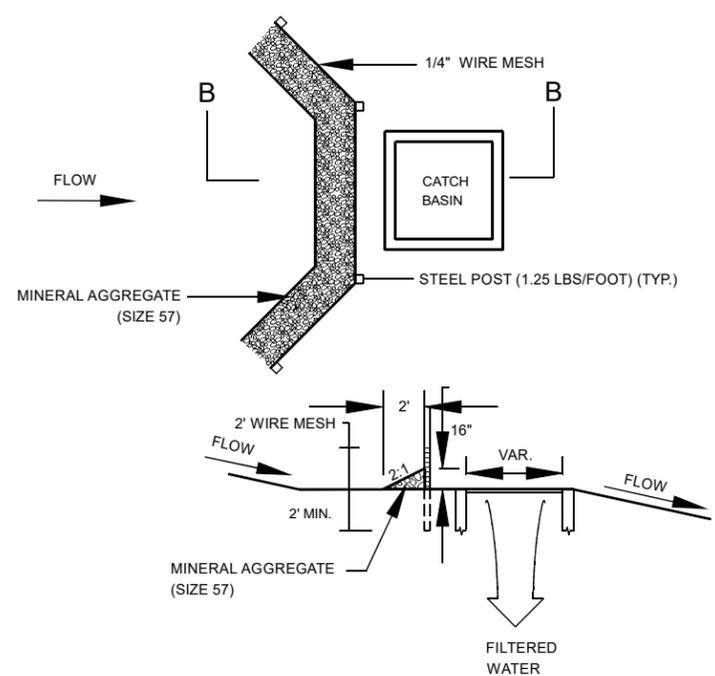
EXCAVATED DROP INLET PROTECTION

INLET PROTECTION AREA



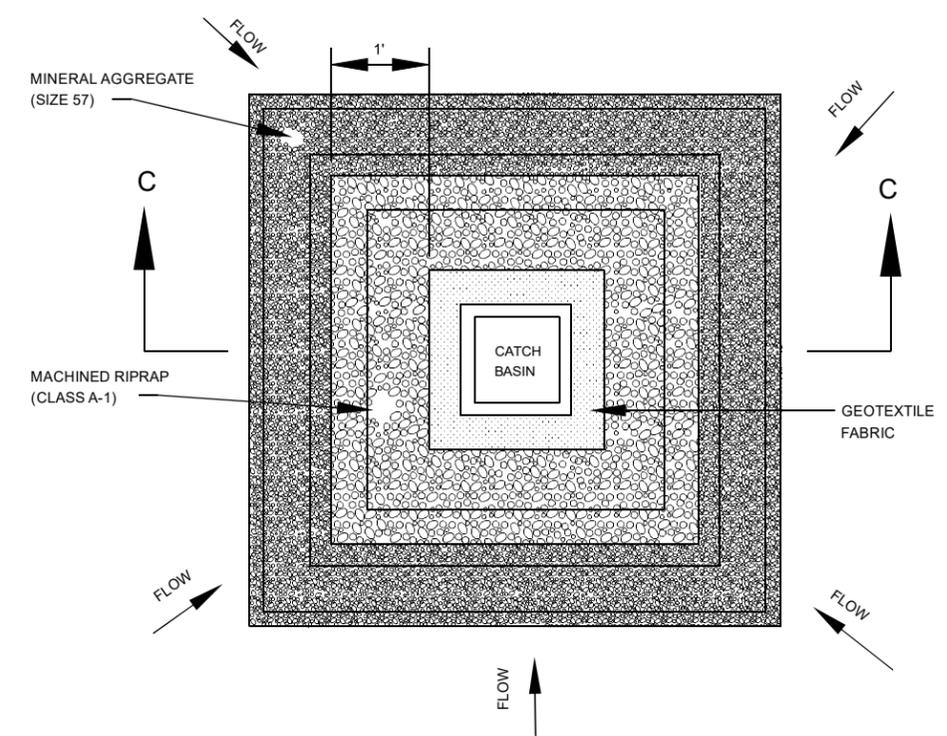
SECTION A-A

HARDWARE CLOTH AND GRAVEL INLET PROTECTION



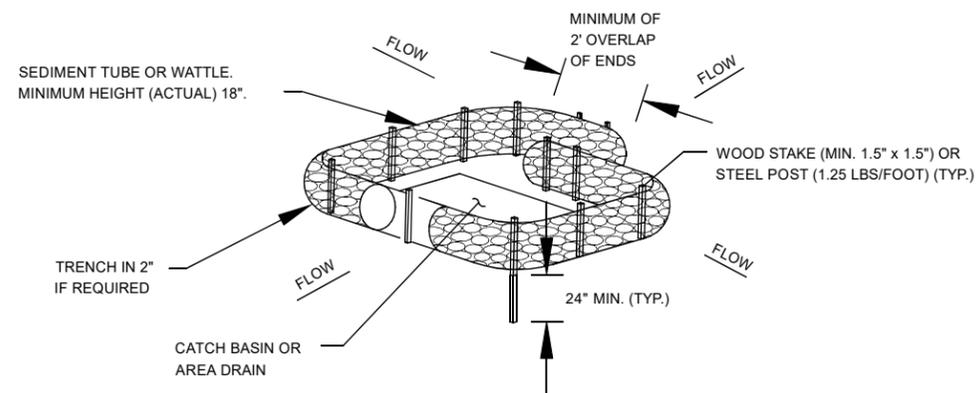
SECTION B-B

HARDWARE CLOTH AND GRAVEL INLET PROTECTION (FLOW FROM ONE SIDE)

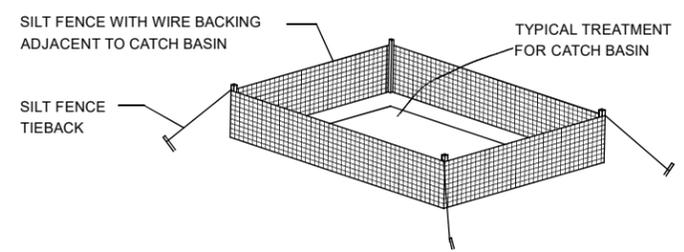


SECTION C-C

ROCK INLET PROTECTION

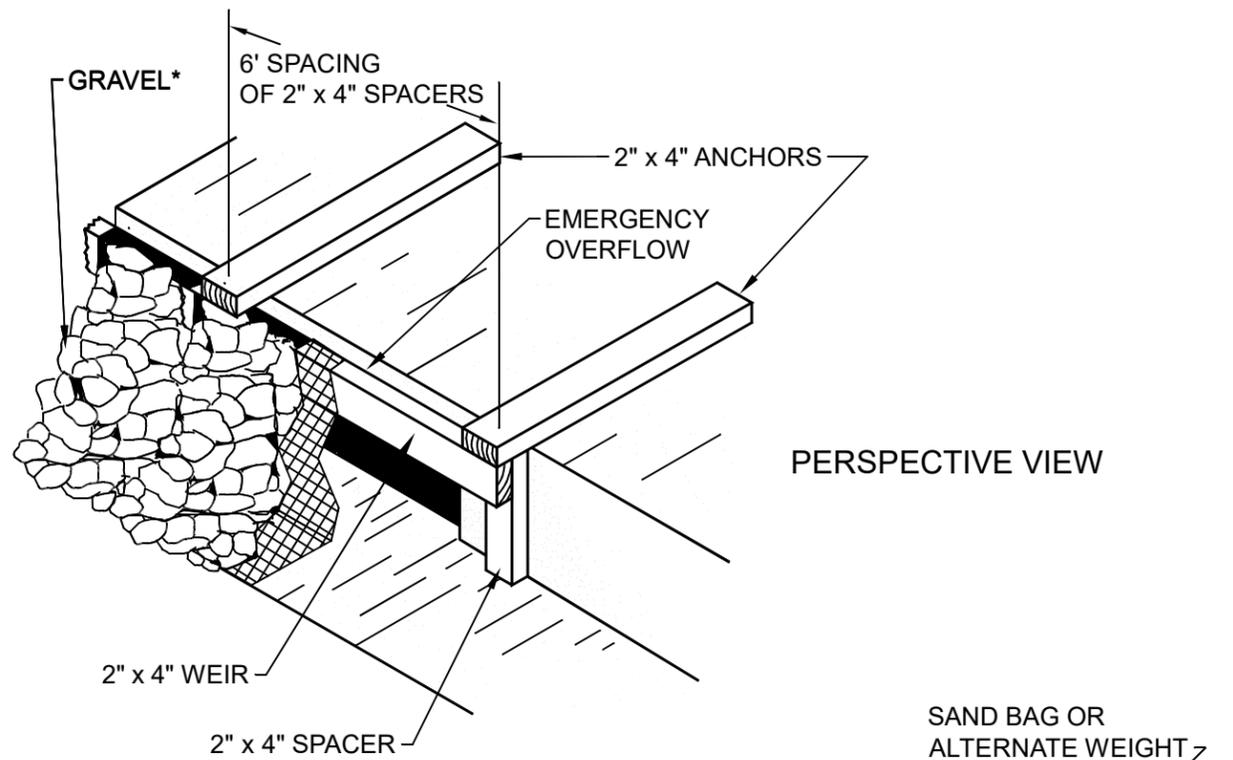


WATTLE INLET PROTECTION

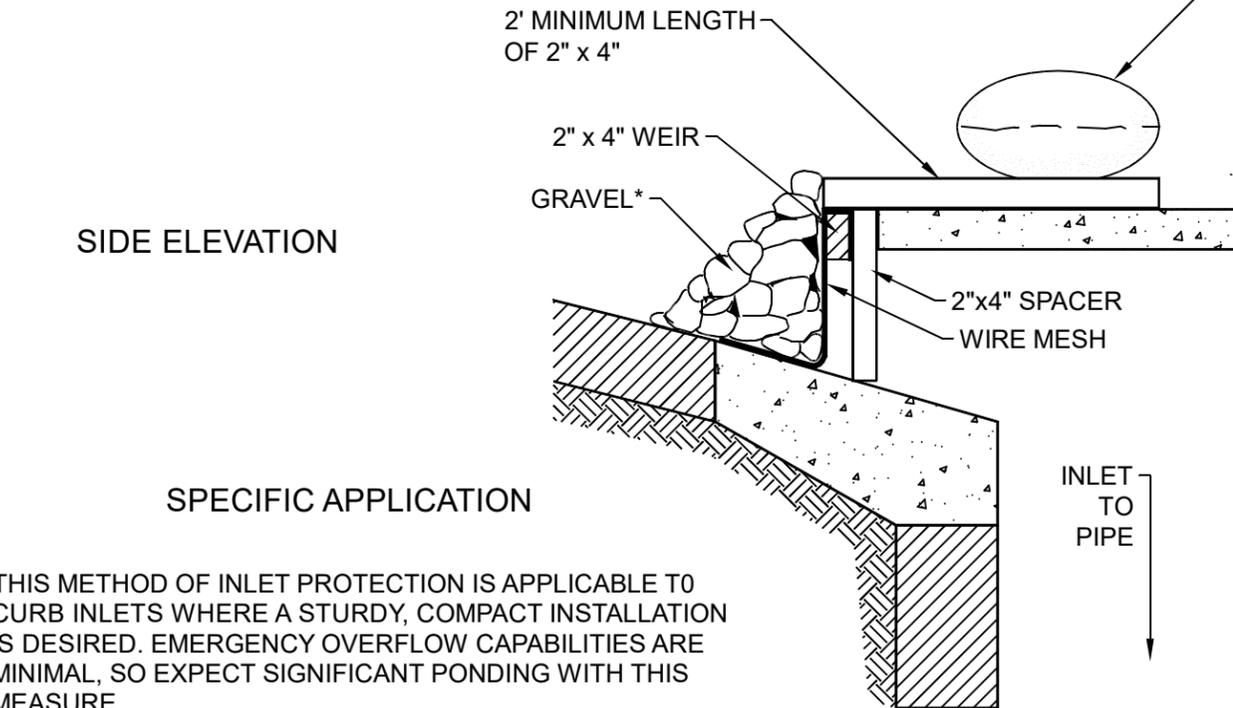


SILT FENCE INLET PROTECTION

INLET PROTECTION AREA



PERSPECTIVE VIEW

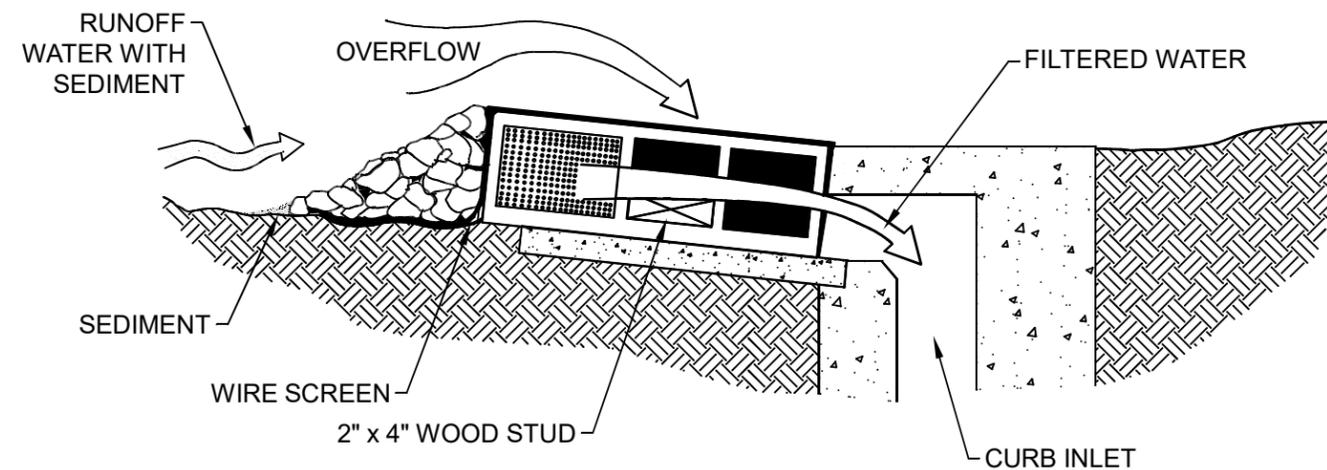
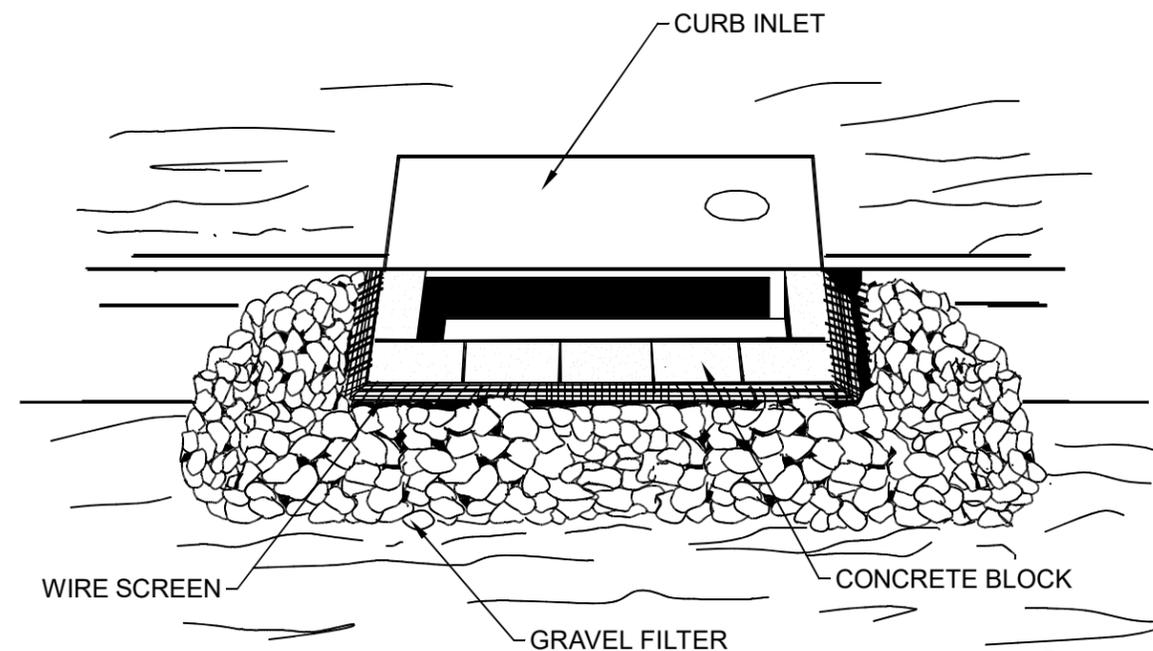


SIDE ELEVATION

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE TO CURB INLETS WHERE A STURDY, COMPACT INSTALLATION IS DESIRED. EMERGENCY OVERFLOW CAPABILITIES ARE MINIMAL, SO EXPECT SIGNIFICANT PONDING WITH THIS MEASURE.

*GRAVEL SHALL BE SIZE 57 MINERAL AGGREGATE.



SPECIAL APPLICATION

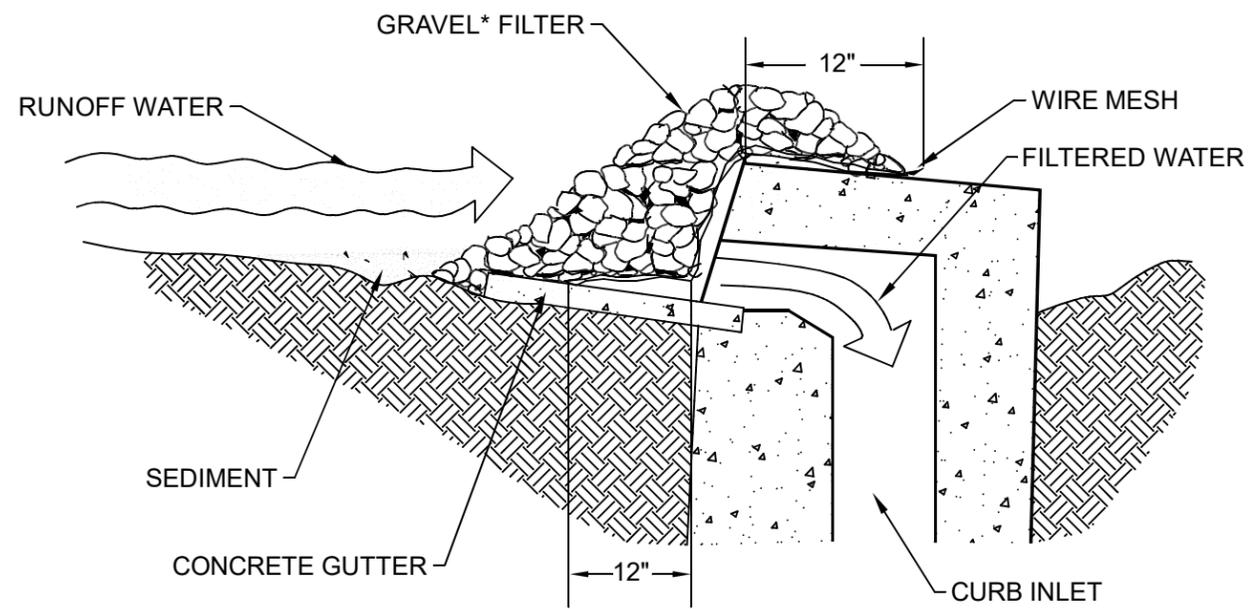
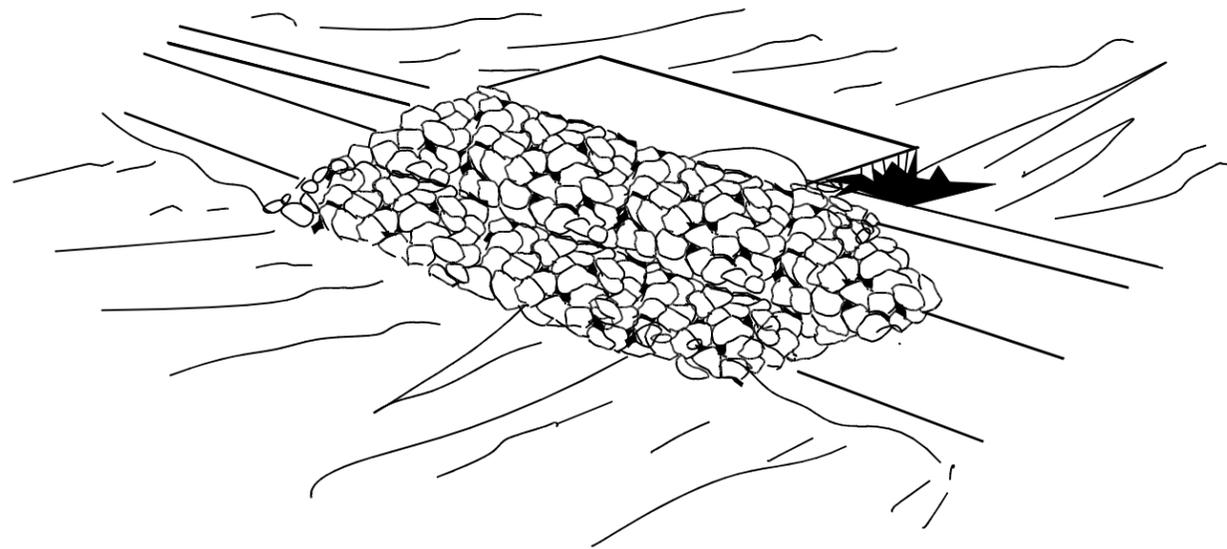
THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE AN OVERFLOW CAPABILITY IS NECESSARY TO PREVENT EXCESSIVE PONDING IN FRONT OF THE STRUCTURE.

* GRAVEL SHALL BE SIZE 57 MINERAL AGGREGATE

CURB INLET PROTECTION WITH 2-INCH X 4-INCH WOODEN WEIR

BLOCK AND GRAVEL CURB INLET SEDIMENT FILTER

INLET PROTECTION CURB



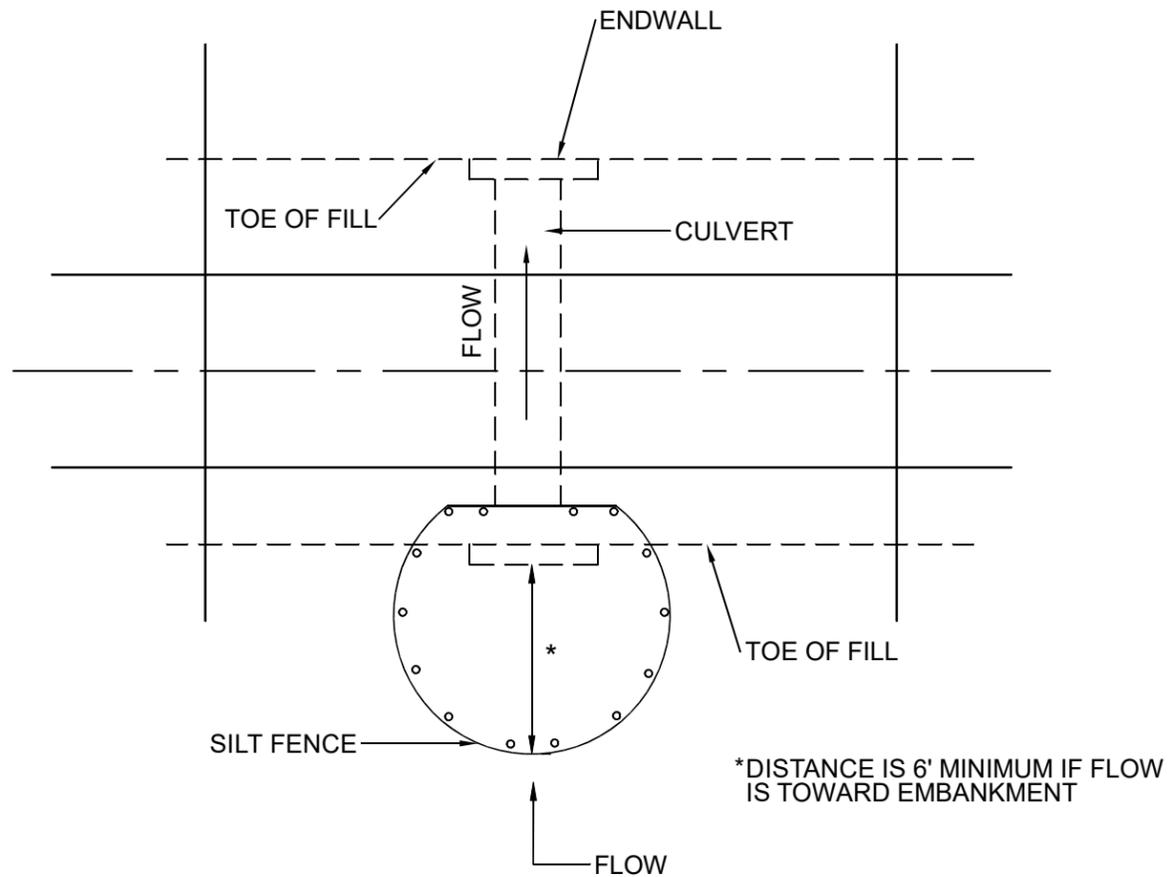
SPECIFIC APPLICATION

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 AND UNPROTECTED AREAS.

