





1

- A

## 3

- ## STRUCTURAL NOTES

- | GRADE 60 REINFORCING STEEL |            |       |       |       |        |        |       |        |       |       |
|----------------------------|------------|-------|-------|-------|--------|--------|-------|--------|-------|-------|
| BAR SIZE                   |            | #3    | #4    | #5    | #6     | #7     | #8    | #9     | #10   | #11   |
| LAP SPLICE LENGTH          |            |       |       |       |        |        |       |        |       |       |
| SPACING <6"                | TOP BARS * | 1'-4" | 2'-0" | 3'-0" | 4'-0"  | 5'-10" | 6'-8" | 7'-6"  | 8'-4" | 9'-2" |
|                            | OTHER BARS | 1'-4" | 1'-7" | 2'-3" | 3'-1"  | 4'-6"  | 5'-2" | 5'-10" | 6'-5" | 7'-1" |
| SPACING ≥6"                | TOP BARS * | 1'-4" | 1'-7" | 2'-0" | 2'-5"  | 3'-6"  | 4'-0" | 5'-0"  | 6'-0" | 7'-1" |
|                            | OTHER BARS | 1'-4" | 1'-4" | 1'-7" | 1'-10" | 2'-9"  | 3'-1" | 3'-10" | 4'-7" | 5'-5" |
| EMBEDMENT LENGTH           |            |       |       |       |        |        |       |        |       |       |
| SPACING <6"                | TOP BARS * | 1'-0" | 1'-7" | 2'-3" | 3'-1"  | 4'-6"  | 5'-2" | 5'-10" | 6'-5" | 7'-1" |
|                            | OTHER BARS | 1'-0" | 1'-2" | 1'-9" | 2'-5"  | 3'-6"  | 4'-0" | 4'-6"  | 5'-0" | 5'-5" |
| SPACING ≥6"                | TOP BARS * | 1'-0" | 1'-3" | 1'-7" | 1'-10" | 2'-9"  | 3'-1" | 3'-10" | 4'-7" | 5'-5" |
|                            | OTHER BARS | 1'-0" | 1'-0" | 1'-2" | 1'-5"  | 2'-1"  | 2'-5" | 2'-11" | 3'-7" | 4'-2" |

EXIST	EACH WAY EACH FACE
EWST	EXISTING
FES	FLARED END SECTION
H	HORIZONTAL
INV	INVERT
N	NORTHING
MAX	MAXIMUM
MIN	MINIMUM
NTS	NOT TO SCALE
OC	ON CENTER
REINF	REINFORCING
S	SLOPE
SSST	STAINLESS STEEL
STA	STATION
STD	STANDARD
TYPE	TYPICAL
USFS	US FOREST SERVICE
WPI	POINT OF INTERSECTION
WWF	WELDED WIRE FABRIC

- ## EROSION CONTROL NOTES

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**REUSE OF DOCUMENTS:**

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BAR IS ONE INCH ON ORIGINAL DRAWING.

DWG	G002
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SHEET 2 of 19











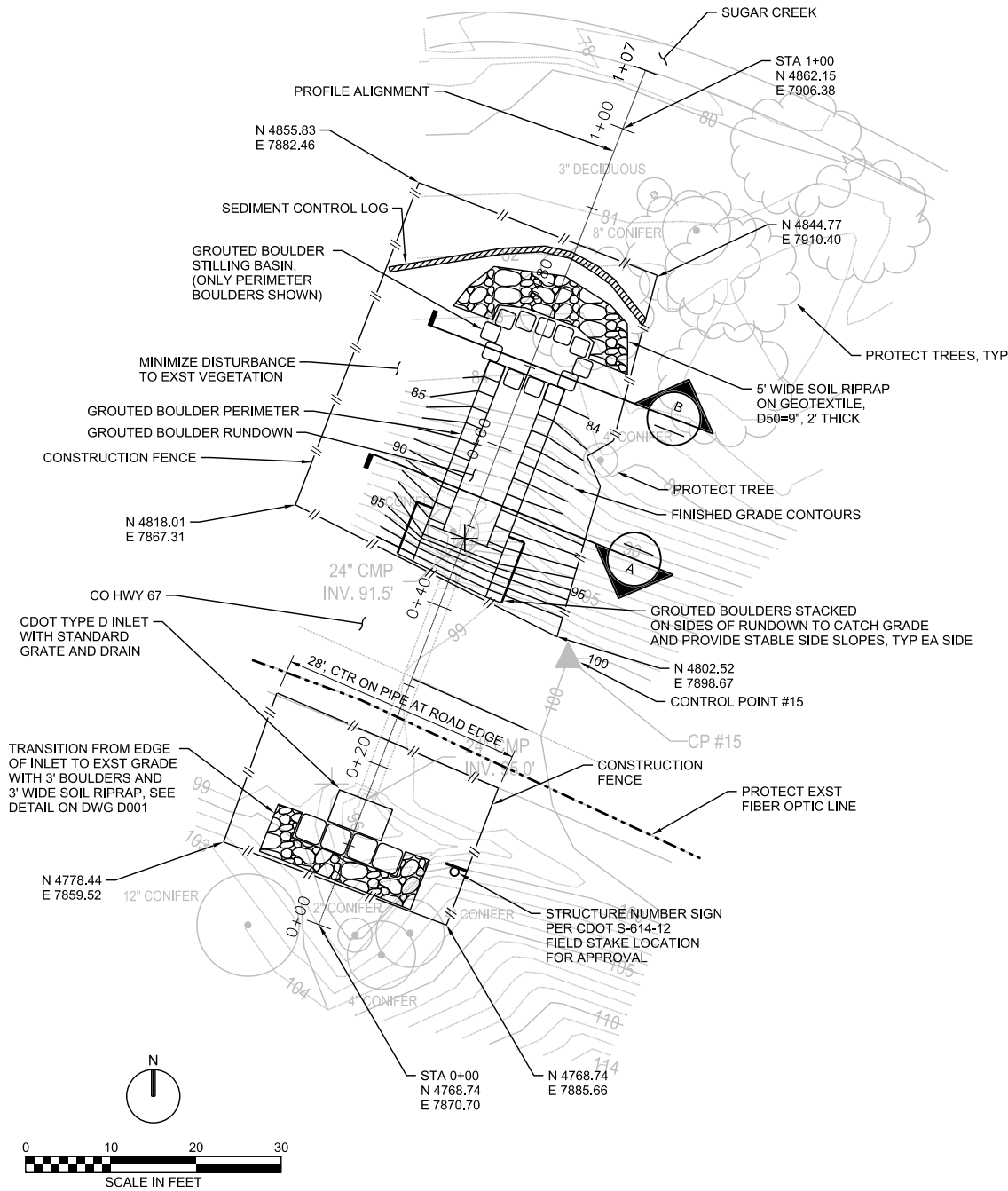
1 2 3 4 5 6

A

B

C

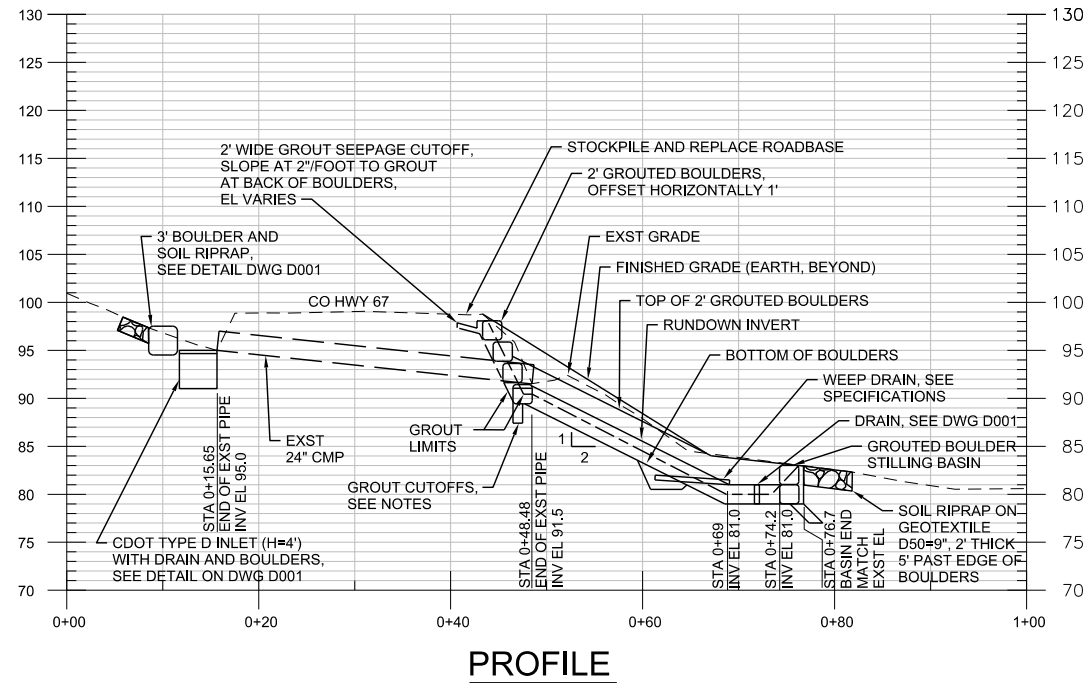
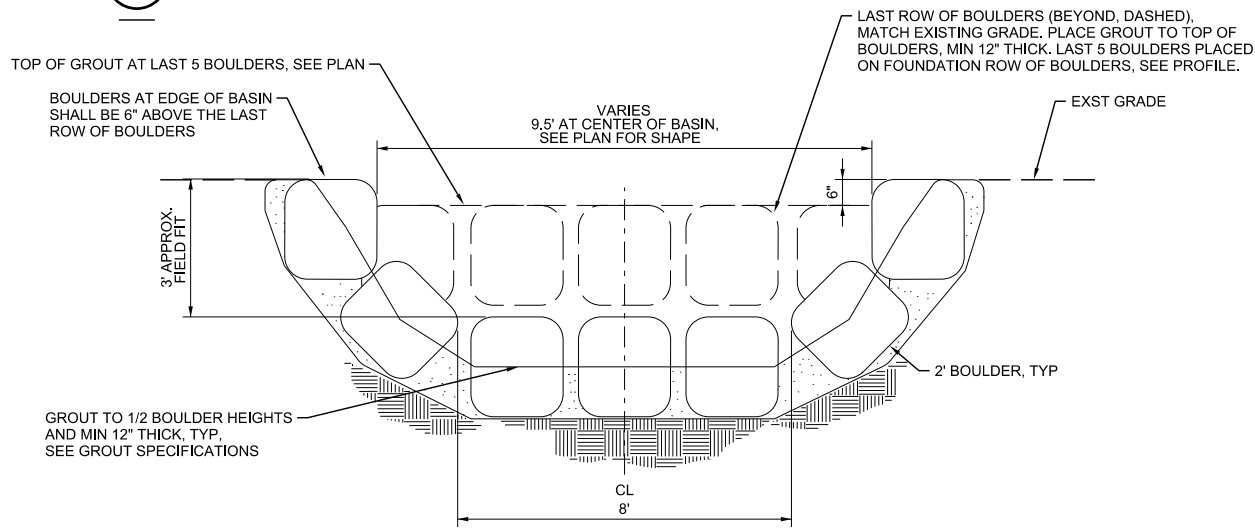
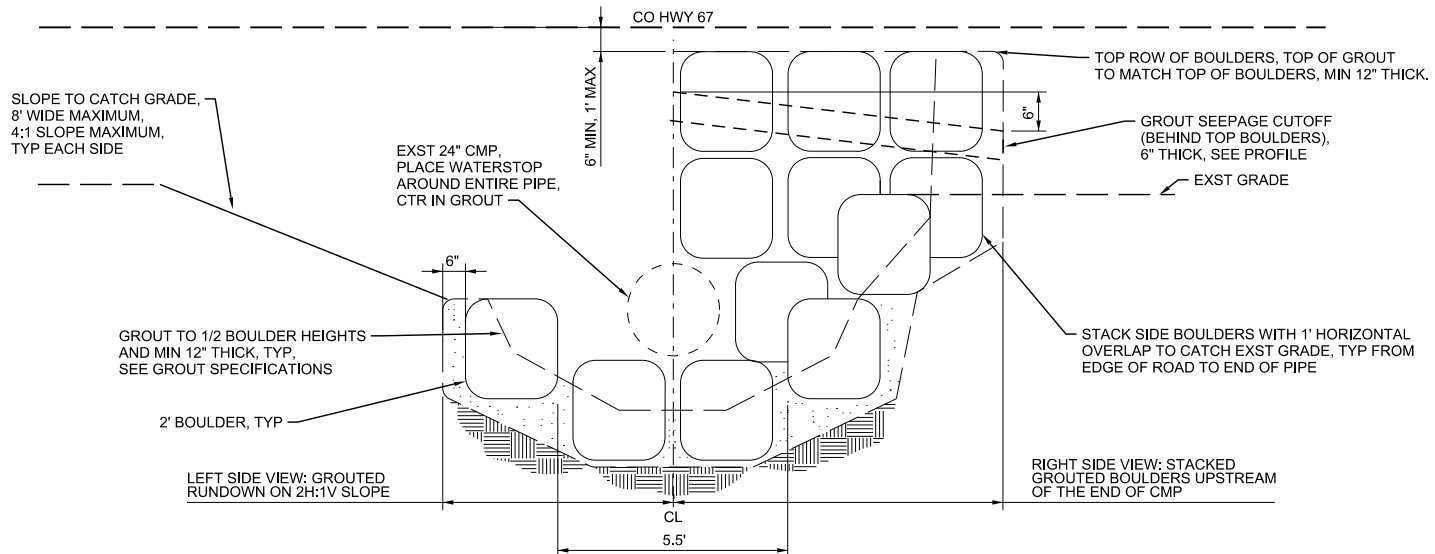
D



NOTES:

GROUT CUTOFFS SHALL BE PROVIDED AT EACH END OF RUNDOWN AS SHOWN. CUTOFFS SHALL BE 1' THICK AND EXTEND A MINIMUM OF 2' BELOW THE BOTTOM OF BOULDERS. DOWNSTREAM CUTOFF MAY BE SLOPED AS SHOWN IF PREFERRED. CUTOFFS SHALL MATCH THE OUTSIDE WIDTH OF THE RUNDOWN.

SEE SPECIFICATIONS REGARDING GROUT LIFTS AND REBAR PLACEMENT.



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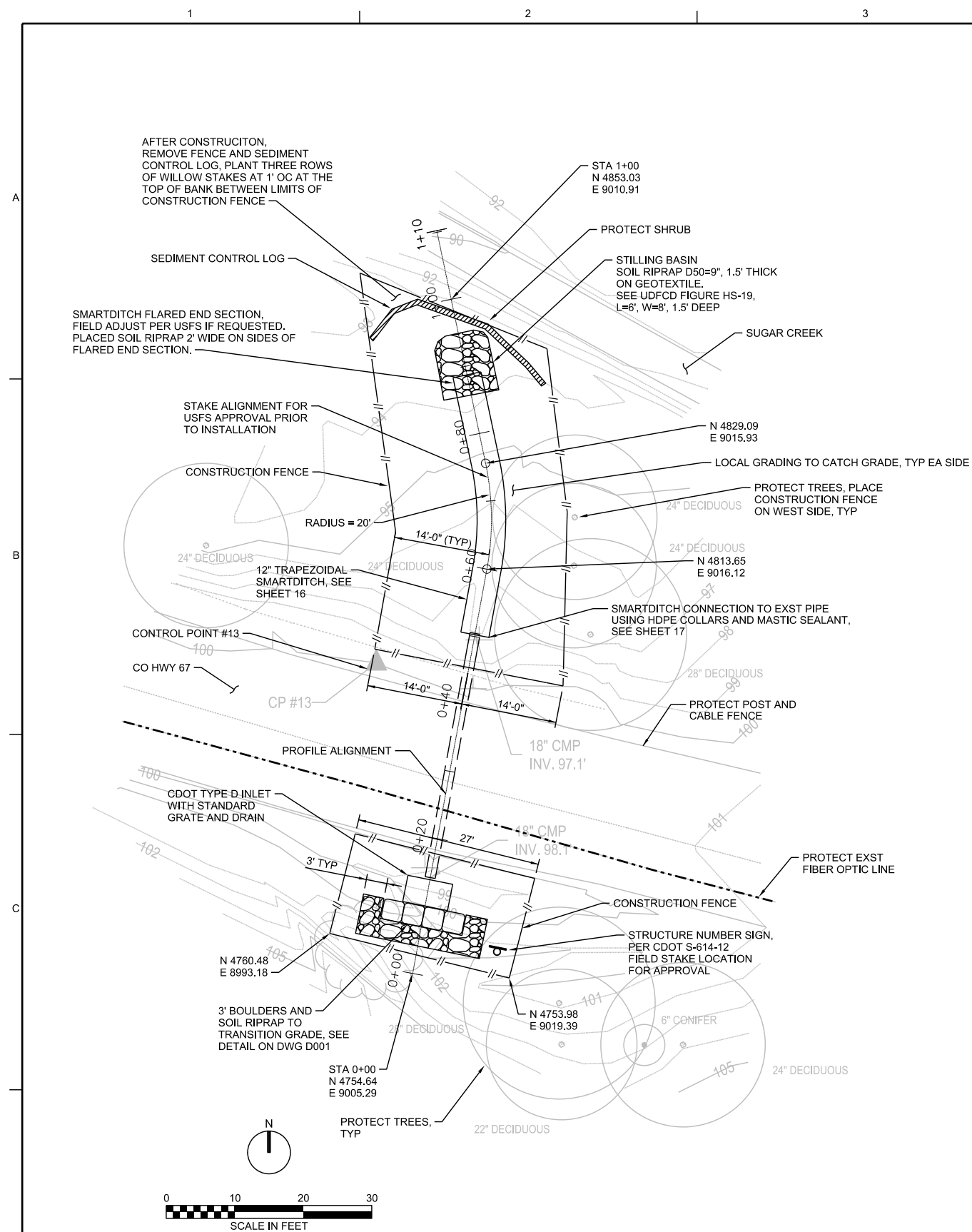
SITE B  
SEDIMENT TRAP AND RUNDOWN

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING, 1"	
DATE	OCTOBER 2012
PROJ	396845 / 395944
DWG	C002
SHEET	5 of 19

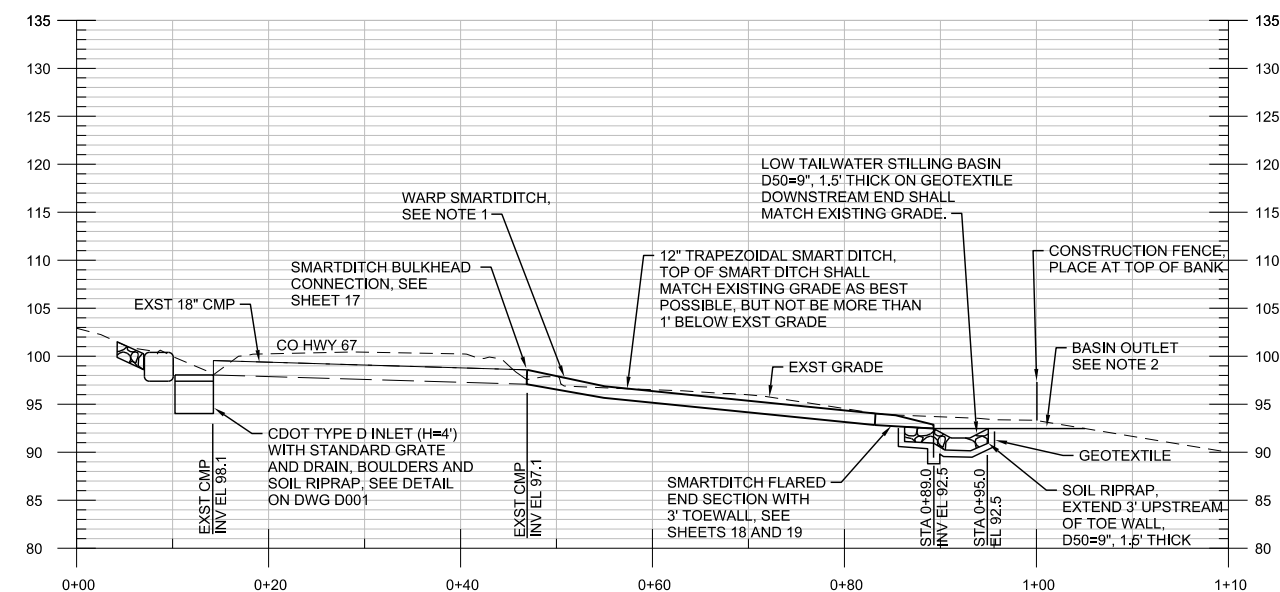
SUGAR CREEK SEDIMENT MITIGATION  
PILOT PROJECT  
HIGHWAY 67 NEAR SPRUCEWOOD, CO  
DOUGLAS COUNTY, CO

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## PLAN



## PROFILE

NOTES:

1. WARP SMARTDITCH VERTICALLY OVER 20' WITH SMOOTH VERTICAL CUTS. 1:1 SLOPE OF SMARTDITCH MATCHES EXIST GRADE. COMPACT NATIVE MATERIAL AROUND PIPE AND SIDES OF SMARTDITCH TO TRANSITION GRADES AT MAX 4H:1V SLOPES.
2. SHOVEL EXCAVATE BASIN OUTLET TO EDGE OF CREEK, 8' WIDE BOTTOM, 4H:1V SLOPE SLOPES TO CATCH GRADE, CONSTANT CHANNEL BOTTOM EL OF 92.5.  
NO EXCAVATION BELOW THE ORDINARY HIGH WATER MARK ALLOWED. USFS STAFF SHALL BE ON SITE DURING THIS WORK FOR APPROVAL.