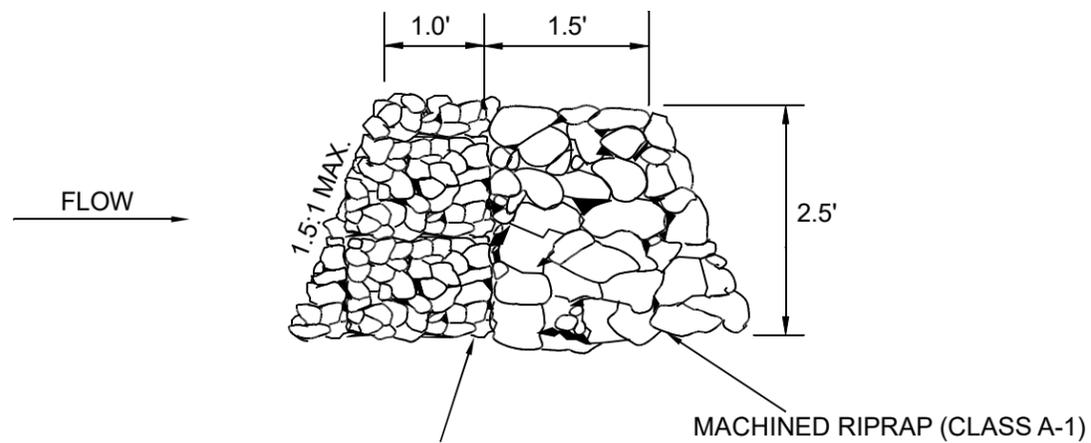
* GRAVEL SHALL BE SIZE 57 MINERAL AGGREGATE

GRAVEL CURB INLET SEDIMENT FILTER

INLET
PROTECTION
CURB

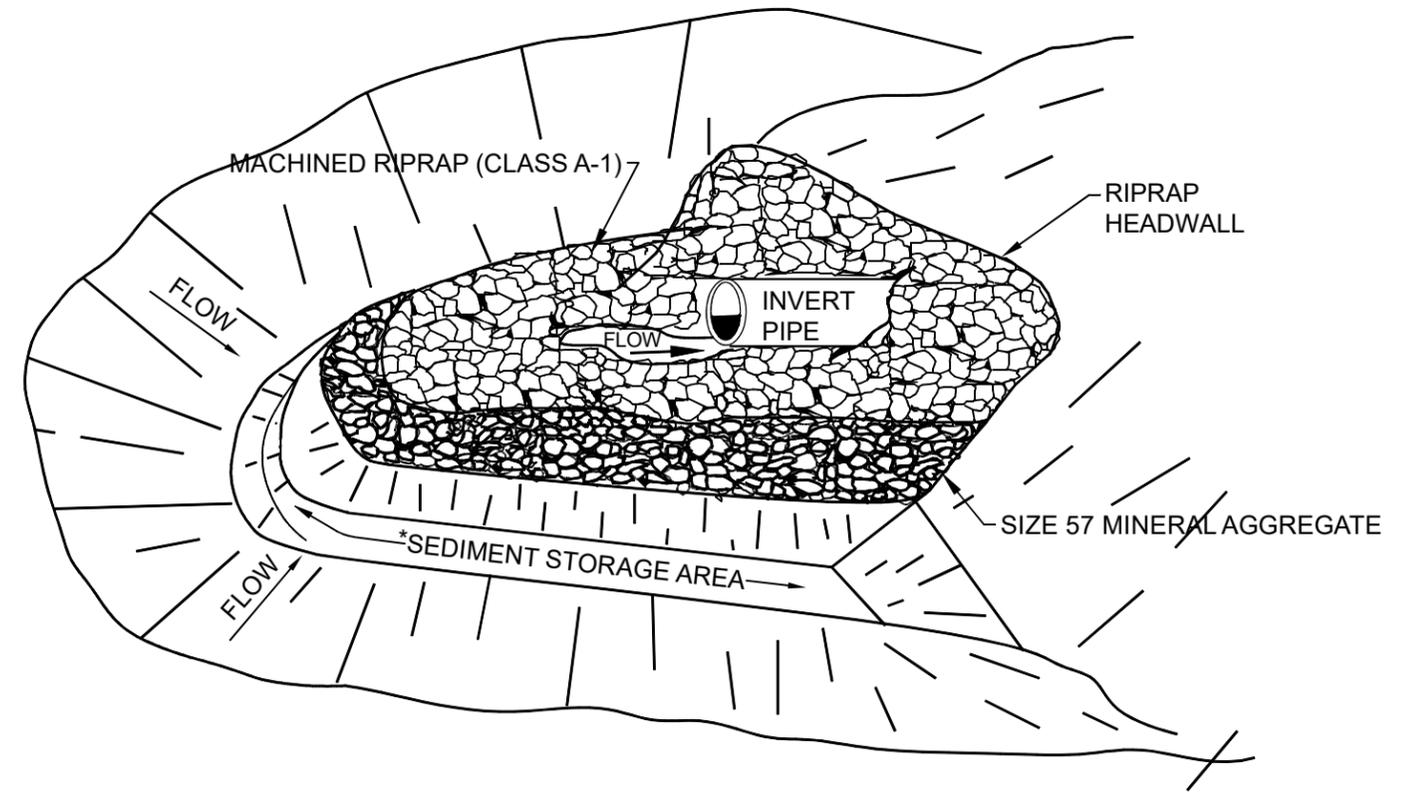


OPTIONAL STONE COMBINATION **



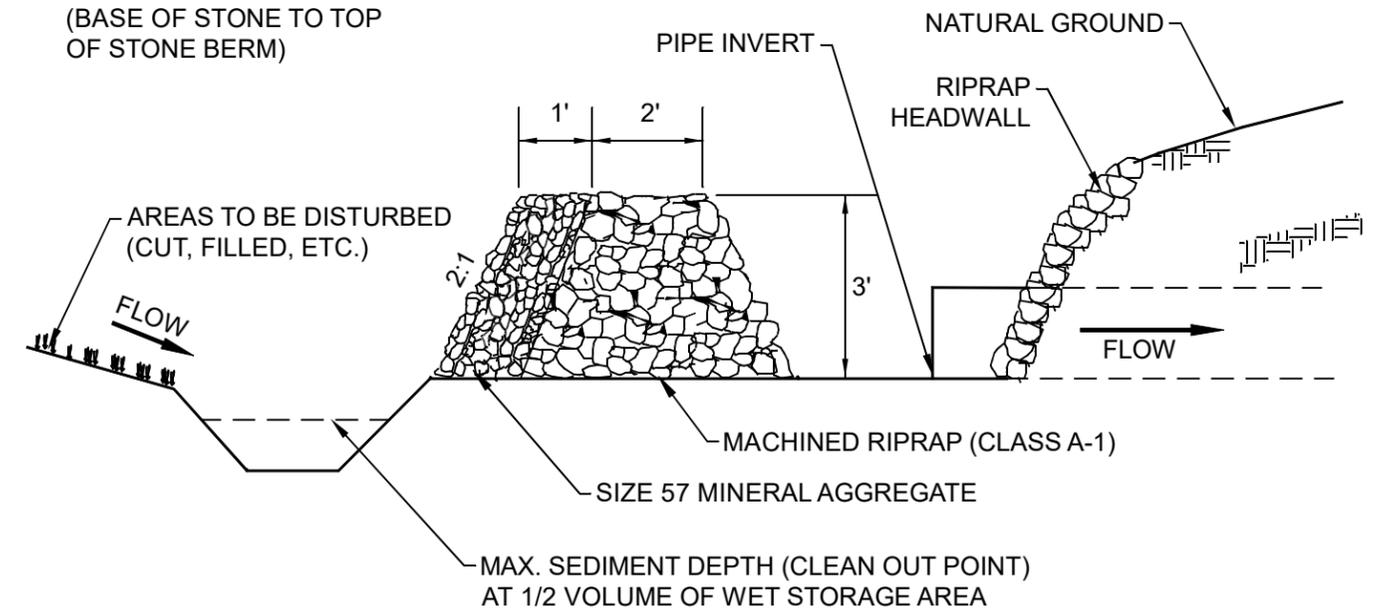
**SIZE 57 MINERAL AGGREGATE TO REPLACE SILT FENCE IN " HORSESHOE " WHEN HIGH VELOCITY OF FLOW IS EXPECTED

SILT FENCE CULVERT INLET PROTECTION



67 C.Y./ACRE WET STORAGE
(BELOW BASE OF STONE)
67 C.Y./ACRE DRY STORAGE
(BASE OF STONE TO TOP
OF STONE BERM)

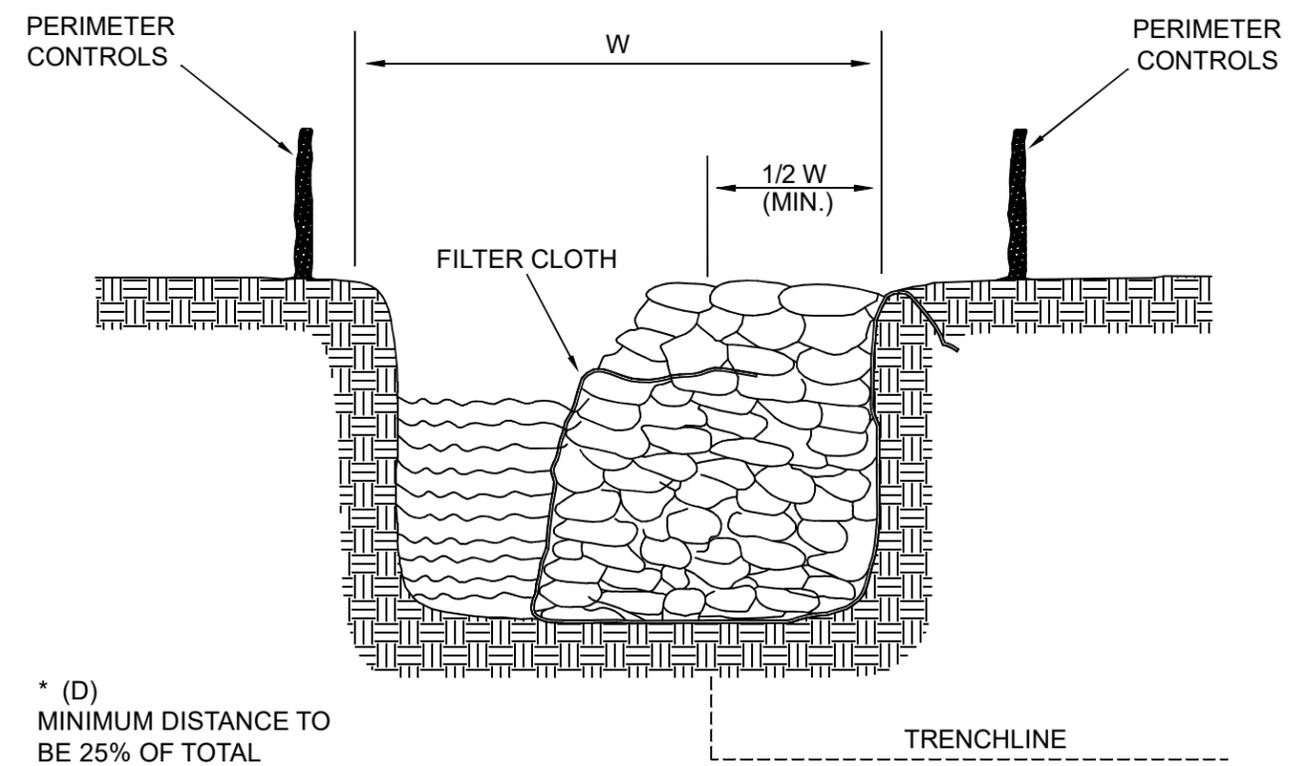
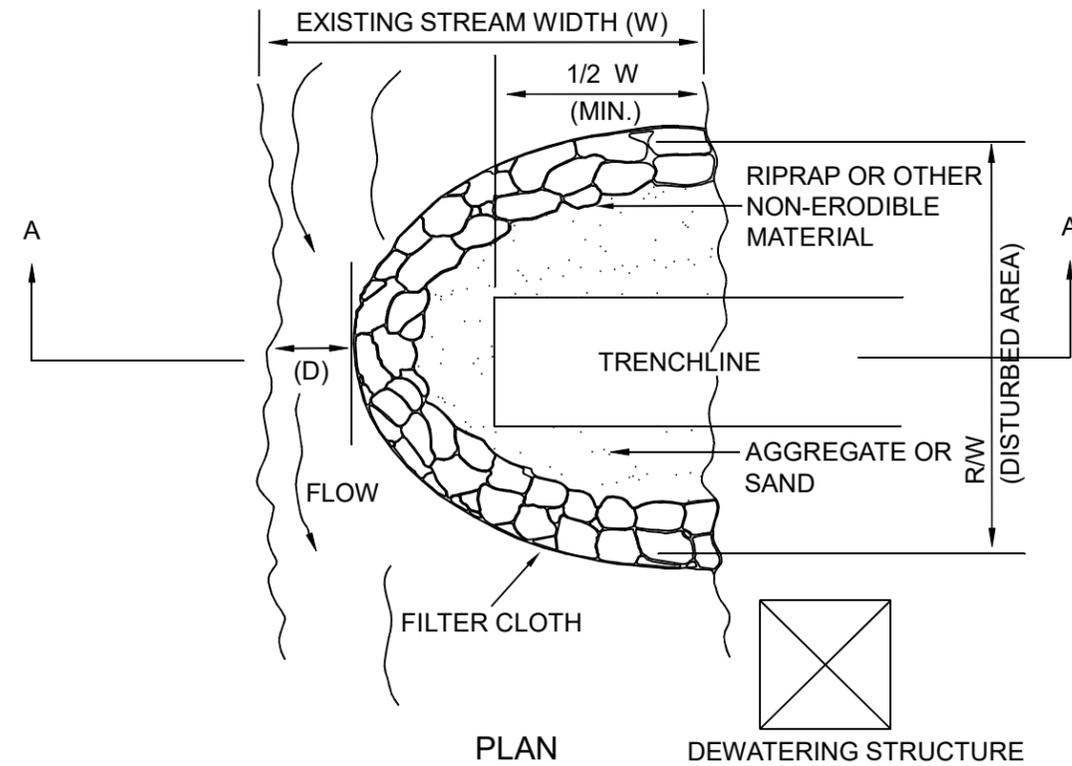
PERSPECTIVE VIEW



ELEVATION

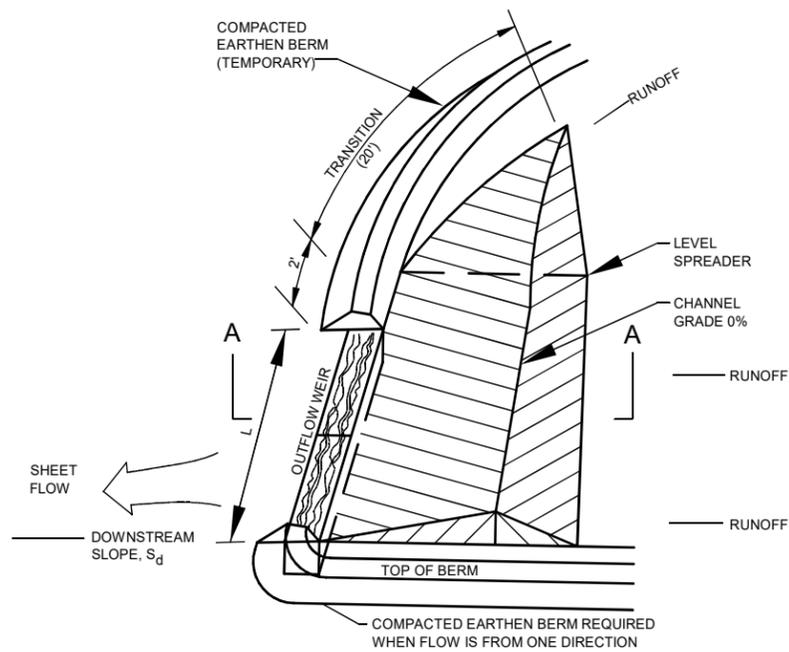
CULVERT INLET SEDIMENT TRAP

INLET
PROTECTION
FILTER
RING FOR
CULVERTS



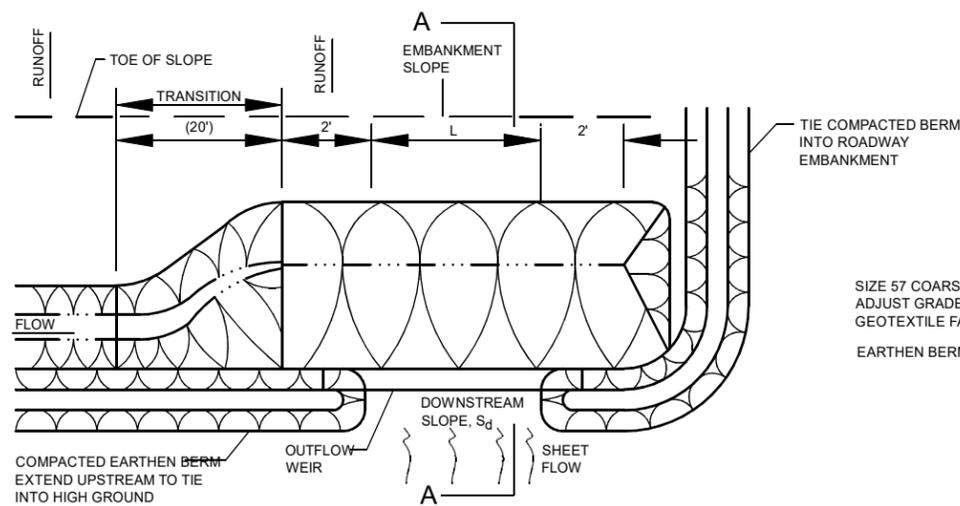
SECTION A-A

INSTREAM
DIVERSION

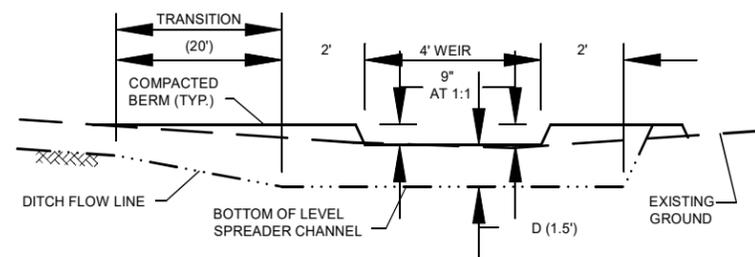


NOTE: ALL TEMPORARY BERMS, SWALES AND LEVEL SPREADER DITCH MUST BE STABILIZED IMMEDIATELY AFTER INSTALLATION

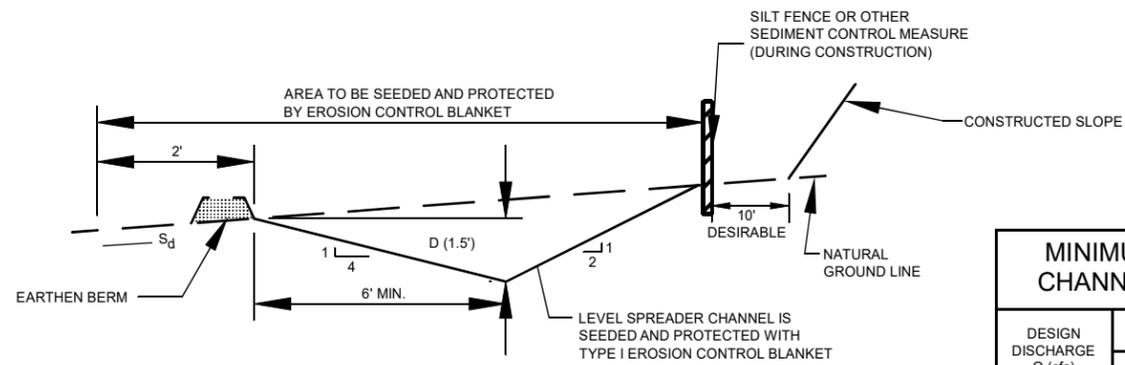
PERSPECTIVE VIEW
(APPLICATION WITH TEMPORARY BERM)



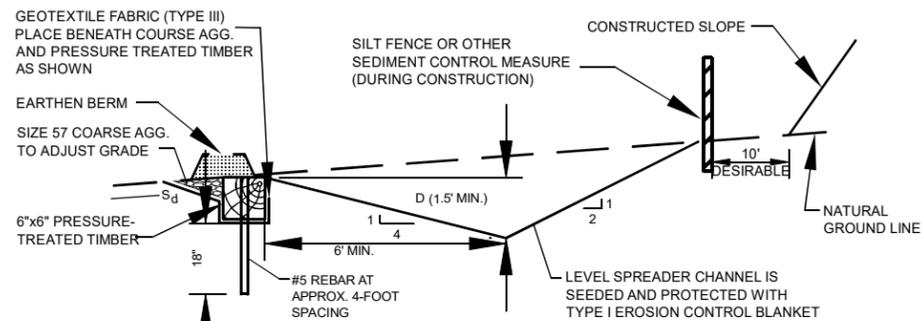
PLAN VIEW
(APPLICATION WITH SIDE DITCH FROM ONE DIRECTION)



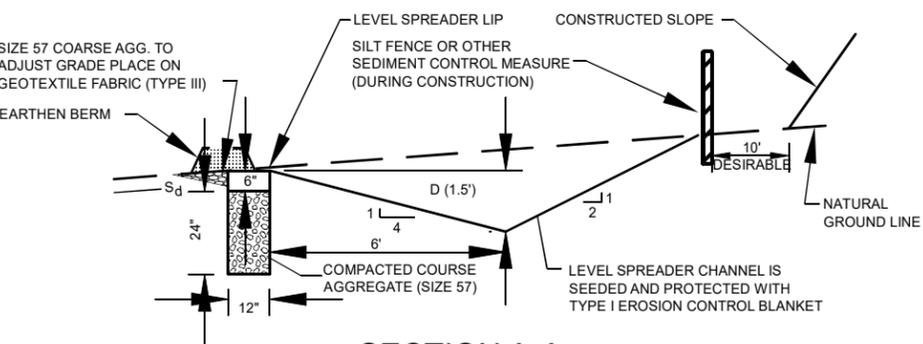
PROFILE VIEW (HORIZONTAL)
(APPLICATION WITH SIDE DITCH FROM ONE DIRECTION)



SECTION A-A
TYPE I WEIR
(TEMPORARY APPLICATION)



SECTION A-A
TYPE II WEIR
(TEMPORARY APPLICATION)



SECTION A-A
TYPE III WEIR
(PERMANENT APPLICATION)

DESIGN DISCHARGE Q (cfs)	DOWNSTREAM SLOPE, "S _d " IN PERCENT (%)			
	0%-4%	4%-6%	6%-8%	8%-10%
1	1.5	1.5	1.5	1.5
2	1.5	1.5	1.7	2.0
4	1.5	1.8	2.5	3.0
7	1.9	2.5	3.5	4.1
10	2.3	3.1	4.2	*
15	3.0	3.9	*	*
20	3.5	4.5	*	*
25	3.9	5.2	*	*
30	4.3	5.7	*	*

* = NOT RECOMMENDED

UNIT WEIR FLOW RATES IN CFS/LF			
DOWNSTREAM SLOPE, "S _d " IN PERCENT (%)			
0%-4%	4%-6%	6%-8%	8%-10%
0.49	0.20	0.07	0.04

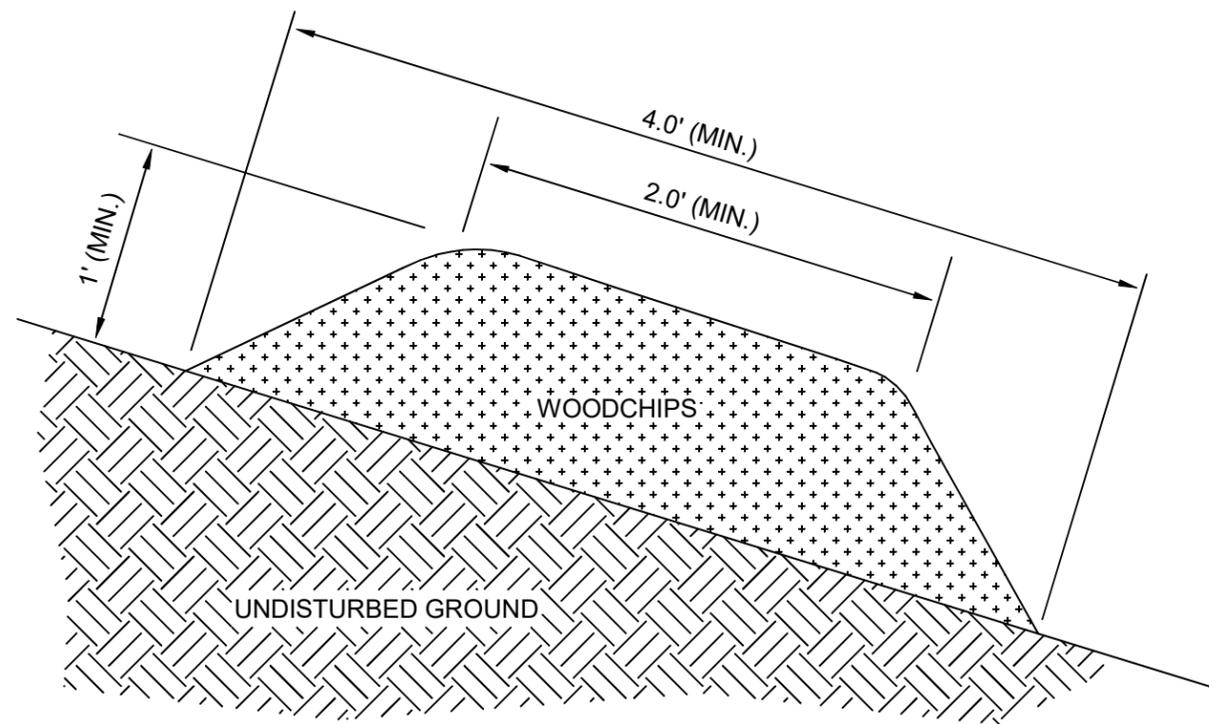
WEIR LENGTH "L" = DESIGN Q IN CFS DIVIDED BY UNIT WEIR FLOW IN CFS/LF

MINIMUM WEIR LENGTH = 4 FEET

WEIR LENGTH > 200 FEET IS NOT RECOMMENDED

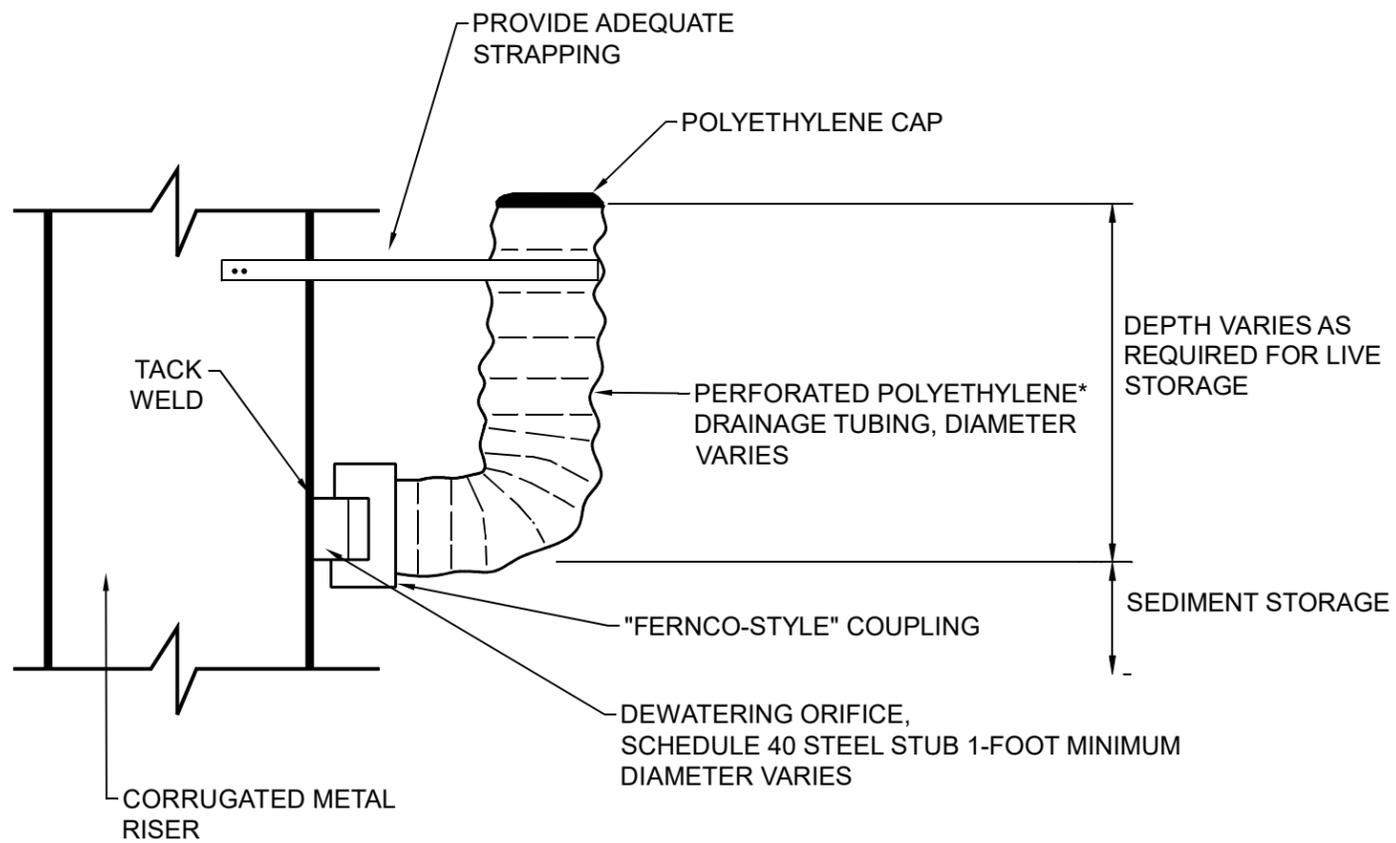
EXAMPLE: DESIGN Q = 7 cfs
S_d = 6%
THUS, L = 7/0.20 = 35 FEET
D = 2.5 FEET

LEVEL SPREADER



MULCH BERM MINIMUM DIMENSIONS

MULCH BERM



NOTE: WITH CONCRETE RISER, USE PVC SCHEDULE 40 STUB FOR DEWATERING ORIFICE

* SIZING AND SPECIFICATIONS SHOULD BE INCLUDED ON DRAWINGS TO PROVIDE A SITE SPECIFIC DESIGN

PERFORATED RISER PIPE

DRAPE BAFFLE MATERIAL OVER WIRE STRAND AND SECURE WITH PLASTIC TIES AT POSTS AND ON WIRE EVERY 12"

9 GAUGE MIN HIGH TENSION WIRE STRAND SHALL BE SECURED TO POST TO SUPPORT BAFFLE MATERIAL

4' POST SPACING

INSTALL T-POST TO ANCHOR BAFFLE TO SIDE OF BASIN AND SECURE TO VERTICAL POST

VARIABLE DEPTH

BAFFLE MATERIAL

SECURE BOTTOM OF BAFFLE TO GROUND WITH 12" STAPLES AT 12" SPACING

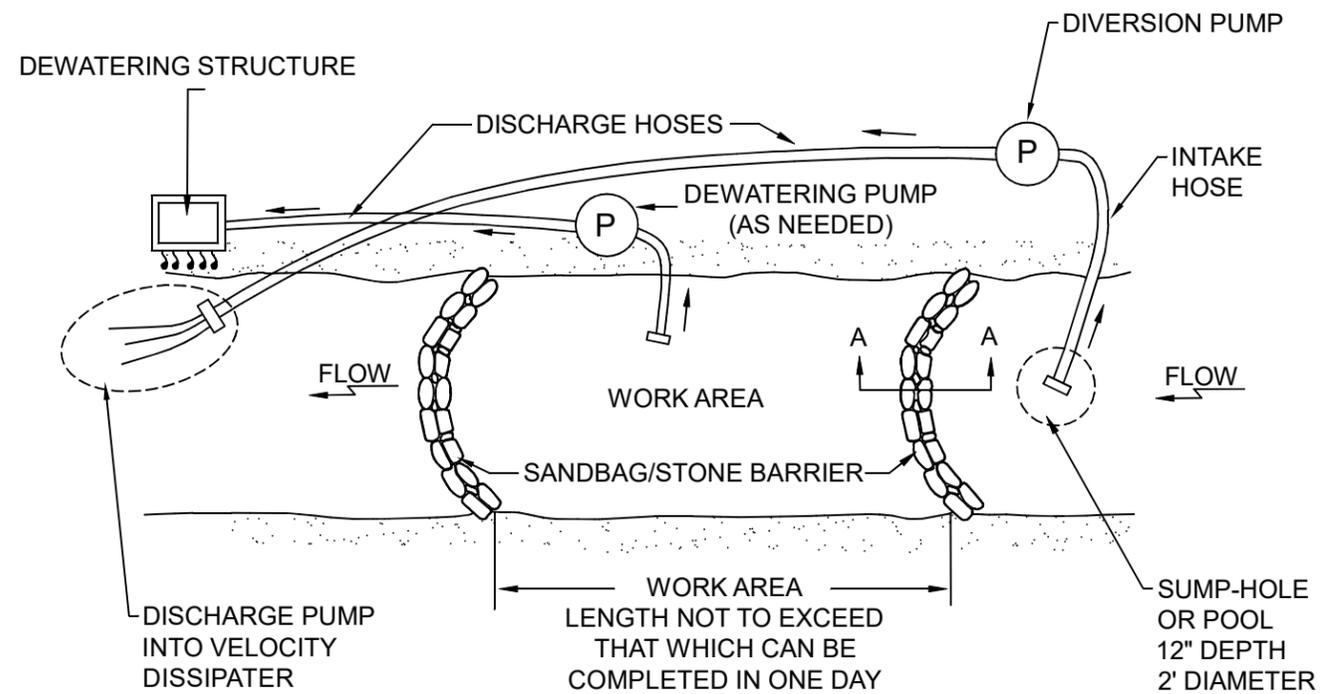
BAFFLE MATERIAL

11 GAUGE LANDSCAPE STAPLE

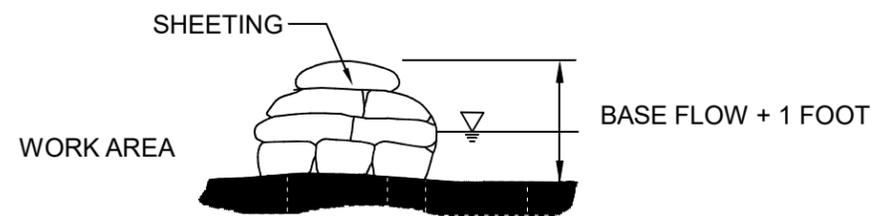
STEEL POST 2'-0" DEPTH

BAFFLE MATERIAL SHALL BE SECURED TO THE BOTTOM AND SIDES OF BASIN USING 12" LANDSCAPE STAPLES. OVERLAP MATTING AT LEAST 6" WHERE 2 OR MORE WIDTHS OF MATTING ARE INSTALLED SIDE BY SIDE.