		<p align="center"><b>SITE C</b></p> <p align="center"><b>SEDIMENT TRAP AND SMARTDITCH</b></p>		<p align="center">SUGAR CREEK SEDIMENT MITIGATION PILOT PROJECT</p> <p align="center">HIGHWAY 67 NEAR SPRUCEWOOD, CO</p> <p align="center">DOUGLAS COUNTY, CO</p>											
<p align="center"><b>VERIFY SCALE</b></p> <p align="center">BAR IS ONE INCH ON ORIGINAL DRAWING.</p> <p align="center">0  1"</p>															
DATE		OCTOBER 2012													
PROJ		396845 / 395944													
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SHEET		6 of 19													





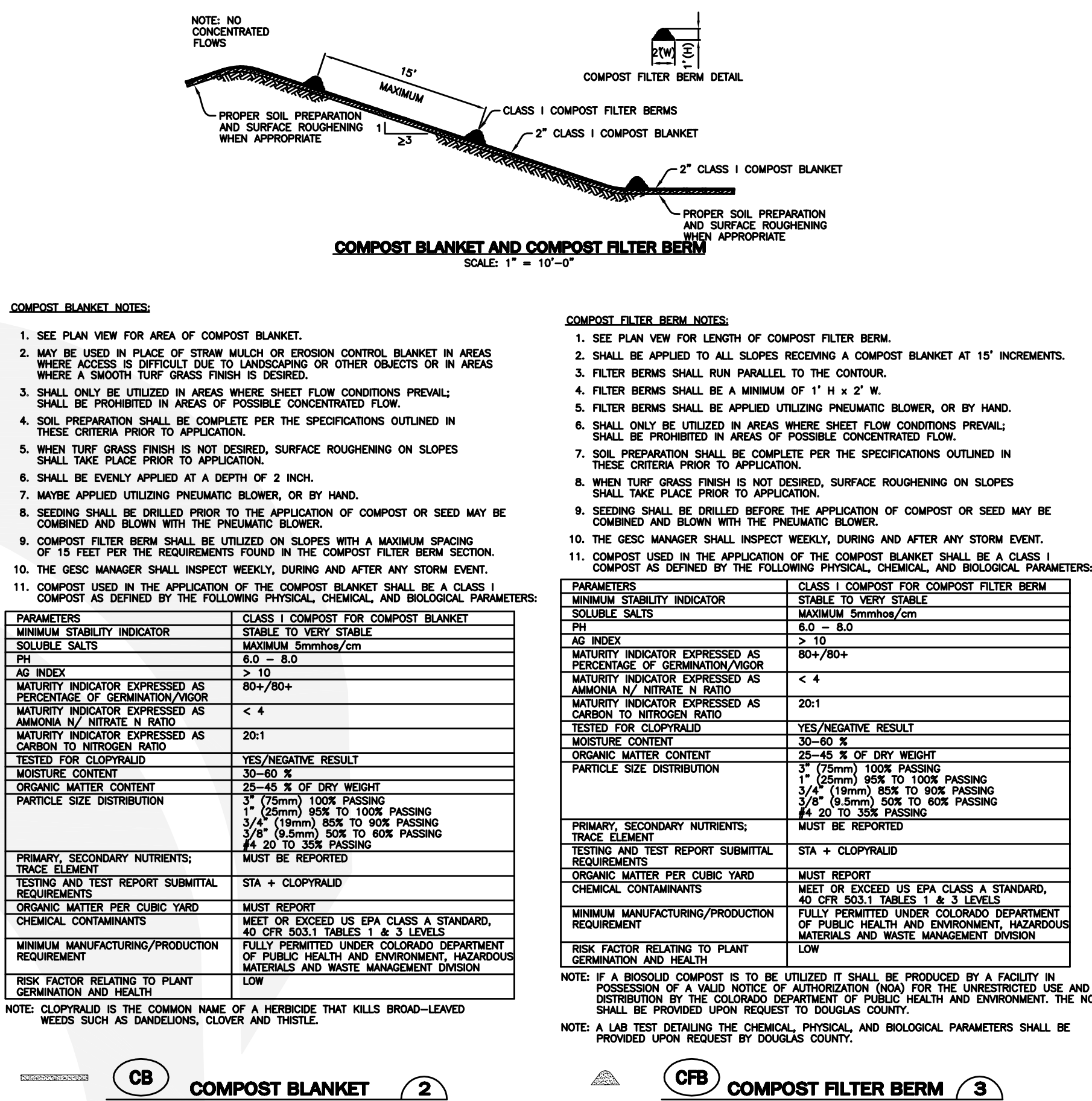






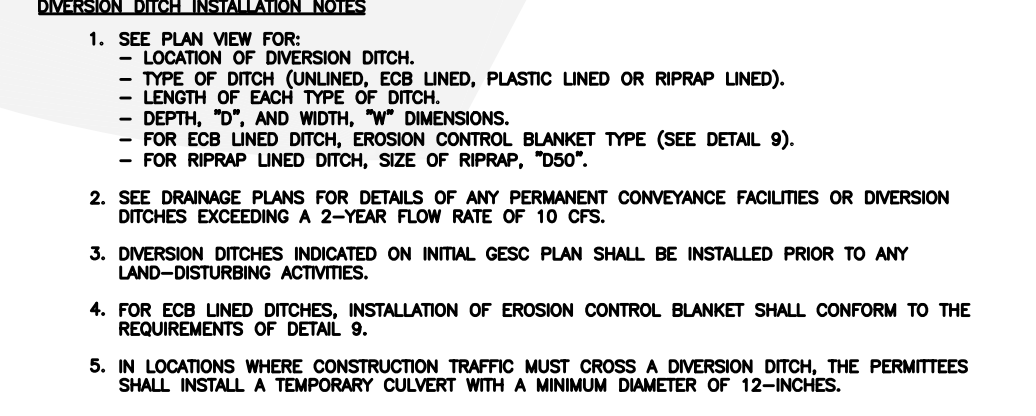
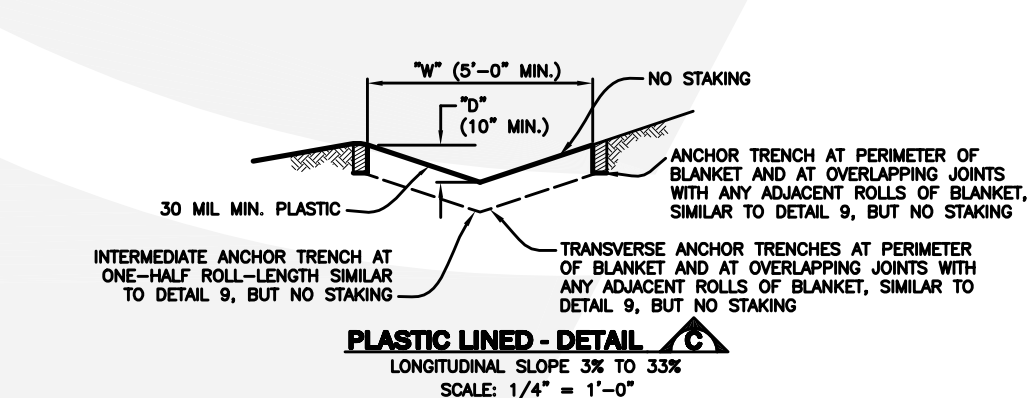
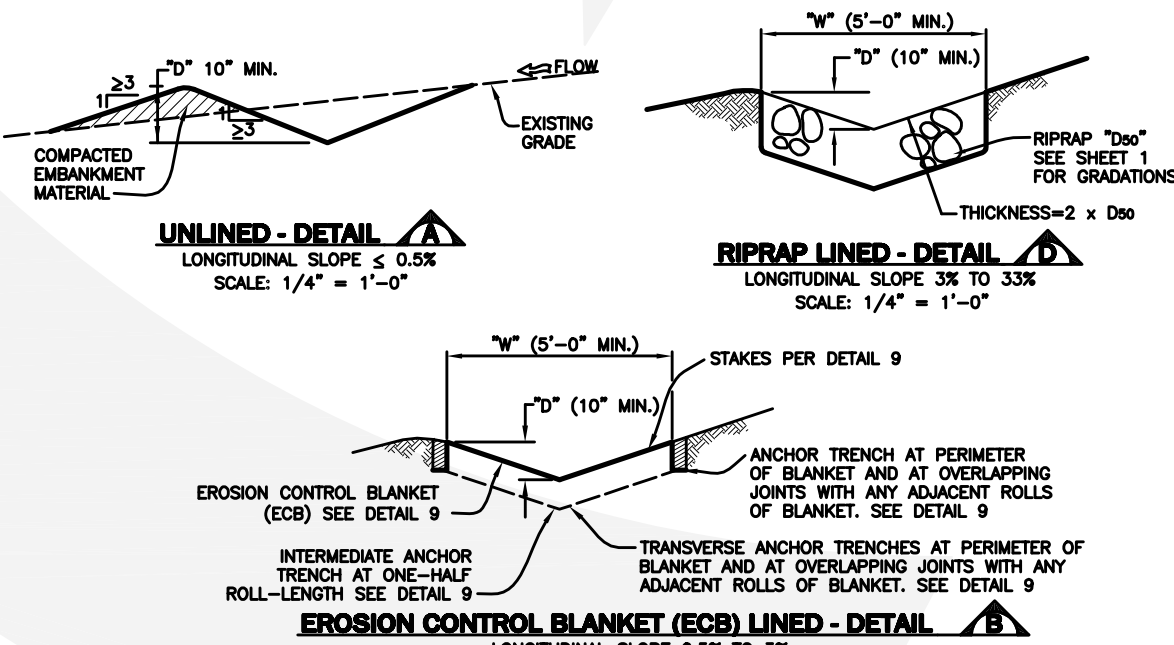
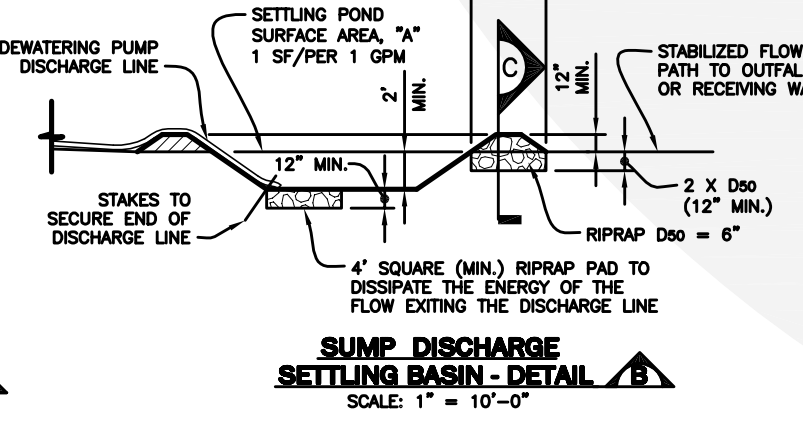
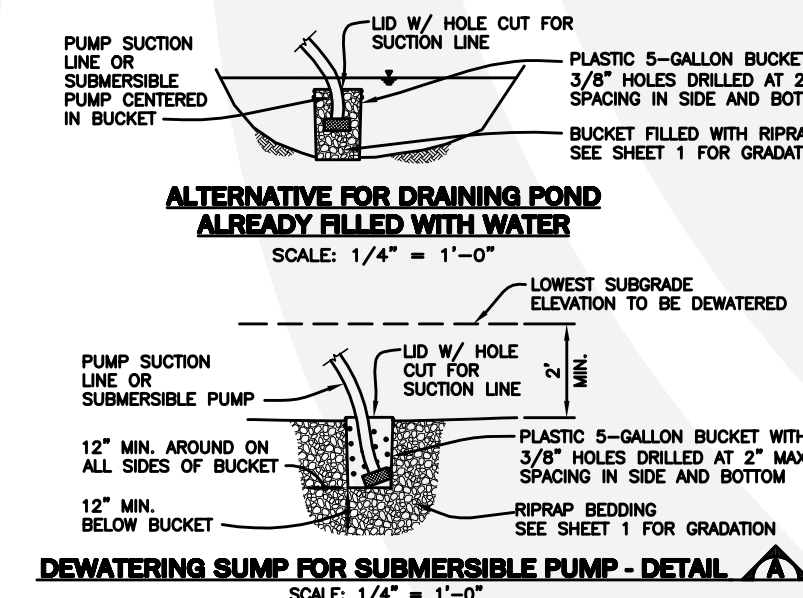
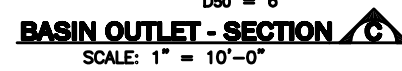
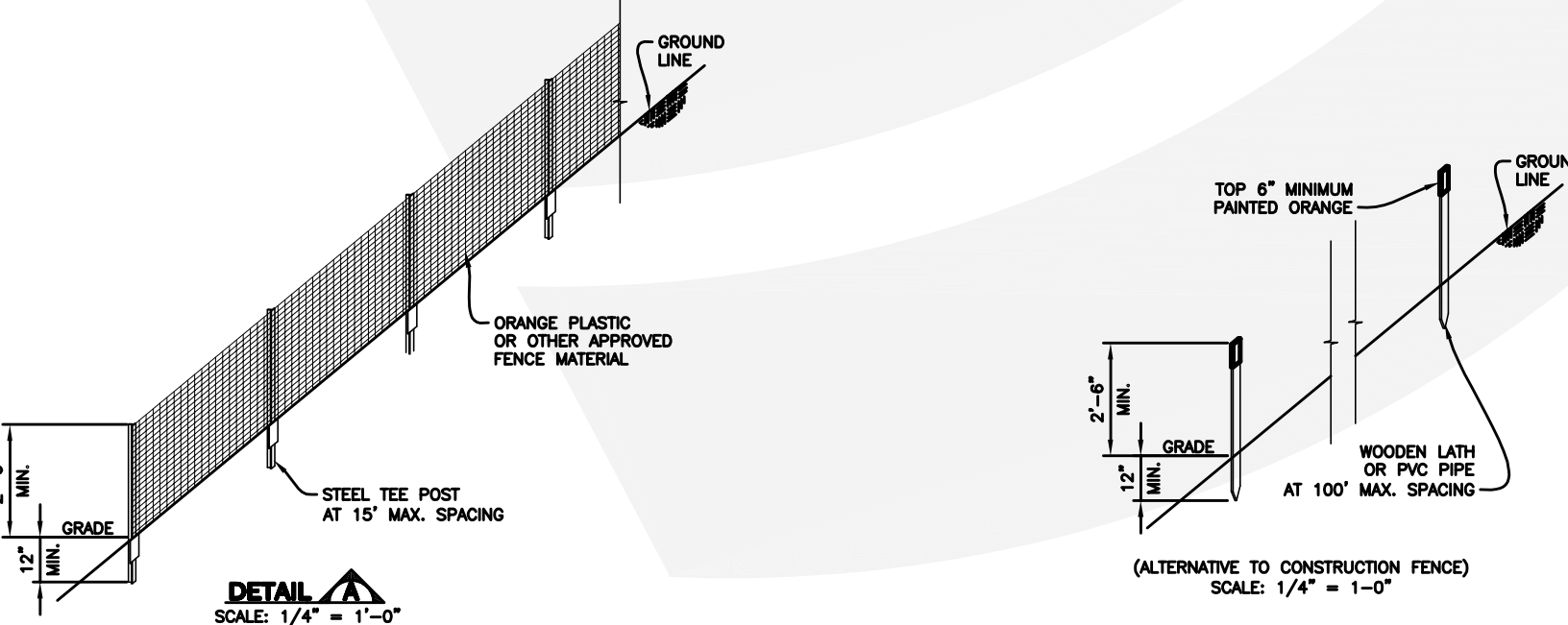
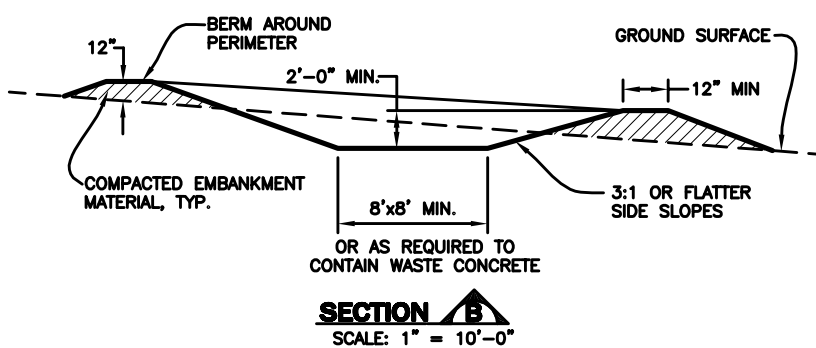
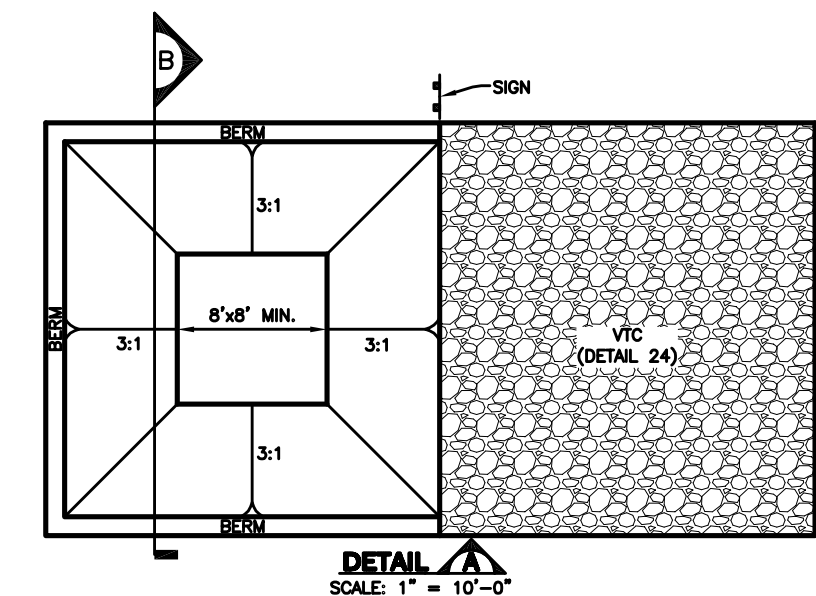
1. THE DOUGLAS COUNTY ENGINEER'S SIGNATURE AFFIXED TO THIS DOCUMENT INDICATES THE DOUGLAS COUNTY PUBLIC WORKS DEPARTMENT, ENGINEERING DIVISION, HAS REVIEWED THE DOCUMENT AND FOUND IT IN GENERAL COMPLIANCE WITH THE DOUGLAS COUNTY SUBURBAN DESIGN MANUAL, CHAPTER 10.0 GRADING, EROSION AND SEDIMENT CONTROL (GESC) CRITERIA. MATERIAL, THE DOUGLAS COUNTY ENGINEER, THROUGH ACCEPTANCE OF THIS DOCUMENT ASSUMES RESPONSIBILITY (OTHER THAN AS STATED ABOVE) FOR THE COMPLETENESS AND/OR ACCURACY OF THESE DOCUMENTS.
2. THE ADEQUACY OF THIS GESC PLAN LIES WITH THE ORIGINAL DESIGN ENGINEER.
3. THE GESC PLAN SHALL BE CONSIDERED VALID FOR TWO (2) YEARS FROM THE DATE OF ACCEPTANCE BY DOUGLAS COUNTY, AFTER WHICH TIME THE PLAN SHALL BE VOID AND WILL BE SUBJECT TO RE-REVIEW AND RE-ACCEPTANCE BY DOUGLAS COUNTY.
4. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE DOUGLAS COUNTY ENGINEERING DIVISION (DOUGLAS COUNTY PUBLIC WORKS DEPARTMENT, ENGINEERING DIVISION) TO VERIFY THE GESC PLAN AND WORKMANSHIP THAT DOES NOT CONFORM TO THE GESC MANUAL, GESC PLAN OR GESC PERMIT.
5. THE PLACEMENT OF EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMPs) SHALL BE IN ACCORDANCE WITH THE DOUGLAS COUNTY - ACCEPTED GESC PLAN AND THE DOUGLAS COUNTY GESC MANUAL.
6. ANY VARIATION IN MATERIAL, TYPE OR LOCATION OF EROSION AND SEDIMENT CONTROL BMPs FROM THE DOUGLAS COUNTY ACCEPTED GESC PLAN WILL REQUIRE APPROVAL FROM AN ACCOUNTABLE REPRESENTATIVE OF THE DOUGLAS COUNTY ENGINEERING DIVISION.
7. AFTER THE GESC PLAN HAS BEEN ACCEPTED, THE GESC PERMIT APPLIED FOR, FEES AND FISCAL SECURITY SUBMITTED TO THE COUNTY, AND THE GESC FIELD MANUAL OBTAINED AND REVIEWED, THE CONTRACTOR MAY INSTALL THE INITIAL-STAGE EROSION AND SEDIMENT CONTROL BMPs INDICATED ON THE ACCEPTED GESC PLAN.
8. THE FIRST BMP SHALL BE INSTALLED ON THE SITE SHALL BE CONSTRUCTION FEES, MARKERS, OR OTHER IDENTIFYING MEANS OF THE PROJECT. THE CONTRACTOR, INCLUDING CONSTRUCTION LIMITS ADJACENT TO STREAM CORRIDORS AND OTHER AREAS IS TO BE PRESERVED.
9. AFTER INSTALLATION OF THE INITIAL-STAGE EROSION AND SEDIMENT CONTROL BMPs, THE PERMITTEE SHALL CALL THE DOUGLAS COUNTY ENGINEERING PERMITS TECHNICIAN AT 303-660-7487 TO SCHEDULE A PRECONSTRUCTION MEETING. THE MEETING SHALL BE HELD WITHIN THE FIRST TWO (2) BUSINESS DAYS PRIOR TO THE REQUESTED MEETING TIME. NO CONSTRUCTION ACTIVITIES SHALL BE PLANNED WITHIN 24 HOURS AFTER THE PRECONSTRUCTION MEETING.
10. THE OWNER OR OWNER'S REPRESENTATIVE, THE GESC MANAGER, THE GENERAL CONTRACTOR, AND THE GRADING CONTRACTOR SHALL BE REQUIRED TO ATTEND THE PRECONSTRUCTION MEETING. IF THE PRECONSTRUCTION MEETING IF ANY OF THE REQUIRED PARTICIPANTS FAIL TO ATTEND THE PRECONSTRUCTION MEETING, OR IF THE GESC FIELD MANUAL IS NOT ON SITE, OR IF THE INSTALLATION OF THE INITIAL BMPs ARE NOT APPROVED BY THE DOUGLAS COUNTY GESC INSPECTOR, THEN THE APPLICANT WILL HAVE TO GET A REDEMPTION FEE. ADDITIONAL PROBLEMS WITH BMP INSTALLATION, AND CALL TO RESCHEDULE THE MEETING, WITH A CORRESPONDING DELAY IN THE START OF CONSTRUCTION. IF DOUGLAS COUNTY STRONGLY ENCOURAGES THE APPLICANT TO HAVE AN ENGINEER OF RECORD AT THE PRECONSTRUCTION MEETING. FAILURE OF THE ENGINEER OF RECORD TO ATTEND MAY RESULT IN A DELAY OF THE START OF CONSTRUCTION.
11. CONSTRUCTION SHALL NOT BEGIN UNTIL THE DOUGLAS COUNTY GESC INSPECTOR APPROVES THE INSTALLATION OF THE INITIAL BMPs. THE INITIAL BMP SHALL BE INSTALLED UP FROM THE COUNTRY. IF THE BMP IS IN-HAND ON THE SITE, THE COMPLETED PERMIT WILL BE AVAILABLE WITHIN 24-HOURS AFTER THE INSTALLATION OF THE INITIAL BMPs ARE APPROVED.
12. THE GESC MANAGER SHALL STRICTLY ADHERE TO THE DOUGLAS COUNTY-APPROVED LIMITS OF CONSTRUCTION AT ALL TIMES. THE DURATION OF CONSTRUCTION SHALL BE LIMITED TO THE LIMITS OF CONSTRUCTION AND, AT THE DISCRETION OF THE ENGINEERING DIVISION, ADDITIONAL EROSION/SEDIMENT CONTROLS MAY BE REQUIRED IN ANY ADDITIONAL AREAS OF CONSTRUCTION.
13. THE MAXIMUM AREA OF CONSTRUCTION SHALL BE LIMITED TO 40 ACRES (70 ACRES IF APPROVED FOR SOIL EROSION OPERATIONS). ANY REDUCTION IN CONSTRUCTION SHALL BE LIMITED TO 10% OF THE TOTAL AREA. SHALL BE DIVIDED INTO PHASES THAT ARE EACH 40 OR (70) ACRES OR LESS IN SIZE. THESE PROJECTS SHALL CONDUCT GRADING ACTIVITIES IN COMPLIANCE WITH THE ACCEPTED GESC PLAN, BMP INSTALLATION AND APPROVED BY DOUGLAS COUNTY GESC INSPECTOR. EACH PHASE SHALL BE CONDUCTED IN ACCORDANCE WITH THE PROCEDURES OUTLINED IN THE GESC MANUAL AND/OR GESC FIELD MANUAL.
14. PRIOR TO ACTUAL CONSTRUCTION, THE PERMITTEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES. FOR INFORMATION, CONTACT THE DENVER INTER-UTILITY GROUP AT 1-800-922-1987 OR FAX AT (303)634-8700.
15. NATURAL VEGETATION SHALL BE RETAINED AND PROTECTED WHEREVER POSSIBLE. EXPOSURE OF SOIL TO EROSION BY REMOVAL OR DESTRUCTION OF VEGETATION SHALL BE LIMITED TO THE AREA REQUIRED FOR IMMEDIATE CONSTRUCTION OPERATIONS.
16. THE GESC PERMIT SHALL BE VALID FOR A PERIOD OF ONE (1) YEAR.
17. A COPY OF THE GESC PERMIT, ACCEPTED GESC PLANS AND THE GESC FIELD MANUAL SHALL BE ON SITE AT ALL TIMES.
18. THE GESC MANAGER SHALL BE RESPONSIBLE FOR ENSURING THAT THE SITE REMAINS IN COMPLIANCE WITH THE GESC PERMIT AND SHALL BE THE PERMITTEE'S CONTACT PERSON WITH THE COUNTY FOR ALL MATTERS PERTAINING TO THE GESC PERMIT. THE GESC MANAGER SHALL BE PRESENT AT THE SITE THE MAJORITY OF THE TIME AND SHALL BE RESPONSIBLE FOR NOTIFYING THE COUNTY OF ANY VIOLATIONS. IF THE CONTRACTOR'S GESC MANAGER IS NOT ON SITE AND CANNOT BE REACHED DURING A VIOLATION, THE ALTERNATE GESC MANAGER SHALL BE NOTIFIED IMMEDIATELY. IF THE ALTERNATE GESC MANAGER CANNOT BE REACHED DURING ANY VIOLATION, A STOP WORK ORDER SHALL BE ISSUED.
19. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE THROUGH THE DOUGLAS COUNTY-APPROVED ACCESS POINT. A VEHICLE TRACKING CONTROL PAD IS REQUIRED AT ALL ACCESS POINTS ON THE SITE. ADDITIONAL CONSTRUCTION ENTRANCES MAY BE ADDED WITH AUTHORIZATION FROM THE DOUGLAS COUNTY ENGINEERING DIVISION.

1. THE GESC MANAGER IS RESPONSIBLE FOR CLEANUP OF SEDIMENT OR CONSTRUCTION DEBRIS TRACKED ONTO ADJACENT AREAS. PAVED AREAS INCLUDING STREETS ARE TO BE KEPT CLEAN THROUGHOUT BUILD-OUT AND SHALL BE CLEANED, WITH A STREET SWEEPER, AT FIRST NOTICE OF ACCIDENTAL TRACKING OR AT THE DISCRETION OF THE DOUGLAS COUNTY GESC INSPECTOR. STREET WASHING IS NOT ALLOWED. DOUGLAS COUNTY GESC INSPECTORS SHALL MEASURE ADDITIONAL LOCATIONS TO ENSURE AREA STREETS ARE KEPT FREE OF SEDIMENT AND/OR CONSTRUCTION DEBRIS.
2. APPROVED EROSION AND SEDIMENT CONTROL BMPs SHALL BE MAINTAINED AND KEPT IN GOOD REPAIR FOR THE DURATION OF THIS PROJECT. AT A MINIMUM, THE GESC MANAGER SHALL INSPECT ALL BMPs IN ACCORDANCE WITH THE GESC MANUAL. ANY DAMAGE TO OR DESTRUCTION OF ANY EROSION OR SEDIMENT CONTROL ACTIVITY SHALL BE COMPLETED WITHIN 48 HOURS FOR LEVEL III VIOLATIONS, AND IMMEDIATELY FOR LEVEL II VIOLATIONS, OR AS DIRECTED BY A DOUGLAS COUNTY GESC INSPECTOR. ACCUMULATED SEDIMENT AND CONSTRUCTION DEBRIS SHALL BE REMOVED AND DISPOSED OF AT AN APPROVED LOCATION.
22. STRAW BALES ARE NOT A DOUGLAS COUNTY GESC-ACCEPTED SEDIMENT CONTROL BMP.
23. TOPSOIL SHALL BE STRIPPED AND STOCKPILED IN THE LOCATION SHOWN ON THE ACCEPTED GESC PLAN. THE GESC MANAGER SHALL BE NOTIFIED IMMEDIATELY BY A DOUGLAS COUNTY GESC INSPECTOR AS SOON AS STOCKPILE STRIPPING IS COMPLETED. FAILURE TO SCHEDULE SUCH INSPECTION OR FAILURE TO STOCKPILE TOPSOIL SHALL RESULT IN CANCELLATION OF A STOP WORK ORDER. THE STOP WORK ORDER SHALL REMAIN IN PLACE UNTIL TOPSOIL IS STOCKPILED ON SITE OR APPROPRIATE SOIL AMENDMENTS ARE STOCKPILED ON SITE.
24. THE ACCEPTED GESC PLAN MAY REQUIRE CHANGES OR ALTERATIONS AFTER APPROVAL TO MEET CHANGING SITE OR PROJECT CONDITIONS OR TO ADDRESS INEFFICIENCIES IN DESIGN OR INSTALLATION. THE GESC MANAGER SHALL OBTAIN PRIOR APPROVAL FROM THE DESIGN ENGINEER AND DOUGLAS COUNTY ENGINEERING FOR ANY SUCH CHANGES.
25. LINING OF TEMPORARY SWALES AND DITCHES SHALL BE IN ACCORDANCE WITH THE GESC CRITERIA MANUAL.
26. NO PERMANENT EARTH SLOPES GREATER THAN 3:1 SHALL BE ALLOWED.
27. ANY SETTLEMENT OR SOIL ACCUMULATIONS BEYOND THE LIMITS OF CONSTRUCTION DUE TO GRADING OR EROSION SHALL BE REPAIRED OTHER THAN BY NOTIFICATION TO THE DOUGLAS COUNTY GESC INSPECTOR. THE GESC MANAGER SHALL BE RESPONSIBLE FOR OBTAINING ACCESS RIGHTS TO ADJACENT PROPERTY, IF NEEDED, AND REMEDIATING ANY ADVERSE IMPACTS TO ADJACENT WATERWAYS, WETLANDS, PROPERTIES, ETC. RESULTING FROM WORK DONE AS PART OF THIS PROJECT.
28. A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
29. SOILS THAT WILL BE STOCKPILED FOR MORE THAN THIRTY (30) DAYS SHALL BE SEEDDED AND MULCHED WITHIN FOURTEEN (14) DAYS OF STOCKPILE CONSTRUCTION. NO STOCKPILES SHALL BE PLACED WITHIN ONE HUNDRED (100) FEET OF A DRAINAGE WAY UNLESS APPROVED BY THE DOUGLAS COUNTY ENGINEERING DIVISION.
30. ALL CHEMICAL OR HAZARDOUS MATERIAL SPILLS WHICH MAY ENTER WATERWAYS OF THE STATE OF COLORADO, WHICH ARE OR MAY BE USED FOR FISH OR WILDLIFE PROPAGATION, OR WHICH MAY BE USED FOR DOMESTIC OR STOCK WATER LEADING TO SURFACE WATER, SHALL BE IMMEDIATELY REPORTED TO THE CDPIPE PER CS 25-8-601, AND DOUGLAS COUNTY. RELATED TO THIS REPORT, THE CDPIPE AND CERTAIN HAZARDOUS SUBSTANCES LISTED UNDER THE FEDERAL CLEAN WATER ACT (40 CFR PART 118) MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER AS WELL AS THE CDPIPE. CONTACT INFORMATION FOR CDPIPE, DOUGLAS COUNTY AND THE NATIONAL RESPONSE CENTER IS LISTED FOR THE DOUGLAS COUNTY GESC MANUAL. ANY SPILL REPORTED TO THE GESC SHALL BE REPORTED TO 911. FAILURE TO REPORT AND CLEAN UP ANY SPILL SHALL RESULT IN ISSUANCE OF A STOP WORK ORDER.
31. ALL WORK ON SITE SHALL START A MINIMUM OF ONE HUNDRED (100) FEET AWAY FROM ANY DRAINAGE WAY, AND SHALL BE COMPLETED WITHIN ONE HUNDRED (100) FEET OF ANY ADJACENT DRAINAGE WAY.
32. ALL PROJECTS SHALL ALLOW IMPORT OR EXPORTS OF MATERIAL. THE PERMITTEE SHALL HAVE A GESC GRANTED BY THE COUNTY ENGINEER TO ALLOW IMPORT OR EXPORT OF MATERIAL. THE PERMITTEE SHALL HAVE A GESC PERMIT IN HAND FOR THE IMPORT OR EXPORT SITE PRIOR TO ANY TRANSPORTING OF EARTH MATERIAL. THE GESC MANAGER SHALL NOTIFY THE DOUGLAS COUNTY GESC INSPECTOR OF THE LOCATION AND PERMIT NUMBERS FOR BOTH THE EXPORTING AND IMPORTING SITES PRIOR TO ANY IMPORT/ EXPORT OPERATIONS.
33. THE USE OF REBAR, STEEL STAKES OR STEEL FENCE POSTS FOR STAKING OR SUPPORT OF ANY EROSION OR SEDIMENT CONTROL BMP IS PROHIBITED EXCEPT STEEL TEE-POSTS FOR USE IN SUPPORTING CONSTRUCTION FENCE).
34. THE CLEANING OF CONCRETE DELIVERY TRUCK CHUTES IS RESTRICTED TO APPROVED CONCRETE WASH OUT LOCATIONS. ON THE JOB SITE, THE DISCHARGE OF WATER CONTAINING WASTE CONCRETE TO THE STORM SEWER SYSTEM IS PROHIBITED. ALL CONCRETE WASTE SHALL BE PROPERLY CLEANED UP AND DISPOSED AT AN APPROPRIATE LOCATION.
41. ALL DETAHERING ON SITE SHALL BE COORDINATED WITH A DOUGLAS COUNTY GESC INSPECTOR AND BE FREE OF SEDIMENT ACCUMULATIONS.
36. ALL PERMANENT INSTALLATIONS OF PIPES FOR STORM SEWERS, SLOPE DRAINS, AND CULVERTS, TOGETHER WITH RIPRAP APRONS OR OTHER INLET AND OUTLET PROTECTION, REQUIRE INSPECTION BY DOUGLAS COUNTY ENGINEERING (SEPARATE FROM GESC INSPECTIONS).
37. ALL DISTURBED AREAS SHALL BE DRILL SEEDED AND CRIMP MULCHED IN ACCORDANCE WITH THE GESC CRITERIA MANUAL WITHIN THIRTY DAYS OF INITIAL EXPOSURE OR WITHIN SEVEN DAYS OF SUBSTANTIAL COMPLETION OF THE DISTURBED DOUGLAS COUNTY GESC MAP OF AN AREA, WHICHEVER IS LESS. THIS MAY REQUIRE MULTIPLE MOBILIZATIONS FOR SEEDING AND MULCHING.
38. HYDRAULIC SEEDING AND HYDRAULIC MULCHING ARE NOT AN ACCEPTABLE METHOD OF SEEDING OR MULCHING IN DOUGLAS COUNTY.
39. NO CURB AND GUTTER PERMITS SHALL BE ISSUED UNTIL ALL DISTURBED AREAS ARE DRILL SEEDED AND CRIMP MULCHED.
40. NO PAVING PERMITS SHALL BE ISSUED UNTIL ALL INTERIM INTERIOR PROTECTION IS INSTALLED AND APPROVED BY THE GESC INSPECTOR.
41. A FINAL GESC INSPECTION SHALL BE CONDUCTED A MINIMUM OF TWO WEEKS PRIOR TO THE ANTICIPATED REQUEST FOR CERTIFICATE OR TEMPORARY CERTIFICATE OF OCCUPANCY OR INITIAL ACCEPTANCE.



STABILITY INDICATOR	CLASS 1 COMPOST FOR COMPOST FILTER BERM
SEALS	STABLE
	MAXIMUM 5mm/shot/cm
	6.0 - 8.0
INDICATOR EXPRESSED AS % OF GERMINATION VECTOR	> 10
INDICATOR EXPRESSED AS % NITRATE N RATIO	80+/80+
INDICATOR EXPRESSED AS % CLOSTRIDIA RATIO	< 1
INDICATOR EXPRESSED AS % NITROGEN RATIO	20+
YES/NEGATIVE RESULT	YES/NEGATIVE RESULT
SIZE DISTRIBUTION	30-50 %
SIZE DISTRIBUTION	25-45 % OF DRY WEIGHT
SIZE DISTRIBUTION	75-100 % PASSING
SIZE DISTRIBUTION	100% 80# TO 100# PASSING
SIZE DISTRIBUTION	100% 100# TO 200# PASSING
SIZE DISTRIBUTION	100% 200# TO 400# PASSING
SIZE DISTRIBUTION	40 # 20 TO 80# PASSING
SIZE DISTRIBUTION	MUST BE REPORTED
SECONDARY NUTRIENTS, ELEMENT	
AND TEST REPORT SUBMITTAL	STA + CLOPP/ROAD
MATTER PER CUBIC YD CONTAMINANTS	MUST REPORT
MATTER PER CUBIC YD CONTAMINANTS	MUST EXCEED USE EPA CLASS 1 STANDARDS OR EPA 503.1 TABLES 1 & 3 LEVELS
MANUFACTURING/PRODUCTION	FULLY PERMITTED UNDER COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT AGRICULTURAL MATERIALS AND WASTE MANAGEMENT DIVISION
FACTORS RELATING TO PLANT HEALTH AND HEALTH	LOW
BIOSSOL COMPOST IS TO BE UTILIZED IF, OR SHALL BE, PRODUCED BY A FACILITY IN COMPLIANCE WITH THE COLORADO DEPARTMENT OF HEALTH'S UNRESTRICTED USE	

NOTE: A LAB TEST DETAILING THE CHEMICAL, PHYSICAL, AND BIOLOGICAL PARAMETERS SHALL BE PROVIDED UPON REQUEST BY DOUGLAS COUNTY.



<b>D50 SIZE MEDIUM STONE (INCHES)</b>	<b>% OF MATERIAL SMALLER THAN TYPICAL STONE</b>	<b>TYPICAL STONE EQUIVALENT DIAMETER (INCHES)</b>	<b>TYPICAL STONE WEIGHT (POUNDS)</b>
<b>6</b>	70 – 100	12	85
	50 – 70	8	35
	30 – 50	6	10
	2 – 10	2	0.4
<b>9</b>	70 – 100	15	160
	50 – 70	12	85
	30 – 50	9	35
	2 – 10	3	1.3
<b>12</b>	70 – 100	21	440
	50 – 70	18	275
	30 – 50	12	65
	2 – 10	4	3
<b>18</b>	100	30	1280
	50 – 70	24	650
	30 – 50	18	275
	2 – 10	6	10
<b>24</b>	100	42	3500
	50 – 70	33	1750
	30 – 50	24	650
	2 – 10	9	35

**TABLE 2. RIPRAP BEDDING**

SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
	CLASS A
3"	100
1 1/2"	20 - 90
NO. 4	0 - 20
NO. 200	0 - 3

MATCHES SPECIFICATIONS FOR CDOT  
CLASS A FILTER MATERIAL, AND UDFC  
TYPE 1 BEDDING. ALL ROCK SHALL BE  
FRACTURED FACE, ALL SIDES.

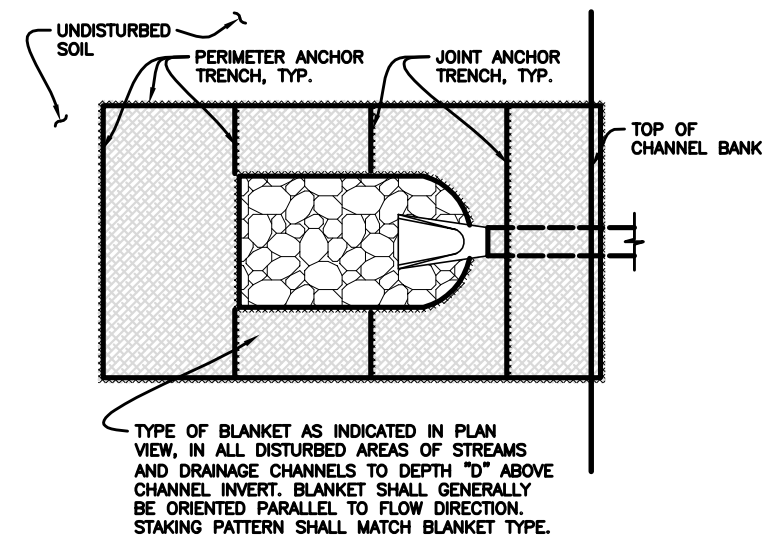
**TABLE 3. 1 1/2" CRUSHED ROCK**

SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
	NO. 4
2"	100
1 1/2"	90 - 100
1"	20 - 55
3/4"	0 - 15
3/8"	0 - 5

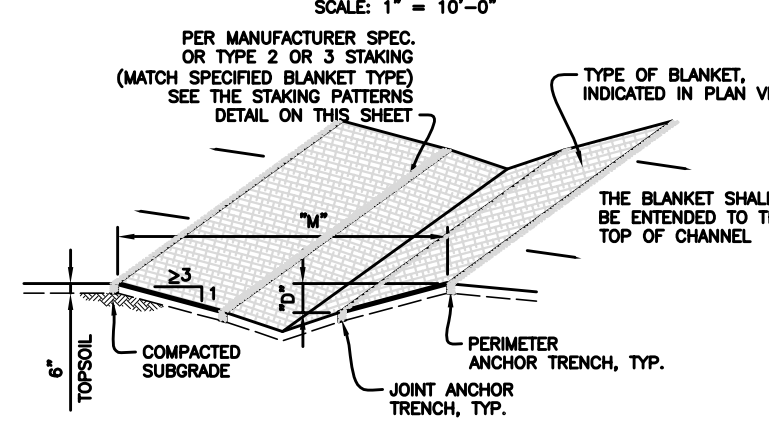
**MATCHES SPECIFICATIONS FOR NO. 4  
COARSE AGGREGATE FOR CONCRETE  
PER ASTM M43. ALL ROCK SHALL  
BE FRACTURED FACE, ALL SIDES.**

## ROCK AND RIPRAP GRADATIONS

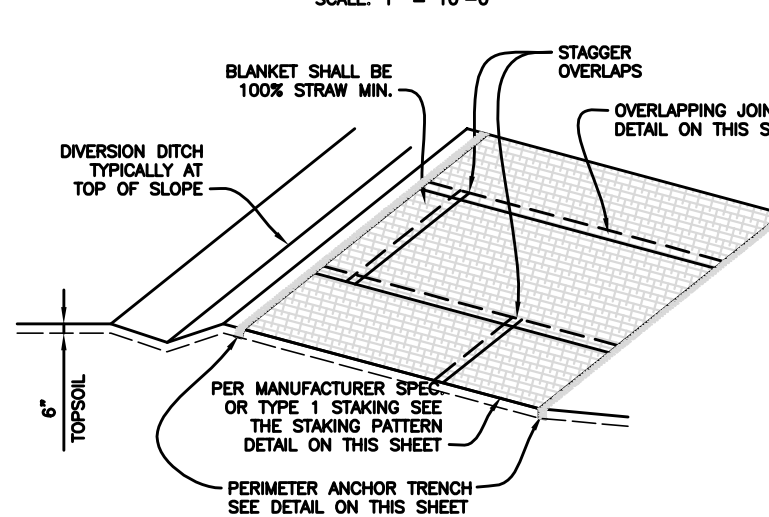




**IN DISTURBED AREAS OF STREAMS AND DRAINAGE CHANNELS - DETAIL A**  
SCALE: 1" = 10'-0"

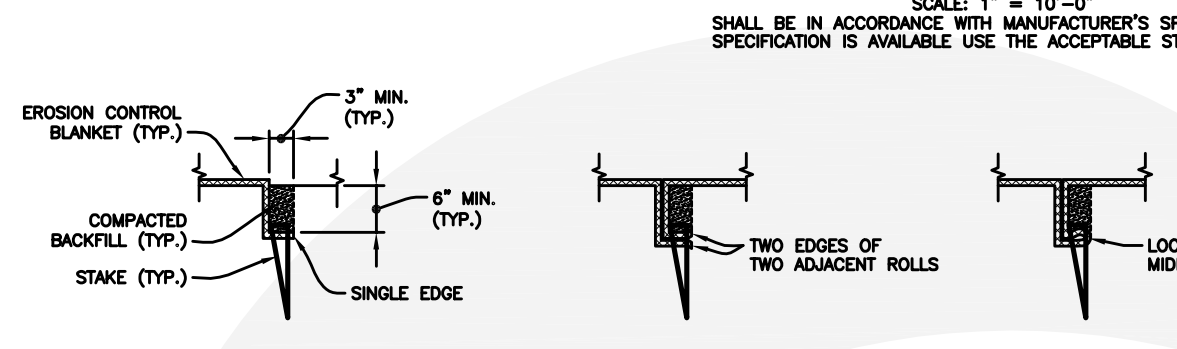


**IN DIVERSION DITCH OR SMALL DITCH DRAINAGEWAY - DETAIL B**  
SCALE: 1" = 10'-0"



**OUTSIDE OF STREAMS AND DRAINAGE CHANNELS - DETAIL C**  
SCALE: 1" = 10'-0"

**STAKING PATTERNS**  
SCALE: 1" = 10'-0"



**PERIMETER ANCHOR TRENCH** SCALE: 1/2" = 1'-0"  
**JOINT ANCHOR TRENCH** SCALE: 1/2" = 1'-0"

**INTERMEDIATE ANCHOR TRENCH** SCALE: 1/2" = 1'-0"  
**OVERLAPPING JOINT** SCALE: 1/2" = 1'-0"  
**WOOD STAKE DETAIL** SCALE: 1/2" = 1'-0"

**EROSION CONTROL BLANKET INSTALLATION NOTES**

- SEE PLAN VIEW FOR:
  - LOCATION OF PERIMETER OF EROSION CONTROL BLANKET.
  - TYPE OF BLANKET (STRAW, STRAW-COCONUT, COCONUT, OR EXCELSIOR).
  - AREA "A" IN SQUARE YARDS OF EACH TYPE OF BLANKET.
- ALL EROSION CONTROL BLANKETS AND NETTING SHALL BE MADE OF 100% NATURAL AND BIODEGRADABLE MATERIAL; NO PLASTIC OR OTHER SYNTHETIC MATERIAL, EVEN IF PHOTO DEGRADABLE, SHALL BE ALLOWED.
- IN AREAS WHERE EROSION CONTROL BLANKET IS SHOWN ON THE PLANS, THE PERMITTEE SHALL PLACE TOPSOIL AND PERFORM FINAL GRADING, SURFACE PREPARATION, AND SEEDING BELOW THE BLANKET IN ACCORDANCE WITH THE REQUIREMENTS OF DETAIL 17. SEEDING AND MULCHING, SUBGRADE SHALL BE SMOOTH AND MOST PRIOR TO BLANKET INSTALLATION AND THE BLANKET SHALL BE IN FULL CONTACT WITH SUBGRADE. NO GAPS OR VOIDS SHALL EXIST UNDER THE BLANKET.
- PERIMETER ANCHOR TRENCH SHALL BE USED AT OUTSIDE PERIMETER OF ALL BLANKET AREAS.
- JOINT ANCHOR TRENCH SHALL BE USED TO JOIN ROLLS OF BLANKETS TOGETHER (LONGITUDINALLY AND TRANSVERSELY) FOR ALL BLANKETS EXCEPT STRAW, WHICH MAY USE AN OVERLAPPING JOINT.
- INTERMEDIATE ANCHOR TRENCH SHALL BE USED AT SPACING OF ONE-HALF THE ROLL LENGTH FOR COCONUT AND EXCELSIOR BLANKETS.
- THE OVERLAPPING JOINT DETAIL SHALL BE USED TO JOIN ROLLS OF BLANKETS TOGETHER FOR BLANKETS ON SLOPES.
- MATERIAL SPECIFICATIONS OF EROSION CONTROL BLANKET SHALL CONFORM TO TABLE 7.1.

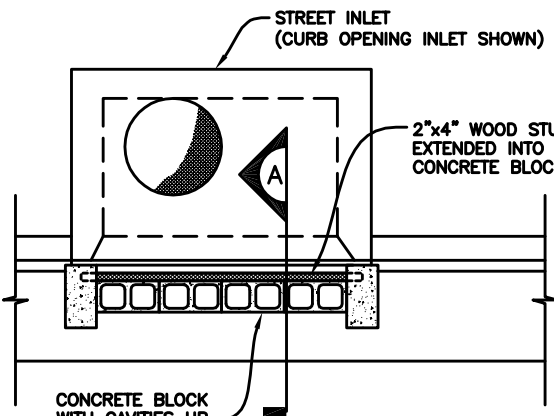
**EROSION CONTROL BLANKET INSTALLATION NOTES - CONTINUED**

- ANY AREAS OF SEEDING AND MULCHING DISTURBED IN THE PROCESS OF INSTALLING EROSION CONTROL BLANKET SHALL BE RESEEDED AND MULCHED IN ACCORDANCE WITH DETAIL 17.
- SEE DRAINAGE DESIGN PLANS FOR MAJOR DRAINAGEWAY STABILIZATION MEASURES THAT MAY EXCEED THE DESIGN CONDITIONS ASSOCIATED WITH THE DETAILS ABOVE.

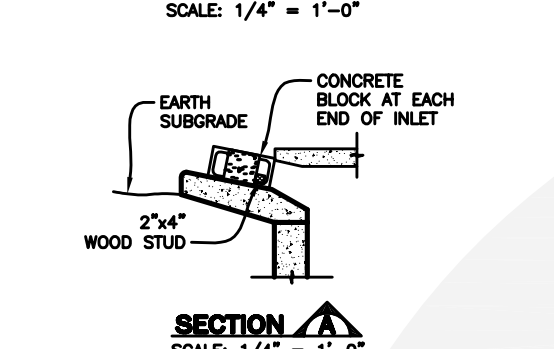
TABLE 7.1 - EROSION CONTROL BLANKET TYPE		COCONUT		STRAW		EXCELSIOR	
TYPE	CONTENT	TYPE	CONTENT	TYPE	CONTENT	TYPE	CONTENT
STRAW*	100%	COCONUT	100%	STRAW	100%	EXCELSIOR	100%
STRAW-COCONUT	30% MIN. 70% MAX.	COCONUT	30% MIN. 70% MAX.	STRAW	30% MIN. 70% MAX.	EXCELSIOR	30% MIN. 70% MAX.
COCONUT	100%	STRAW	100%	EXCELSIOR	100%	STRAW-COCONUT	30% MIN. 70% MAX.
EXCELSIOR	100%	STRAW-COCONUT	30% MIN. 70% MAX.	COCONUT	30% MIN. 70% MAX.	STRAW	30% MIN. 70% MAX.

**EROSION CONTROL BLANKET MAINTENANCE NOTES**

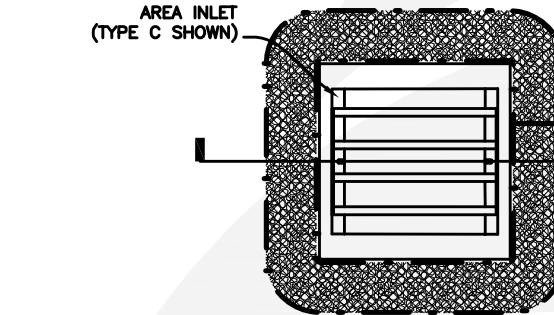
- THE GESC MANAGER SHALL INSPECT EROSION CONTROL BLANKETS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS AS NECESSARY.
- EROSION CONTROL BLANKET IS TO BE LEFT IN PLACE UNLESS REQUESTED TO BE REMOVED BY THE COUNTY.
- ANY EROSION CONTROL BLANKET PULLED OUT, TORN, OR OTHERWISE DAMAGED SHALL BE RE-INSTALLED. ANY SUBGRADE AREAS BELOW THE BLANKET THAT HAVE ERODED TO CREATE A VOID UNDER THE BLANKET, OR THAT REMAIN DEVOID OF GRASS SHALL BE REPAIRED, RESEEDED AND MULCHED AND THE EROSION CONTROL BLANKET REINSTALLED.