POROUS
BAFFLE



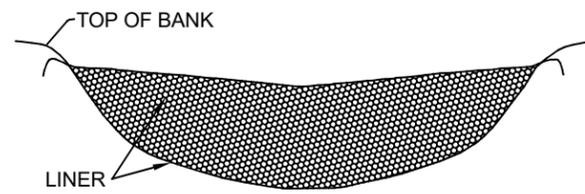
PLAN



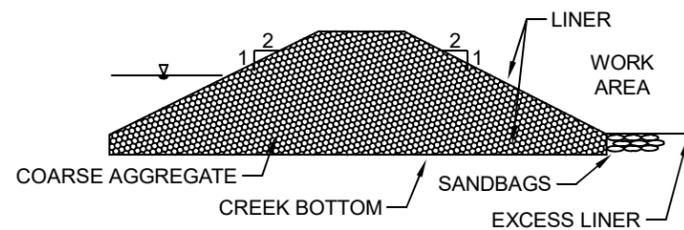
CROSS-SECTION OF SANDBAG DIKE

SECTION A-A

PUMP
AROUND
STREAM
DIVERSION



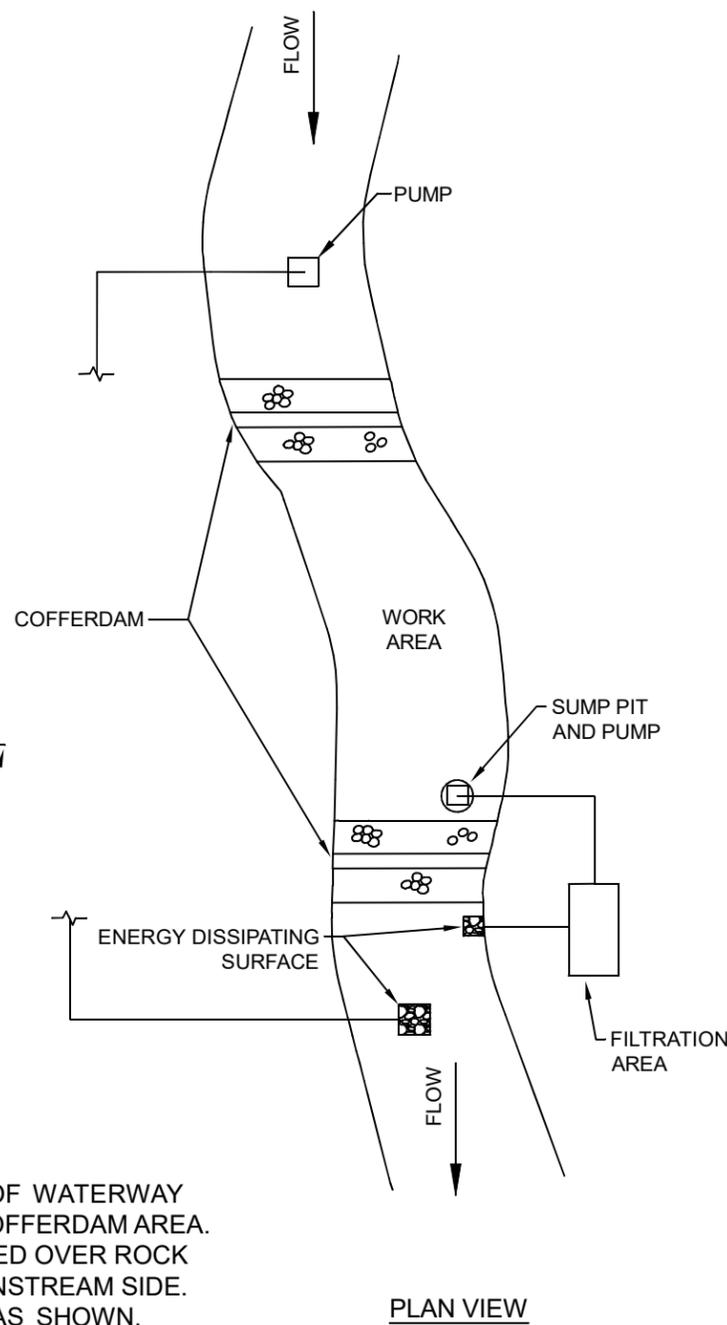
COFFERDAM CROSS-SECTION



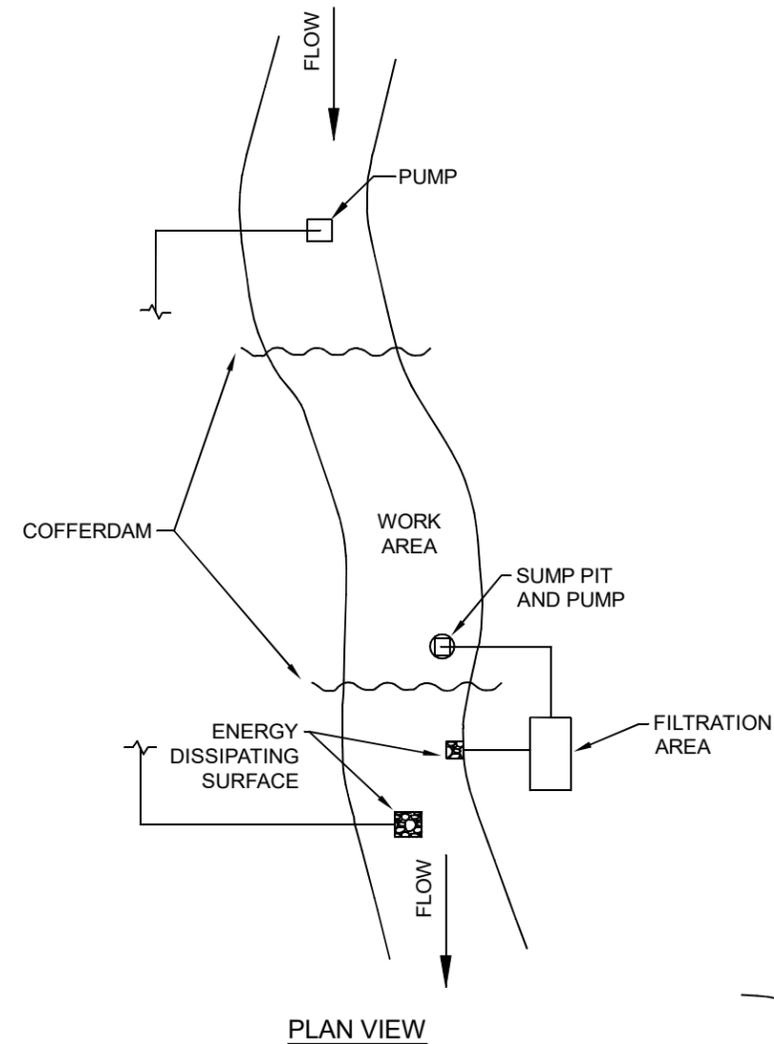
COFFERDAM PROFILE

NOTES:
 1. THE LINER SHALL BE PLACED ON BOTTOM OF WATERWAY W/ EXCESS LINER EXTENDING OUT OF THE COFFERDAM AREA. ONCE STONE IS PLACED, LINER WILL BE PULLED OVER ROCK AND EXTEND BEYOND THE PILE ON THE DOWNSTREAM SIDE. SANDBAGS WILL SECURE THE EXCESS LINER AS SHOWN. REFER TO THE STANDARD FOR LINER SPECIFICATIONS.

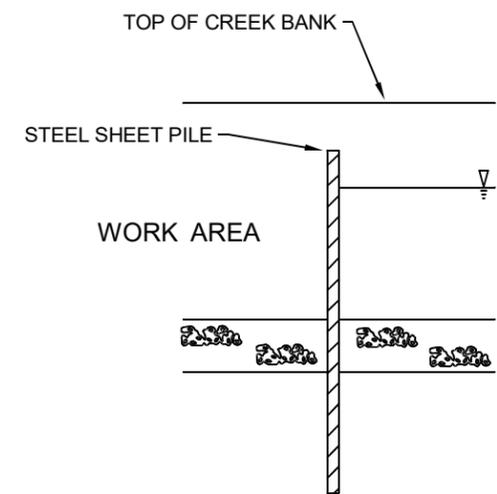
STONE & IMPERMEABLE BARRIER COFFERDAM CROSSING



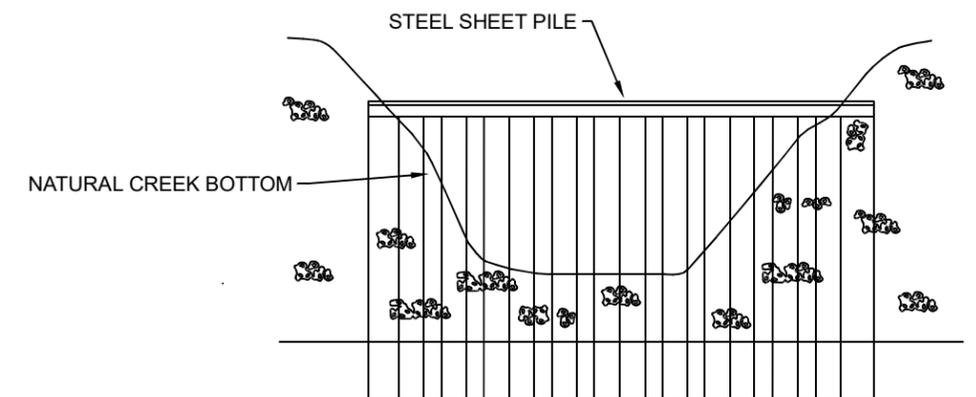
PLAN VIEW



PLAN VIEW



PROFILE

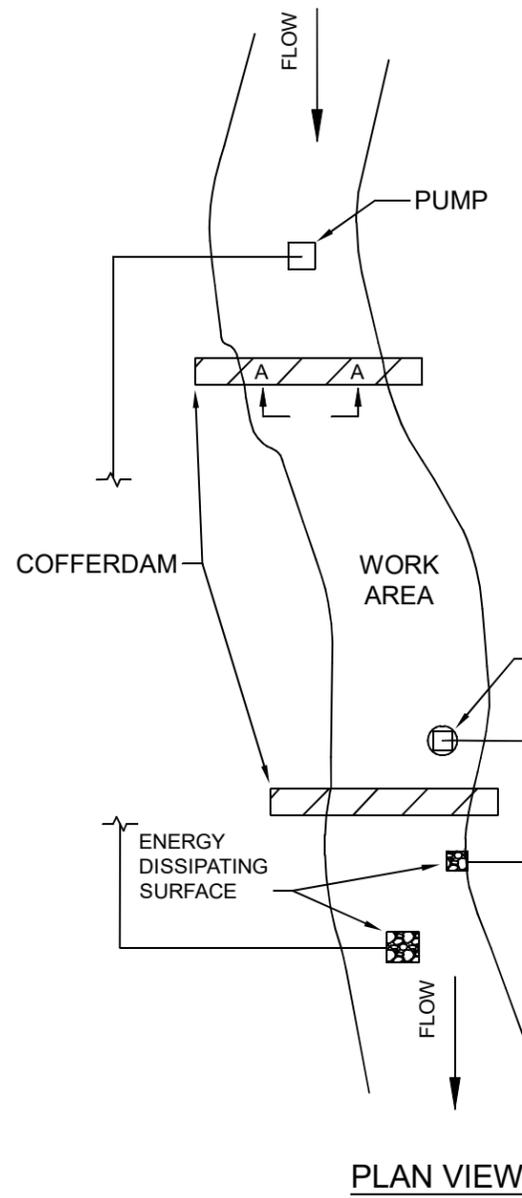


CROSS-SECTION

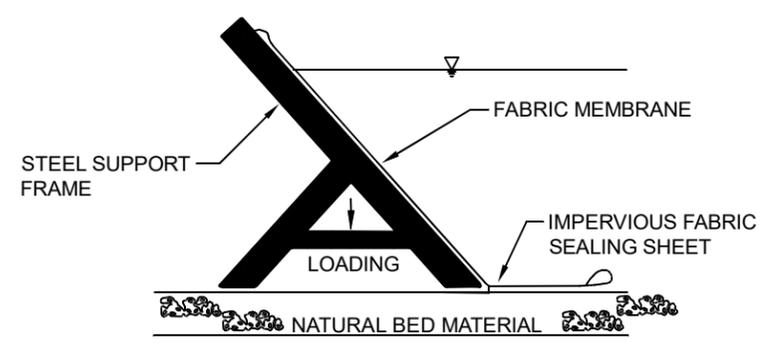
NOTES:
 1. ALL DISCHARGES SHOULD BE ON ENERGY DISSIPATING SURFACES.
 2. LOCATION FOR SUMP PIT, FILTRATION AREA, AND ENERGY DISSIPATING SURFACES MAY VARY DEPENDING ON SITE CONDITIONS.

STEEL SHEET COFFERDAM CROSSING

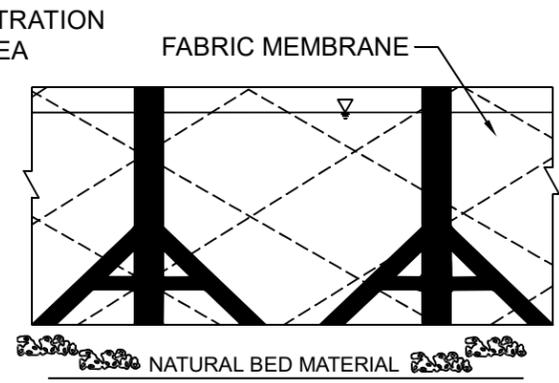
PUMP
 AROUND
 STREAM
 DIVERSION



PLAN VIEW



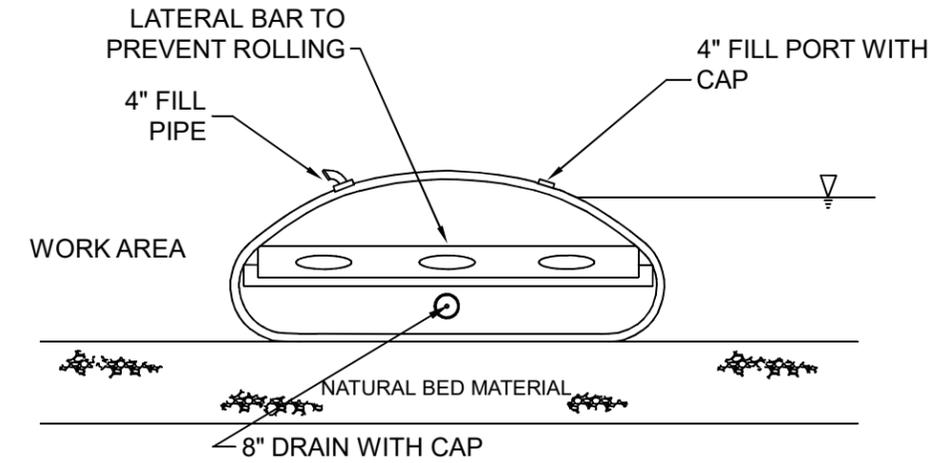
COFFERDAM PROFILE



SECTION A-A

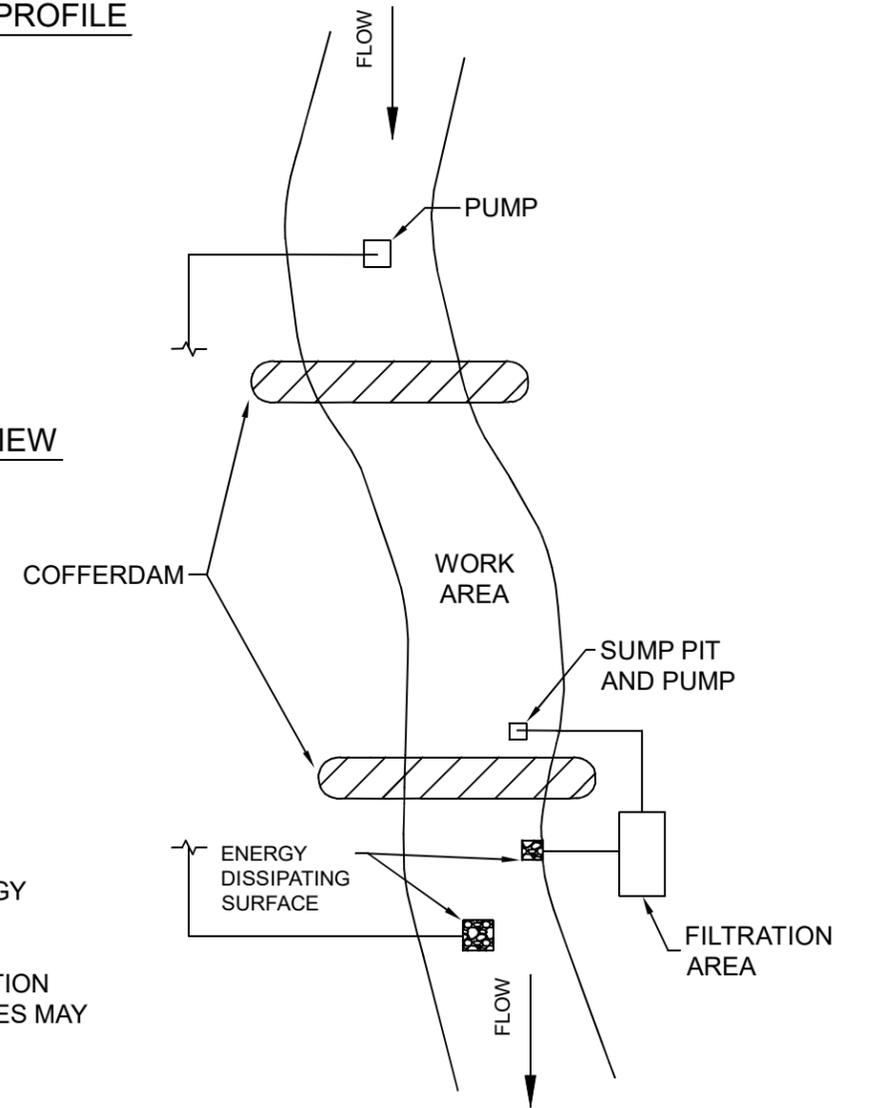
- NOTES:**
1. ALL DISCHARGES SHOULD BE ON ENERGY DISSIPATING SURFACES.
 2. LOCATIONS FOR SUMP PIT, FILTRATION AREA, AND ENERGY DISSIPATING SURFACES MAY VARY DEPENDING ON SITE CONDITIONS
 3. A-FRAME SHOULD BE INSTALLED ON MANUFACTURER'S SPECIFICATIONS.

A-FRAME COFFERDAM CROSSING



COFFERDAM PROFILE

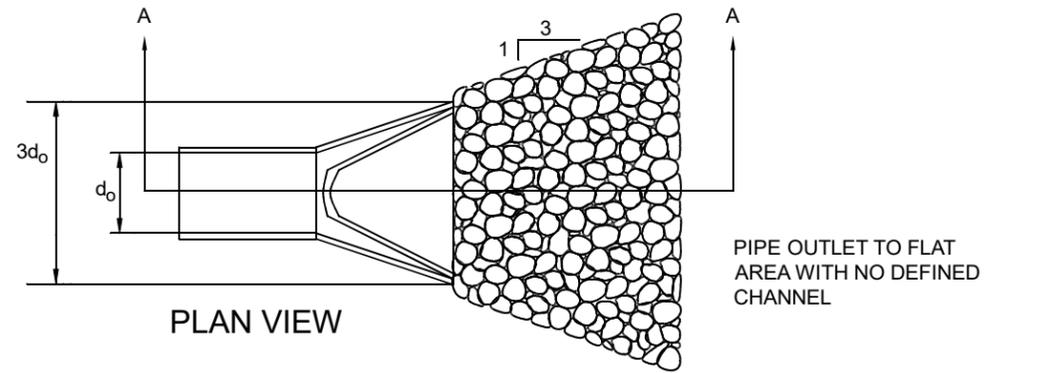
PLAN VIEW



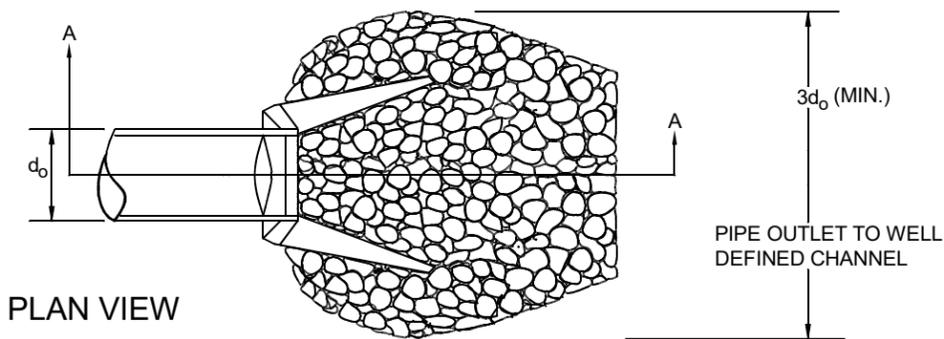
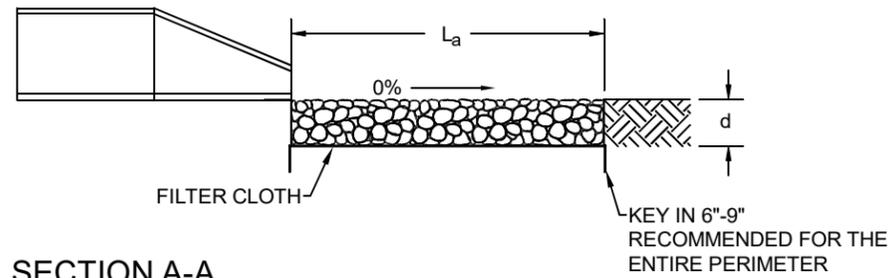
- NOTES:**
1. ALL DISCHARGES SHOULD BE ON ENERGY DISSIPATING SURFACES.
 2. LOCATIONS FOR THE SUMP PIT, FILTRATION AREA, AND ENERGY DISSIPATING SURFACES MAY VARY DEPENDING ON SITE CONDITIONS.

INFLATABLE BLADDER COFFERDAM CROSSING

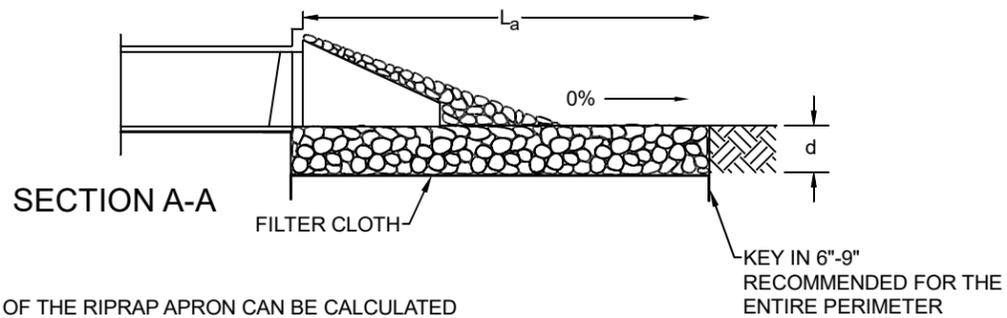
**PUMP
AROUND
STREAM
DIVERSION**



PLAN VIEW



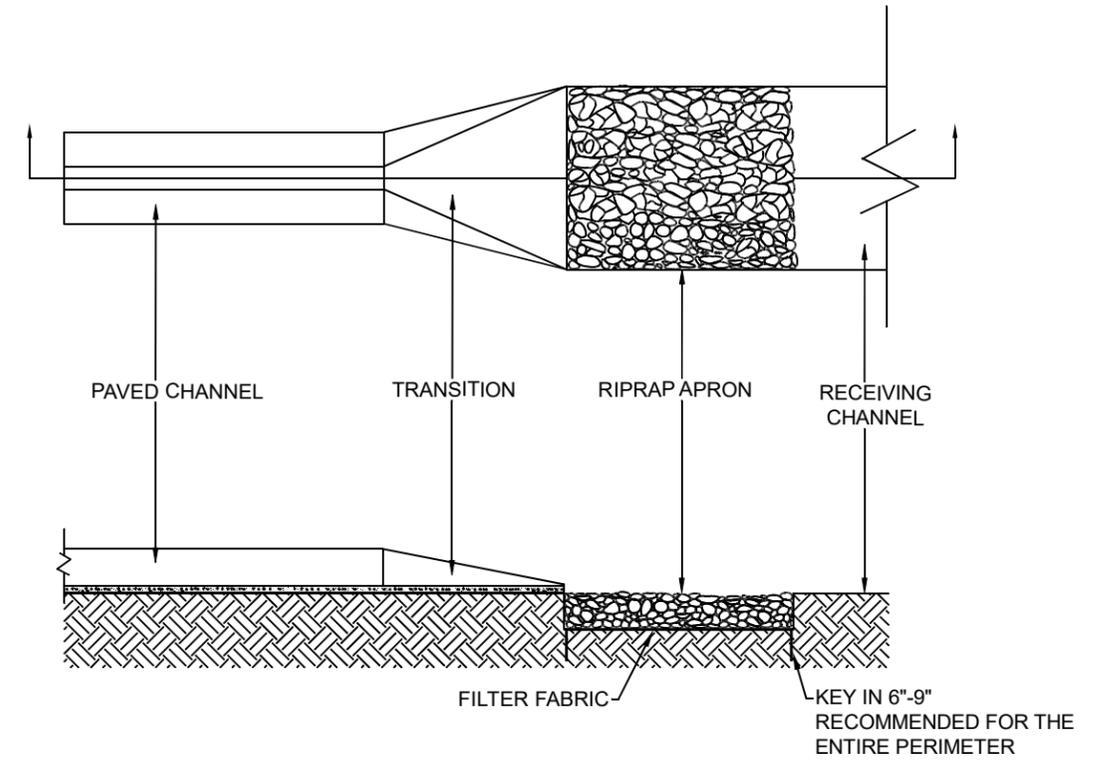
PLAN VIEW



PIPE OUTLET CONDITIONS

NOTES

1. THE DIMENSIONS OF THE RIPRAP APRON CAN BE CALCULATED USING TABLE 4.3.6-A WITHIN SECTION 4.3.6 RIPRAP APRON.

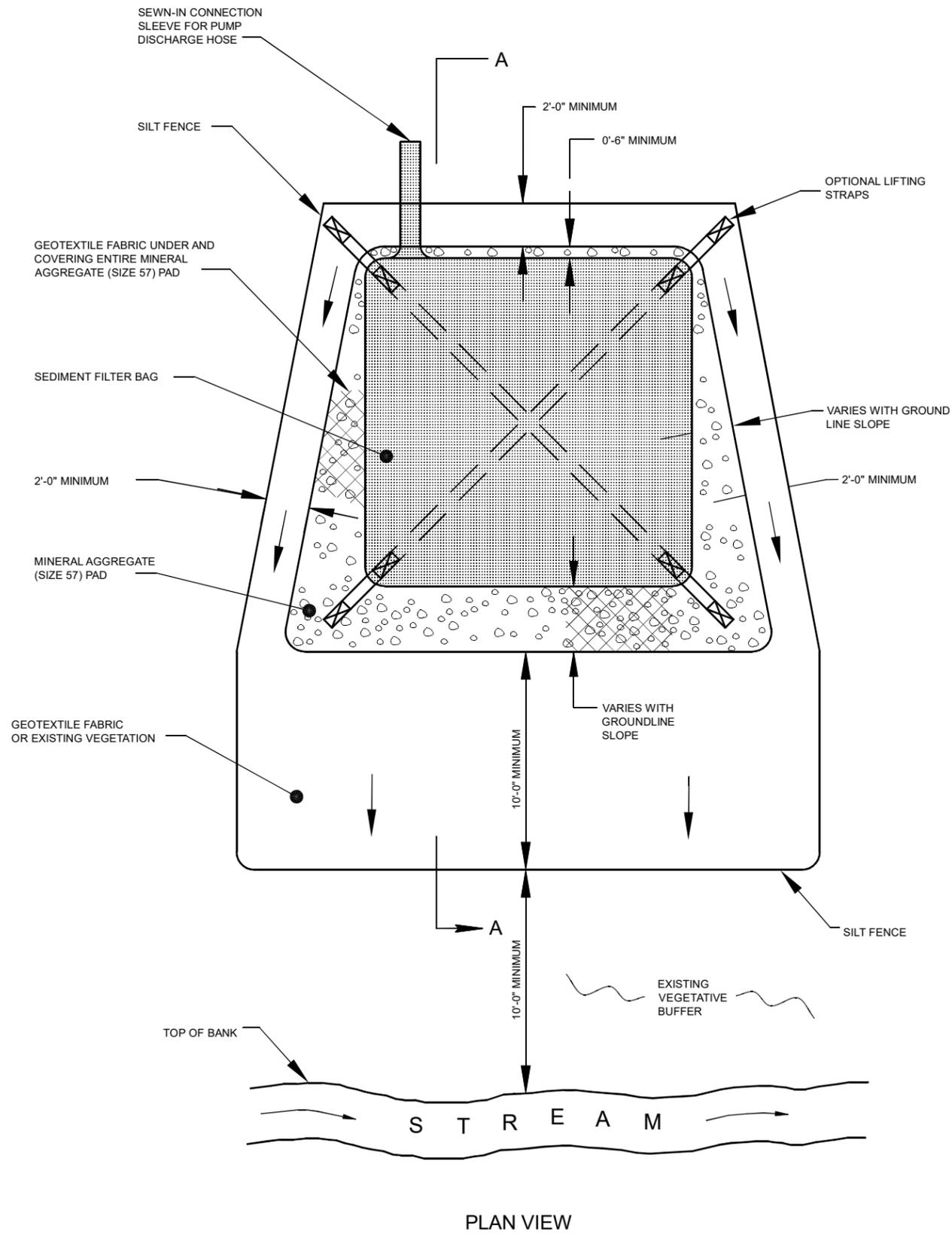


NOTES:

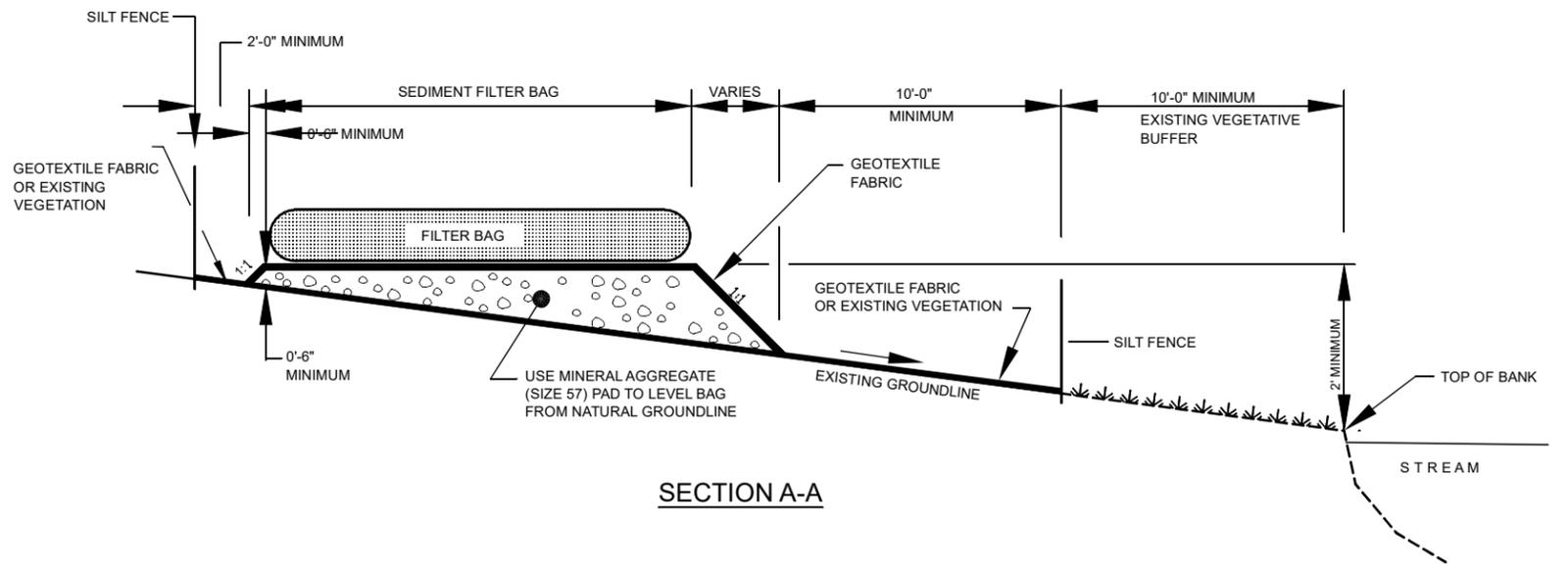
1. RIPRAP APRON REDUCES THE FLOW VELOCITY BELOW THE PERMISSIBLE VELOCITY OF THE NATURAL RECEIVING CHANNEL.

PAVED CHANNEL OUTLET SPECIFICATIONS

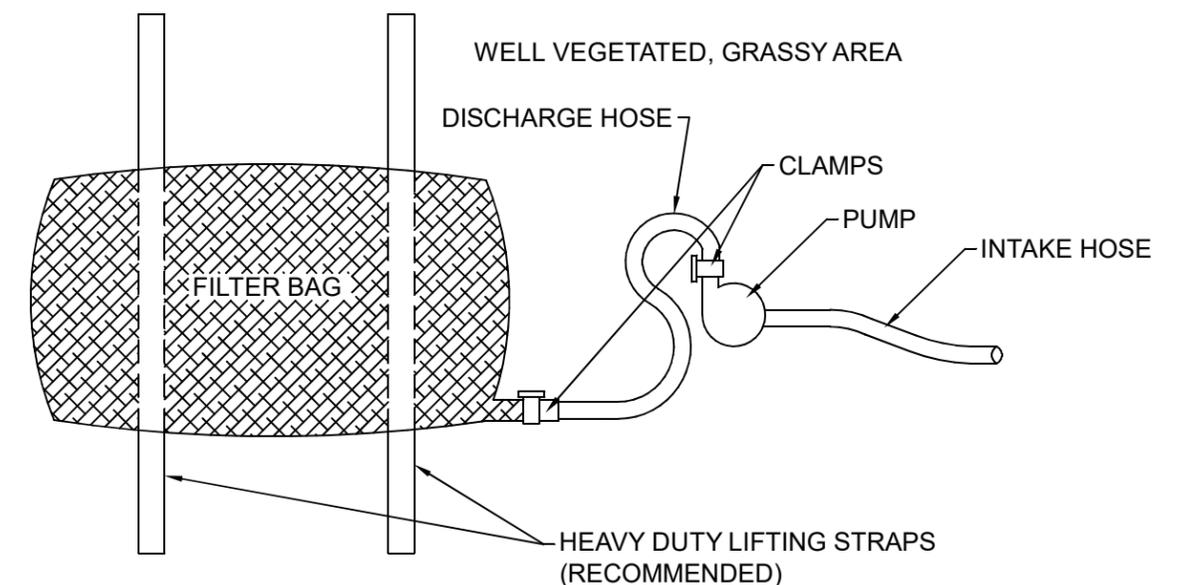
RIPRAP APRON



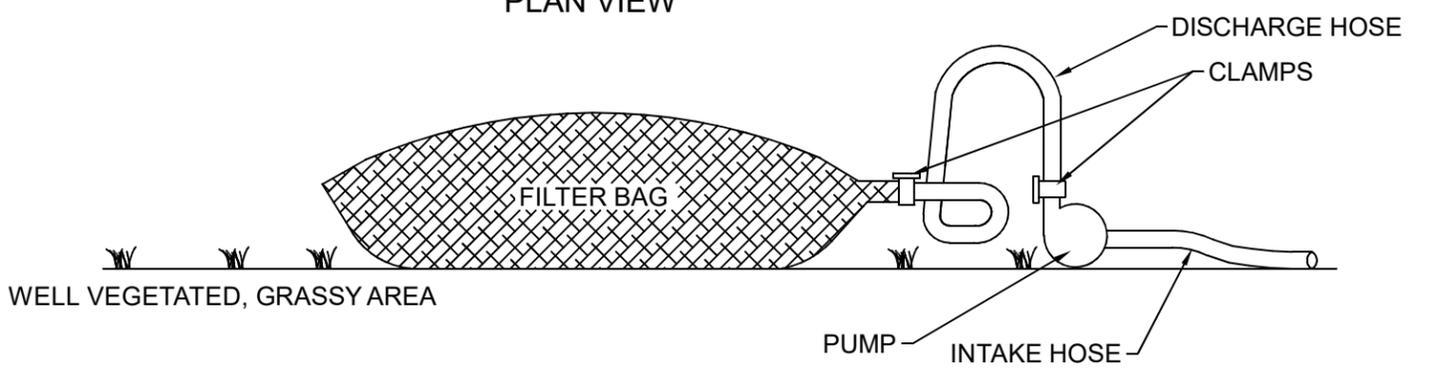
PLAN VIEW



SECTION A-A



PLAN VIEW

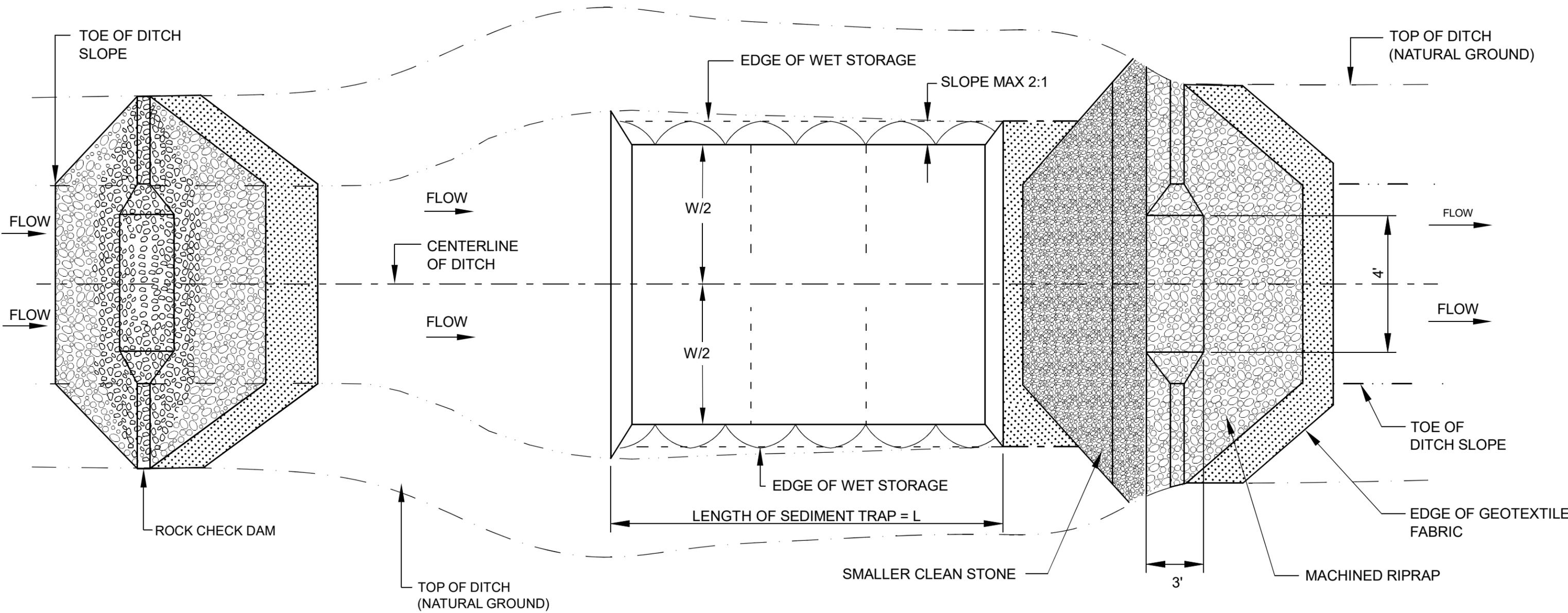


ELEVATION VIEW

ADAPTED FROM VIRGINIA STORMWATER MANAGEMENT HANDBOOK, DEPARTMENT OF ENVIRONMENTAL QUALITY, 2024

SEDIMENT FILTER BAG

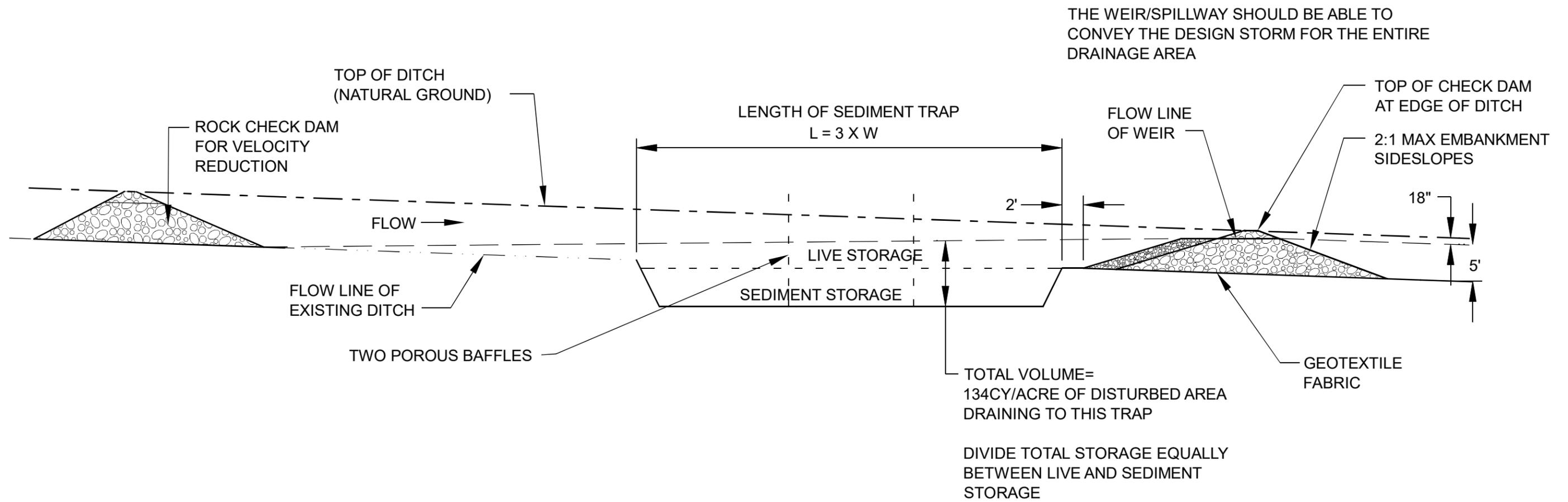
NOT TO SCALE



PLAN VIEW

SEDIMENT TRAP PLAN VIEW

NOT TO SCALE



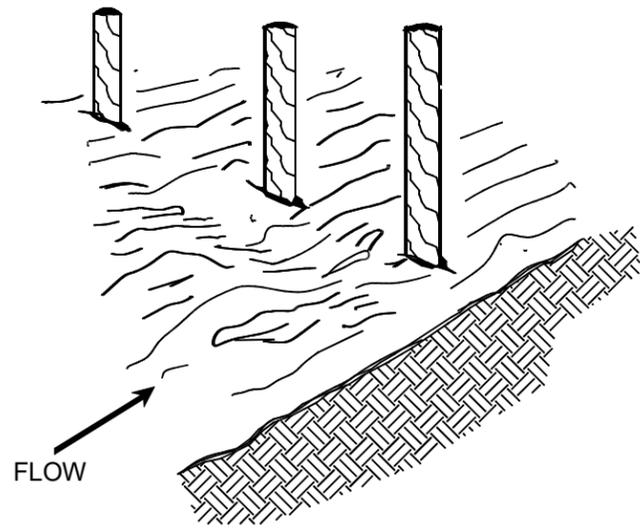
PROFILE VIEW

*DESIGN ELEVATIONS AND VOLUMES SHOULD BE INCLUDED ON DRAWINGS TO PROVIDE A SITE SPECIFIC DESIGN

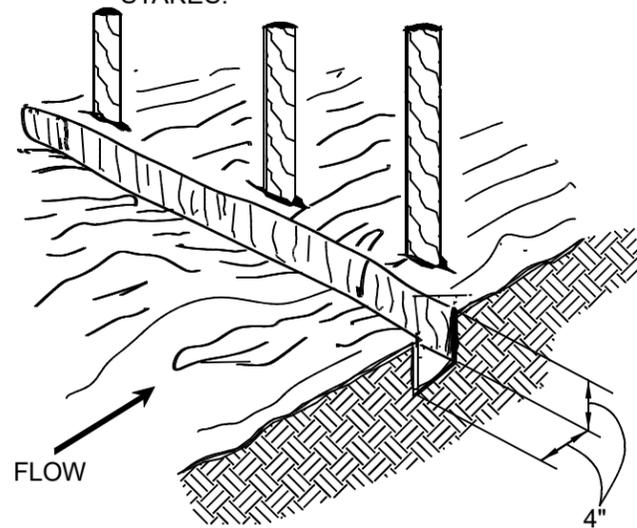
NOT TO SCALE

SEDIMENT TRAP PROFILE VIEW

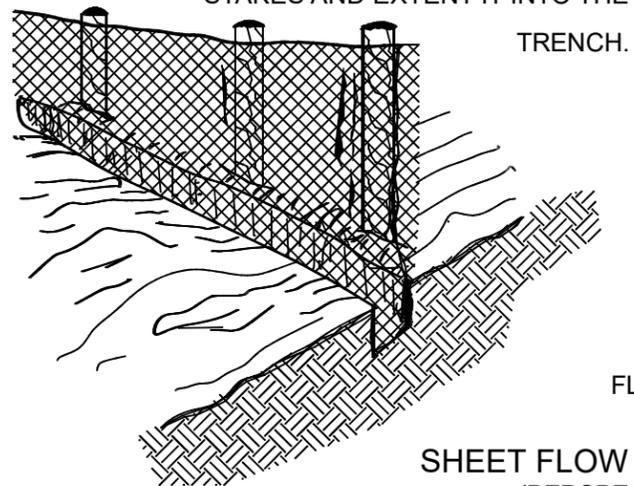
1. SET THE STAKES



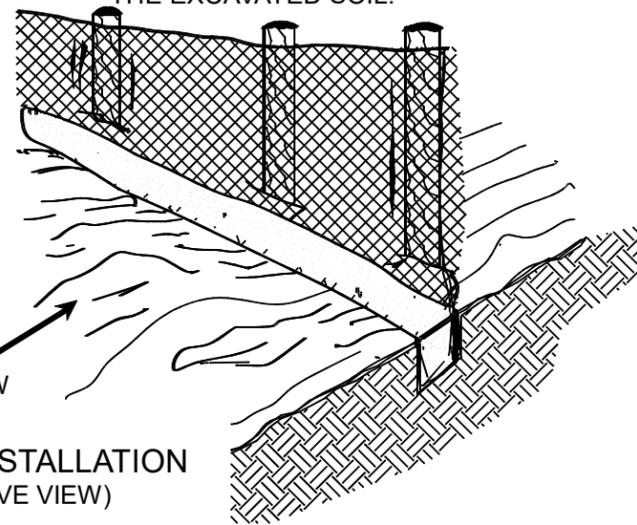
2. EXCAVATE A 4"x4" TRENCH UPSLOPE ALONG THE LINE OF STAKES.



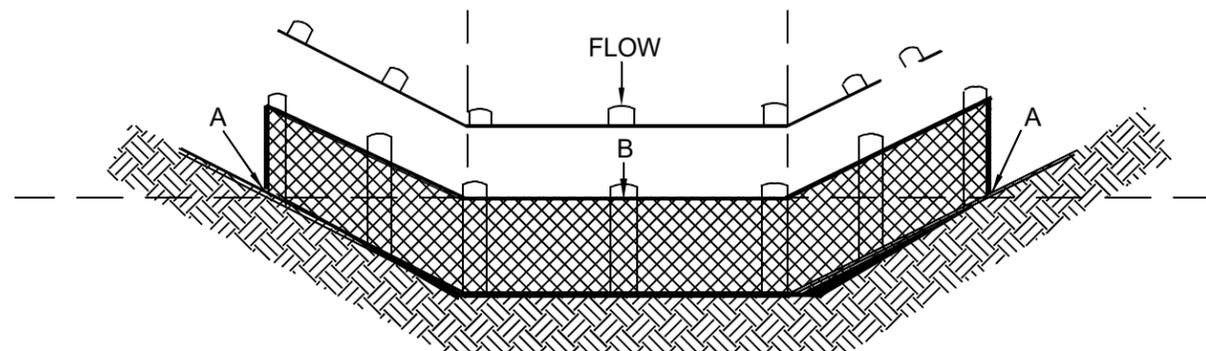
3. STAPLE THE FILTER MATERIAL TO STAKES AND EXTEND IT INTO THE TRENCH.



4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



SHEET FLOW INSTALLATION
(PERSPECTIVE VIEW)

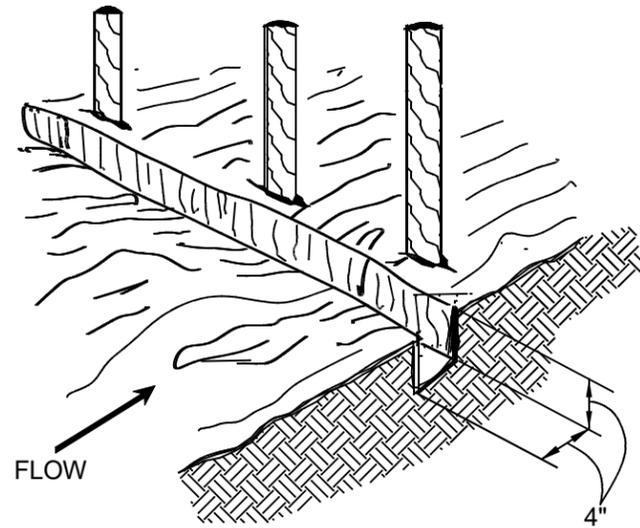


POINTS A SHOULD BE HIGHER THAN POINT B.

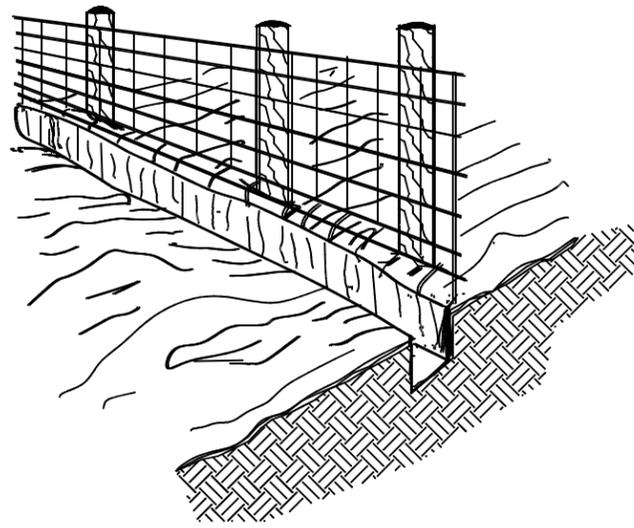
DRAINAGEWAY INSTALLATION
(FRONT ELEVATION)

SILT FENCE

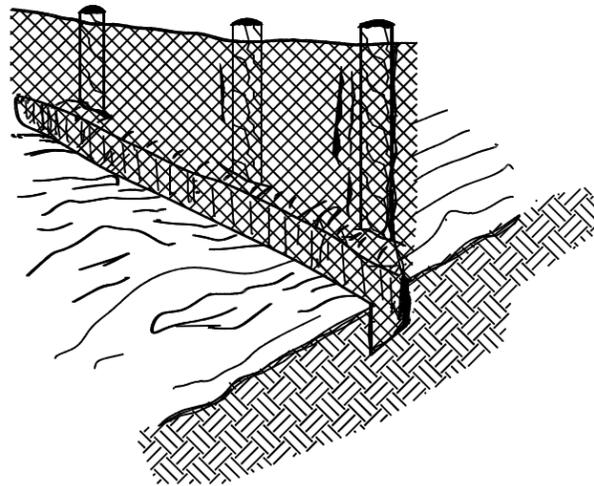
1. SET POSTS AND EXCAVATE A 4"X4" TRENCH UPSLOPE ALONG THE LINE OF POSTS.



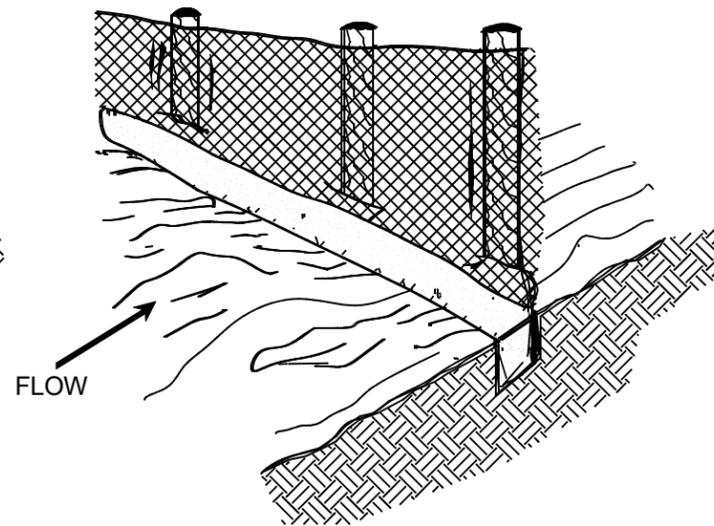
2. STAPLE WIRE FENCING TO THE POSTS.



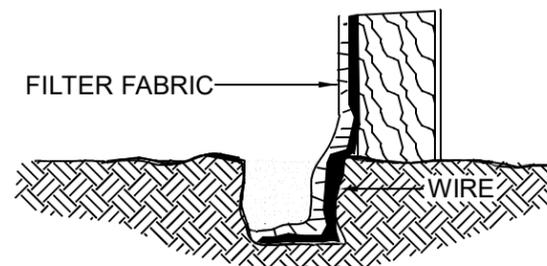
3. ATTACH THE FILTER FABRIC TO THE WIRE FENCE AND EXTEND IT INTO THE TRENCH.