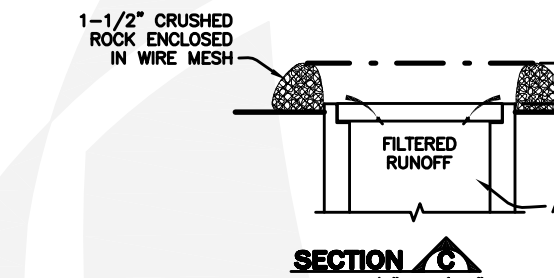
**INTERIM CONFIGURATION (BEFORE PAVING) STREET INLET - PLAN**  
SCALE: 1/4" = 1'-0"



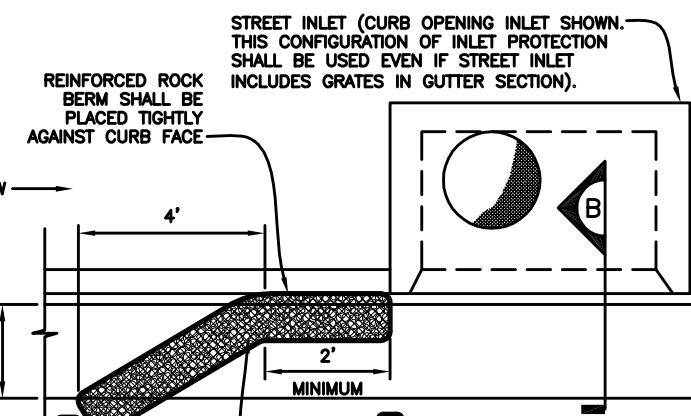
**SECTION A** SCALE: 1/4" = 1'-0"



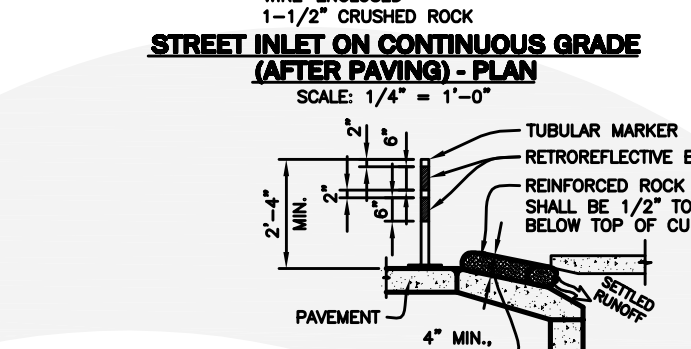
**AREA INLET - PLAN** SCALE: 1/4" = 1'-0"



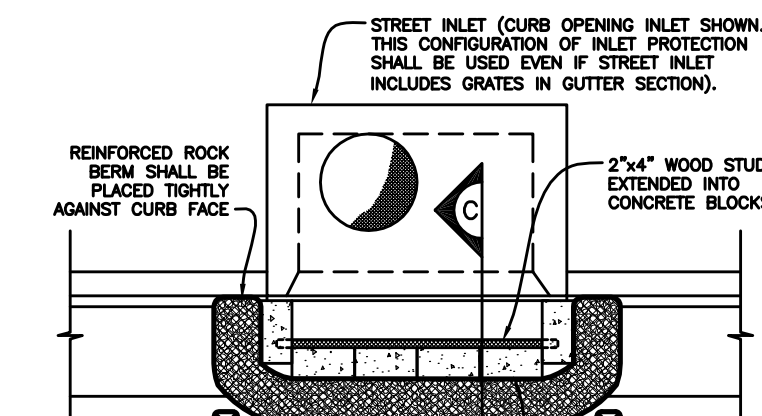
**SECTION A** SCALE: 1/4" = 1'-0"



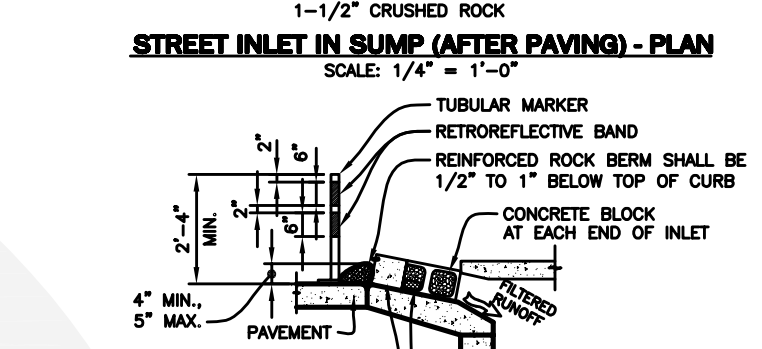
**STREET INLET ON CONTINUOUS GRADE (AFTER PAVING) - PLAN**  
SCALE: 1/4" = 1'-0"



**SECTION A** SCALE: 1/4" = 1'-0"



**STREET INLET IN SUMP (AFTER PAVING) - PLAN**  
SCALE: 1/4" = 1'-0"



**SECTION A** SCALE: 1/4" = 1'-0"

**JOINT DETAIL** SCALE: 1/4" = 1'-0"

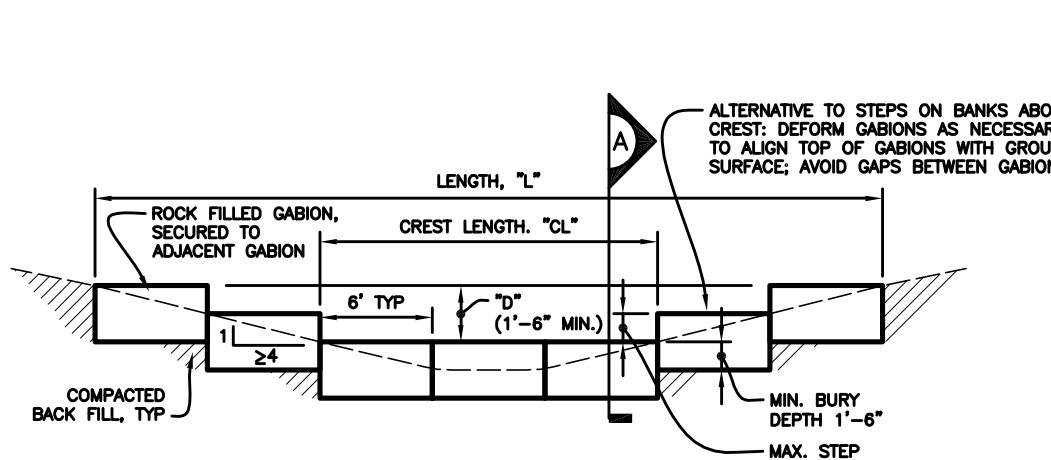
**INLET PROTECTION INSTALLATION NOTES**

- INTERIM CONFIGURATION OF INLET PROTECTION IN STREETS SHALL BE INSTALLED WITHIN 48-HOURS OF POURING INLET. INLET PROTECTION (AFTER PAVING) SHALL BE INSTALLED WITHIN 48-HOURS OF POURING INLET.
- INLET PROTECTION AT AREA INLETS SHALL BE INSTALLED WITHIN 48-HOURS OF POURING INLET.
- CRUSHED ROCK SHALL BE FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON SHEET 1 (1-1/2" MINUS). RECYCLED CONCRETE MEETING THIS GRADATION MAY BE USED.
- WIRE MESH SHALL BE FABRICATED OF 10 GAUGE WIRE TWISTED INTO A MESH WITH A MAXIMUM OPENING OF 1.0 INCH (COMMONLY TERMED "CHICKEN WIRE"). ROLL WIDTH SHALL BE 48-INCHES.
- WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT 6-INCH CENTERS ALONG ALL JOINTS AND AT 2-INCH CENTERS ON ENDS OF BERM.
- REINFORCED ROCK BERM SHALL BE CONSTRUCTED IN ONE PIECE OR SHALL BE CONSTRUCTED USING JOINT DETAIL.
- TUBULAR MARKERS SHALL MEET REQUIREMENTS OF MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), AS AMENDED.
- THE TOP OF REINFORCED ROCK BERM SHALL BE 1/2"-1" BELOW TOP OF CURB.

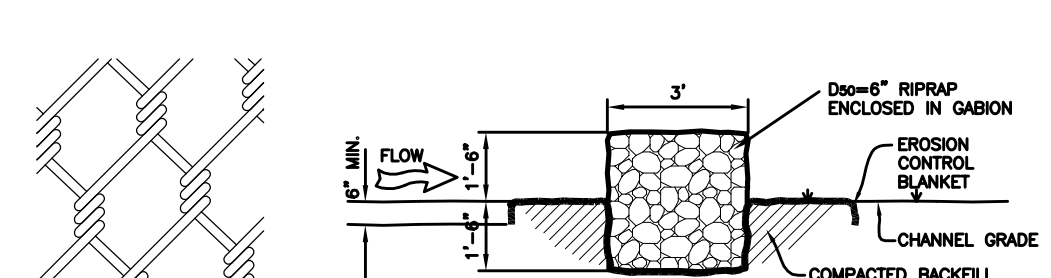
**INLET PROTECTION MAINTENANCE NOTES**

- THE GESC MANAGER SHALL INSPECT INLET PROTECTION WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY. MORE FREQUENT INSPECTIONS AND REPAIRS SHALL BE REQUIRED DURING WINTER CONDITIONS DUE TO FREEZE/THAW PROBLEMS.
- SEDIMENT ACCUMULATED UPSTREAM OF INLET PROTECTION SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF ROCK BERM IS WITHIN 2-1/2 INCHES OF THE CREST.
- INLET PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED, UNLESS THE COUNTY APPROVES EARLIER REMOVAL OF INLET PROTECTION IN STREETS.
- WHEN INLET PROTECTION AT AREA INLETS ARE REMOVED, THE DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE COUNTY.

**IP INLET PROTECTION 10**



**REINFORCED - ELEVATION** SCALE: 1" = 10'-0"



**REINFORCED - SECTION A** SCALE: 1/4" = 1'-0"

**BLOW UP OF TWISTED WIRE GABION** SCALE: NTS

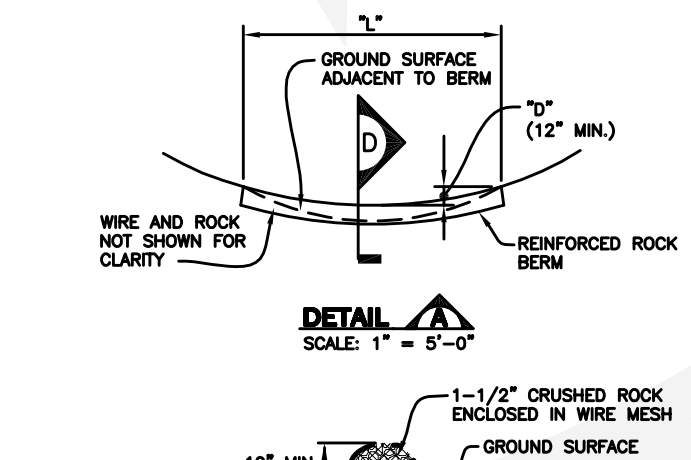
**REINFORCED CHECK DAM INSTALLATION NOTES**

- SEE PLAN VIEW FOR:
  - LOCATIONS OF CHECK DAMS.
  - CHECK DAM TYPE (CHECK DAM OR REINFORCED CHECK DAM).
  - LENGTH, "L", CREST LENGTH, "CL", AND DEPTH, "D".
- CHECK DAMS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED AFTER CONSTRUCTION FENCE, BUT PRIOR TO ANY UPSTREAM LAND-DISTURBING ACTIVITIES.
- REINFORCED CHECK DAMS, GABIONS SHALL HAVE GALVANIZED TWISTED WIRE NETTING WITH A MAXIMUM OPENING DIMENSION OF 4-1/2" AND A MINIMUM WIRE THICKNESS OF 0.10". WIRE "HOG RINGS" AT 4" SPACING OR OTHER APPROVED MEANS SHALL BE USED AT ALL GABION SEAMS AND TO SECURE THE GABION TO THE ADJACENT GABION.
- RIPRAP UTILIZED FOR CHECK DAMS SHALL HAVE A  $D_{50}$  MEDIAN STONE SIZE OF 6".
- THE CHECK DAM SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 1'-6".
- EROSION BLANKET SHALL BE PLACED IN THE REINFORCED CHECK DAM TRENCH EXTENDING A MINIMUM OF 1'-6" ON BOTH THE UPSTREAM AND DOWNSTREAM SIDES OF THE REINFORCED CHECK DAM.

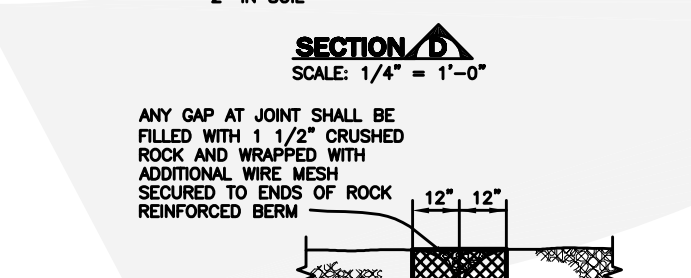
**REINFORCED CHECK DAM MAINTENANCE NOTES**

- THE GESC MANAGER SHALL INSPECT REINFORCED CHECK DAMS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY.
- SEDIMENT ACCUMULATED UPSTREAM OF CHECK DAMS SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF CHECK DAM IS WITHIN 1/2 THE HEIGHT OF THE CREST.
- CHECK DAMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY THE COUNTY.
- WHEN CHECK DAMS ARE REMOVED, EXCAVATIONS SHALL BE FILLED WITH SUITABLE COMPACTED BACK FILL. ANY DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED AND COVERED WITH EROSION CONTROL BLANKET OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE COUNTY.

**RCD REINFORCED CHECK DAM 11**



**SECTION A** SCALE: 1" = 10'-0"



**JOINT DETAIL** SCALE: 1/4" = 1'-0"

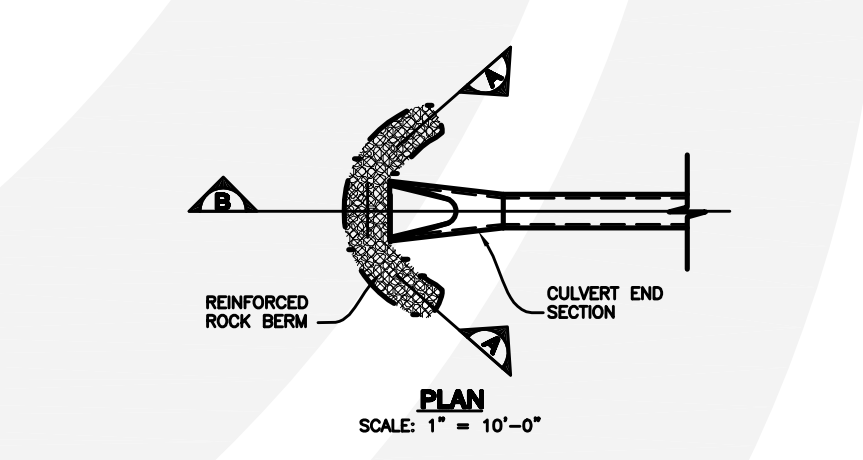
**REINFORCED ROCK BERM INSTALLATION NOTES**

- SEE PLAN VIEW FOR:
  - LOCATIONS OF REINFORCED ROCK BERMS.
  - LENGTH, "L", AND DEPTH, "D" DIMENSIONS.
- REINFORCED ROCK BERM SECTION APPLIES TO CULVERT INLET FILTER AND INLET PROTECTION.
- CRUSHED ROCK SHALL BE FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON SHEET 1 (1-1/2" MINUS). RECYCLED CONCRETE MEETING THIS GRADATION MAY BE USED.
- WIRE MESH SHALL BE FABRICATED OF 10 GAUGE WIRE TWISTED INTO A MESH WITH A MAXIMUM OPENING OF 1.0 INCH (COMMONLY TERMED "CHICKEN WIRE"). ROLL WIDTH SHALL BE 48-INCHES.
- WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT 6-INCH CENTERS ALONG ALL JOINTS AND AT 2-INCH CENTERS ON ENDS OF BERM.
- FOR CONCENTRATED FLOW AREAS THE ENDS OF THE REINFORCED ROCK BERM SHALL BE 12" HIGHER THAN THE CENTER OF THE BERM.

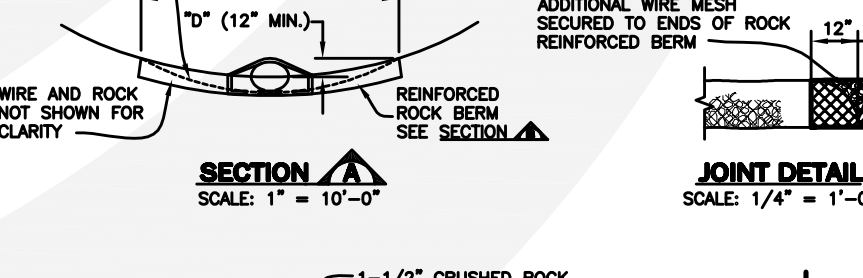
**REINFORCED ROCK BERM MAINTENANCE NOTES**

- THE GESC MANAGER SHALL INSPECT REINFORCED ROCK BERM WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY.
- SEDIMENT ACCUMULATED UPSTREAM OF REINFORCED ROCK BERM SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF FILTER IS WITHIN 5 INCHES OF THE CREST.
- REINFORCED ROCK BERMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED.
- WHEN REINFORCED ROCK BERMS ARE REMOVED, ANY DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE COUNTY.

**RRB REINFORCED ROCK BERM 12**



**SECTION A** SCALE: 1" = 10'-0"



**SECTION A** SCALE: 1/4" = 1'-0"

**JOINT DETAIL** SCALE: 1/4" = 1'-0"

**SECTION A** SCALE: 1/4" = 1'-0"

**SECTION A** SCALE: 1/4" = 1'-0"

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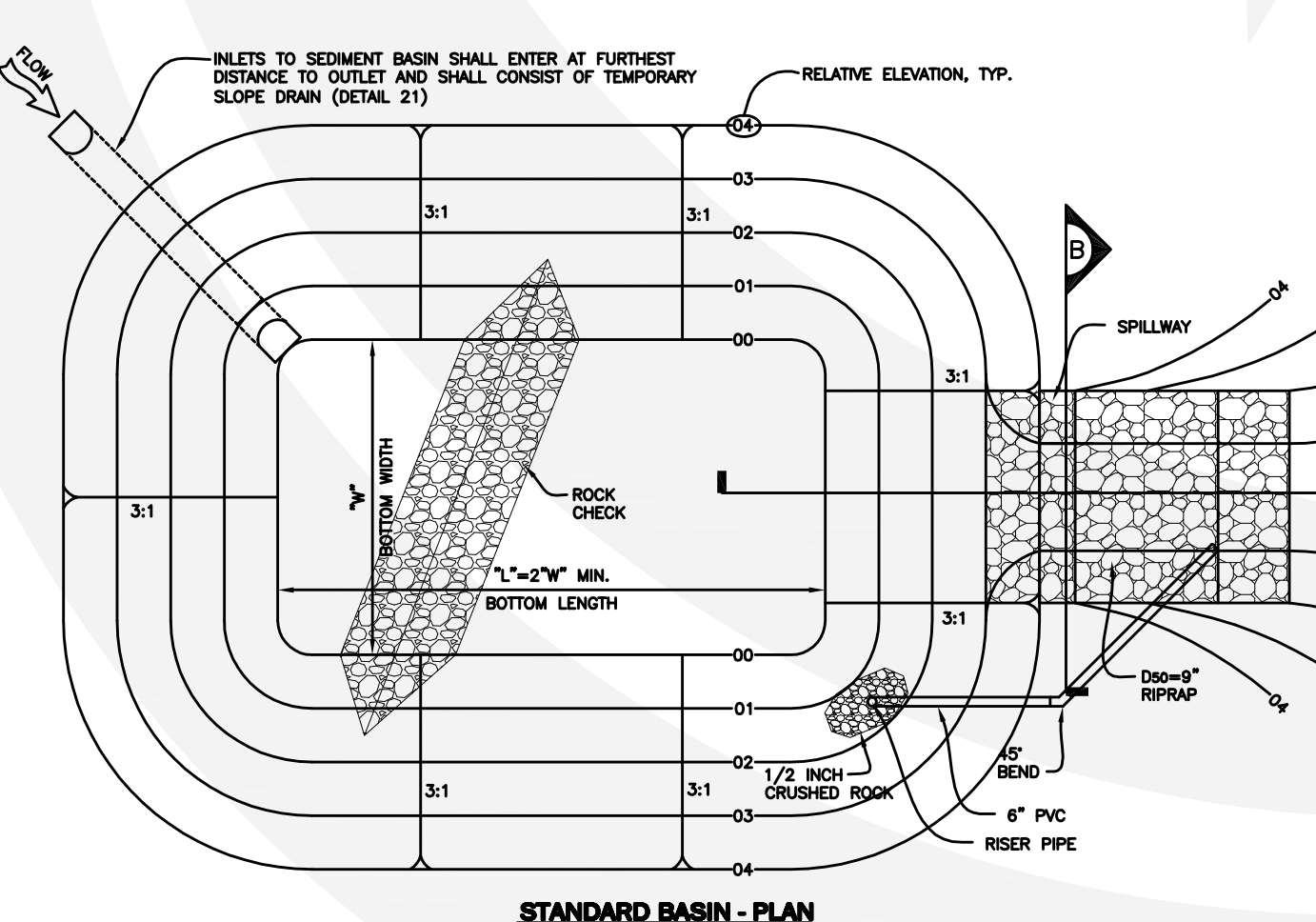
**SECTION A** SCALE: 1/4" = 1'-0"

**SECTION A** SCALE: 1/4" = 1'-0"

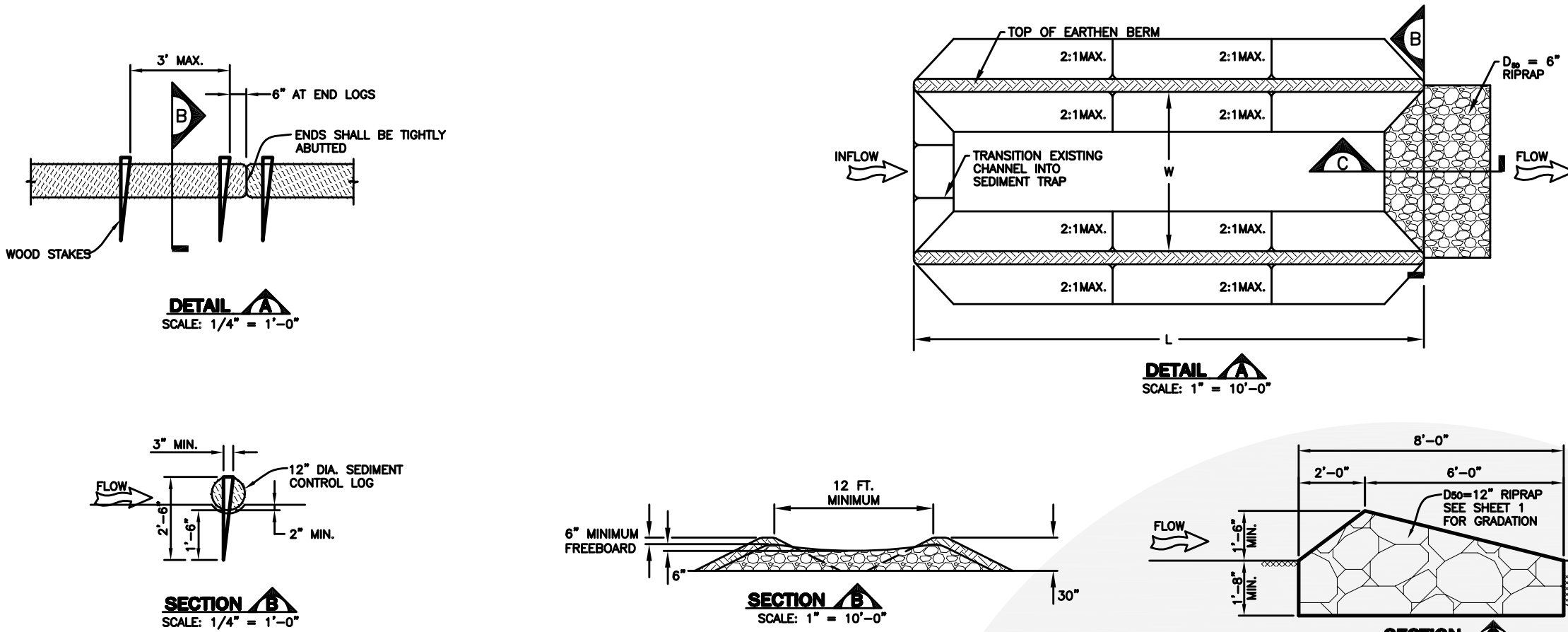
**SECTION A** SCALE: 1/4" = 1'-0"

**SECTION A** SCALE: 1/4" = 1'-0"

**SECTION A** SCALE: 1/4" = 1'-0"







#### SEDIMENT CONTROL LOG INSTALLATION NOTES

- SEE PLAN VIEW FOR:
  - LOCATION AND LENGTH OF SEDIMENT CONTROL LOG.
- SEDIMENT CONTROL LOGS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.
- SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELLOID, OR COCONUT FIBER.
- NOT FOR USE IN CONCENTRATED FLOW AREAS.
- THE SEDIMENT CONTROL LOG SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 2".