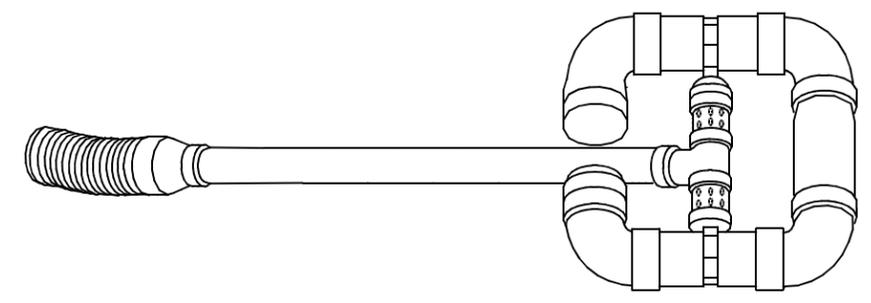
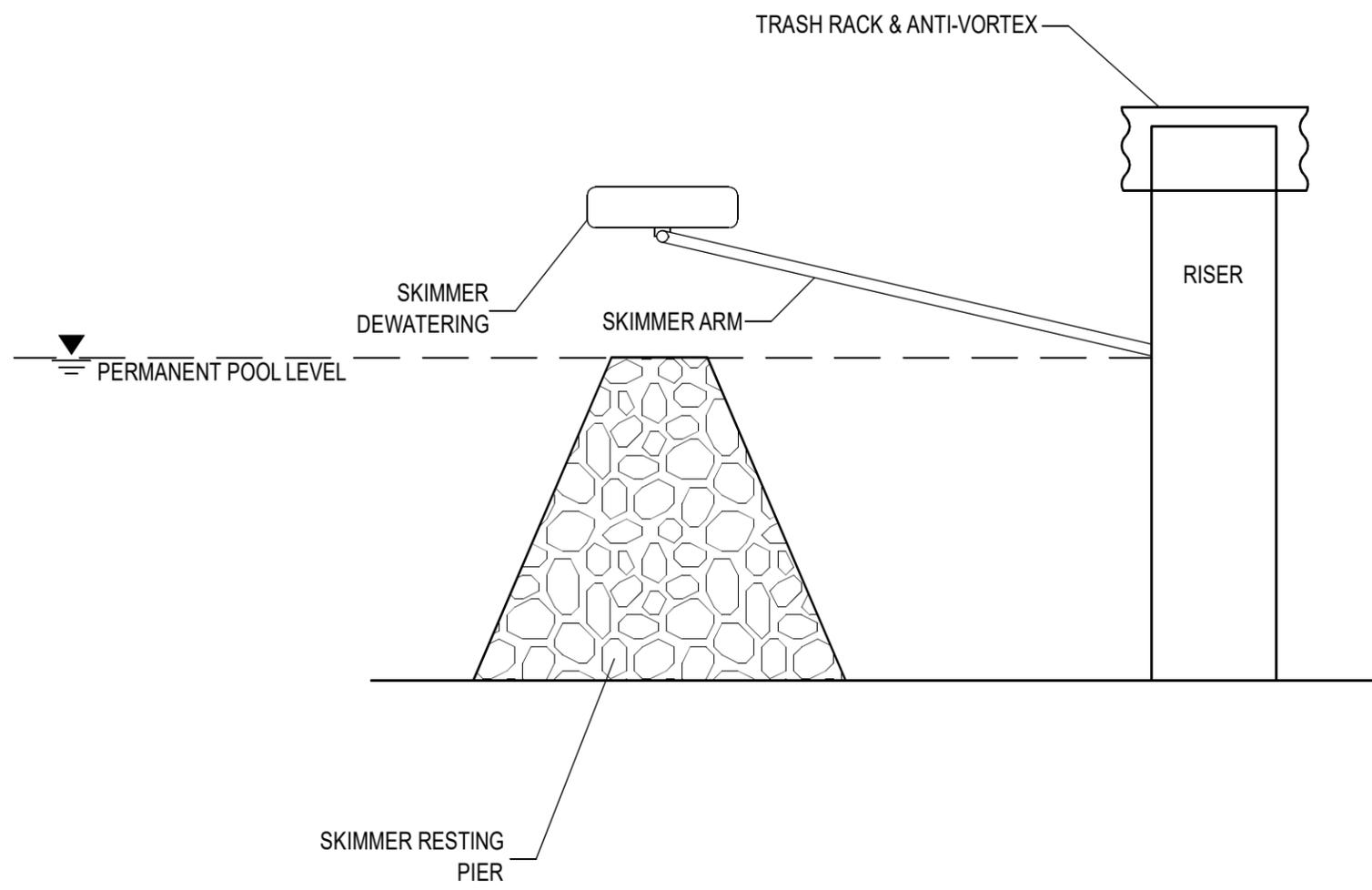
4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



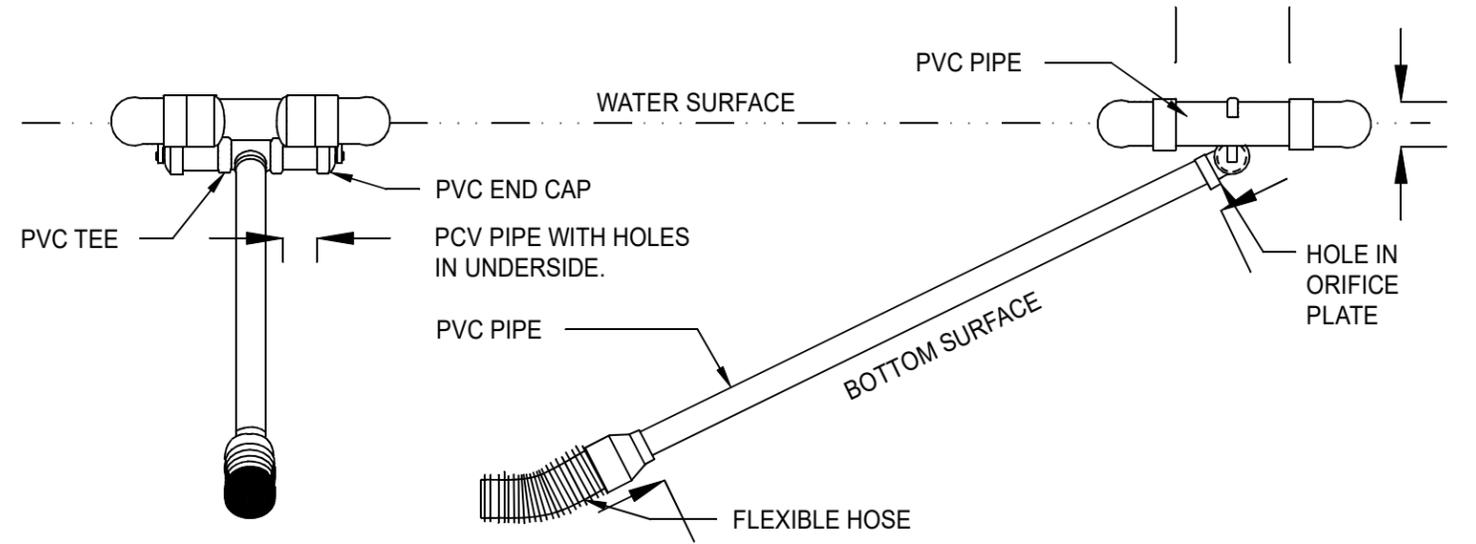
EXTENSION OF FABRIC AND WIRE INTO THE TRENCH.



SILT FENCE WITH WIRE BACKING



SKIMMER PERSPECTIVE



SKIMMER FRONTAL SECTION VIEW

SKIMMER SIDE SECTION VIEW

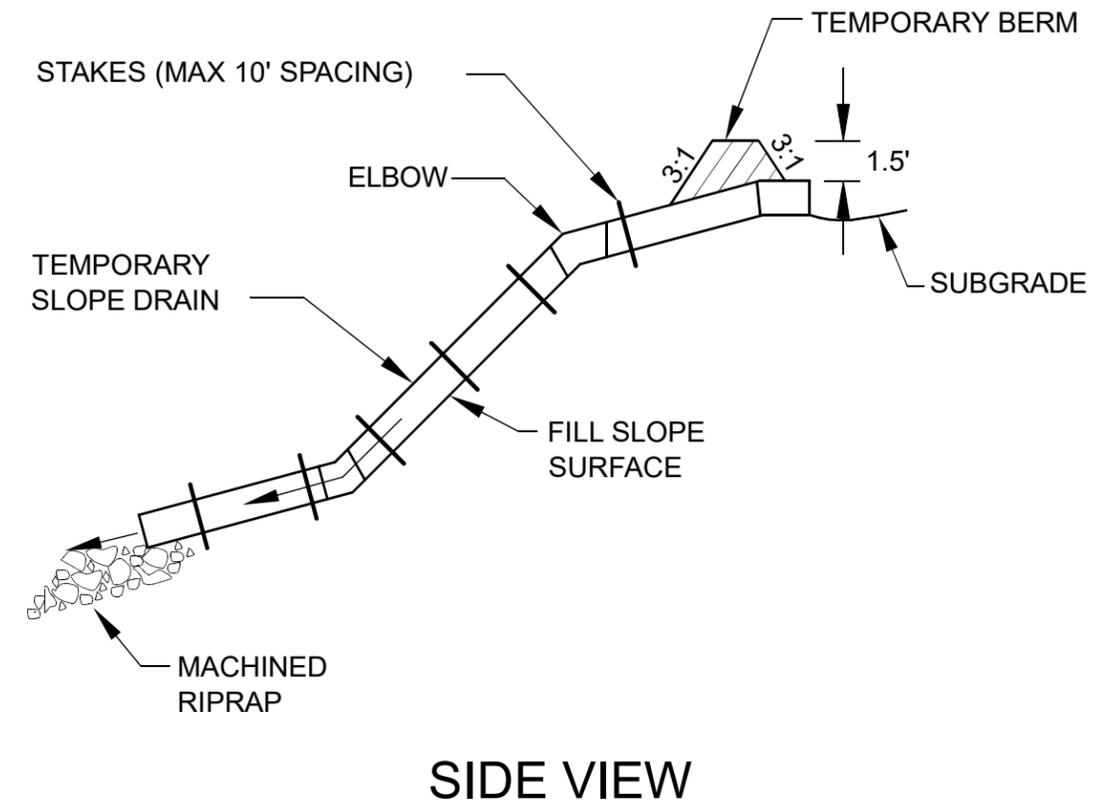
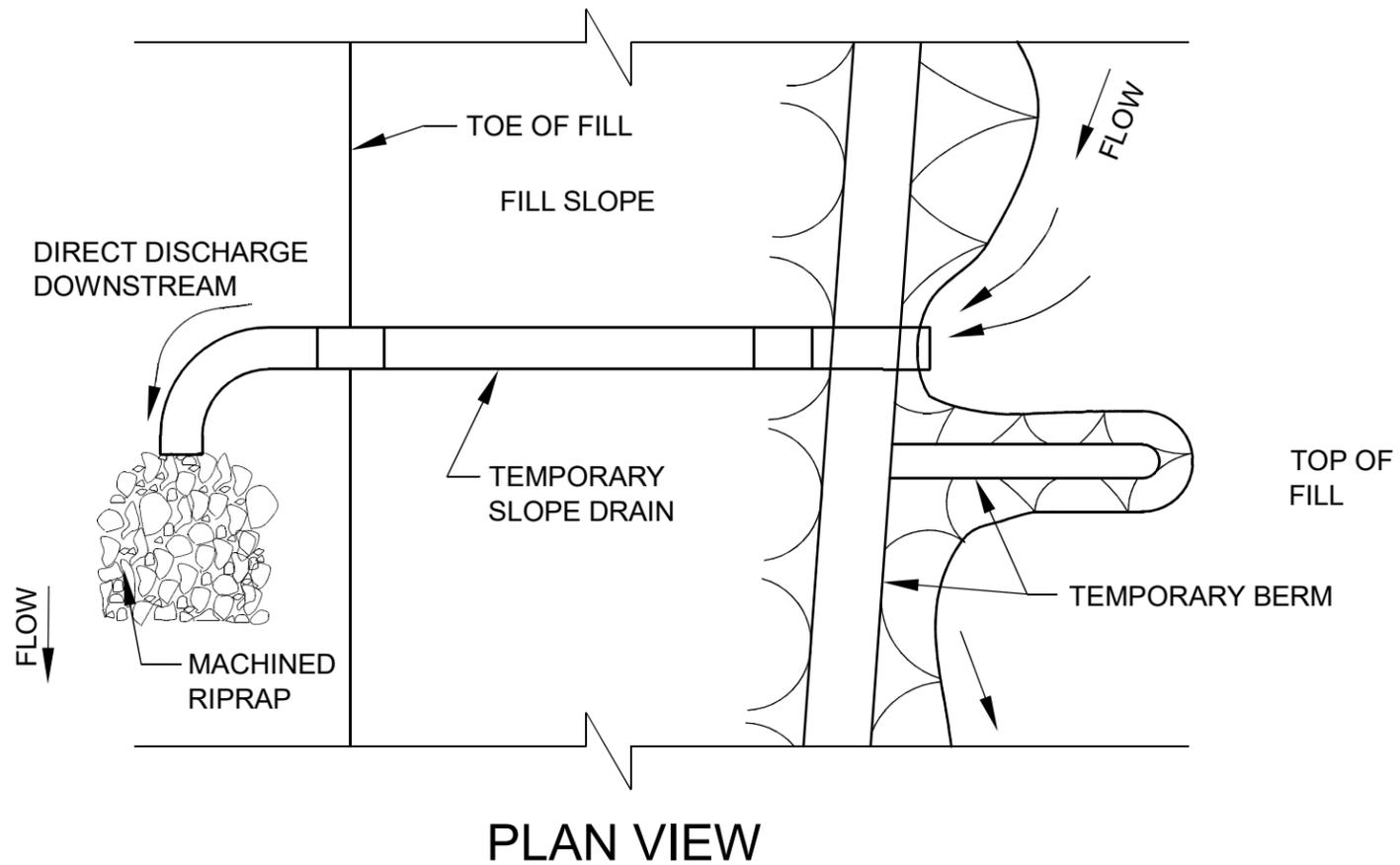
NOTES:

1. ADAPTED FROM GEORGIA SOIL AND WATER CONSERVATION COMISSION (2010).
2. DEWATERING OF THE LIVE STORAGE SHOULD TAKE PLACE BETWEEN 48 AND 72 HOURS

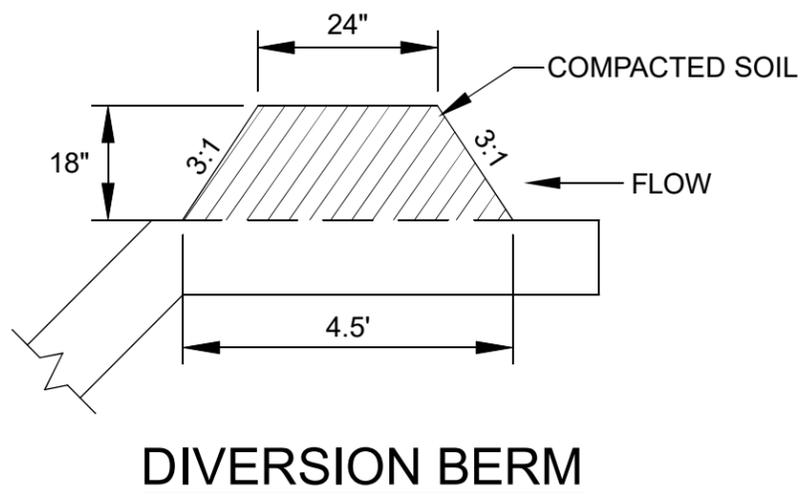
* SIZING AND SPECIFICATIONS SHOULD BE INCLUDED ON DRAWINGS TO PROVIDE A SITE SPECIFIC DESIGN

SKIMMER

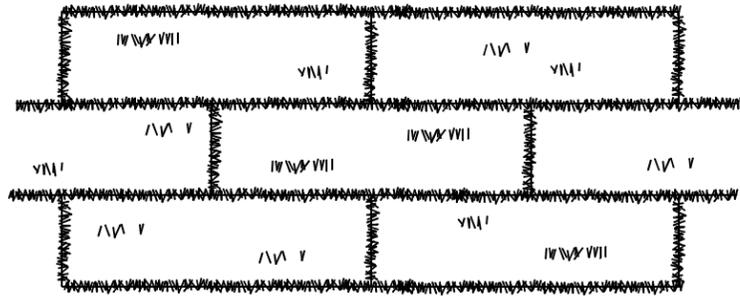
TEMPORARY SLOPE DRAIN WITH BERM AND RIP-RAP



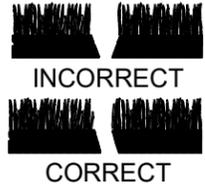
TEMPORARY BERM DETAILS



SLOPE DRAIN



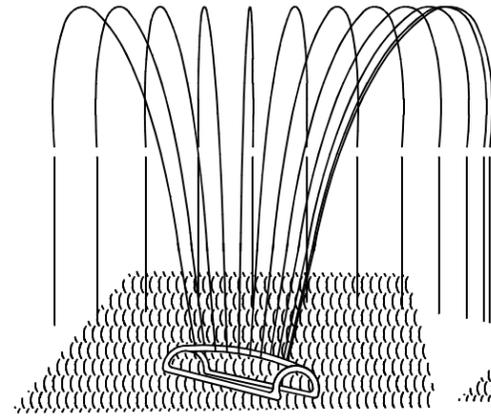
LAY SOD IN A STAGGERED PATTERN. BUTT THE STRIPS TIGHTLY AGAINST EACH OTHER. DO NOT LEAVE SPACES AND DO NOT OVERLAP. A SHARPENED MASON'S TROWEL IS A HANDY TOOL FOR TUCKING DOWN THE ENDS AND TRIMMING PIECES.



BUTTING - ANGLED ENDS CAUSED BY THE AUTO-MATIC SOD CUTTER MUST BE MATCHED CORRECTLY.



ROLL SOD IMMEDIATELY TO ACHIEVE FIRM CONTACT WITH THE SOIL.

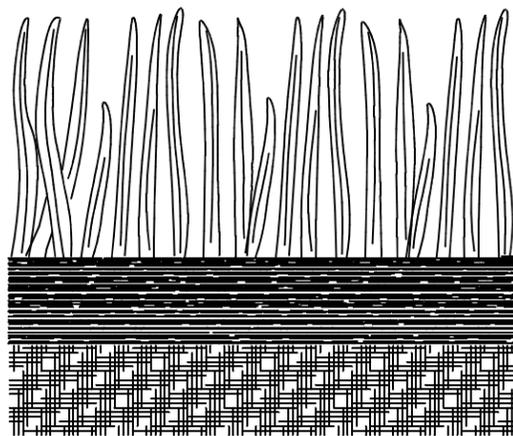


WATER TO A DEPTH OF 4" AS NEEDED. WATER WELL AS SOON AS THE SOD IS LAID.



MOW WHEN THE SOD IS ESTABLISHED - IN 2-3 WEEKS. SET THE MOWER HIGH (2"-3").

APPEARANCE OF GOOD SOD

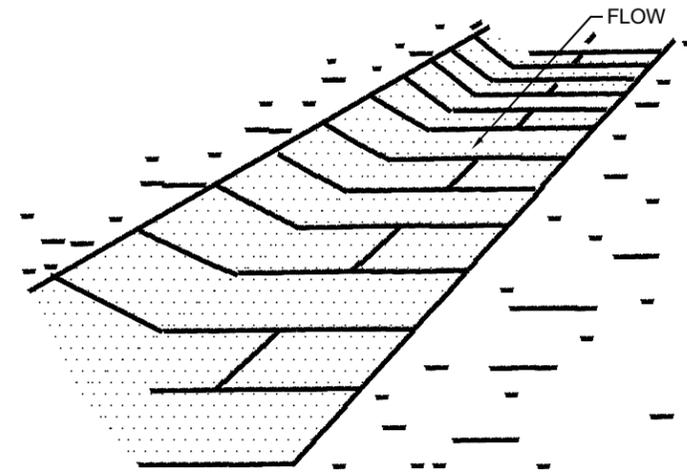


SHOOTS OR GRASS BLADES. GRASS SHOULD BE GREEN AND HEALTHY, OFTEN MOWED AT A 2"-3" CUTTING HEIGHT.

THATCH - GRASS CLIPPINGS AND DEAD LEAVES.

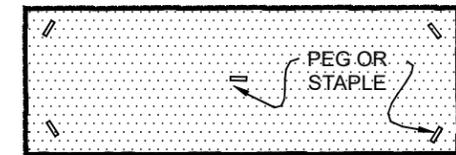
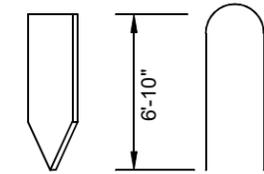
ROOT ZONE - SOIL AND ROOTS SHOULD HAVE DENSE ROOT MAT FOR STRENGTH.

SODDING

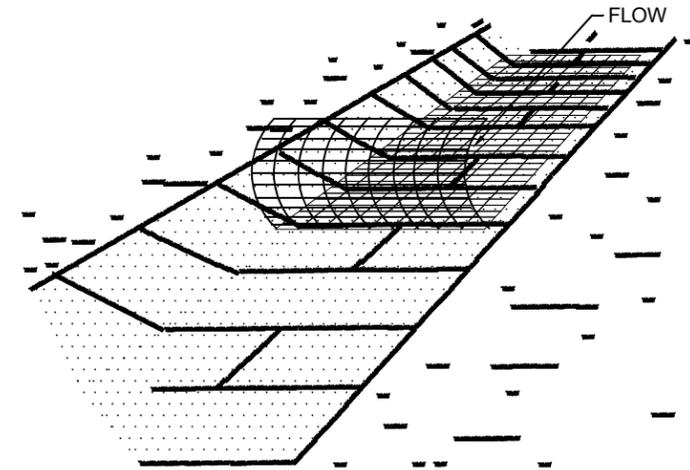


LAY SOD ACROSS THE DIRECTION OF FLOW.

USE PEGS OR STAPLES TO FASTEN SOD FIRMLY - AT THE ENDS OF STRIPS AND IN THE CENTER, OR EVERY 3-4 FEET IF THE STRIPS ARE LONG. WHEN READY TO MOW, DRIVE PEGS OR STAPLES FLUSH WITH THE GROUND.



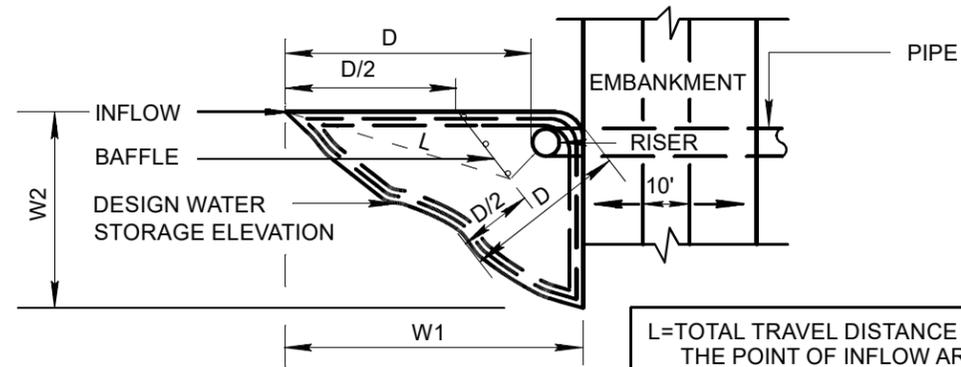
IN CRITICAL AREAS, SECURE SOD WITH NETTING. USE STAPLES.