#### SEDIMENT CONTROL LOG MAINTENANCE NOTES

- THE GESC MANAGER SHALL INSPECT SEDIMENT CONTROL LOGS DAILY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
- SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOGS SHALL BE REMOVED WHEN THE UPSTREAM SEDIMENT DEPTH IS WITHIN  $\frac{1}{2}$  THE HEIGHT OF THE CREST OF LOG.
- SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION, IF ANY DISTURBED AREA EXISTS AFTER REMOVAL, IT SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE COUNTY.

### SCL SEDIMENT CONTROL LOG 15

#### SEDIMENT TRAP INSTALLATION NOTES

- SEE PLAN VIEW FOR:
  - LOCATION, LENGTH AND WIDTH OF SEDIMENT TRAP.
- SEDIMENT TRAPS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.
- SEDIMENT TRAP BERM SHALL BE CONSTRUCTED FROM MATERIAL FROM EXCAVATION, THE BERM SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D698.
- RRIPAP OUTLET SHALL BE CONSTRUCTED WITH  $D_{50}=12"$  RRIPAP WITH A MINIMUM OVERFLOW OF 6".
- THE TOP OF THE EARTHEN BERM SHALL BE A MINIMUM OF 6" HIGHER THAN THE TOP OF THE RRIPAP OUTLET STRUCTURE.
- THE ENDS OF THE RRIPAP OUTLET STRUCTURE SHALL BE MINIMUM OF 6" HIGHER THAN THE CENTER OF THE OUTLET STRUCTURE.

#### SEDIMENT TRAP MAINTENANCE NOTES

- THE GESC MANAGER SHALL INSPECT SEDIMENT TRAPS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
- SEDIMENT ACCUMULATED UPSTREAM OF RRIPAP SHALL BE REMOVED WHEN THE UPSTREAM SEDIMENT DEPTH IS WITHIN  $\frac{1}{2}$  THE HEIGHT OF THE RRIPAP OUTLET STRUCTURE.
- SEDIMENT TRAPS SHALL REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVERAGE IS APPROVED BY THE COUNTY.
- WHEN SEDIMENT TRAPS ARE REMOVED THE DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE COUNTY.

### ST SEDIMENT TRAP 16

#### SEEDING AND MULCHING INSTALLATION NOTES

- SEE PLAN VIEW FOR:
  - AREA OF SEEDING AND MULCHING.
  - TYPE OF SEED MIX (PERMANENT, TEMPORARY, OR LOW-GROWTH).
- ALL BRANDS FURNISHED SHALL BE FREE FROM SUCH NOXIOUS SEEDS AS RUSSIAN OR CANADIAN THISTLE, COARSE FESCUE, EUROPEAN BROWNED, JOHNSON GRASS, KNAW WEED AND LEAFY SPURGE.
- THE SEEDER SHALL FURNISH TO THE CONTRACTOR A SIGNED STATEMENT CERTIFYING THAT THE SEED FURNISHED IS FROM A LOT THAT HAS BEEN TESTED BY A RECOGNIZED LABORATORY, SEED WHICH HAS BECOME WET, MOLDY, OR OTHERWISE DAMAGED IN TRANSIT OR IN STORAGE WILL NOT BE ACCEPTABLE. SEED TICKETS SHALL BE PROVIDED TO DOUGLAS COUNTY UPON REQUEST.
- DRILL SEEDING MIX SHALL CONFORM TO THE TABLE ON THE RIGHT:
- IF THE SEED AVAILABLE ON THE MARKET DOES NOT MEET THE MINIMUM PURITY AND GERMINATION PERCENTAGES SPECIFIED, THE SUBCONTRACTOR MUST COMPENSATE FOR A LESSER PERCENTAGE OF PURITY OR GERMINATION BY FURNISHING SUFFICIENT ADDITIONAL SEED TO EQUAL THE SPECIFIED PRODUCT. THE TASS FROM THE SEED MIXES MUST BE SUPPLIED TO CONTRACTOR AND FORWARDED TO THE DOUGLAS COUNTY GESC INSPECTOR.
- THE FORMULA USED FOR DETERMINING THE QUANTITY OF PURE LIVE SEED (PLS) SHALL BE (POUNDS OF SEED) X (PURITY) X (GERMINATION) = POUNDS OF PURE LIVE SEED (PLS).
- PERMANENT SEED MIX SHALL BE USED UNLESS OTHERWISE APPROVED BY THE COUNTY.
- ALL AREAS TO BE SEEDED AND MULCHED SHALL HAVE NATIVE TOPSOIL OR APPROVED SOIL AMENDMENTS SPREAD TO A DEPTH OF AT LEAST 6 INCHES (LOOSE DEPTH), HAIL ROADS AND OTHER COMPACTED AREAS SHALL BE LOOSENED TO A DEPTH OF 6 INCHES PRIOR TO SPREADING TOPSOIL.
- SOIL IS TO BE THOROUGHLY LOOSENED (TILLED) TO A DEPTH OF AT LEAST 6 INCHES PRIOR TO SEEDING. THE TOP 6 INCHES OF THE SEED BED SHALL BE FREE OF ROCKS GREATER THAN 4 INCHES AND SOIL CLOSURE GREATER THAN 3 INCHES. SEEDING OVER ANY COMPACTED AREAS THAT HAVEN'T BEEN THOROUGHLY LOOSENED SHALL BE REJECTED.
- SEED IS TO BE APPLIED USING A MECHANICAL DRILL TO A DEPTH OF 1/4 INCH. ROW SPACING SHALL BE NO MORE THAN 6 INCHES. MATERIAL USED FOR MULCH SHALL CONSIST OF LONG-STEAMED STRAW, AT LEAST 50 PERCENT OF THE MULCH, BY WEIGHT, SHALL BE 10 INCHES OR MORE IN LENGTH. MULCH SHALL BE APPLIED AND MECHANICALLY ANCHORED TO A DEPTH OF AT LEAST 2 INCHES. MULCH SHALL BE APPLIED AT A RATE OF 4000 LB. OF STRAW PER ACRE.
- IF THE PERMITTEE DEMONSTRATES TO THE COUNTY THAT IT IS NOT POSSIBLE TO DRILL SEED, SEED IS TO BE UNIFORM BROADCAST AT TWO TIMES THE DRILLED RATE, THEN LOOSELY HARROWED TO PROVIDE A SEED DEPTH OF APPROXIMATELY 1/4 INCH, THEN ROLLED TO COMPACT, THEN MULCHED AS SPECIFIED ABOVE.
- MULCH SHALL BE APPLIED WITHIN 24-HOURS OF SEEDING.
- TACKIFIER SHOULD BE UTILIZED TO HELP WITH STRAW DISPLACEMENT.

#### SEEDING AND MULCHING MAINTENANCE NOTES

- SEEDED AND MULCHED AREAS SHALL BE INSPECTED FOR REQUIRED COVERAGE MONTHLY FOR A PERIOD OF TWO YEARS FOLLOWING INITIAL SEEDING. REPAIRS AND RE-SEEDING AND MULCHING SHALL BE UNDERTAKEN AFTER THE FIRST GROWING SEASON FOR ANY AREAS FAILING TO MEET THE REQUIRED COVERAGE.
- REQUIRED COVERAGE FOR STANDARD, OPEN SPACE AND LOW GROWTH SEED MIXES SHALL BE DEFINED AS FOLLOWS:
  - THREE (3) PLANTS PER SQUARE FOOT WITH A MINIMUM HEIGHT OF 3 INCHES. THE 3 PLANTS PER SQUARE FOOT SHALL BE OF THE VARIETY AND SPECIES FOUND IN THE DOUGLAS COUNTY-APPROVED MIX.
  - NO BARE AREAS LARGER THAN 4 SQUARE FEET (TWO-FOOT BY TWO-FOOT OR EQUIVALENT).
  - FREE OF CROOKED AREAS.
  - FREE FROM INFESTATION OF NOXIOUS WEEDS IN ACCORDANCE WITH SECTION 6.4 OF THE GESC CRITERIA MANUAL.
- REQUIRED COVERAGE FOR TURF GRASS AREAS SHALL BE DEFINED AS FOLLOWS:
  - AT LEAST 80% VEGETATIVE COVER OF GRASS SPECIES PLANTED.
  - NO BARE AREAS LARGER THAN 4 SQUARE FEET (TWO-FOOT BY TWO-FOOT OR EQUIVALENT).
  - FREE OF CROOKED AREAS.
  - FREE FROM INFESTATION OF NOXIOUS WEEDS IN ACCORDANCE WITH SECTION 6.4 OF THE GESC CRITERIA MANUAL.
- RILL AND GULLY EROSION SHALL BE FILLED WITH TOPSOIL PRIOR TO RESEEDING. THE RESEEDING METHOD SHALL BE APPROVED BY THE COUNTY.

### SM SEEDING AND MULCHING 17

#### DOUGLAS COUNTY PERMANENT DRILL SEEDING MIX

SPECIES	VARIETY	NOTES	% IN MIX	POUNDS OF PLS PER ACRE
BIG BLUESTEM	KAW	PWNS	10	1.1
YELLOW INDIANGRASS	CHEYENNE	PWNS	10	1
SWITCHGRASS	BLACKWELL	PWNS	10	0.4
SIDEOTS GRAMA	VAUGHN	PWNB	10	0.9
WESTERN WHEATGRASS	ARRIBA	PNCB	10	1.6
BLUE GRAMA	HACHITA	PWNB	10	0.3
THICKSPRUE WHEATGRASS	CRITANA	PNCB	10	1
PRAIRIE SANDREED	DOOSHEN	PWNS	10	0.7
GREEN NEEDLEGRASS	LODORM	PNCB	10	1
SLENDER WHEATGRASS	PRYOR	PNCB	5	0.6
STREAMBANK WHEATGRASS	SODAR	PNCB	5	0.6
			TOTAL	9.2

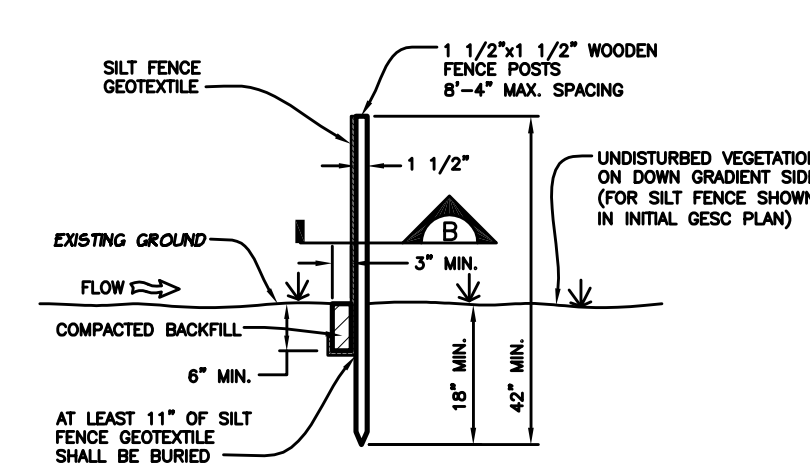
#### DOUGLAS COUNTY TEMPORARY DRILL SEEDING MIX

SPECIES	VARIETY	NOTES	% IN MIX	POUNDS OF PLS PER ACRE
SMOOTH BROMEGRASS	LINCOLN	PICS	30	3.9
INTERMEDIATE WHEATGRASS	OHNE	PICS	30	4.5
PUBESCENT WHEATGRASS	LUNA	PICS	30	4.2
ANNUAL RYEGRASS	N/A	ACB	10	0.8
			TOTAL	13.4

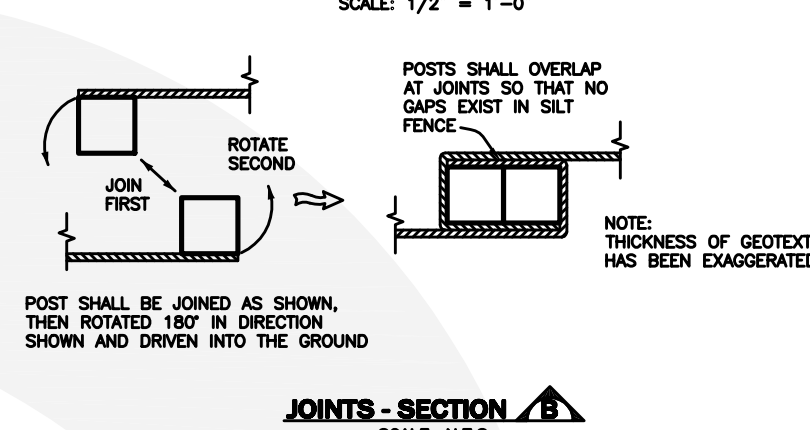
#### DOUGLAS COUNTY LOW-GROWTH DRILL SEEDING MIX

SPECIES	VARIETY	NOTES	% IN MIX	POUNDS OF PLS PER ACRE
BUFFALOGRASS	TEXOKA	PWNS	20	3.2
BLUE GRAMA	HACHITA	PWNB	20	0.6
WESTERN WHEATGRASS	ARRIBA	PNCB	20	3.2
SIDEOTS GRAMA	VAUGHN	PWNB	20	1.8
THICKSPRUE WHEATGRASS	CRITANA	PNCB	10	1
STREAMBANK WHEATGRASS	SODAR	PNCB	10	1.2
			TOTAL	11.0

NOTES:  
P=PERENNIAL  
A=ANNUAL  
N=NATIVE  
I=INTRODUCED  
W=WARM SEASON  
C=COLD SEASON  
S=SOO FORTHER  
B=BUNCHGRASS



#### DETAIL SCALE: 1/2" = 1'-0"



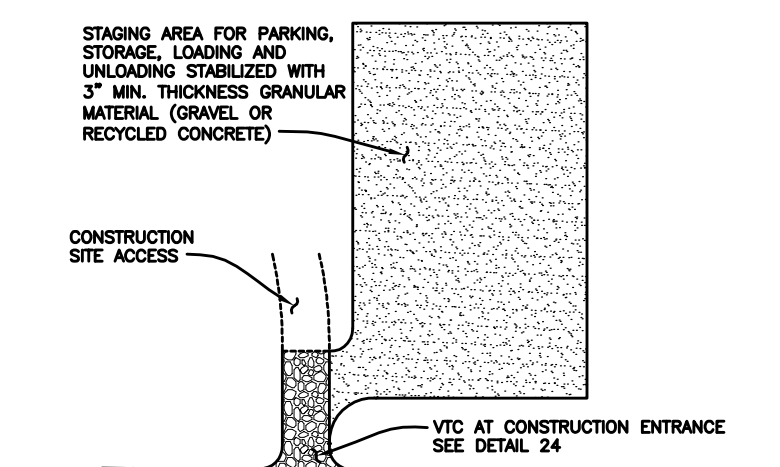
#### DETAIL SCALE: 1/2" = 1'-0"

- SEE PLAN VIEW FOR:
  - LOCATION AND LENGTH OF FENCE.
- ANCHOR TRENCH SHALL BE EXCAVATED WITH TRENCHER, OR WITH SILT FENCE INSTALLATION MACHINE, NO ROAD GRADERS, BACKHOES, ETC. SHALL BE USED. TRENCH SHALL BE COMPACTED BY HAND, WITH "JUMPING JACK" OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.
- SILT FENCE GEOTEXTILE SHALL MEET THE FOLLOWING REQUIREMENTS:
  - 6-TO 12-GALLONS PER MINUTE PER SQUARE FOOT FLOW CAPACITY.
  - 50 LB. TENSILE STRENGTH PER ASTM D4632.
  - UV DESIGN AT 500 HRS MIN. 70% STRENGTH RETAINED PER ASTM D 4355.
- SILT FENCE INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.

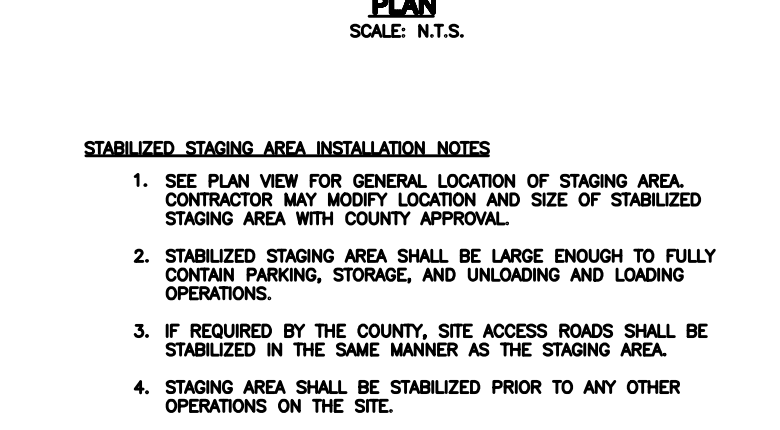
#### SILT FENCE MAINTENANCE NOTES

- THE GESC MANAGER SHALL INSPECT SILT FENCE DAILY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
- SEDIMENT ACCUMULATED UPSTREAM OF SILT FENCE SHALL BE REMOVED WHEN THE UPSTREAM SEDIMENT REACHES A DEPTH OF 6-INCHES.
- SILT FENCE SHALL BE REMOVED WHEN THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY THE COUNTY. IF ANY DISTURBED AREA EXISTS AFTER REMOVAL, IT SHALL BE SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE COUNTY.

### SF SILT FENCE 18



#### DETAIL SCALE: 1/2" = 1'-0"



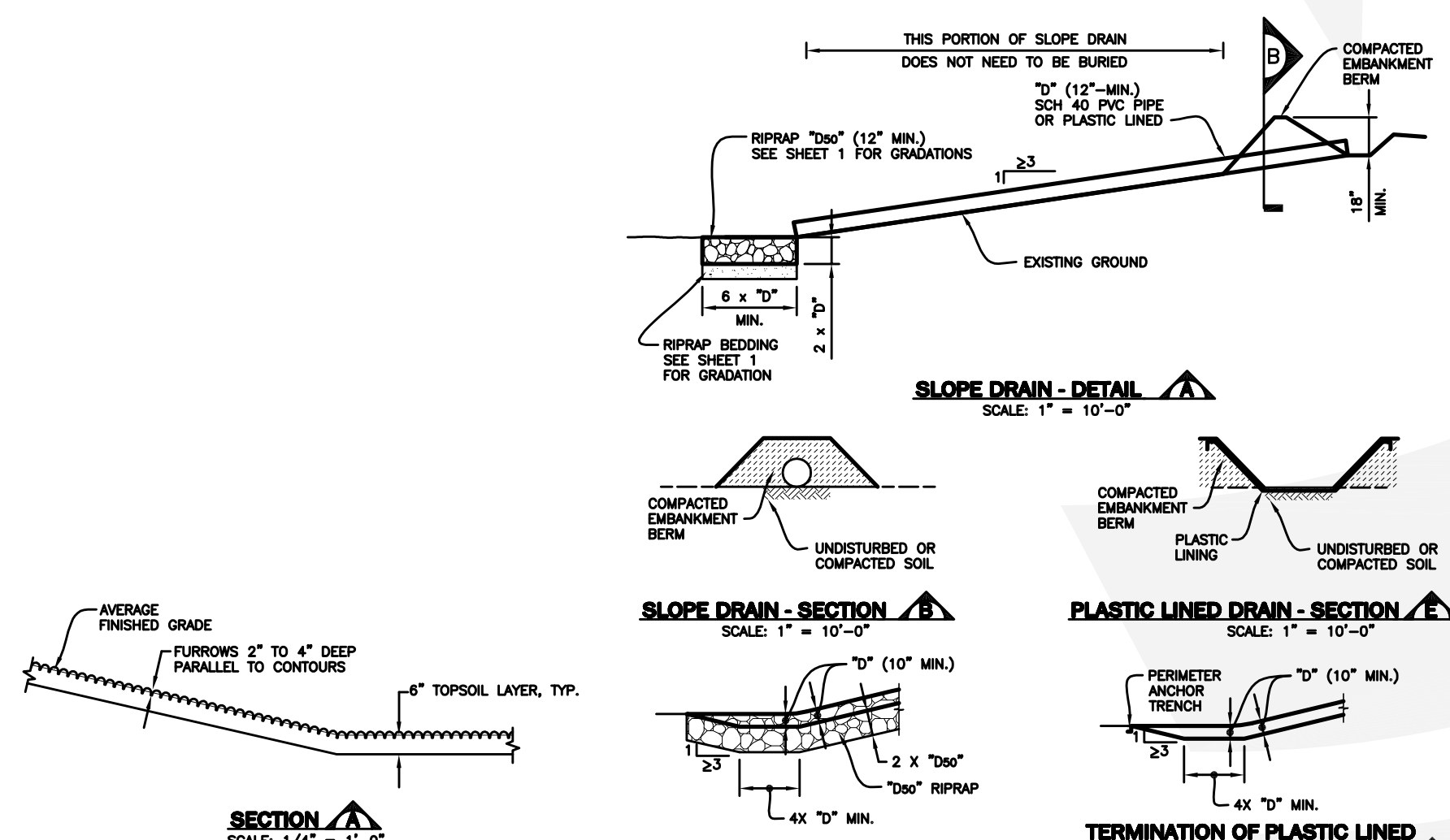
#### DETAIL SCALE: 1/2" = 1'-0"

- SEE PLAN VIEW FOR GENERAL LOCATION OF STAGING AREA. CONTRACTOR MAY MOVE LOCATION AND SIZE OF STABILIZED STAGING AREA WITH COUNTY APPROVAL.
- STABILIZED STAGING AREA SHALL BE LARGE ENOUGH TO FULLY CONTAIN PARKING, STORAGE, AND UNLOADING AND LOADING OPERATIONS.
- IF REQUIRED BY THE COUNTY, SITE ACCESS ROADS SHALL BE STABILIZED IN THE SAME MANNER AS THE STAGING AREA.
- STAGING AREA SHALL BE STABILIZED PRIOR TO ANY OTHER OPERATIONS ON THE SITE.
- THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM OF 3" OF GRANULAR MATERIAL (GRAVEL OR RECYCLED CONCRETE).

#### STABILIZED STAGING AREA MAINTENANCE NOTES

- THE GESC MANAGER SHALL INSPECT THE STABILIZED STAGING AREA WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
- GESC MANAGER SHALL PROVIDE ADDITIONAL THICKNESS OF GRANULAR MATERIAL, IF ANY RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.
- STABILIZED STAGING AREA SHALL BE MAINTAINED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING AND LOADING OPERATIONS.
- ANY ACCUMULATED DIRT OR MUD SHALL BE REMOVED FROM THE SURFACE OF THE STAGING AREA.
- THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY THE COUNTY, USED ON SITE, AND THE AREA TOPSOILED, DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED.