SODDING WATERWAYS

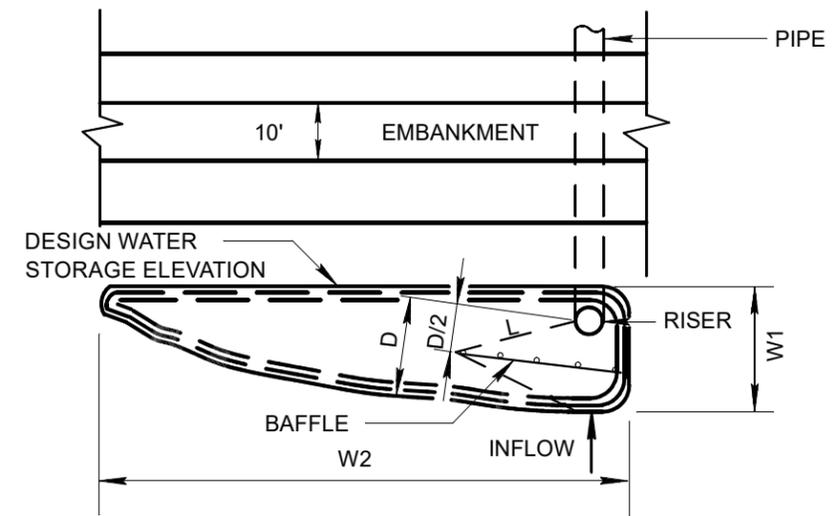
SOD

EXAMPLE PLAN VIEWS OF BAFFLE LOCATIONS IN SEDIMENT BASINS

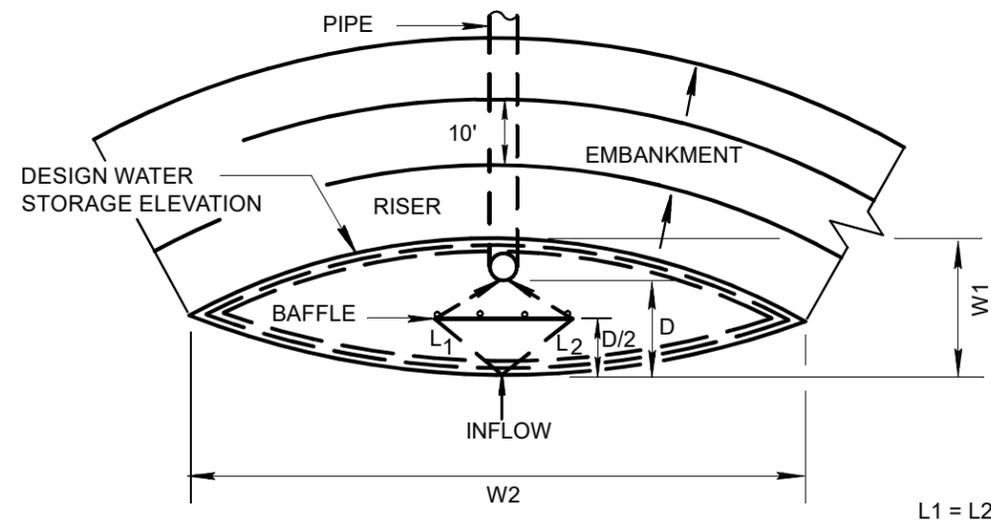


L=TOTAL TRAVEL DISTANCE FROM THE POINT OF INFLOW AROUND THE BAFFLE TO THE RISER

SHAPE NO.1

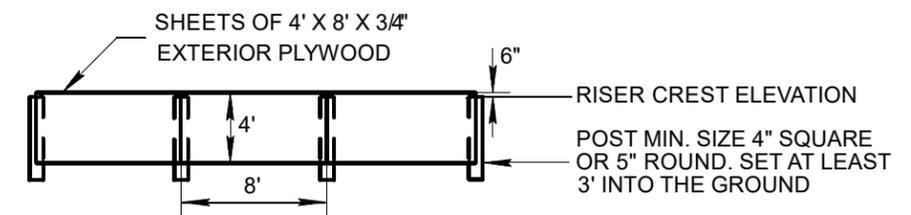


SHAPE NO.2



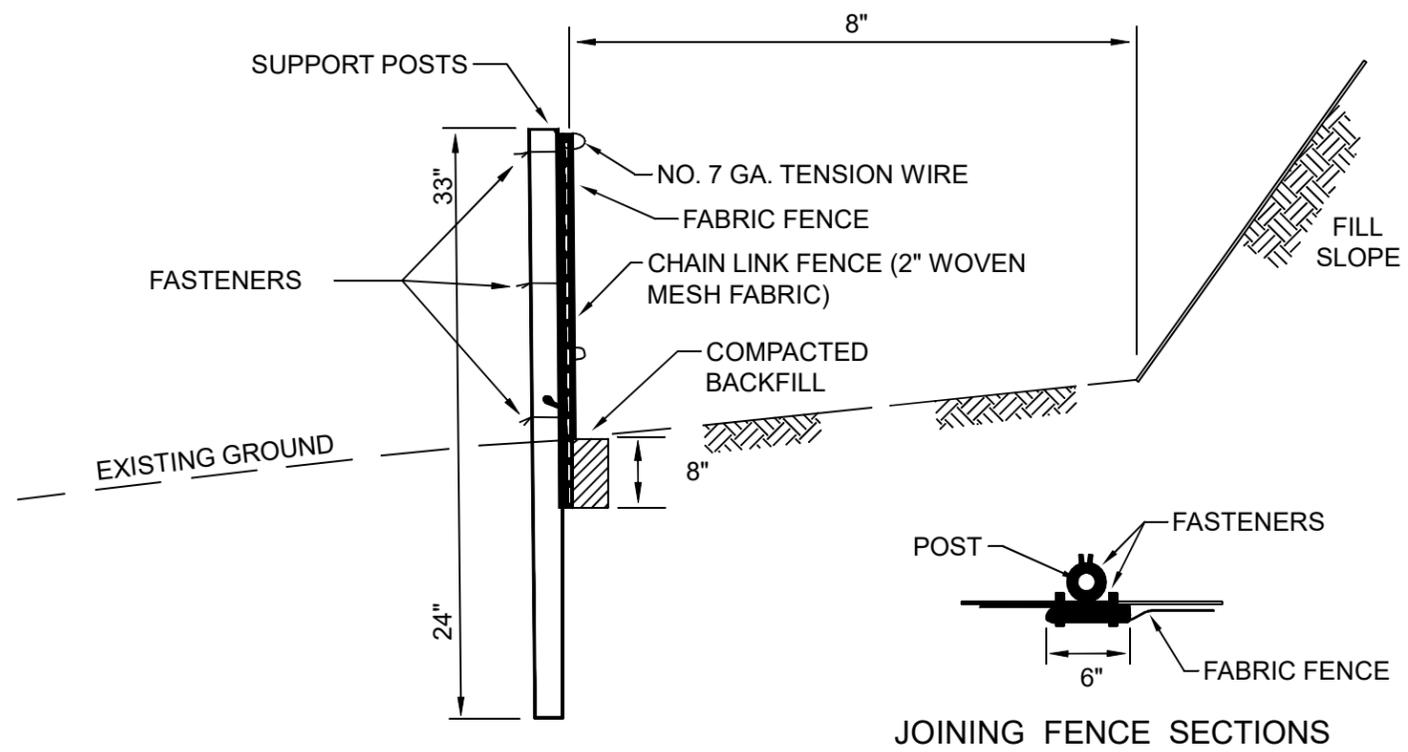
L1 = L2

SHAPE NO.3

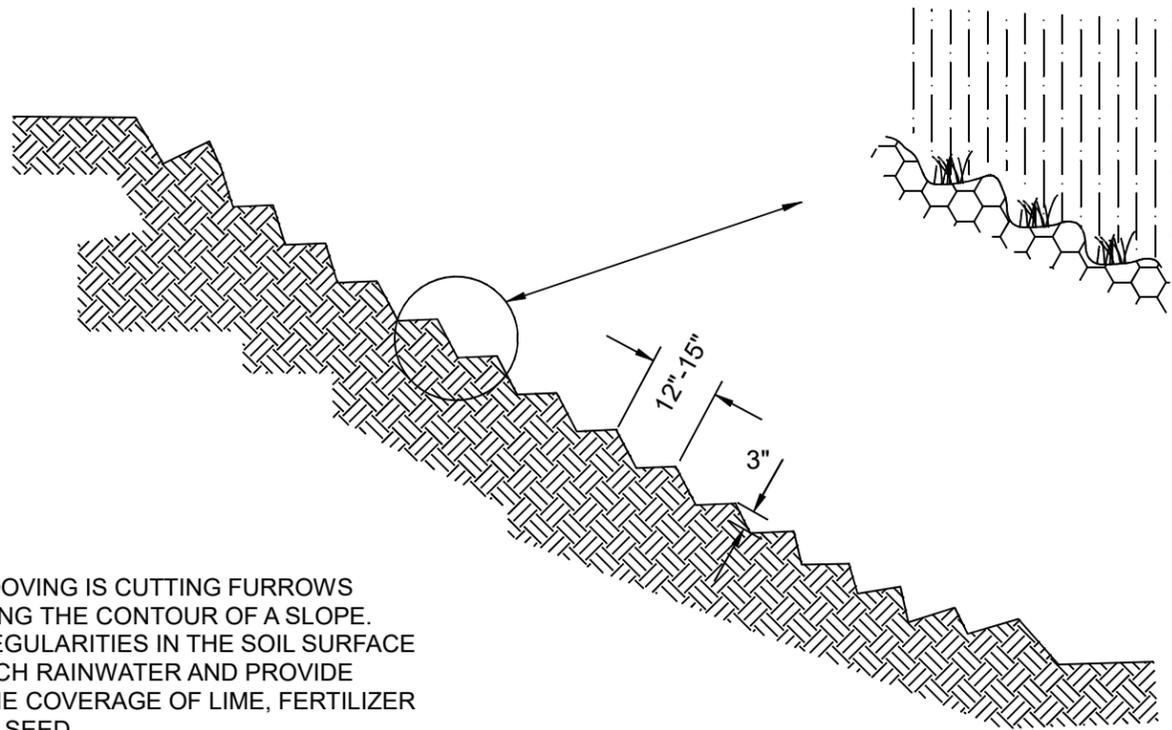


BAFFLE DETAIL

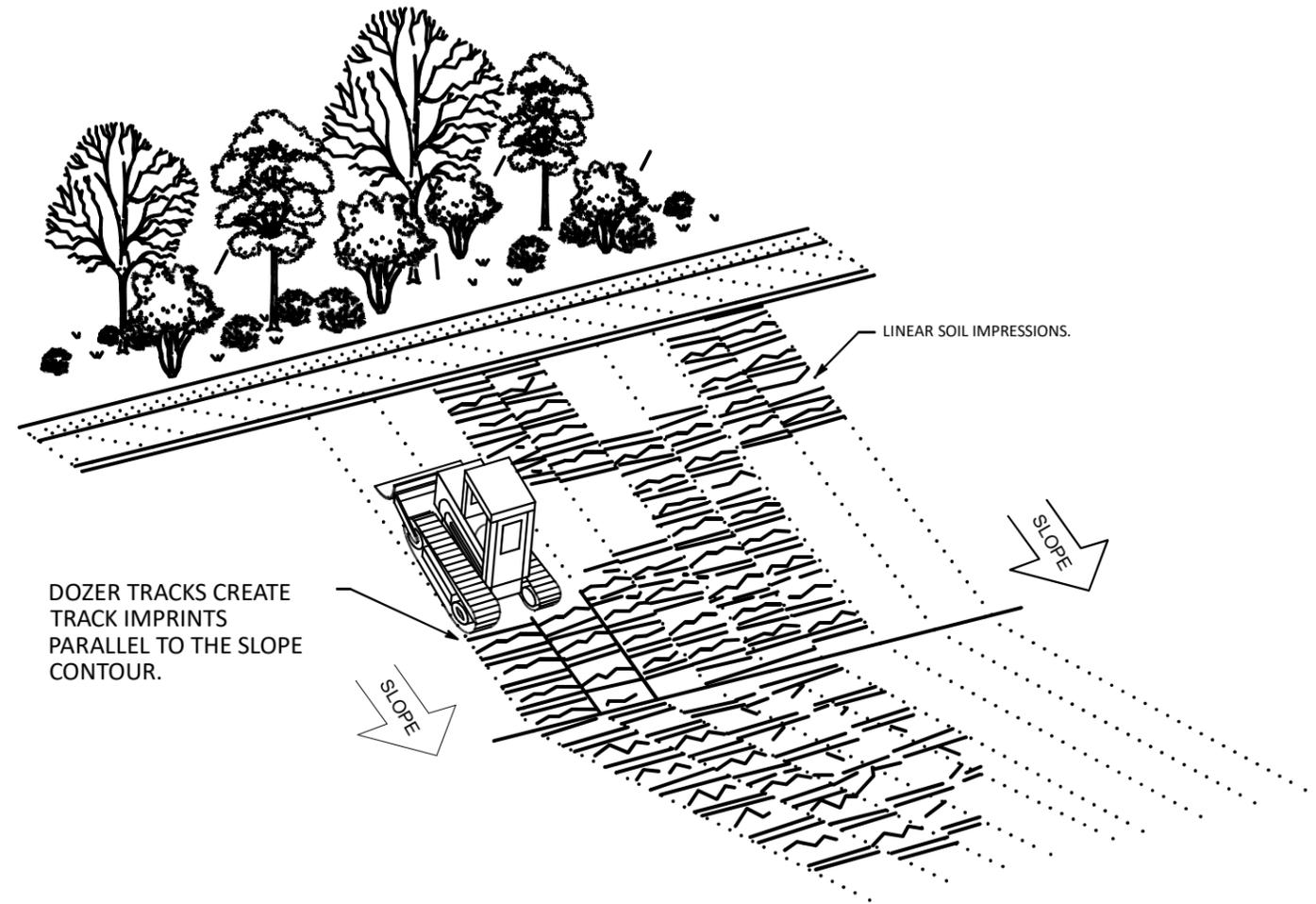
**SOLID
BAFFLES**



SUPER SILT FENCE



GROOVING IS CUTTING FURROWS ALONG THE CONTOUR OF A SLOPE. IRREGULARITIES IN THE SOIL SURFACE CATCH RAINWATER AND PROVIDE SOME COVERAGE OF LIME, FERTILIZER AND SEED.



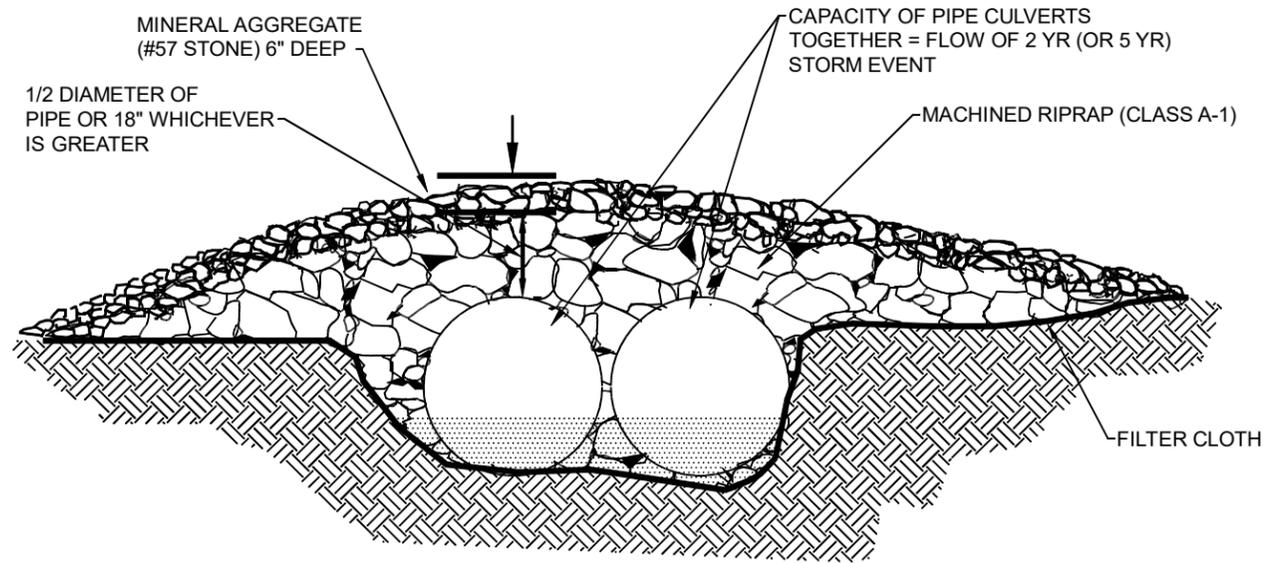
DOZER TRACKS CREATE TRACK IMPRINTS PARALLEL TO THE SLOPE CONTOUR.

VERTICAL TRACKING

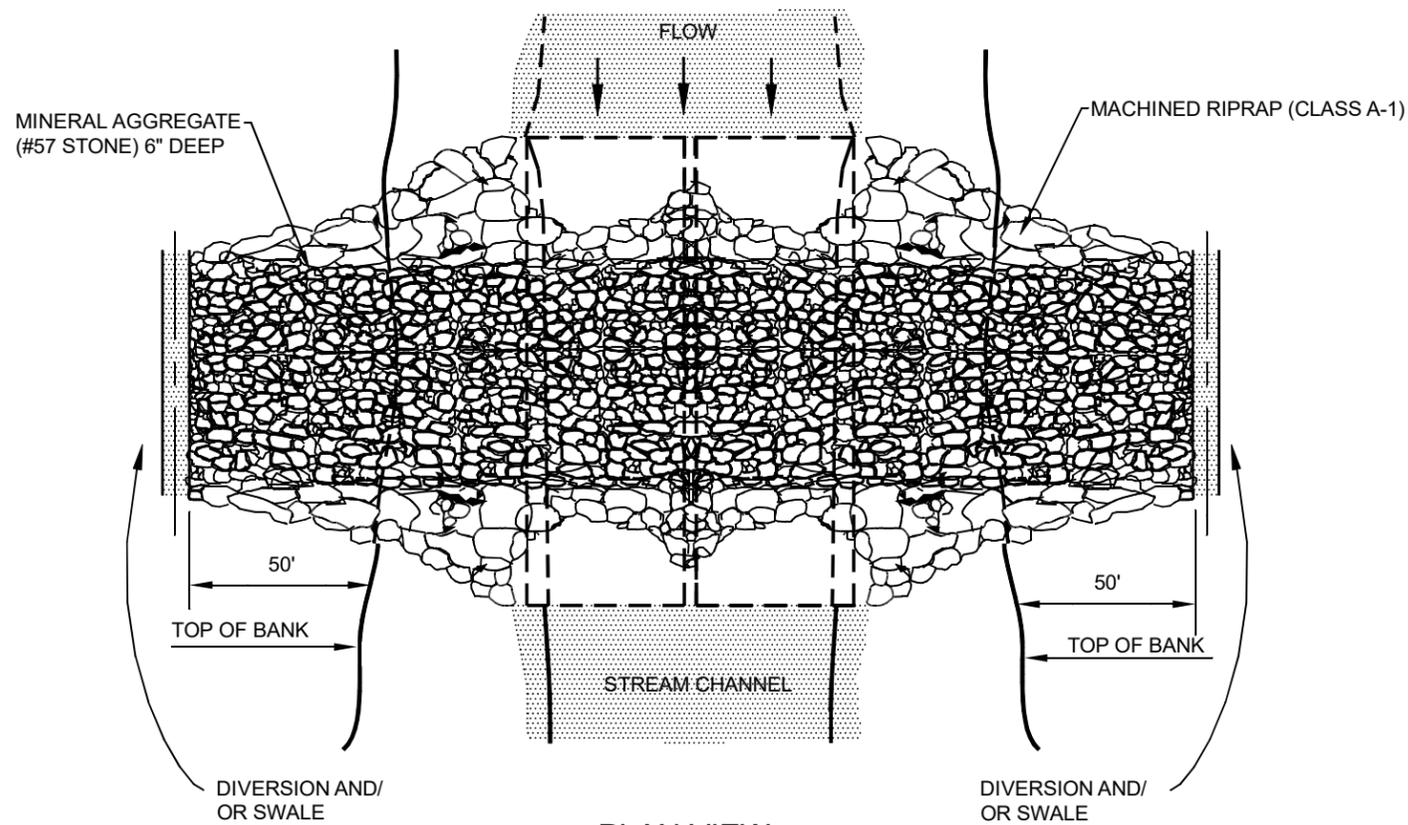
NOTES:

1. VERTICAL TRACKING IS REQUIRED ON PROJECTS WHERE SOIL DISTRIBUTING ACTIVITIES HAVE OCCURRED UNLESS OTHERWISE APPROVED.
2. PERFORM VERTICAL TRACKING ON SLOPES TO TEMPORARILY STABILIZE SOIL.
3. PROVIDE EQUIPMENT WITH A TRACK UNDERCARRIAGE CAPABLE OF PRODUCING LINEAR SOIL IMPRESSIONS MEASURING A MINIMUM OF 12" IN LENGTH BY 2" TO 4" IN WIDTH BY 1/2" TO 2" IN DEPTH.
4. DO NOT EXCEED 12" BETWEEN TRACK IMPRESSIONS.
5. INSTALL CONTINUOUS LINEAR TRACK IMPRESSIONS WHERE THE MINIMUM 12" LENGTH IMPRESSIONS ARE PERPENDICULAR TO THE SLOPE OR DIRECTION OF WATER FLOW.