### SSA STABILIZED STAGING AREA 19



#### SECTION SCALE: 1/4" = 1'-0"

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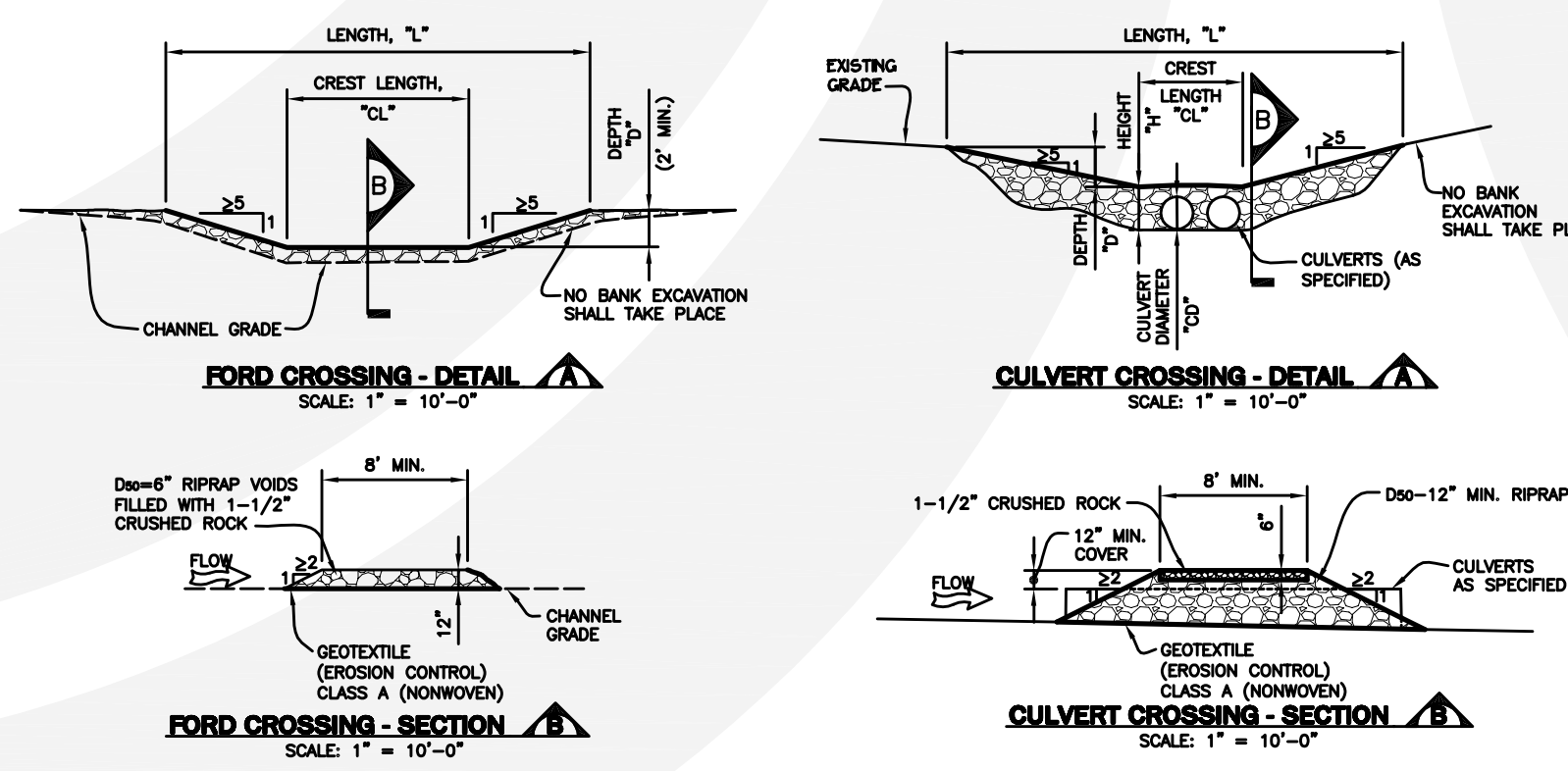
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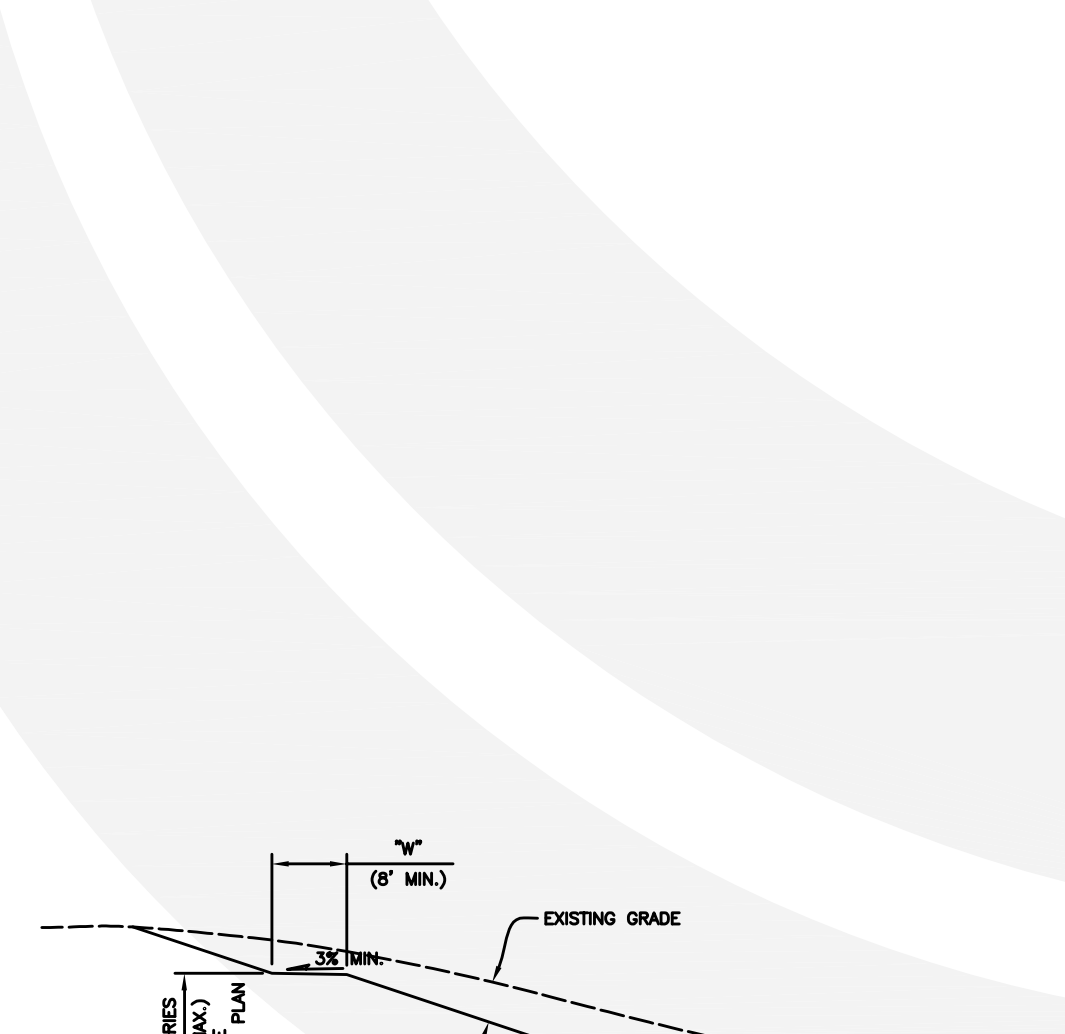
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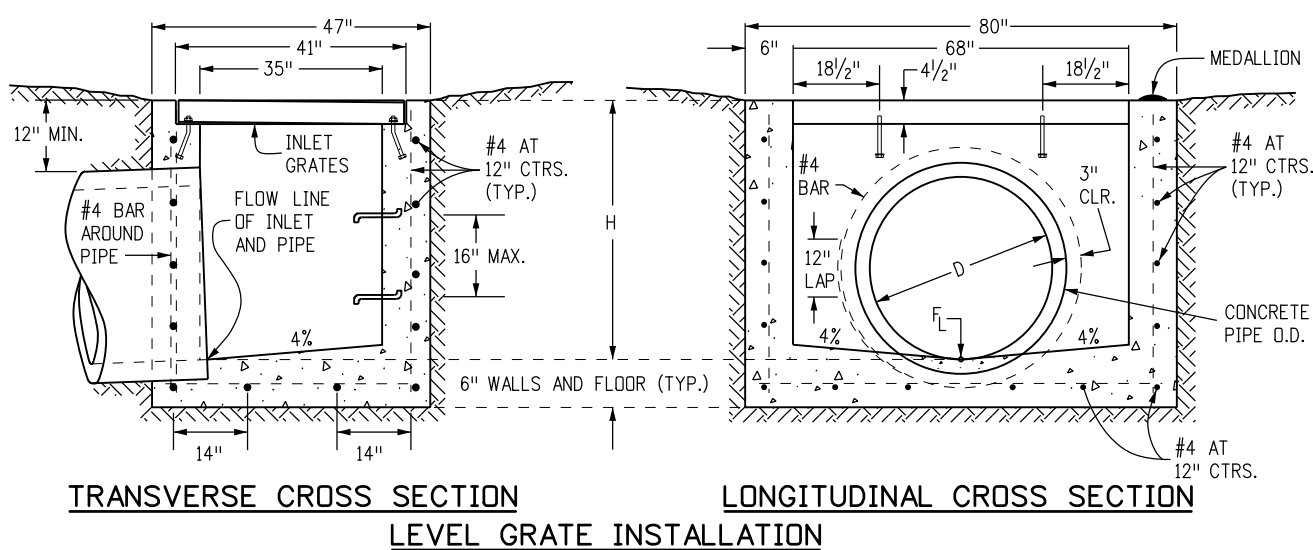
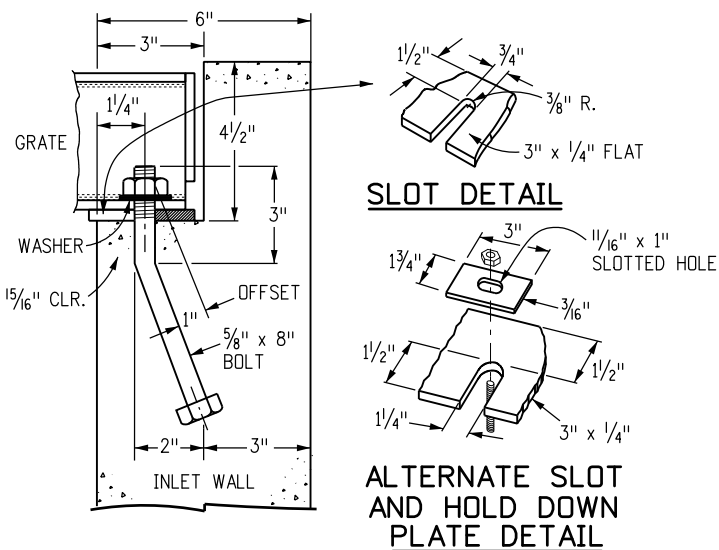
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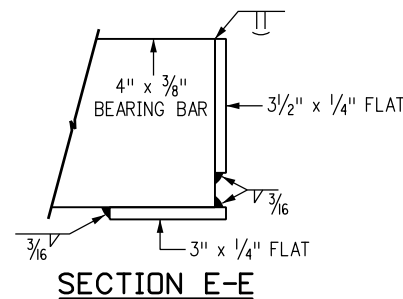
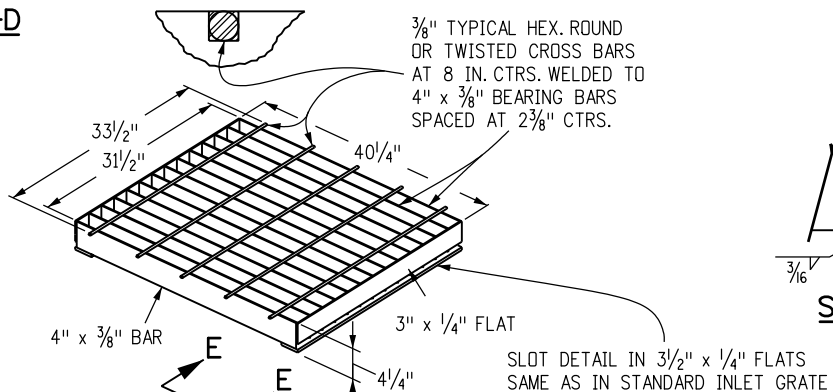
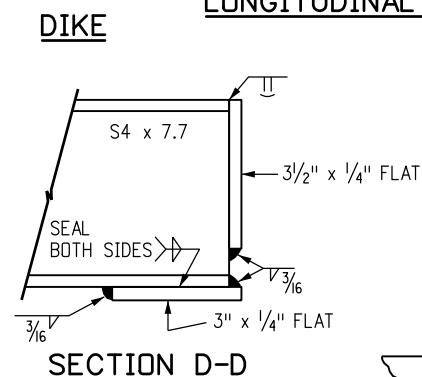
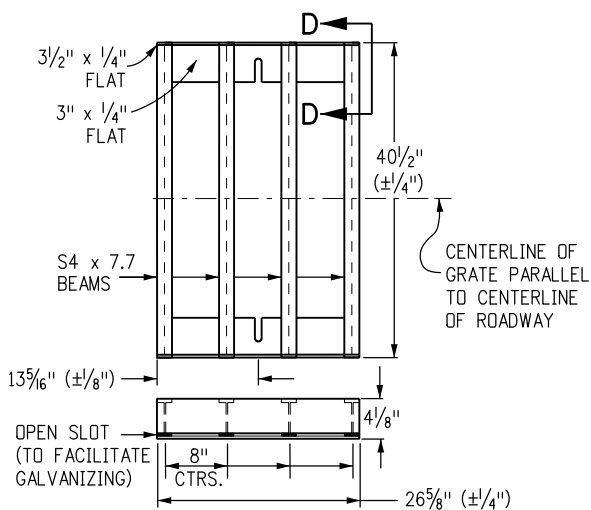
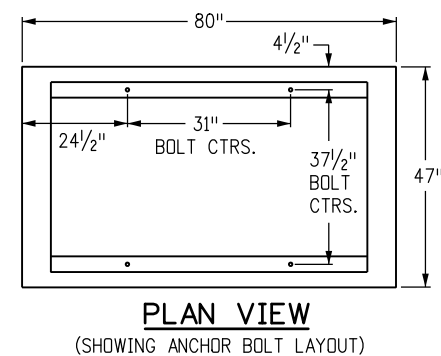
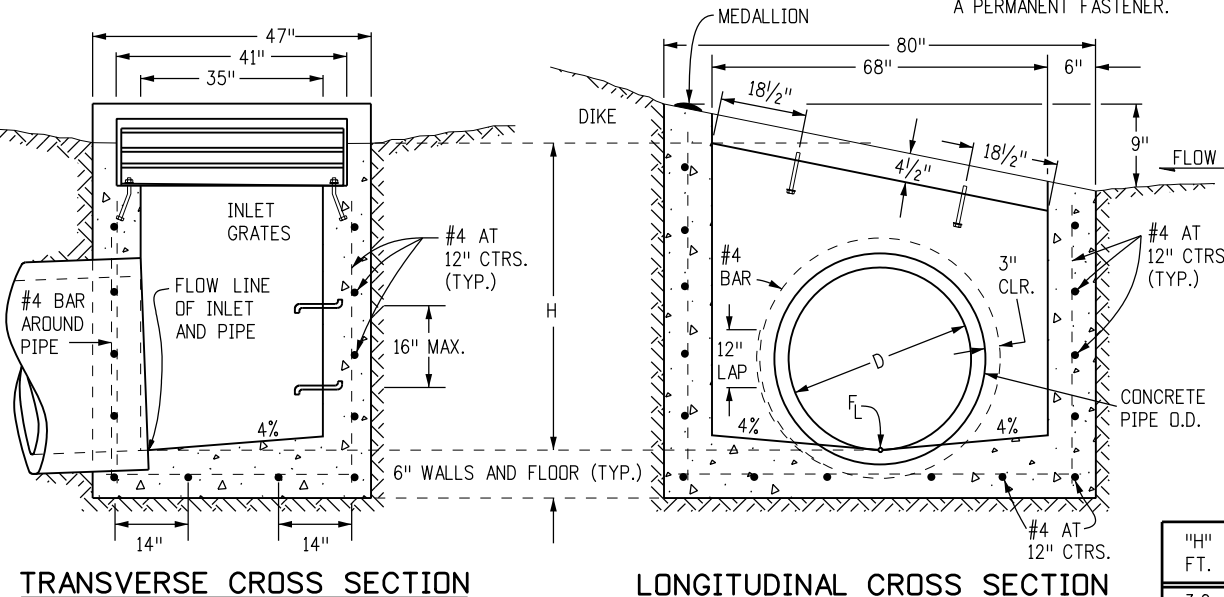
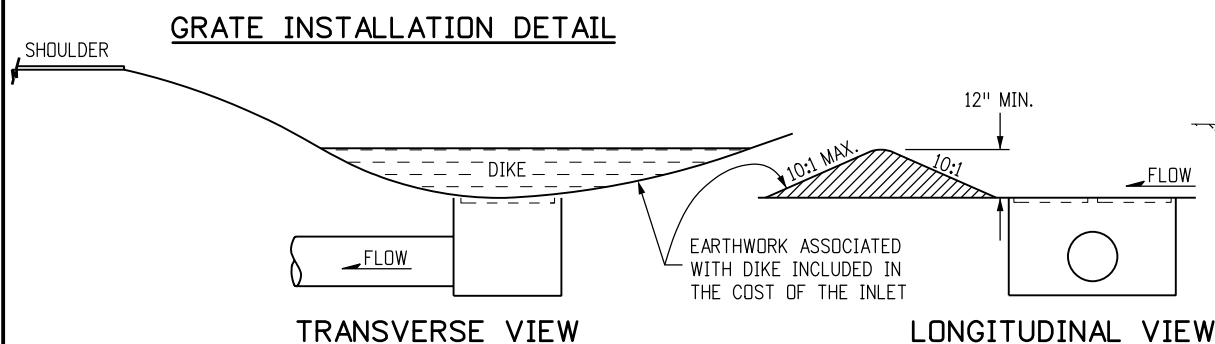
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- GENERAL NOTES**
1. INLET TYPE D IS NOT HS-20 RATED AND SHALL NOT BE PLACED IN PAVED ROADWAYS. THIS INLET SHALL BE USED ONLY OUTSIDE PAVED ROADWAYS.
  2. CONCRETE SHALL BE CLASS B. INLET MAY BE CAST-IN-PLACE OR PRECAST.
  3. SEE PLANS FOR SIZE AND LOCATION OF PIPE.
  4. STRUCTURAL STEEL FOR GRATES AND GRATE INSTALLATION HARDWARE SHALL BE GALVANIZED AND SHALL BE IN ACCORDANCE WITH SUBSECTION 712.06.
  5. STANDARD INLET GRATES SHALL BE USED ON ALL TYPE D INLETS UNLESS CLOSE MESH GRATES ARE SPECIFIED ON THE PLANS.
  6. CLOSE MESH GRATES ARE RECOMMENDED WHERE FOOT TRAFFIC OR BICYCLE ROUTES ARE IN CLOSE PROXIMITY TO GRATE. THIS GRATE IS NOT ADA COMPLIANT OR BICYCLE FRIENDLY AND SHALL NOT BE PLACED DIRECTLY IN SIDEWALKS, CROSSWALKS OR BIKE PATHS.
  7. STEPS SHALL BE PROVIDED WHEN INLET DIMENSION "H" IS EQUAL TO OR GREATER THAN 3 FT.-6 IN. AND SHALL CONFORM WITH AASHTO M 199.
  8. REINFORCING BARS SHALL BE EPOXY COATED AND DEFORMED #4, AND SHALL HAVE A 2 IN. MINIMUM CLEARANCE. CUT OR BEND BARS AROUND PIPE AS REQUIRED.
  9. ALL INLETS SHALL HAVE A 4 IN. DIA. METAL MEDALLION WITH A "NO DUMPING DRAINS TO STREAM" MESSAGE ON IT. THE MEDALLION SHALL HAVE A FISH SYMBOL WITH A BLUE BACKGROUND. IT SHALL BE FIRMLY ATTACHED TO THE INLET'S SURFACE WITH A PERMANENT FASTENER.



OUTLET PIPE INSIDE DIA. FT. - "D"	MIN. "H" FT.
1.5	3.0
2.0	3.5
2.5	4.0
3.0	4.5
3.5	5.0

"H" FT.	CONCRETE CU. YDS.	STEEL LBS.	CIRCULAR PIPE RANGE INSIDE DIA. IN. - "D"
3.0	1.5	127	18
3.5	1.7	149	18-24
4.0	1.9	157	18-30
4.5	2.0	179	18-36
5.0	2.2	187	18-42
5.5	2.4	208	18-42
6.0	2.6	215	18-42
6.5	2.8	236	18-42
7.0	2.9	243	18-42
7.5	3.1	264	18-42
8.0	3.3	271	18-42
8.5	3.5	292	18-42
9.0	3.6	299	18-42
9.5	3.8	320	18-42
10.0	4.0	327	18-42

CONCRETE AND STEEL QUANTITIES ARE FOR ONE ENTIRE INLET BEFORE DEDUCTION FOR VOLUME OCCUPIED BY PIPE. WEIGHT OF STEEL INCLUDES A RING FOR THE MAXIMUM PIPE DIAMETER.

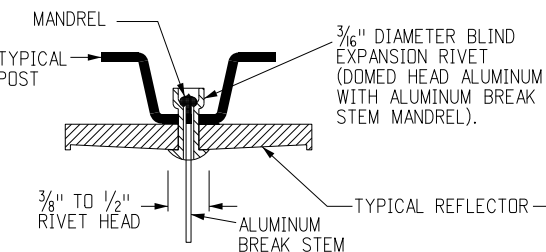
#### QUANTITIES FOR ONE INLET

<b>Computer File Information</b>		<b>Sheet Revisions</b>		<b>Colorado Department of Transportation</b>  4201 East Arkansas Avenue Denver, Colorado 80222 Phone: (303) 757-9083 Fax: (303) 757-9820 <b>Project Development Branch</b> <b>DD/LTA</b>	<b>INLET, TYPE D</b>  Issued By: Project Development Branch July 4, 2012	<b>STANDARD PLAN NO.</b>	
Creation Date: 07/04/12	Initials: DD	Date:	Comments			M-604-11	
Last Modification Date: 07/04/12	Initials: LTA					Sheet No. 1 of 1	
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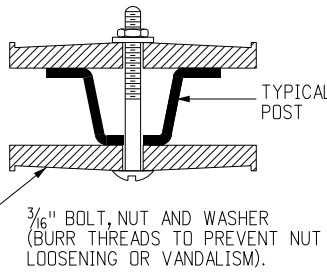


SPACING FOR DELINEATOR POSTS ON HORIZONTAL CURVES					
'R' RADIUS (FEET)	'D' DEGREE OF CURVE	* - ● SPACING ON CURVE (FEET)	* SPACING IN ADVANCE OF AND BEYOND CURVE (FEET)		
			FIRST SPACE	SECOND SPACE	THIRD SPACE
20000	0° 17'	300	300	300	300
17000	0° 20'	300	300	300	300
14000	0° 25'	300	300	300	300
12000	0° 29'	300	300	300	300
10000	0° 34'	299	300	300	300
8000	0° 43'	267	300	300	300
6000	0° 57'	231	300	300	300
5000	1° 09'	211	300	300	300
4000	1° 26'	189	300	300	300
3500	1° 38'	176	300	300	300
3000	1° 55'	163	300	300	300
2500	2° 18'	148	297	300	300
2000	2° 52'	132	265	300	300
1800	3° 11'	125	251	300	300
1600	3° 35'	118	236	300	300
1400	4° 06'	110	220	300	300
1200	4° 47'	102	203	300	300
1000	5° 44'	92	185	277	300
900	6° 22'	87	175	262	300
800	7° 10'	82	164	246	300
700	8° 11'	76	153	229	300
600	9° 33'	70	141	211	300
500	11° 28'	64	127	191	300
450	12° 44'	60	120	180	300
400	14° 20'	56	112	168	300
350	16° 22'	52	104	156	300
300	19° 06'	47	95	142	285
250	22° 55'	42	85	127	255
200	28° 39'	37	73	110	220
150	38° 12'	30	60	90	180
100	57° 18'	21	42	64	127
75	76° 24'	20	30	45	90
* ON CONVENTIONAL ROADWAYS OMIT THE "THIRD SPACE" AND DOUBLE THE SPACING "ON THE CURVE" AND "IN ADVANCE OF AND BEYOND THE CURVE" (300' MAX.)					
● SPACING FOR CURVES NOT SHOWN MAY BE COMPUTED FROM THE FORMULA: $S = 3\sqrt{R-50}$					
SPACING IN ADVANCE OF AND BEYOND THE CURVE IS: FIRST SPACE = 2S, SECOND SPACE = 3S AND THIRD SPACE = 6S. SPACES SHOULD NOT BE LESS THAN 20 FT. OR GREATER THAN 300 FT. RESIDUAL SPACE AFTER "ON CURVE" SPACING IS APPLIED, SHALL BE DIVIDED EQUALLY AMONG ALL OF THE "ON CURVE" SPACES SO THAT THE LAST DELINEATOR FALLS AT THE P.T. OR C.S. OF THE CURVE.					