SURFACE ROUGHENING

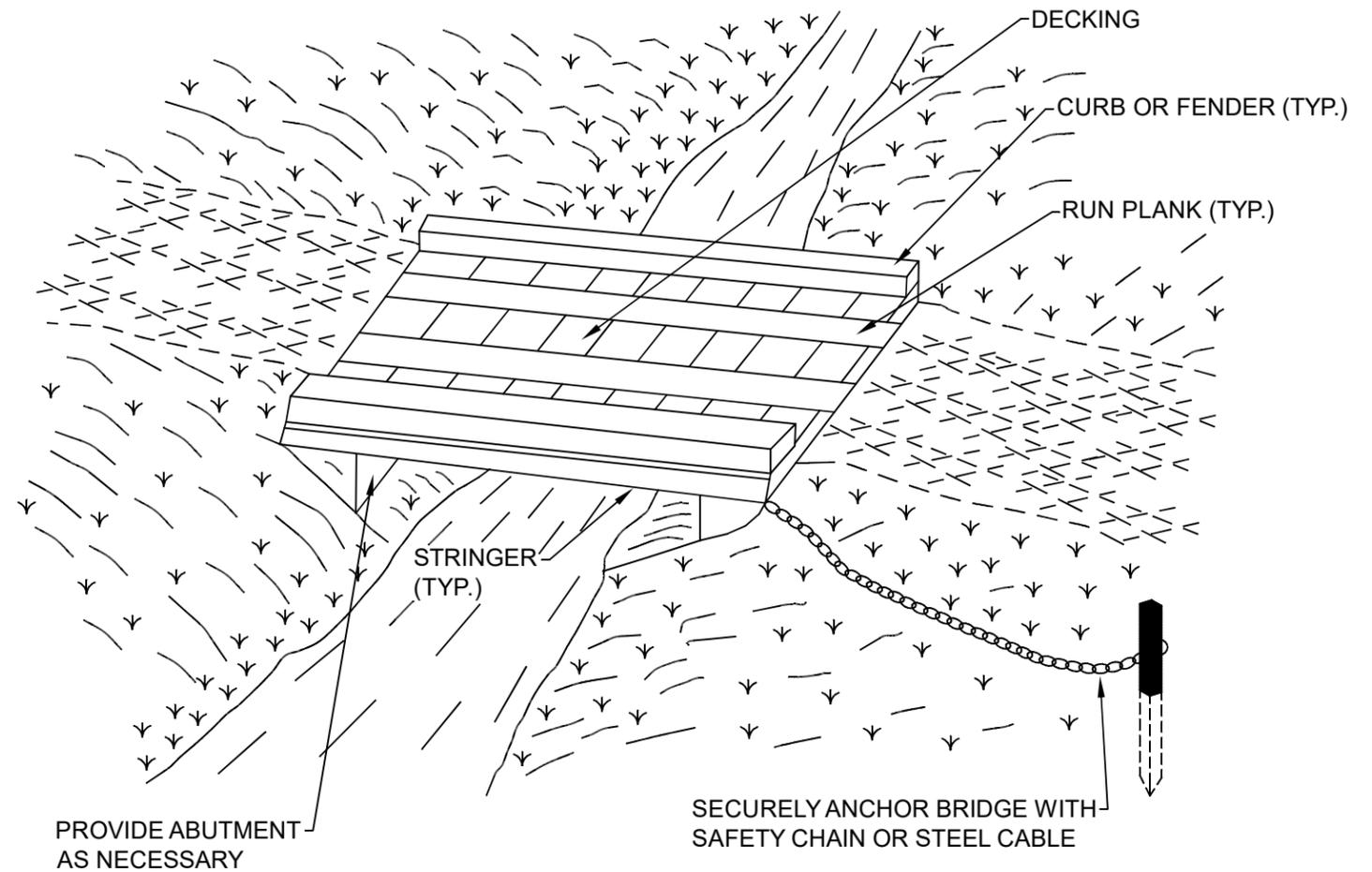


ELEVATION



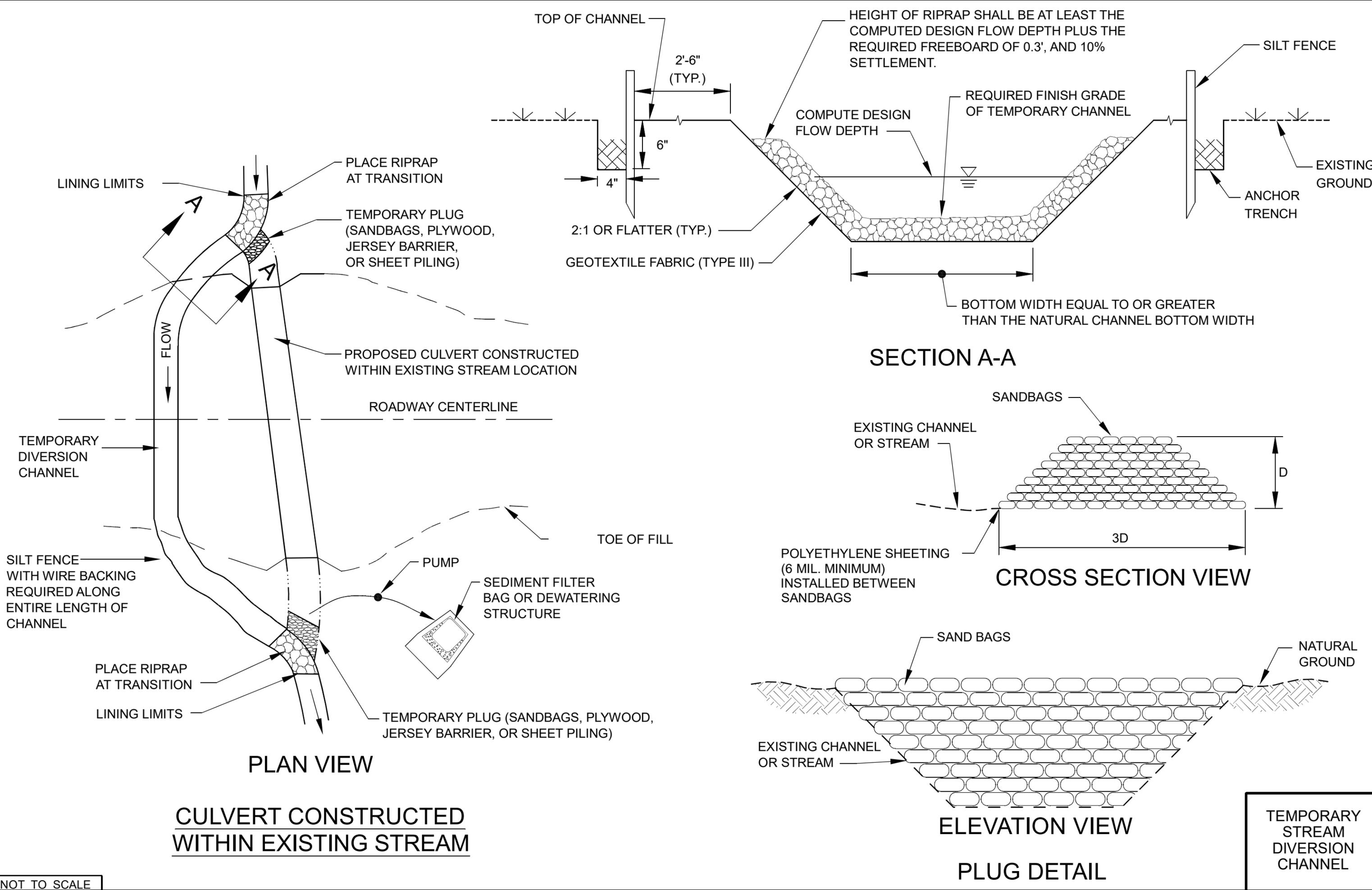
PLAN VIEW

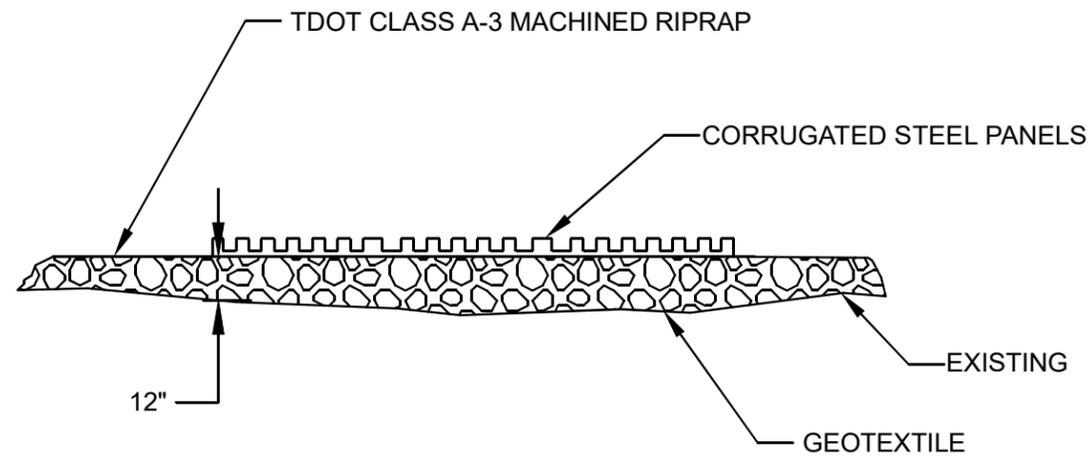
TEMPORARY CULVERT CROSSING



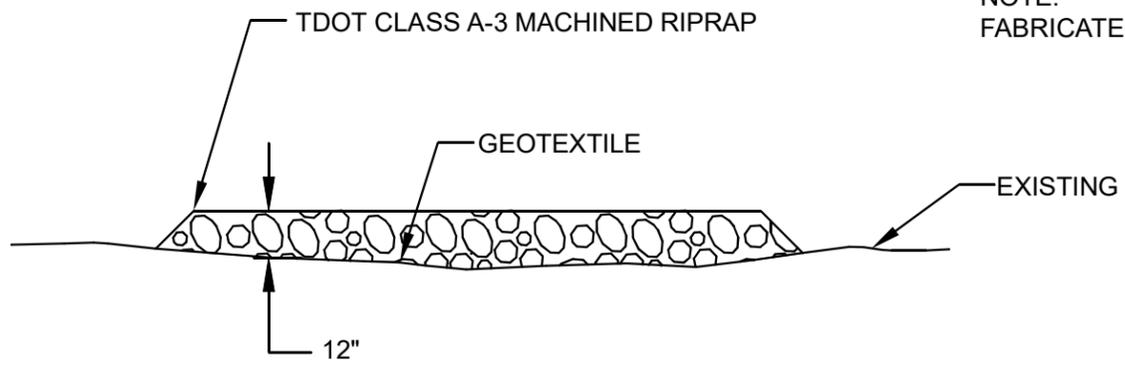
TEMPORARY BRIDGE CROSSING

TEMPORARY
STREAM
CROSSING



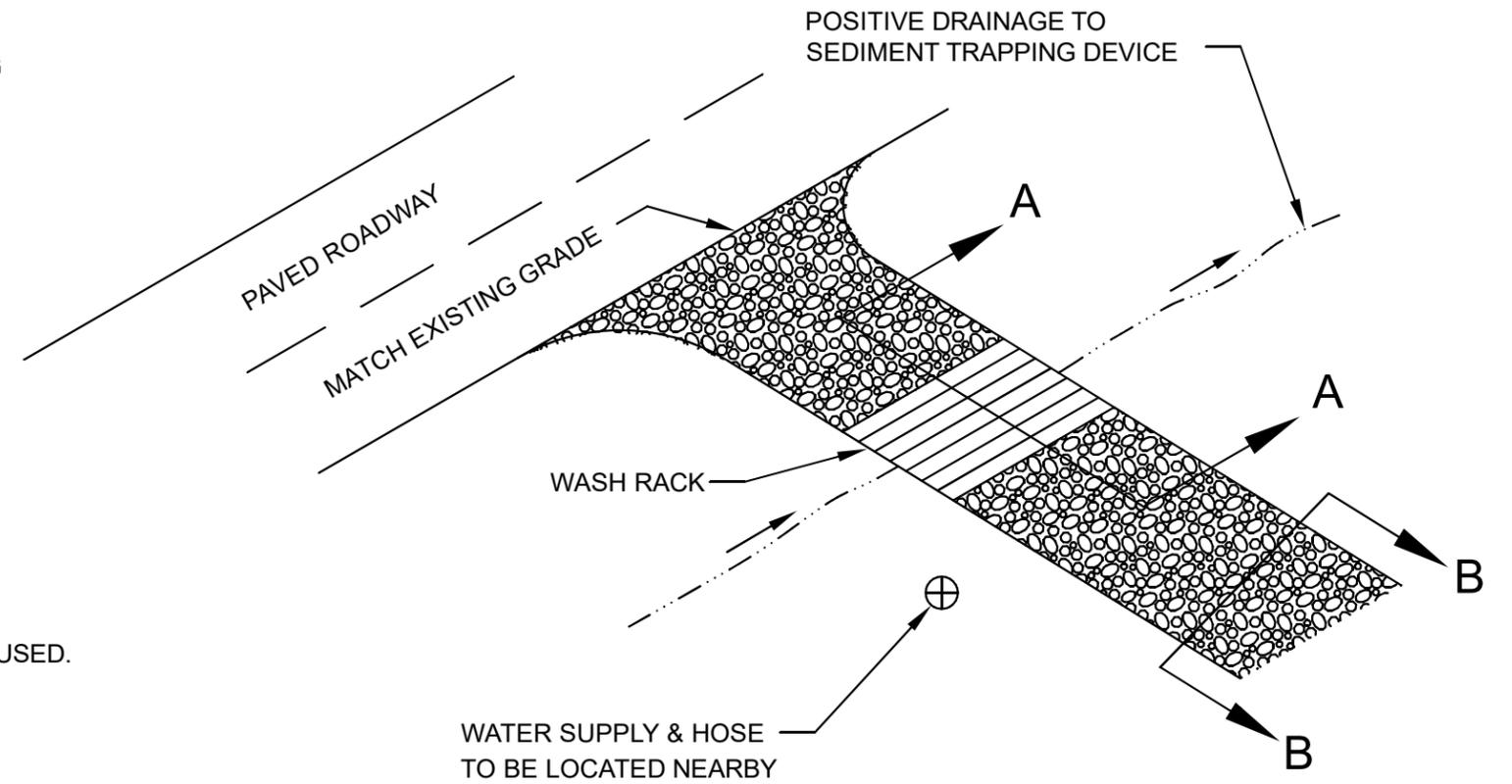


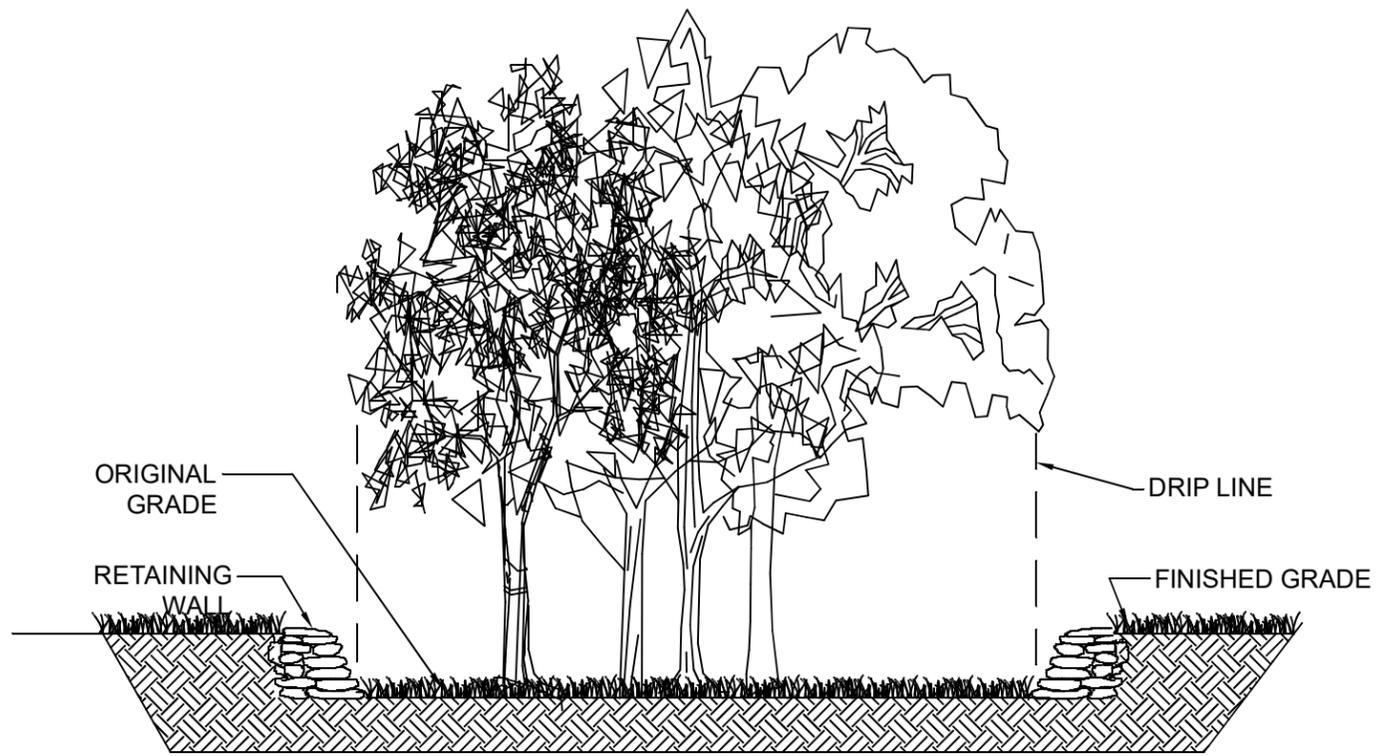
SECTION A-A



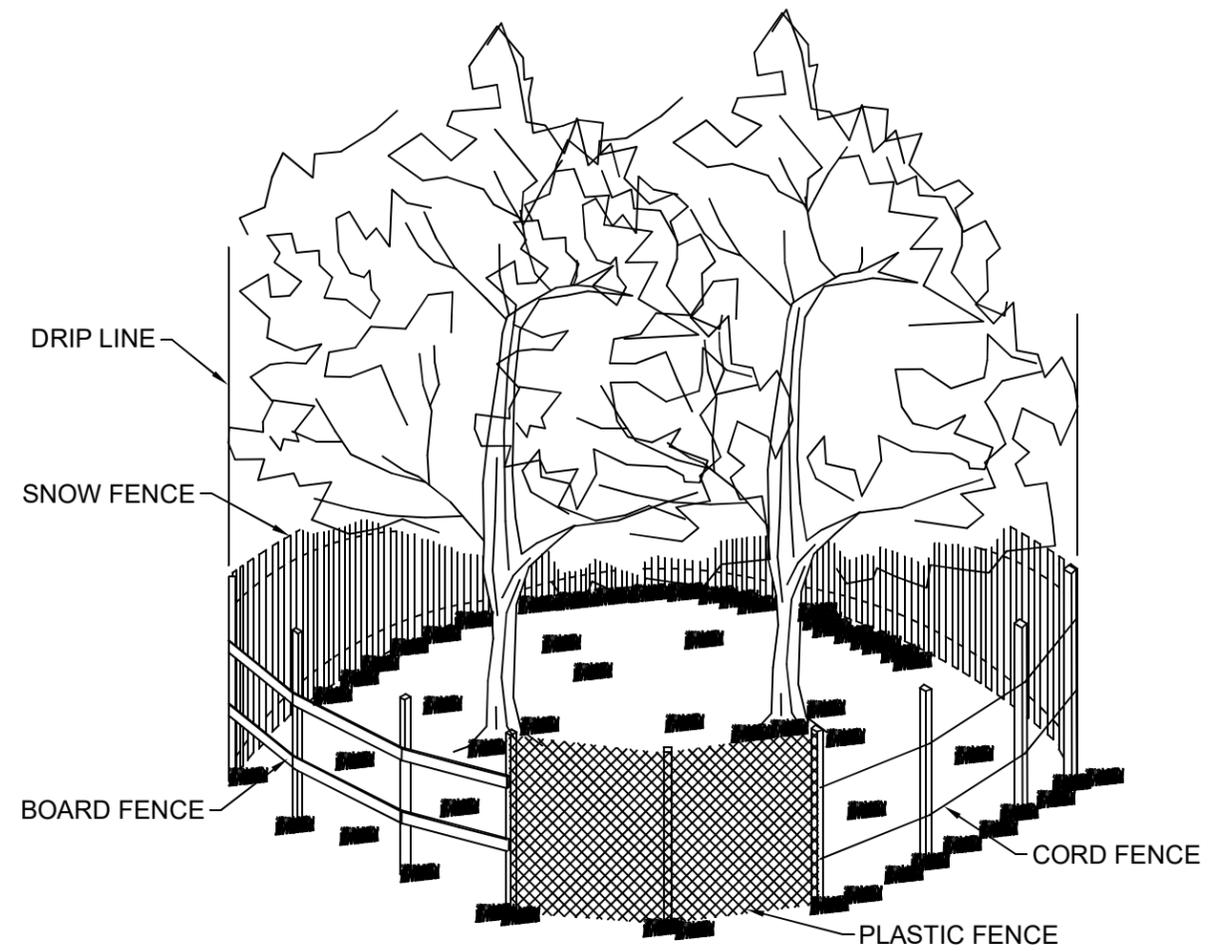
SECTION B-B

NOTE:
FABRICATED UNITS MAY BE USED.

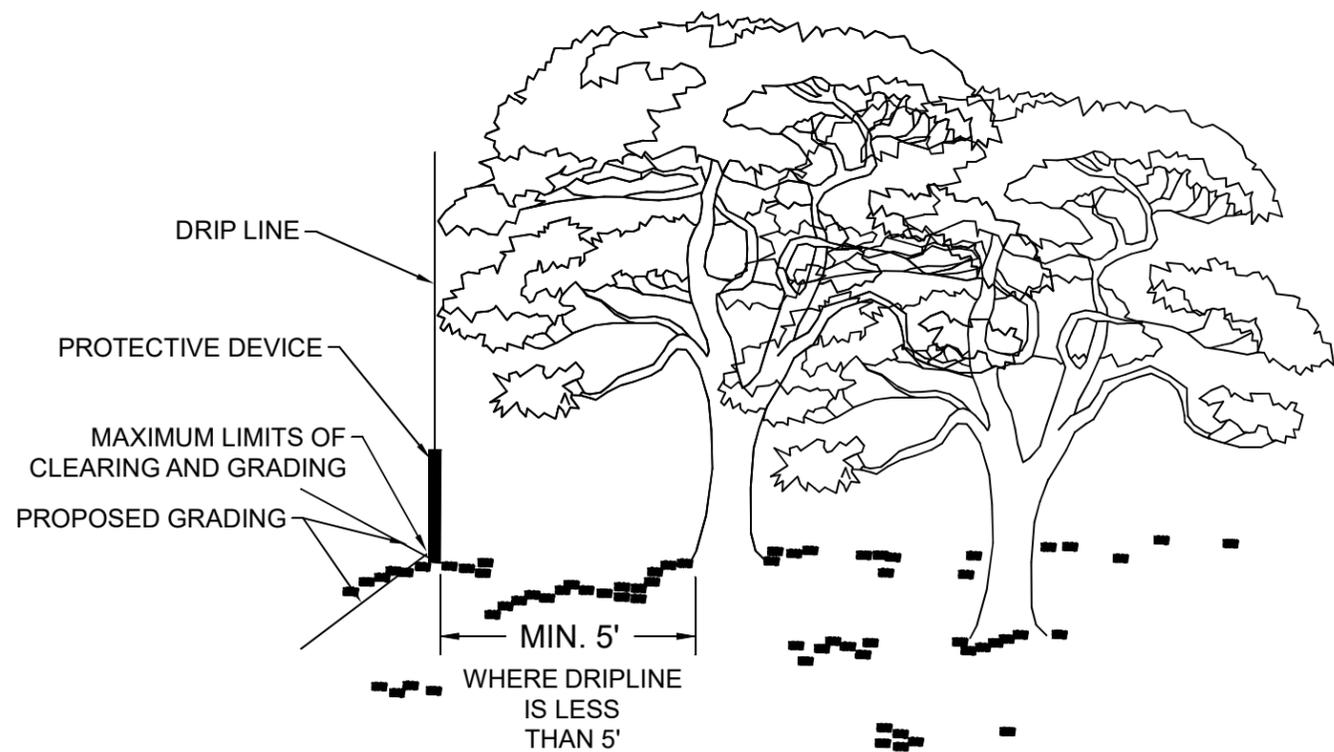




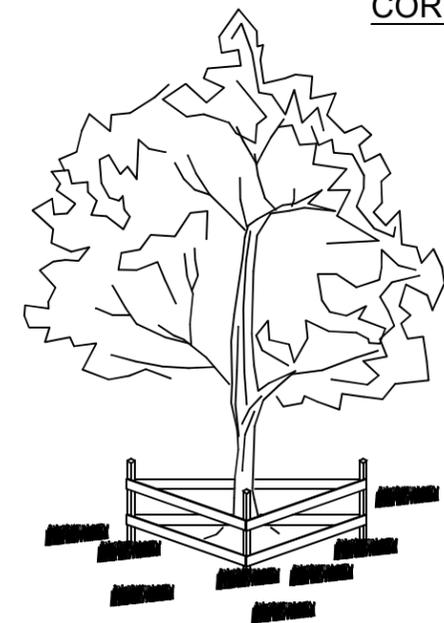
TREE WELL



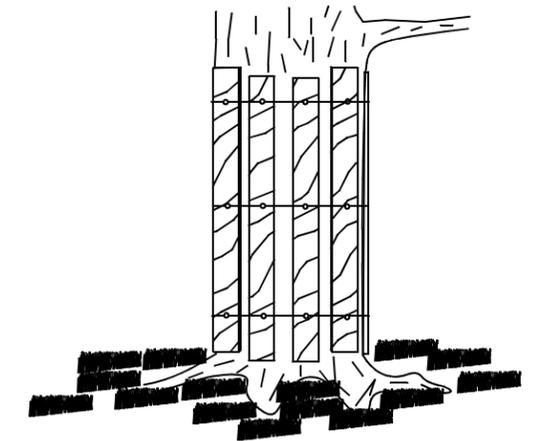
CORRECT METHODS OF TREE FENCING



CONSTRUCTION OPERATIONS
RELATIVE TO THE LOCATION OF
PROTECTED TREES

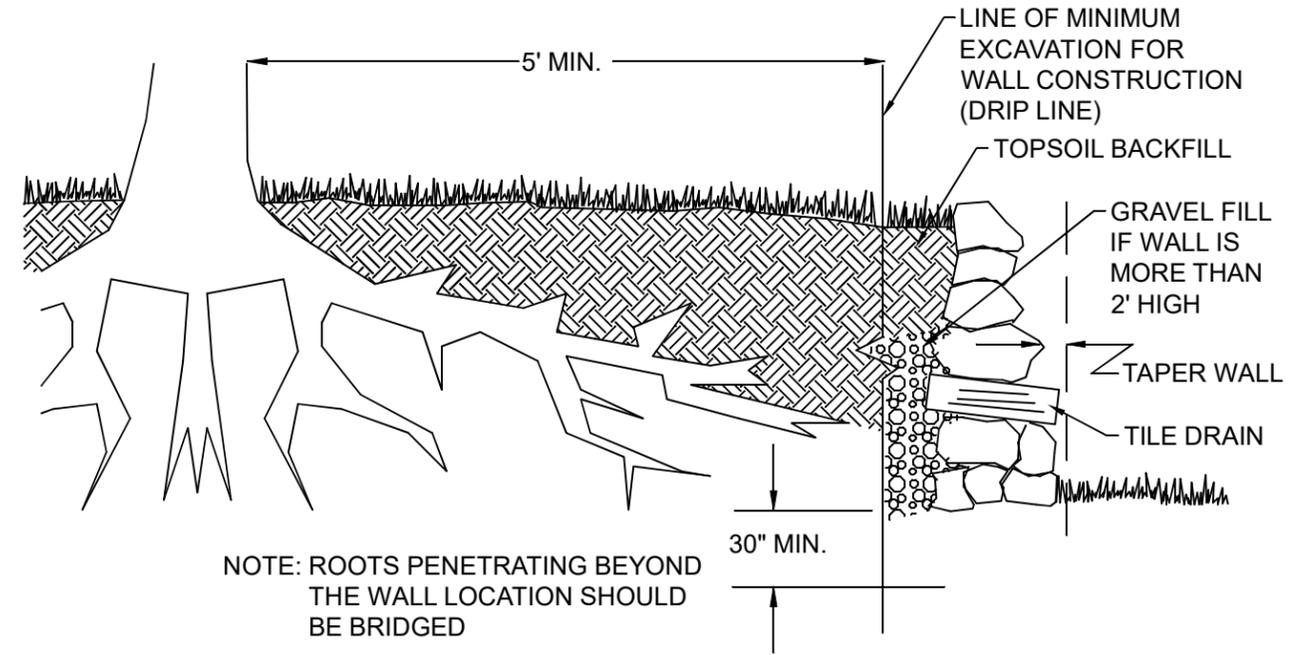
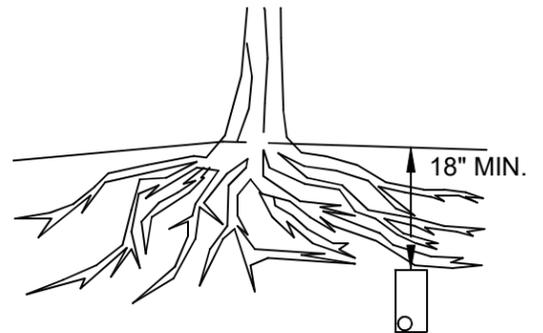
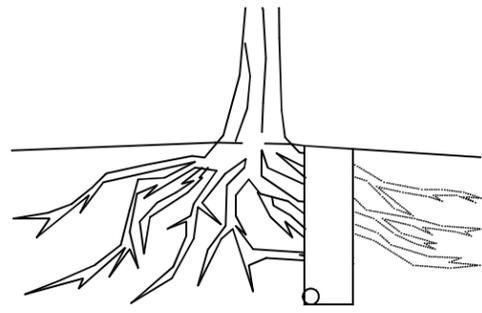
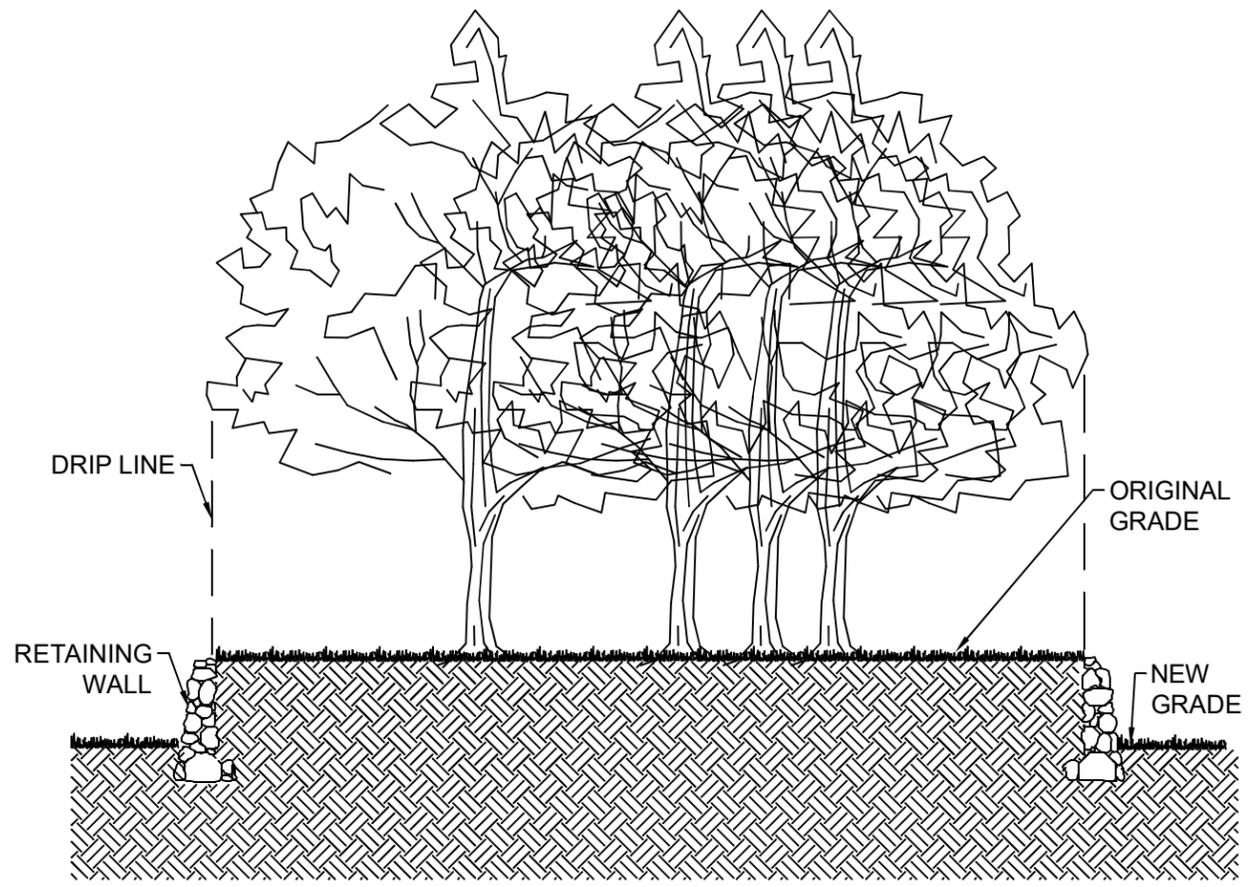


TRIANGULAR BOARD FENCE



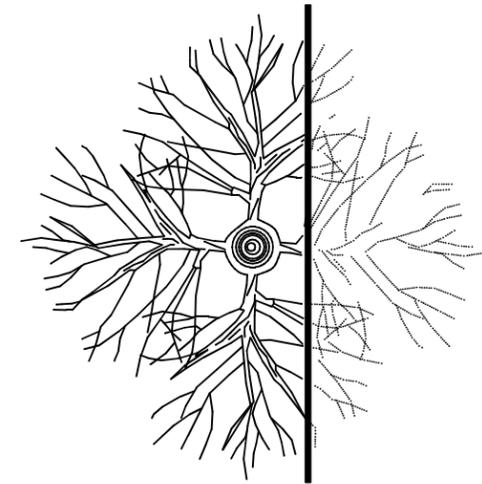
CORRECT TRUNK ARMORING

TREE
PRESERVATION

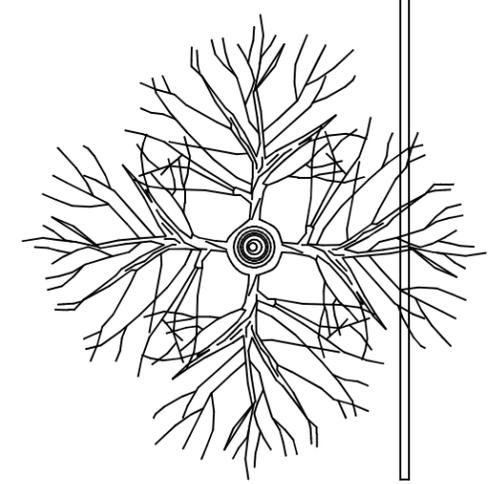


NOTE: ROOTS PENETRATING BEYOND THE WALL LOCATION SHOULD BE BRIDGED

TREE WALL



DESTRUCTION OF FEEDER ROOTS WILL PROBABLY KILL THE TREE



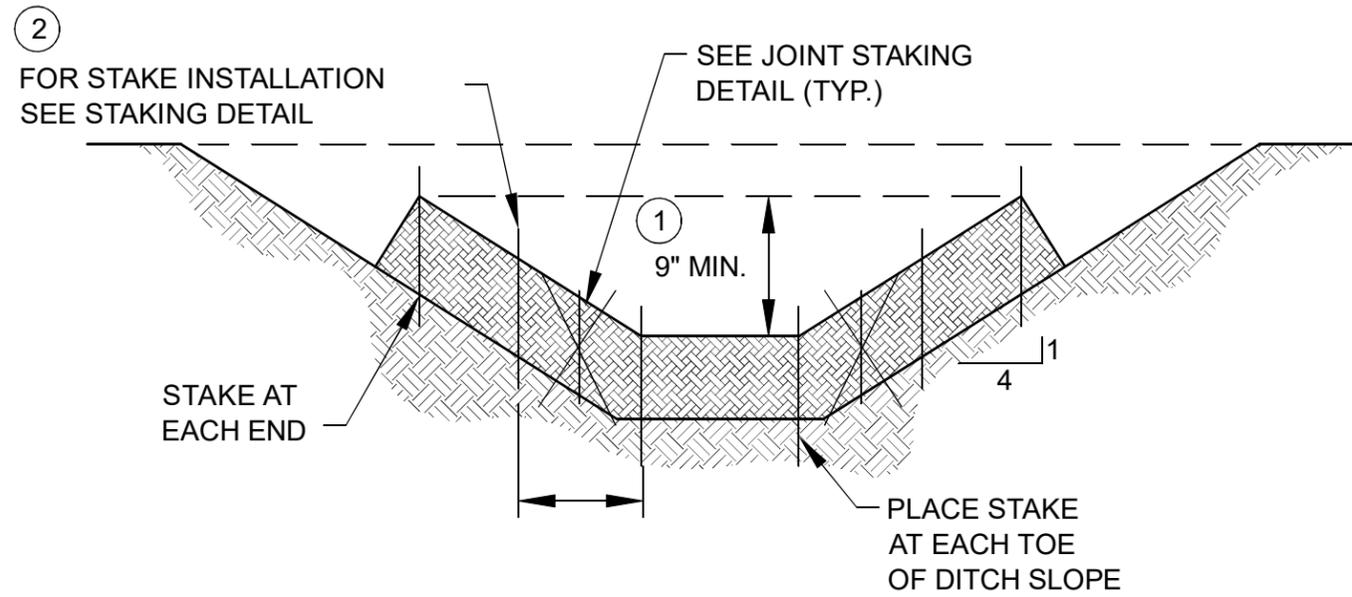
TUNNELING UNDER THE TREE WILL PRESERVE IMPORTANT FEEDER ROOTS

TRENCHING VS. TUNNELING

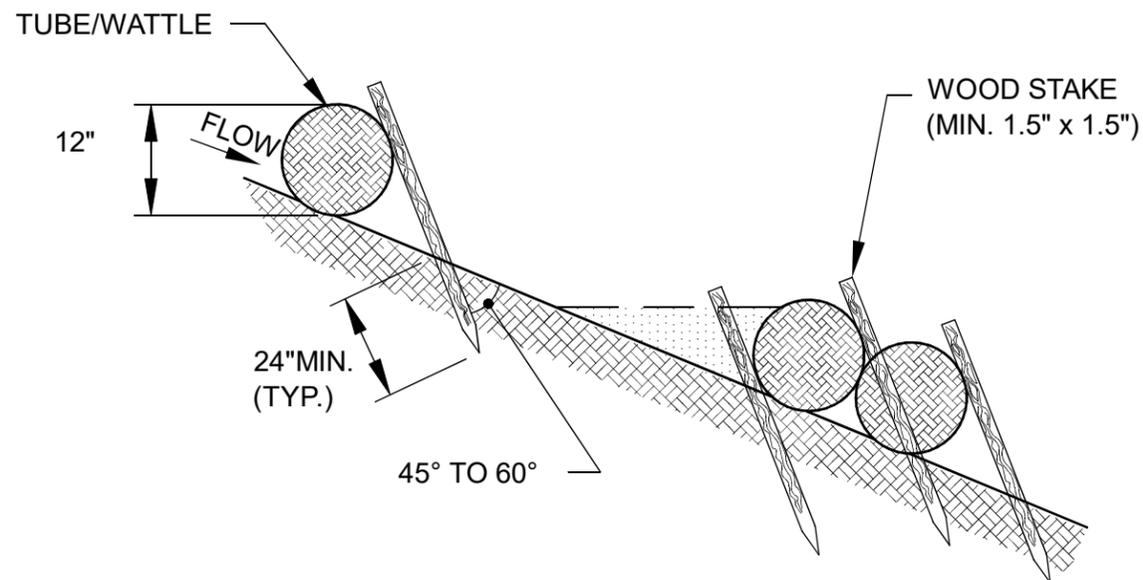
TREE PRESERVATION

NOTES:

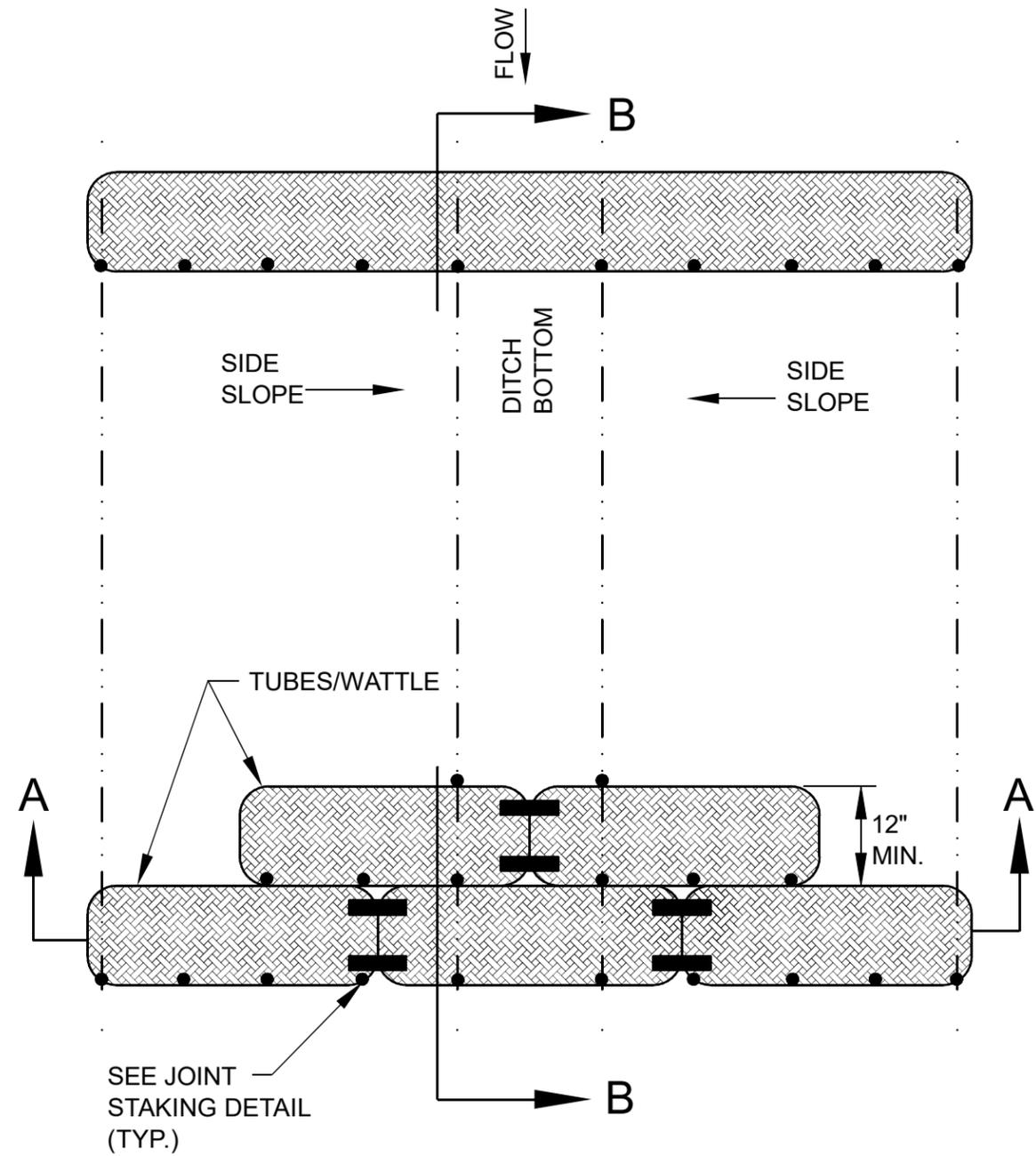
- ① THE DEPTH AND WIDTH OF THE WEIR SECTION OF THE WATTLE SHALL BE DESIGNED TO PASS THE DESIGN STORM EVENT WITHOUT OVERTOPPING THE CHANNEL.
- ② STAKE PER MANUFACTURERS RECOMMENDATIONS



SECTION A-A

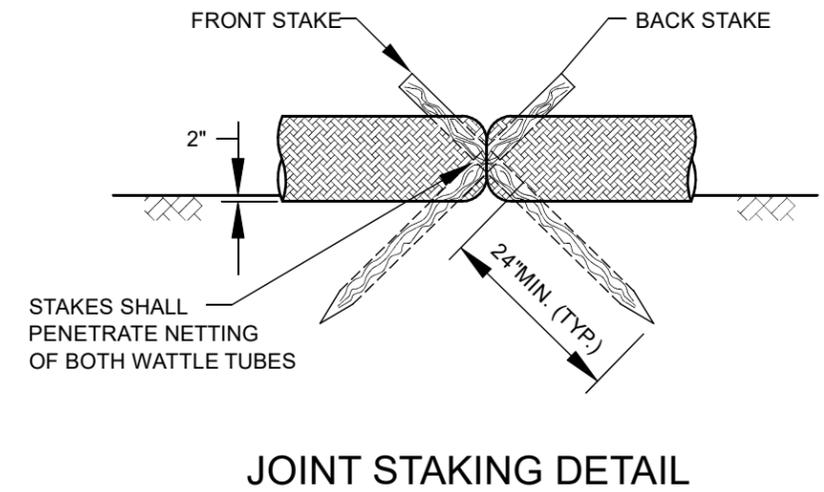
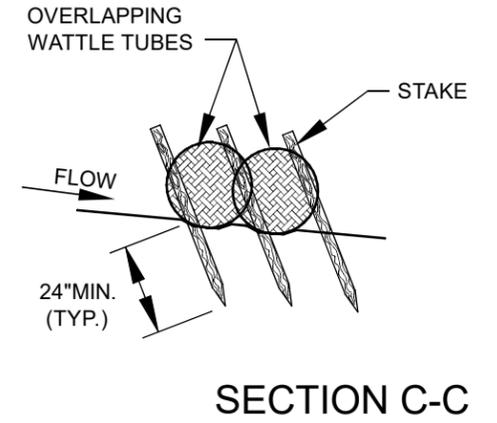
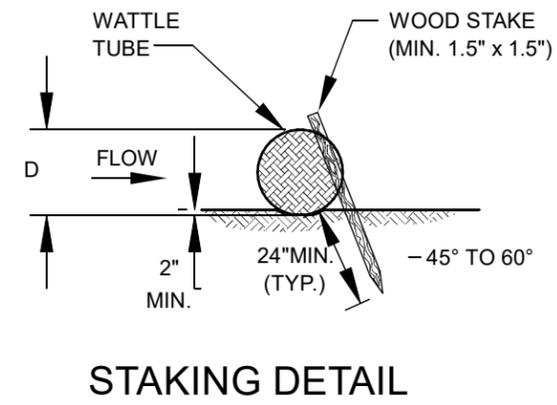
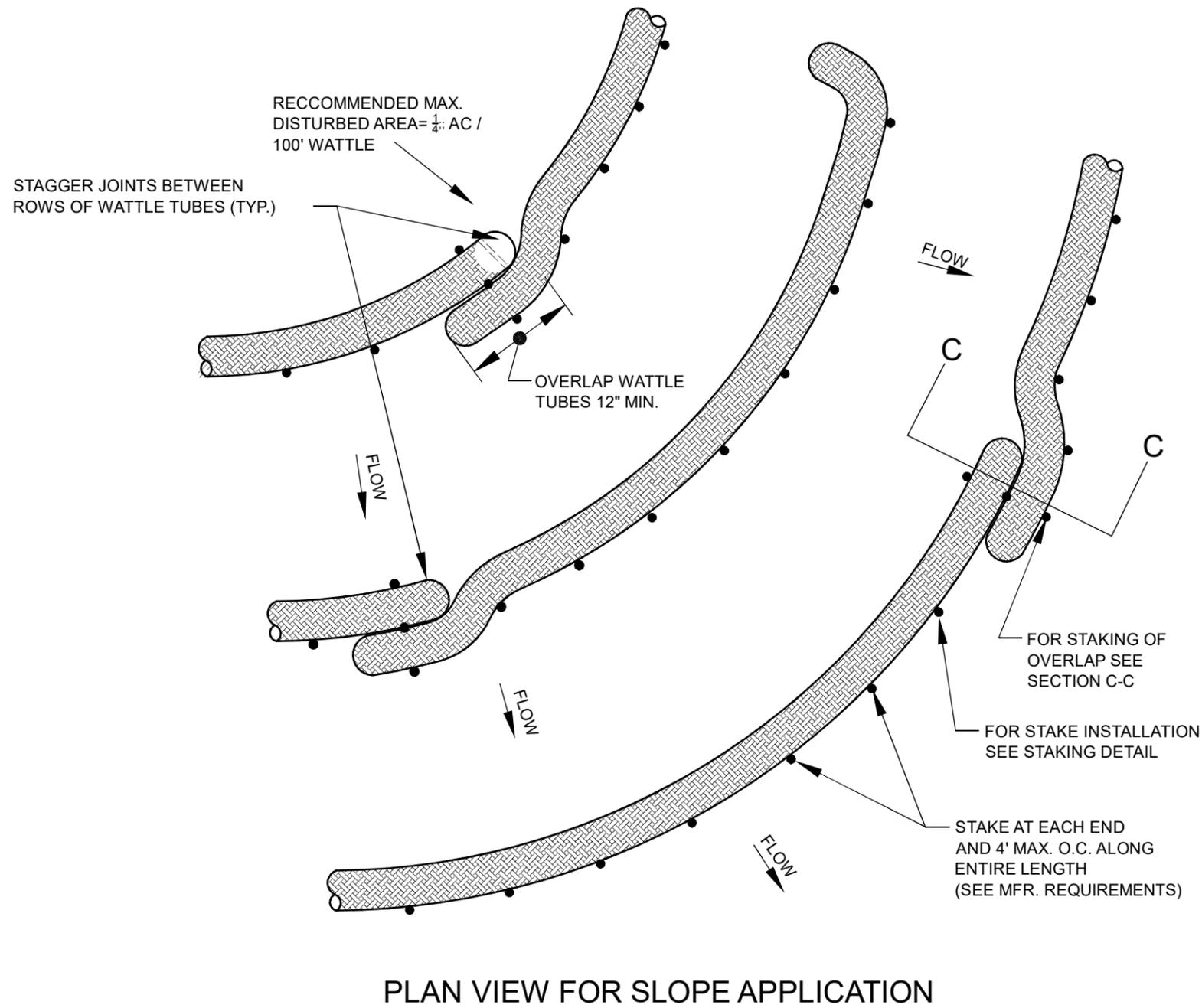


SECTION B-B



PLAN VIEW FOR DITCH APPLICATION

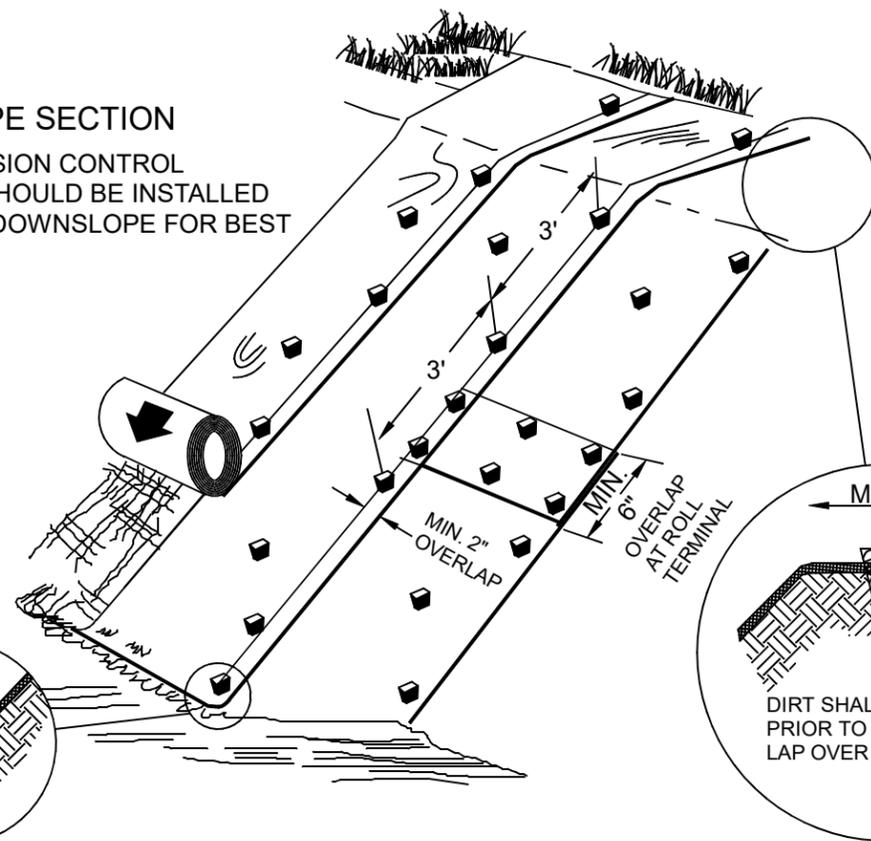
TUBES AND
WATTLES
DITCH
APPLICATION



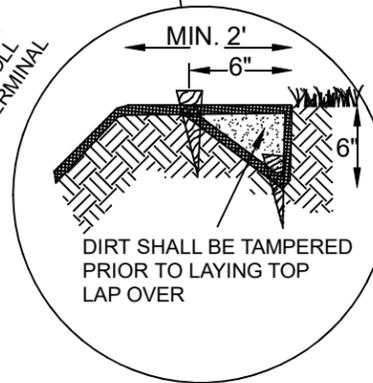
TUBES AND
WATTLES
SLOPE
APPLICATION

FILL SLOPE SECTION

ROLLED EROSION CONTROL PRODUCTS SHOULD BE INSTALLED VERTICALLY DOWNSLOPE FOR BEST RESULTS.



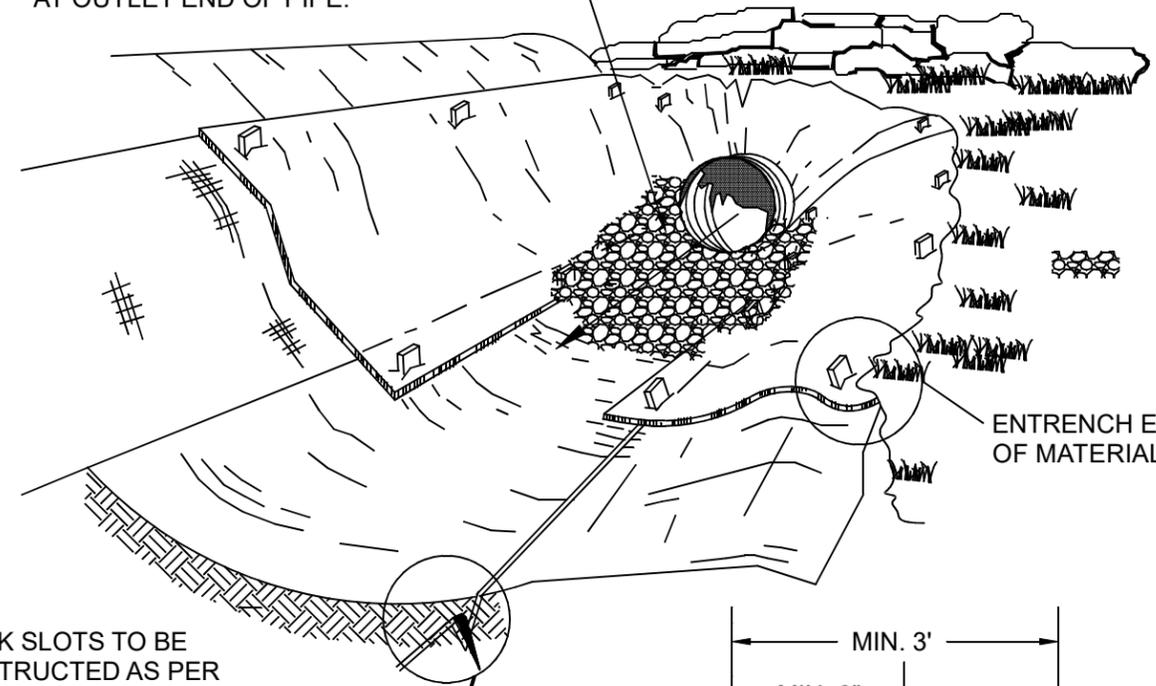
NOTE: SLOPE SURFACE SHALL BE SMOOTH AND FREE OF ROCKS, LUMPS OF DIRT, GRASS AND STICKS. MAT SHALL BE PLACED FLAT ON SURFACE FOR PROPER SOIL CONTACT.



TOE
MAINTAIN SLOPE ANGLE

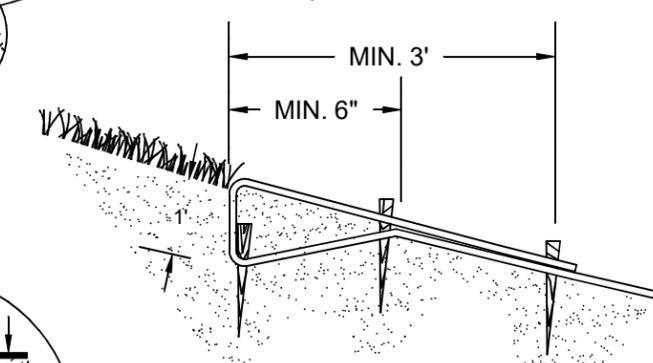
BERM
TRENCH INTO BERM AND PROGRESS DOWNSLOPE

ROLLED EROSION CONTROL PRODUCTS CAN BE USED IN CONJUNCTION WITH RIPRAP AT OUTLET END OF PIPE.



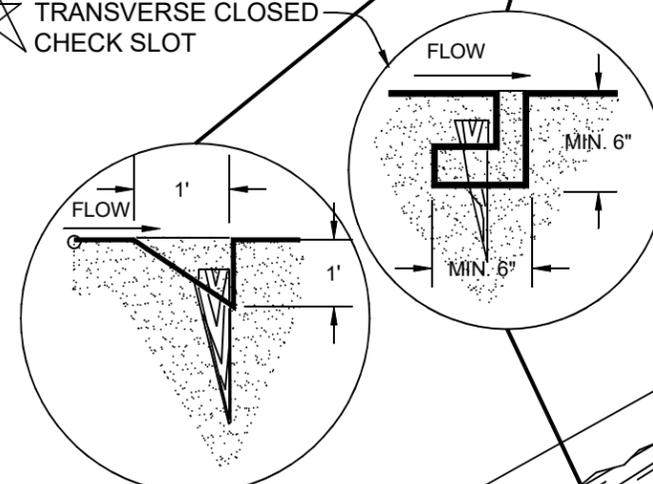
ENTRENCH EDGES OF MATERIAL 6"

CHECK SLOTS TO BE CONSTRUCTED AS PER MANUFACTURERS RECOMMENDATIONS.

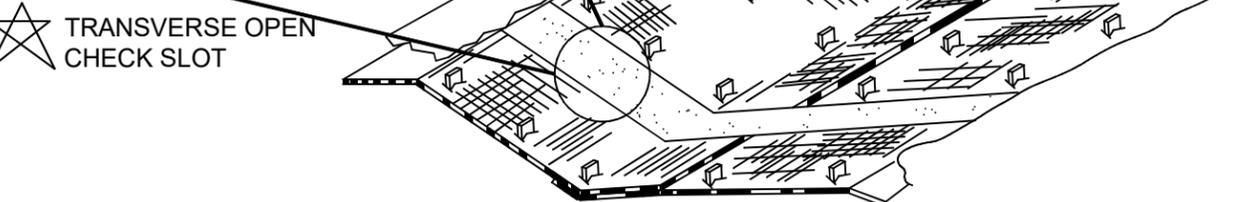


UPSTREAM AND DOWNSTREAM TERMINAL

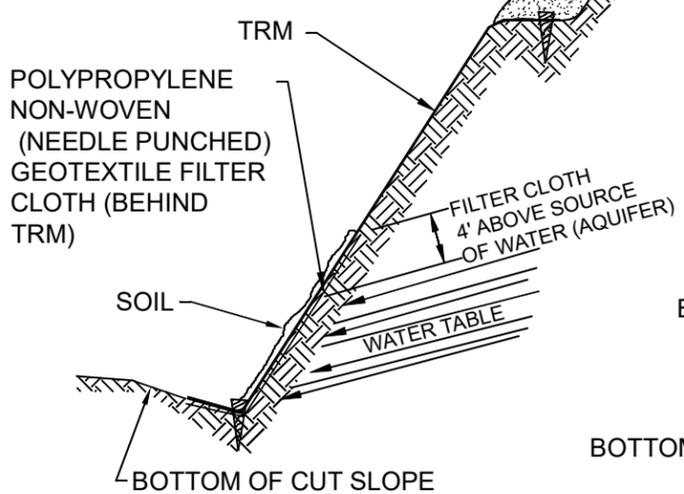
TRANSVERSE CLOSED CHECK SLOT



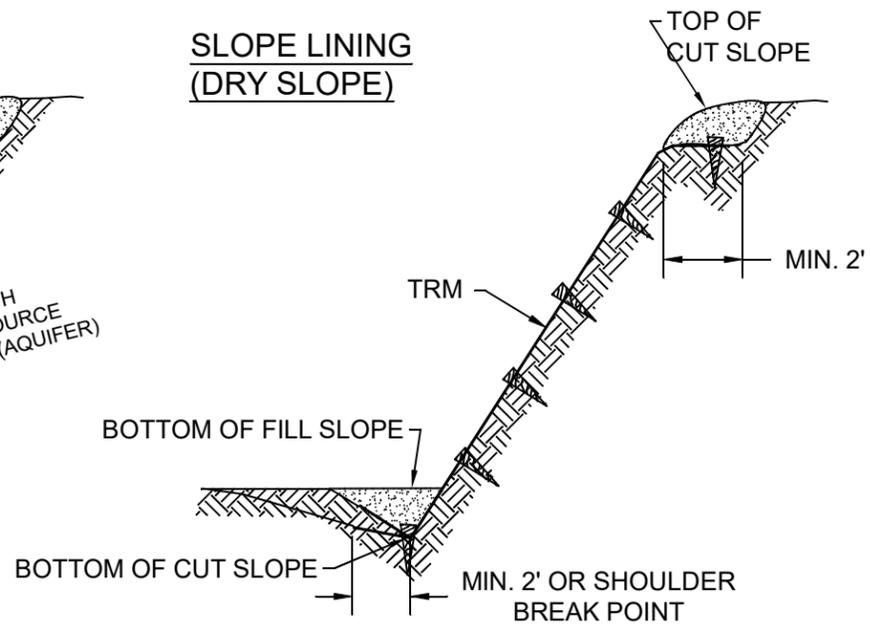
TRANSVERSE OPEN CHECK SLOT



SLOPE LINING (WET SLOPE)



SLOPE LINING (DRY SLOPE)

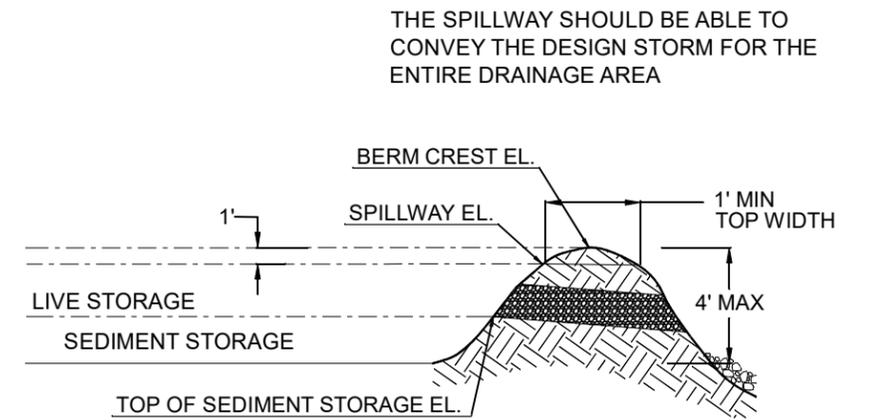
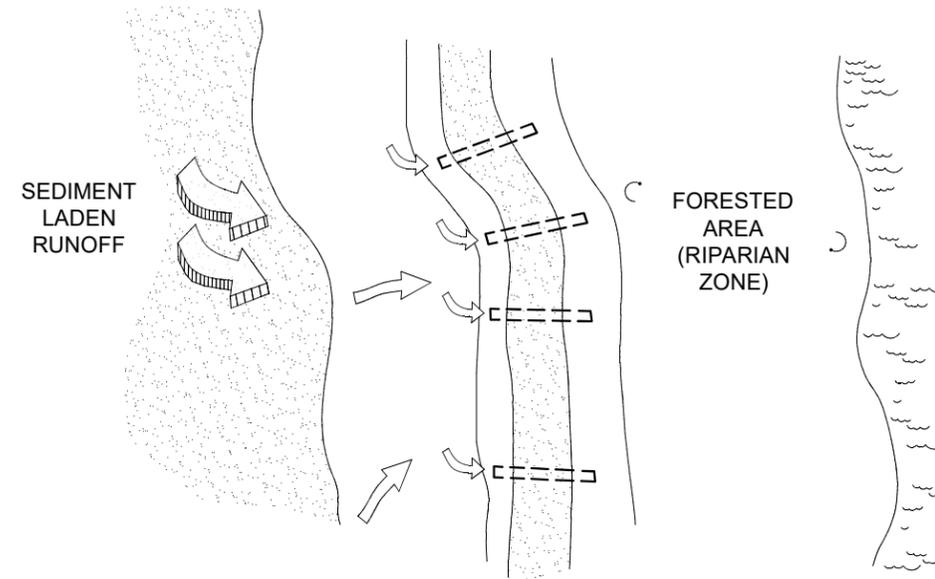


INSTALLATION OF TURF REINFORCED MATTING ON SLOPES

INSTALLATION OF TURF REINFORCED MATTING IN CHANNELS

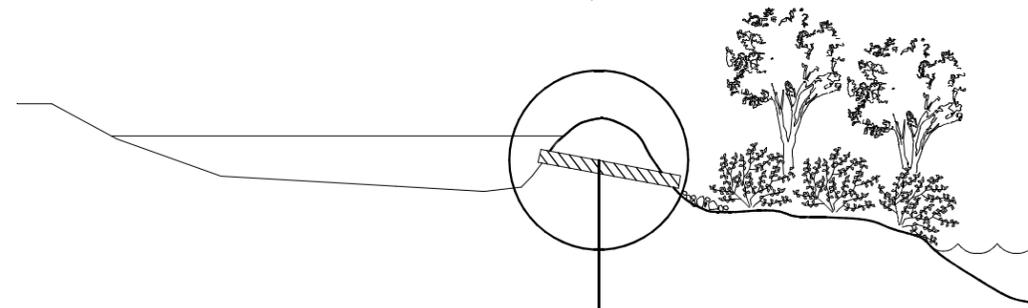
TURF REINFORCED MAT

WEEP BERM PLAN AND CROSS-SECTION



TOTAL VOLUME=
134CY/ACRE OF DISTURBED AREA DRAINING TO THIS TRAP

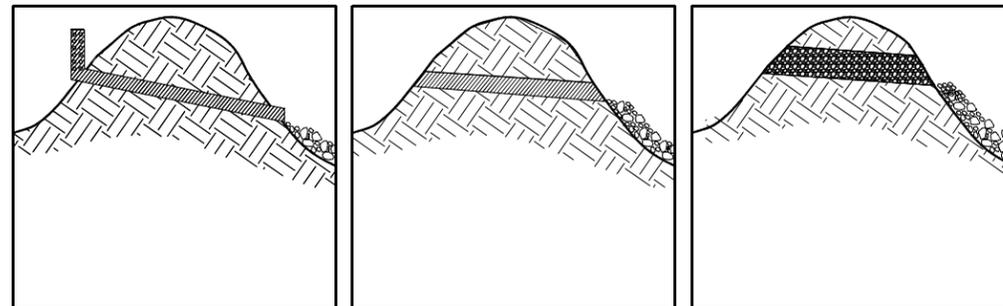
DIVIDE TOTAL STORAGE EQUALLY BETWEEN LIVE AND SEDIMENT STORAGE



PERFORATED RISER

PIPE OUTLET

ROCK MEDIA OUTLET



*DESIGN ELEVATIONS AND VOLUMES SHOULD BE INCLUDED ON DRAWINGS TO PROVIDE A SITE SPECIFIC DESIGN

WEEP BERM