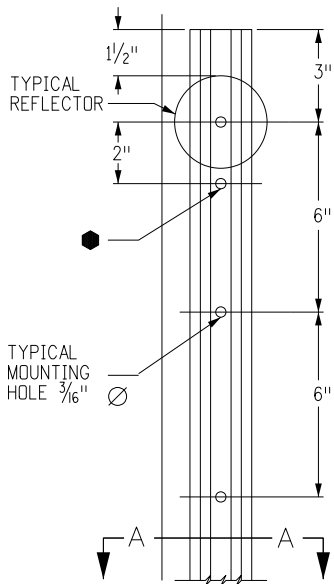
TYPICAL INSTALLATION SINGLE DIRECTION



TYPICAL INSTALLATION BACK - TO - BACK



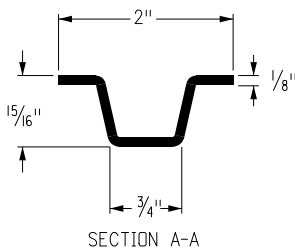
TYPICAL DELINEATOR FABRICATION DETAILS



TYPICAL 1,12# DELINEATOR POST

GENERAL NOTES

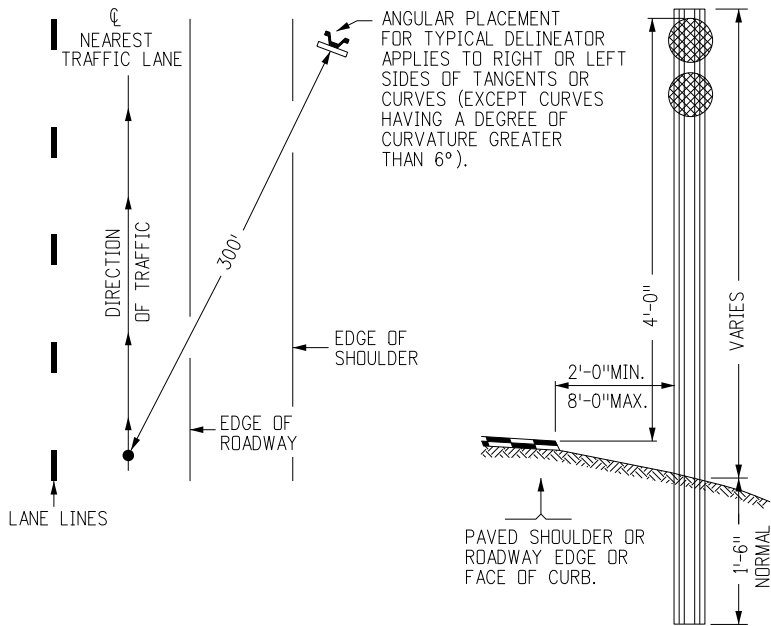
- SEE THE TABULATION OF QUANTITIES INCLUDED IN THE PLANS FOR THE NUMBERS AND LOCATIONS OF DELINEATORS REQUIRED.
- THE COLOR OF DELINEATORS SHALL, IN ALL CASES, CONFORM TO THE COLOR OF EDGE LINES, EXCEPT:  
A. RED, GREEN AND BLUE DELINEATORS  
B. TYPE III DELINEATORS (3 YELLOW).
- THE COLOR OF DELINEATOR POSTS AND ALL SPECIAL MOUNTING BRACKETS SHALL BE INTERSTATE GREEN.
- DELINEATORS ARE MANDATORY ON ALL ROADWAYS ON THE STATE HIGHWAY SYSTEM. THEY ARE OPTIONAL WHERE FIXED SOURCE LIGHTING IS IN OPERATION; HOWEVER, ALL CONCRETE BARRIER AND TYPE 3 GUARDRAIL SHALL HAVE REFLECTORS OR SUPPLEMENTAL TABS.
- TYPE I (YELLOW) DELINEATORS ARE MANDATORY ON THE LEFT SIDE OF EXPRESSWAY ROADWAYS (MEDIAN).
- RED DELINEATORS MAY BE INSTALLED ON THE REVERSE SIDE OF ANY DELINEATOR AND/OR A SEPARATE POST ON ONE-WAY ROADWAYS OR RAMPS WHERE INVESTIGATION SHOWS A NEED FOR WRONG-WAY MOVEMENT PROTECTION.
- TYPE III (3-YELLOW) DELINEATORS ARE TO BE INSTALLED TO WARN OF THE EXISTENCE OF OBJECTS NOT ACTUALLY IN THE ROADWAY BUT THAT MAY BE SO CLOSE TO THE EDGE OF THE ROADWAY THAT THEY NEED A MARKER. THESE INCLUDE UNDERPASS PIERS, BRIDGE ABUTMENTS, HANDRAILS, AND CULVERTS HEADS. THE INSIDE EDGE OF THE MARKER SHALL BE IN LINE WITH THE INNER EDGE OF THE OBSTRUCTION.
- INTERCHANGE RAMPS SHALL BE DELINEATED ON THE RIGHT SIDE, THE LEFT SIDE, OR BOTH SIDES WITH TYPE I DELINEATORS OF THE APPROPRIATE COLOR (CRYSTAL OR YELLOW) AS ILLUSTRATED ON SHEET NUMBER 3.
- FRONTAGE ROAD DELINEATORS ARE NOT TO BE INSTALLED WHERE THEY MIGHT BE MISLEADING TO MAINLINE TRAFFIC.
- SPACING OF DELINEATORS FOR TUNNELS AND SNOW SHEDS SHALL BE AS SHOWN ON THE PLANS.
- WHERE PRACTICABLE THE APPROACH ENDS OF ISLANDS AND MEDIANS SHOULD BE DELINEATED.
- NORMAL SPACING WILL BE 528 FEET FOR TANGENT SECTIONS AND A 200 FOOT MINIMUM WILL APPLY TO A "LAST SPACE". (MAXIMUM SPACING IS ALSO 528 FEET.) AT ALL OTHER LOCATIONS, SUCH AS A & D LANES, RAMPS, WIDTH TRANSITIONS AND TURN LANES A "LAST SPACE" SHOULD NOT BE LESS THAN 50% OF THE SPACING SHOWN FOR THAT LOCATION.
- TYPE II DELINEATORS SHALL BE INSTALLED AT 100 FOOT SPACING ON ALL ACCELERATION LANES AND TAPERS, DECELERATION LANES AND TAPERS, AND LANE TRANSITIONS INVOLVING PAVEMENT WIDTH REDUCTIONS IN THE DIRECTION OF TRAFFIC. TYPE II DELINEATORS ARE NOT REQUIRED FOR REDIRECT TAPERS, FOR TRAFFIC MOVING IN THE DIRECTION OF WIDER PAVEMENT OR ON THE SIDE OF THE ROADWAY WHERE THE ALIGNMENT IS NOT AFFECTED BY THE LANE REDUCTION. TYPE II (YELLOW) DELINEATORS SHALL ONLY BE USED WHEN A RAISED OR DEPRESSED MEDIAN IS PRESENT. FOR WIDTH TRANSITIONS WHERE TRAFFIC MOVES IN THE DIRECTION OF WIDER PAVEMENT, THE NORMAL SPACING SHALL BE ADJUSTED SO THERE IS A DELINEATOR AT EACH OF THE ANGLE POINTS OF THE WIDTH TRANSITION.
- TYPE I DELINEATORS SHALL BE INSTALLED AT 100 FOOT SPACING ON INTERCHANGE RAMP TANGENT SECTION AND BY THE SPACING TABLE ON RAMP CURVES. SPACING "IN ADVANCE OF AND BEYOND CURVE" DOES NOT APPLY TO RAMP CURVES.
- FOR SPACING ON A CURVE THAT FOLLOWS A TANGENT SECTION WITH SPACES SHORTER THAN THOSE SHOWN IN THE CURVE SPACING TABLE: MODIFY THE TABLE SO THAT THE CURVE SPACING IS NO GREATER THAN THE TANGENT SPACING,
- WHERE GUARDRAIL INTRUDES INTO THE SPACE BETWEEN THE PAVEMENT EDGE AND THE LINE OF DELINEATORS, PLACE THE DELINEATORS IMMEDIATELY ABOVE OR BEHIND THE RAIL FACE, AND DELINEATOR SPACING SHALL BE THE SAME BEHIND THE RAIL FACE.
- WHEN NORMAL SPACING FALLS ON AN INTERSECTING ROADWAY, DRIVEWAY, ETC. THE DELINEATOR MAY BE MOVED EITHER DIRECTION A DISTANCE NOT EXCEEDING ONE-QUARTER OF THE NORMAL SPACING.
- THE ANGULAR PLACEMENT FOR ALL DELINEATORS SHOULD BE BY THE "TRAFFIC ORIENTING" METHOD: AIM THE FACE OF THE DELINEATOR AT THE CENTERLINE OF THE NEAREST LANE OF APPROACHING TRAFFIC AT A POINT 300 FEET AWAY (OR AS DIRECTED BY THE ENGINEER FOR SPECIAL OR LOCATIONS AND CURVES HAVING A DEGREE OF CURVATURE GREATER THAN 6 DEGREES).



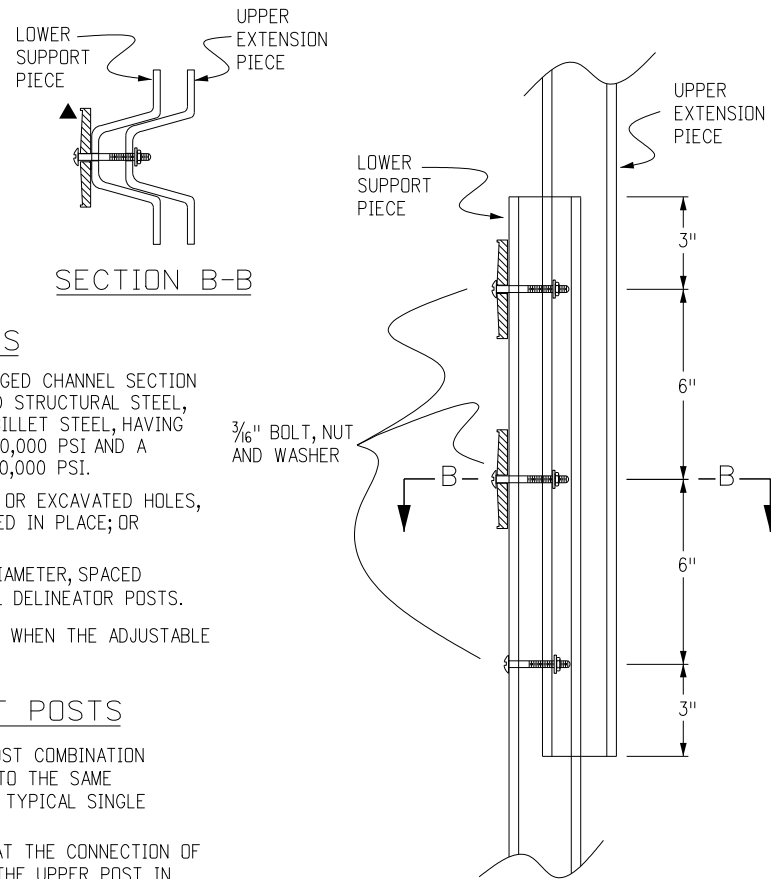
ALLOWABLE TOLERANCE DIMENSION:

- |                |         |
|----------------|---------|
| 1" AND UP      | ± 1/8"  |
| 1/2" TO 1"     | ± 1/16" |
| 1/2" AND BELOW | ± 1/32" |

WEIGHT:  
MINUS 3 1/2% OF THE WEIGHT  
OF ANY ONE POST.



TYPICAL DELINEATOR PLACEMENT



TYPICAL DOUBLE HEIGHT INSTALLATION

POST NOTES

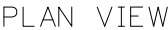
- POSTS SHALL BE A UNIFORM FLANGED CHANNEL SECTION (U-SHAPE) MADE FROM HOT ROLLED STRUCTURAL STEEL, RE-ROLLED RAIL STEEL, OR NEW BILLET STEEL, HAVING A MINIMUM YIELD STRENGTH OF 30,000 PSI AND A MINIMUM TENSILE STRENGTH OF 50,000 PSI.
- POSTS SHALL BE SET IN DRILLED OR EXCAVATED HOLES, PLACED PLUMB AND FIRMLY TAMPED IN PLACE; OR MAY BE DRIVEN PLUMB.
- A MINIMUM OF 3 HOLES OF 3/16" DIAMETER, SPACED AS SHOWN, ARE REQUIRED FOR ALL DELINEATOR POSTS.
- AN ADDITIONAL HOLE IS REQUIRED WHEN THE ADJUSTABLE REFLECTOR BRACKET IS USED.

DOUBLE HEIGHT POSTS

- THE LOWER SECTION OF THE 2-POST COMBINATION SHALL BE INSTALLED ACCORDING TO THE SAME PLACEMENT SPECIFICATIONS AS A TYPICAL SINGLE POST INSTALLATION.
- REFLECTORS SHALL BE MOUNTED AT THE CONNECTION OF THE POSTS AND AT THE TOP OF THE UPPER POST IN ACCORDANCE WITH THE APPROPRIATE CONFIGURATION FOR THE APPLICATION.
- THE LENGTH OF THE UPPER EXTENSION PIECE SHALL NOT EXCEED 7 FEET.

Computer File Information		<div><div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div></div></div>	Sheet Revisions		<div><div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div></div></div> <div>Colorado Department of Transportation 4201 East Arkansas Avenue Denver, Colorado 80222 Phone: (303) 757-9543 Fax: (303) 757-9458 Safety &amp; Traffic Engineering Branch KCM/KEN</div>	DELINEATOR INSTALLATIONS		STANDARD PLAN NO.
Creation Date: 07/04/12	Initials: KEN		Date:	Comments		S-612-1		
Last Modification Date:	Initials:							
Full Path: <a href="http://www.coloradodot.info/library/traffic/traffic-s-standard-plans">www.coloradodot.info/library/traffic/traffic-s-standard-plans</a>								
Drawing File Name: S-612-01_1of7.dgn								
CAD Ver.: MicroStation V8	Scale: Not to Scale		Units: English					
				Issued By: Safety & Traffic Engineering Branch July 4, 2012		Sheet No. 1 of 7		





## MOUNTING POSITION ON GUARD RAIL TYPE 3

# TYPICAL GUARDRAIL REFLECTOR TAB

## TYPICAL REFLECTOR DETAILS FOR CONCRETE BARRIER



BRACKET NOTES

- BARRIER REFLECTOR NOTES

1. BARRIER REFLECTORS, REGARDLESS OF TYPE, SHALL MEET THE RETROREFLECTIVE QUALITIES SPECIFIED IN SECTION 713 OF THE STANDARD SPECIFICATIONS FOR DELINEATOR REFLECTORS, AND BE PAID FOR AS DELINEATOR (TYPE \_) (BARRIER) (EACH). USE OF THESE REFLECTORS IS MANDATORY.
2. THE COLOR OF REFLECTIVE SURFACE SHALL MATCH THE COLOR OF THE ADJACENT EDGE LINE.
3. CONCRETE SURFACE PREPARATION, ADHESIVE, AND METHOD OF APPLICATION SHALL BE AS RECOMMENDED BY THE REFLECTOR MANUFACTURER.
4. UNLESS OTHERWISE NOTED IN THE PLANS OR DIRECTED BY THE ENGINEER, A 200 FOOT MAXIMUM TANGENT AND CURVE SPACING APPLIES TO BARRIER REFLECTORS.
5. TOP MOUNT REFLECTORS ARE STANDARD. SIDEMOUNT BARRIER REFLECTORS OR 6 INCH WIDE REFLECTOR STRIPS MAY BE REQUIRED IF SPECIFIED IN THE PLANS.
6. MEDIAN BARRIER REFLECTORS SHALL BE TYPE II (YELLOW-YELLOW, BACK-TO-BACK).
7. FOR A TWO-WAY ROADWAY BARRIER, REFLECTORS SHALL BE TYPE II (CRYSTAL-CRYSTAL, BACK-TO-BACK).
8. FOR TEMPORARY CONCRETE BARRIER, REFLECTORS SHALL BE INSTALLED THAT MEET THE MINIMUM REQUIREMENTS OF STANDARD TYPICAL DELINEATOR INSTALLATIONS, EXCEPT THE MAXIMUM SPACING SHALL BE 5 FT., AND THEY WILL NOT BE PAID FOR, BUT ARE INCLUDED IN THE WORK.

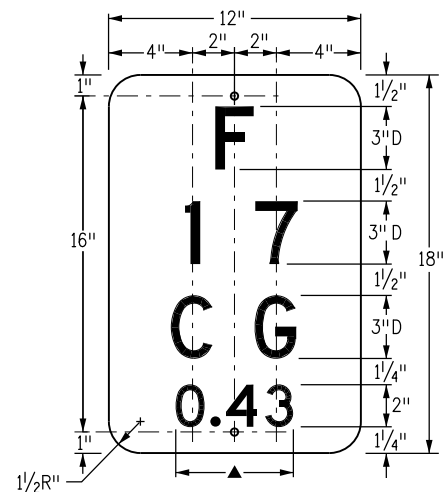


A cross-sectional diagram of a sign post installation. A central vertical post is labeled "6\"

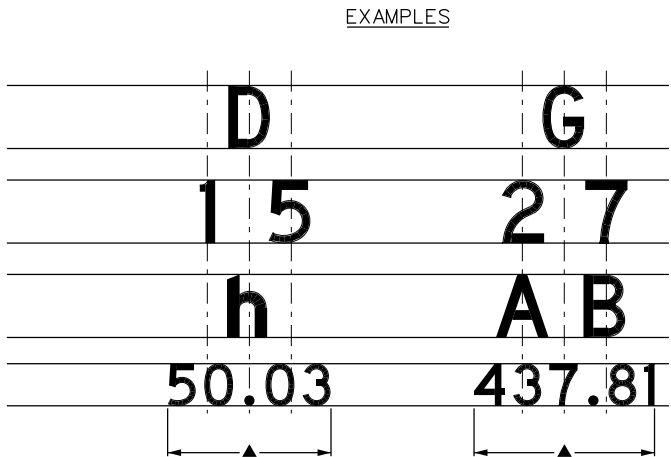
## TYPICAL SLEEVE INSTALLATION FOR MEDIAN DELINEATOR POSTS

# DELINEATOR INSTALLATIONS

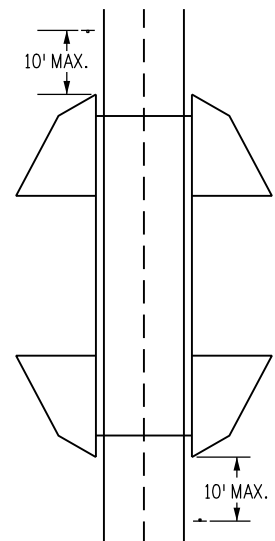




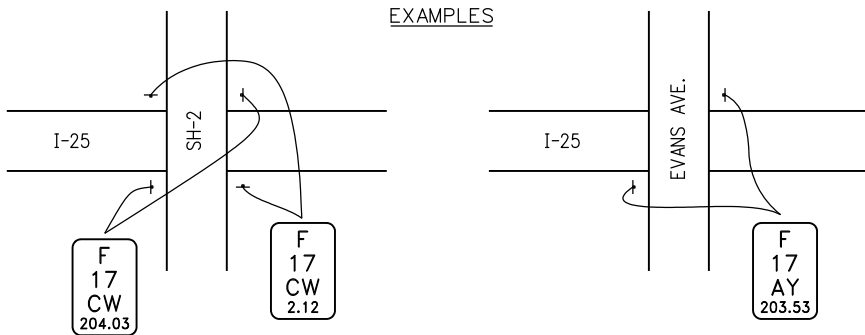
STRUCTURE IDENTIFICATION PANEL



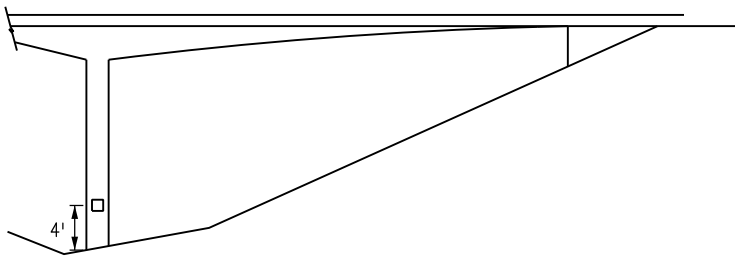
▲ OPTICALLY CENTER  
REQUIRED REFERENCE POINT



LOCATION DETAIL



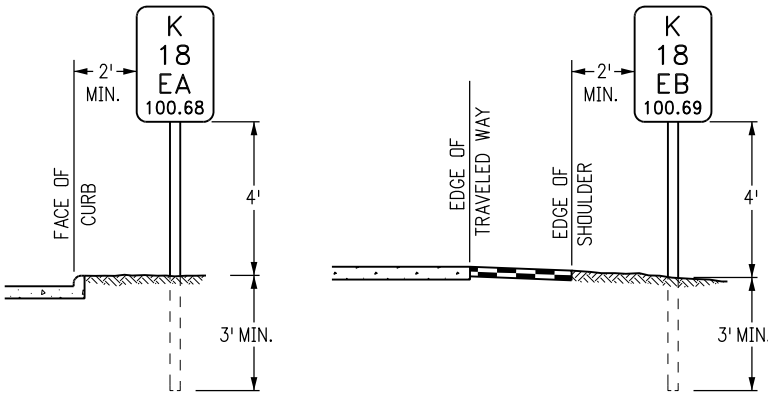
HWY SYSTEM LOCATION



STRUCTURE NUMBER LOCATION  
ON PIERS

GENERAL NOTES

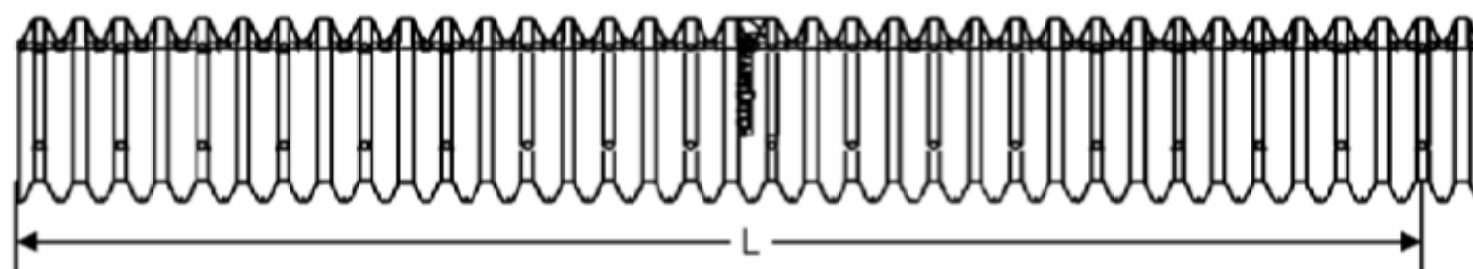
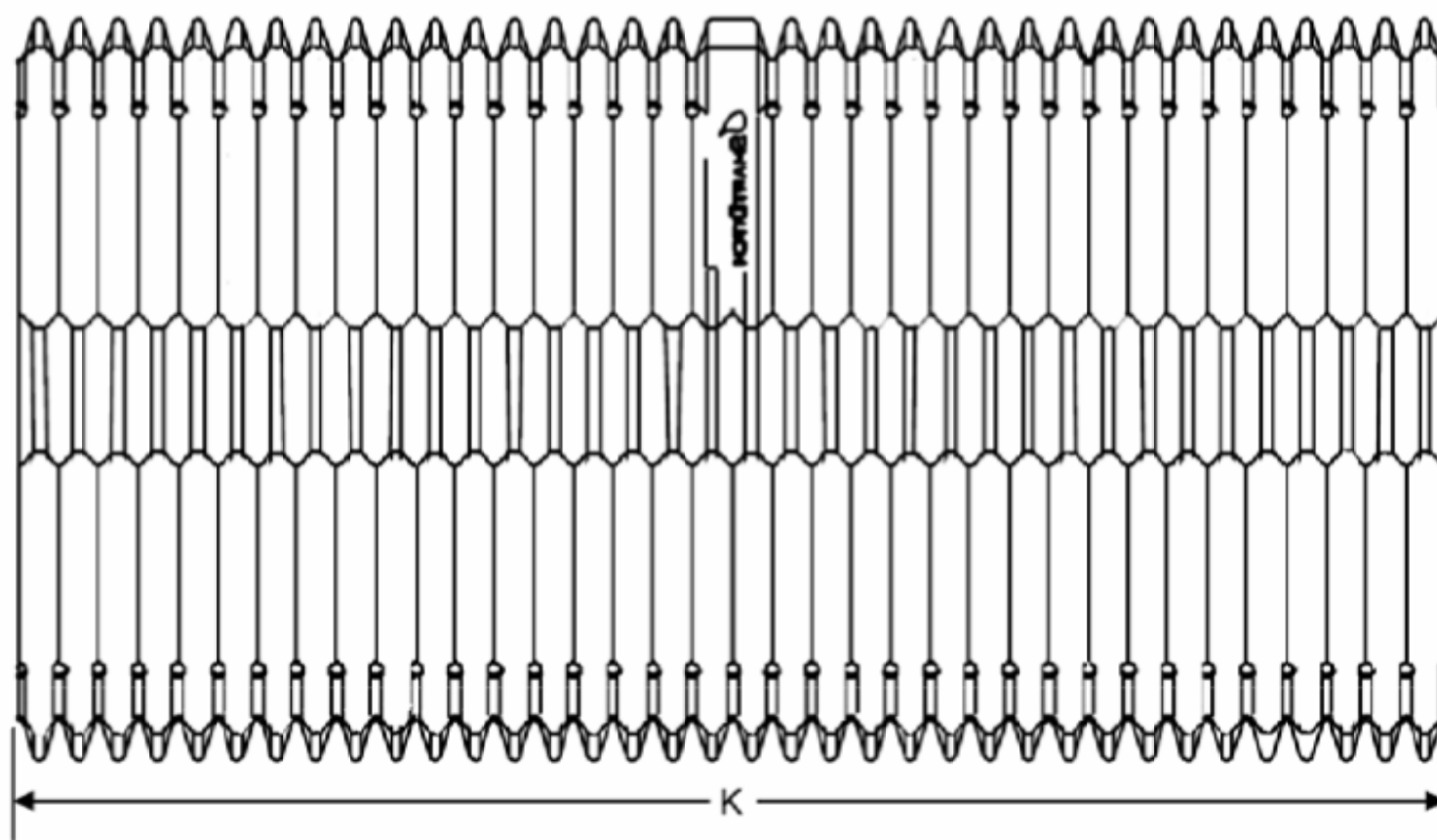
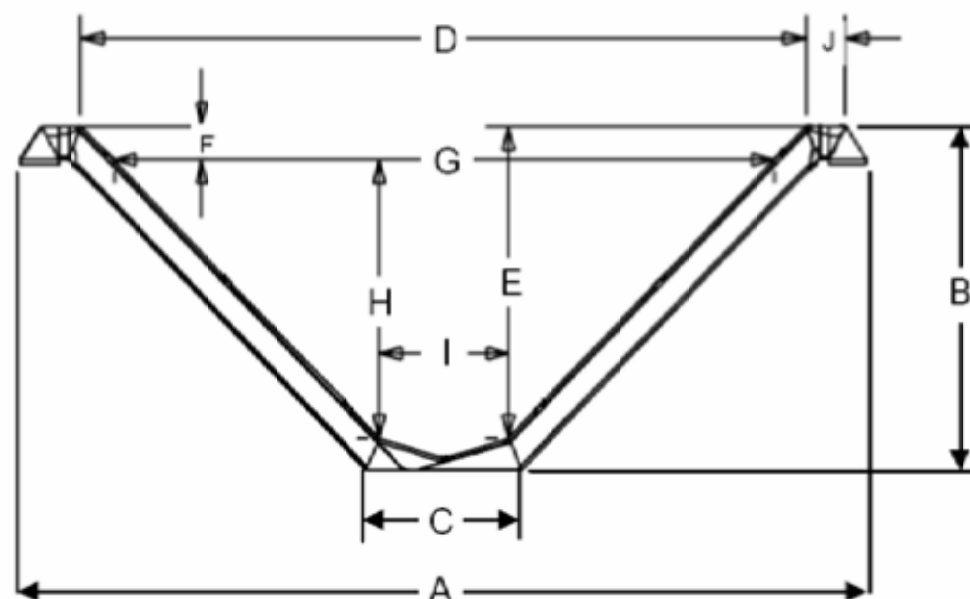
- SIGN PANEL SHALL BE FABRICATED FROM SINGLE SHEET ALUMINUM 0.080 IN. MINIMUM THICKNESS.
- WHEN SIGN PANELS ARE NOT ATTACHED TO THE STRUCTURE, THEY SHALL BE FASTENED TO U-POSTS OR TO 2 IN. TUBULAR STEEL POSTS (P POSTS) IN ACCORDANCE WITH STANDARDS FOR CLASS 1 SIGNS. SEE STANDARD PLANS S-614-2 AND S-614-8 FOR DETAILS.
- THE STRUCTURE NUMBER IS SHOWN ON THE PLANS.
- ALL SIGNS SHALL BE FABRICATED USING RETROREFLECTIVE SHEETING CONFORMING TO ASTM D4956, TYPE I MINIMUM. THE SIGN SHALL HAVE WHITE REFLECTIVE SHEETING BACKGROUND WITH BLACK LETTERS.
- STRUCTURE NUMBER IDENTIFICATION SIGN WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
- IN ADDITION TO THE REQUIREMENTS STATED ABOVE, STRUCTURE NUMBERS FOR HIGHWAYS PASSING UNDER CROSSROADS ARE TO BE PLACED AT THE FOLLOWING POINTS USING TWO 1/2 IN. WIDE STAINLESS STEEL BANDS AND STAINLESS STEEL FLARED LEG BRACKETS WITH HEX HEAD BOLTS (BAND - IT D315 OR EQUIVALENT):
  - FOR STRUCTURES OF THREE OR MORE SPANS, THE STRUCTURE NUMBER SHALL BE MOUNTED, FACING TRAFFIC, ON THE OUTSIDE FACE OF THE END COLUMN OF THE RIGHT HAND PIER.
  - FOR TWO SPAN STRUCTURES, THE STRUCTURE NUMBER SHALL BE MOUNTED, FACING TRAFFIC, ON THE OUTSIDE FACE OF EACH END COLUMN OF THE CENTER PIER.
  - FOR OVERHEAD SIGNS, THE STRUCTURE NUMBER SHALL BE MOUNTED DIRECTLY ON THE POST OR THE OUTSIDE POST OF A TWO-POST STRUCTURE.
- THE STRUCTURE REFERENCE POINTS (MILE POINT) IN THE FIELD LOG OF STRUCTURES SHOW THREE PLACES AFTER DECIMAL POINT. THE LAST DIGIT IS TO BE DROPPED ON THIS PANEL (DO NOT ROUND OFF).
- THIS STRUCTURE IDENTIFICATION SHALL BE DISPLAYED ON ALL STATE HIGHWAYS BUT NOT ON OFF-SYSTEM CROSSROADS.



VERTICAL AND LATERAL PLACEMENT DETAILS

Computer File Information		Sheet Revisions		<div>Colorado Department of Transportation</div> <div>4201 East Arkansas Avenue Denver, Colorado 80222 Phone: (303) 757-9543 Fax: (303) 757-9219</div> <div>Safety &amp; Traffic Engineering Branch</div> <div>KCM/KEN</div>	STRUCTURE NUMBER INSTALLATION	STANDARD PLAN NO.
Creation Date: 07/04/12	Initials: KEN	Date:	Comments			S-614-12
Last Modification Date:	Initials:					Sheet No. 1 of 1
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans					Issued By: Safety & Traffic Engineering Branch July 4, 2012	
Drawing File Name: S-614-12_1of1.dgn						
CAD Ver.: MicroStation V8	Scale: Not to Scale	Units: English				



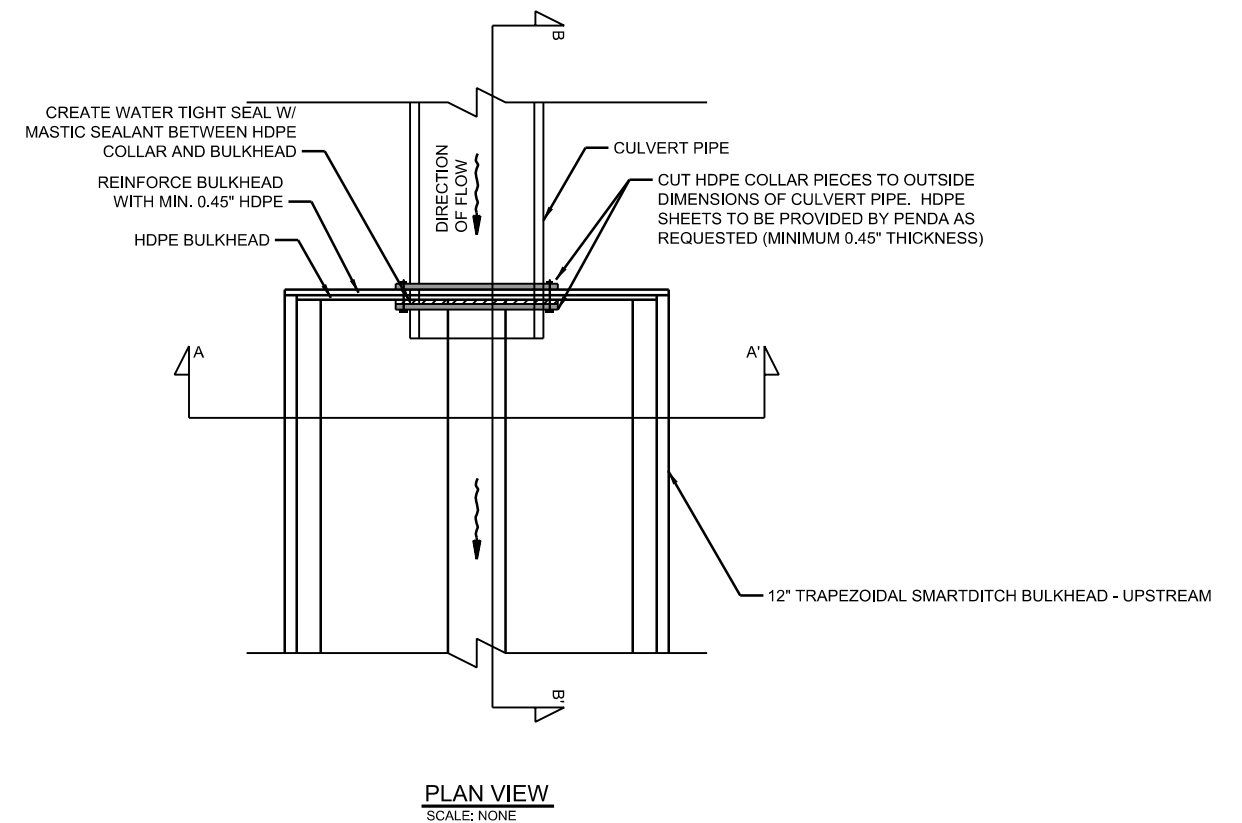
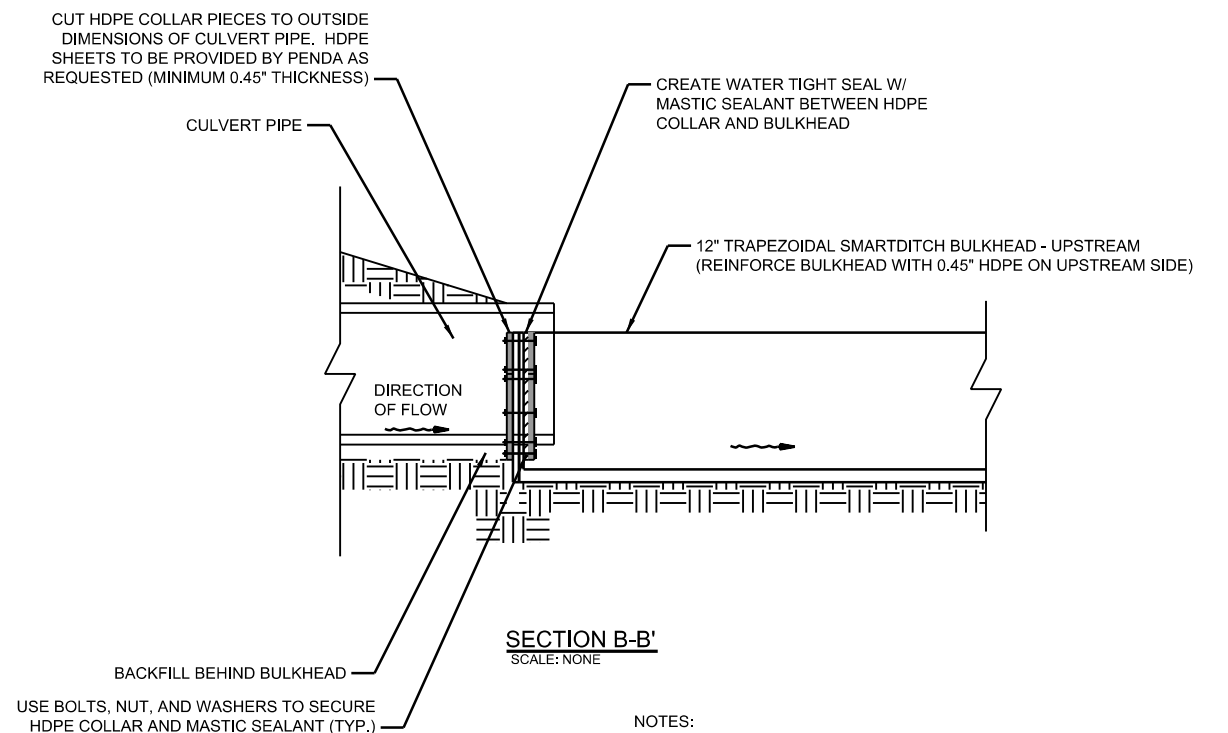
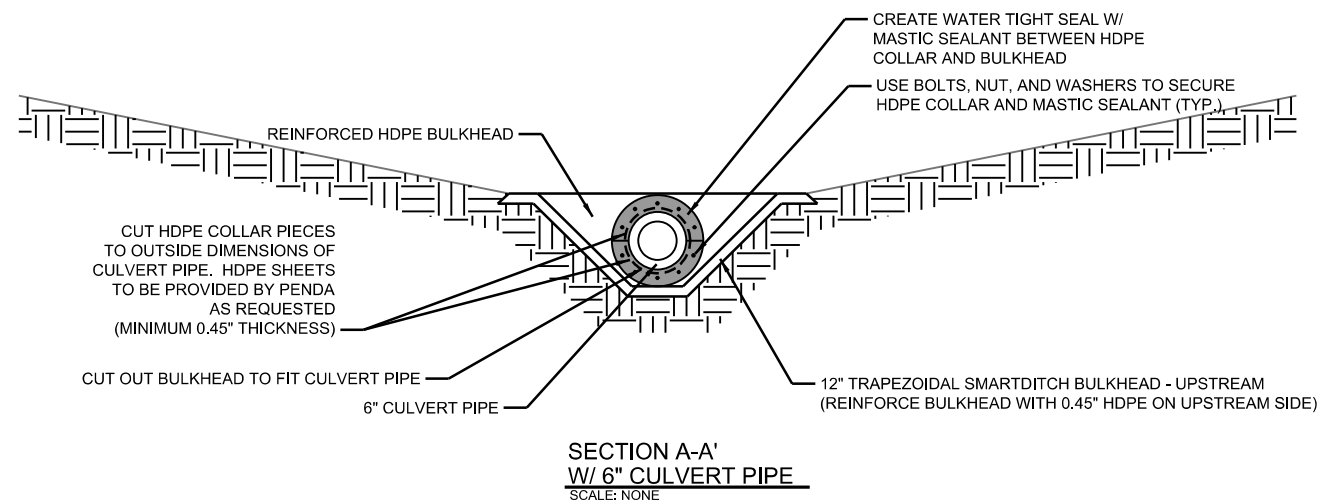
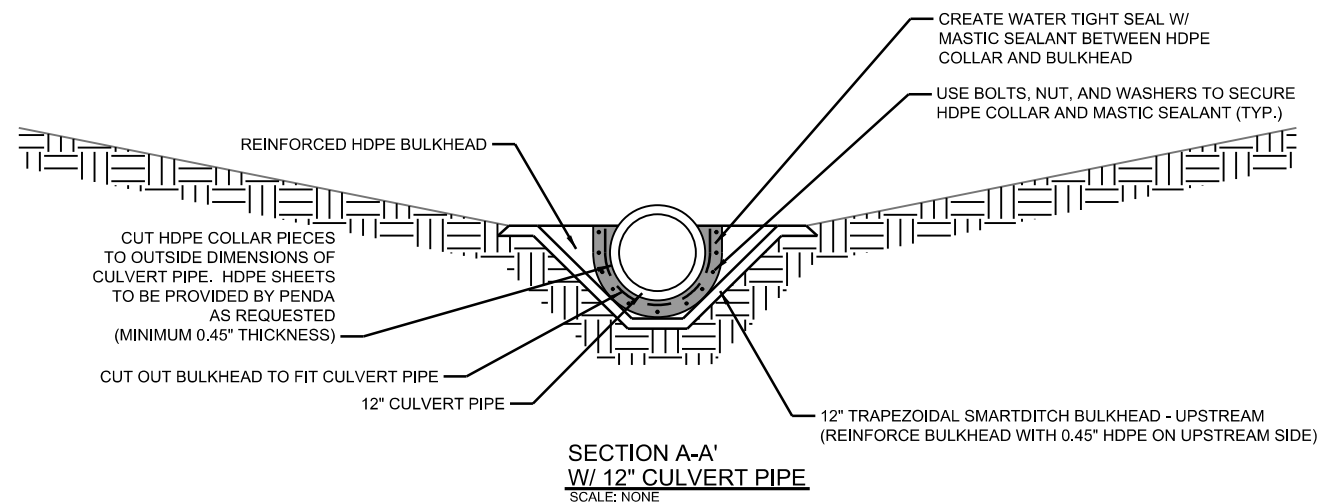
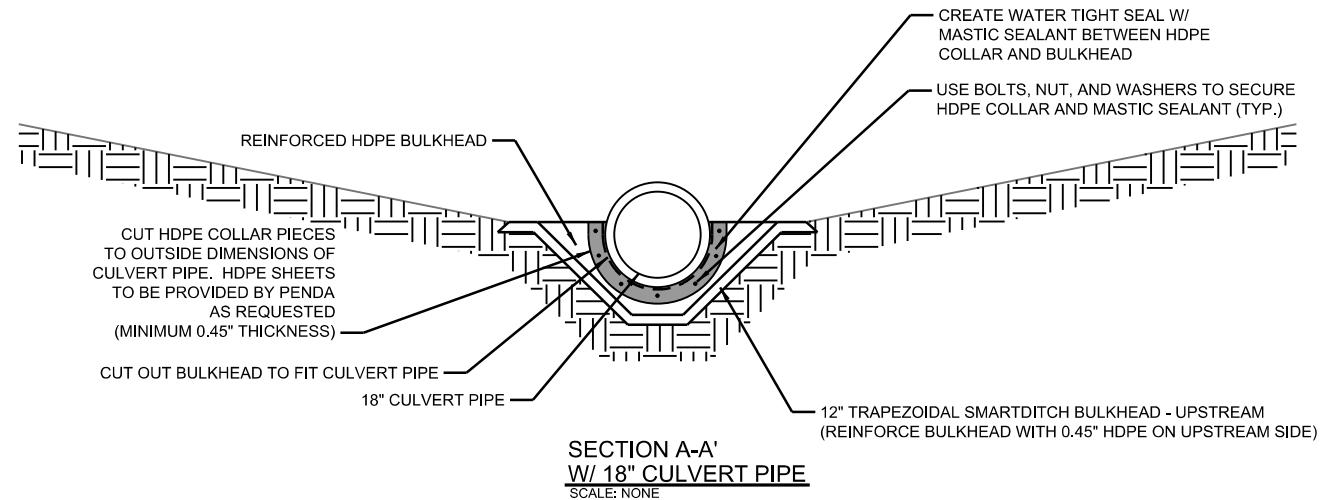


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Item Description	Item #	Dimension Length
Overall exterior width	A	50.0" (1270.0 mm)
Overall exterior height	B	16.25" (412.75 mm)
Bottom channel exterior width	C	10.0" (254.0 mm)
Channel top width	D	37.5" (952.5 mm)
Channel height (interior)	E	14.5" (368.3 mm)
Minimum freeboard	F	1.0" (25.4 mm)
Maximum flow area top width	G	34.5" (876.3 mm)
Maximum flow depth	H	13.5" (342.9 mm)
Bottom channel width (interior)	I	8.0" (203.2 mm)
Top shoulder width (w/out knuckle)	J	4.5" (114.3 mm)
Overall exterior length	K	120.0" (3048.0 mm)
Lay length	L	112.0" (2844.8 mm)

<b>PENDA CORPORATION</b>		2344 W. Wisconsin St. P.O. Box 449 Portage, WI 53901
12" TRAPEZOIDAL STRAIGHT BLK		
SIZE	ITEM NO./ONG NO.	REV





PROJECT NO.: 13024002	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE: APRIL 2012	DRAWN BY: BSR				
CHECKED BY:					
PLOT DATE: TRAP Detail Sheet 2a, Culvert Connection Detail.dgn 4/9/2012 4:40:27 PM jpenchel					

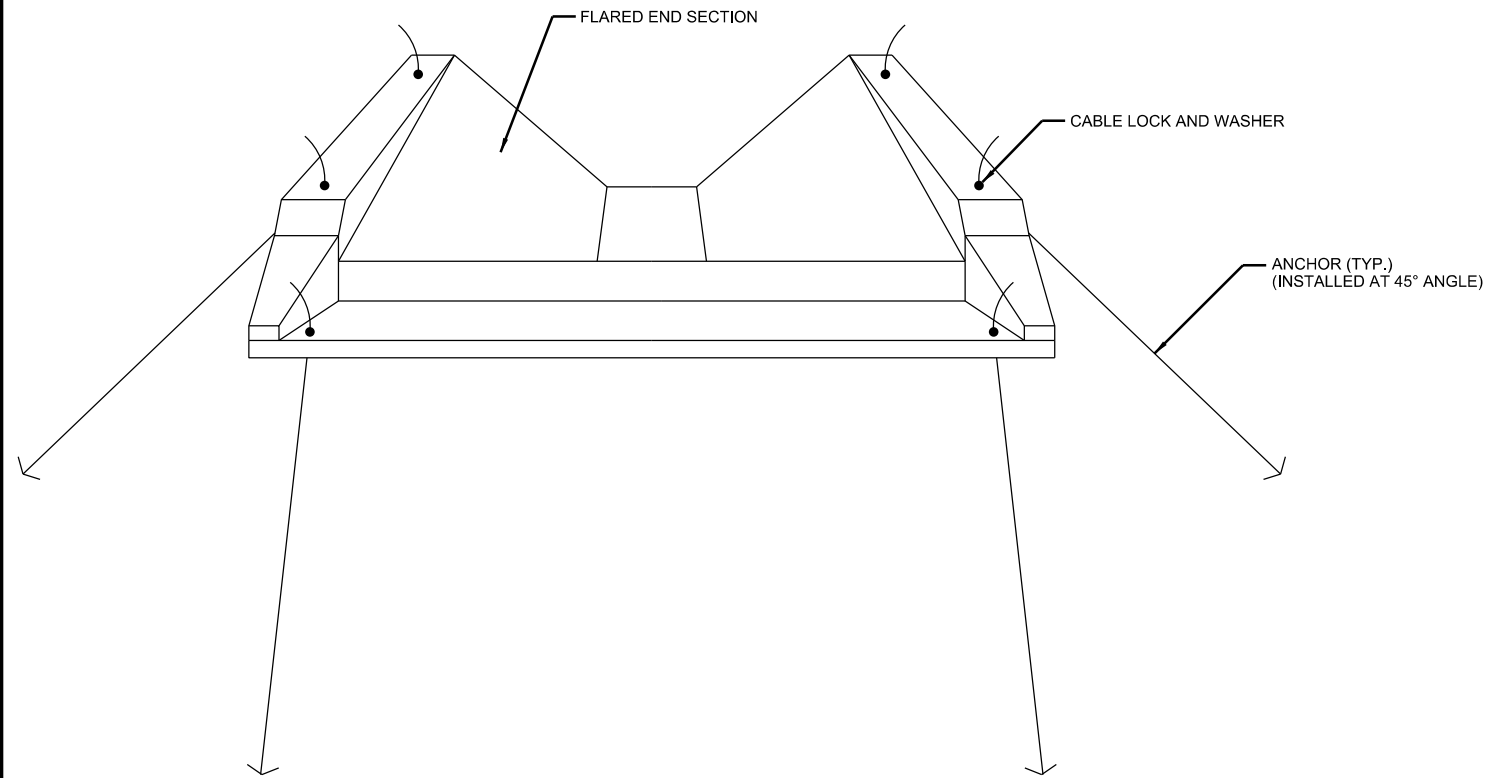


SmartDitch  
PENDA CORPORATION  
2344 W. WISCONSIN STREET  
PORTAGE WI, 53901  
(866) 576-2783

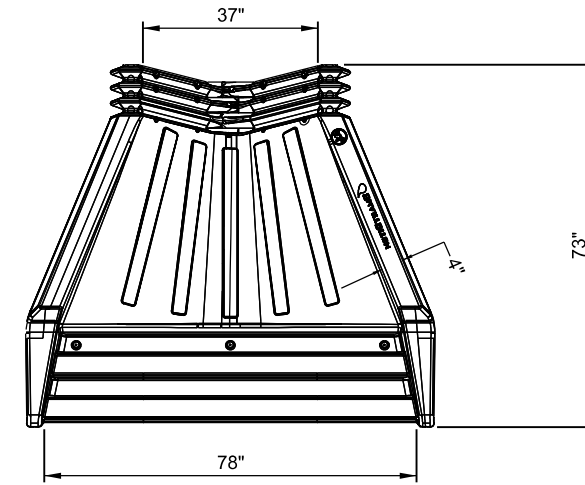
CULVERT CONNECTION TO REINFORCED 12" TRAP BULKHEAD DETAIL

FILE NO.  
13024002  
SHEET  
1 OF 1

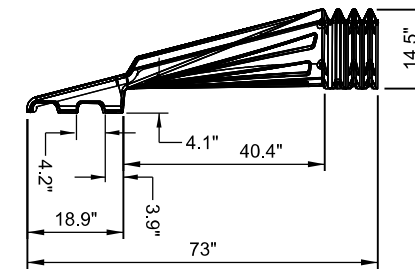




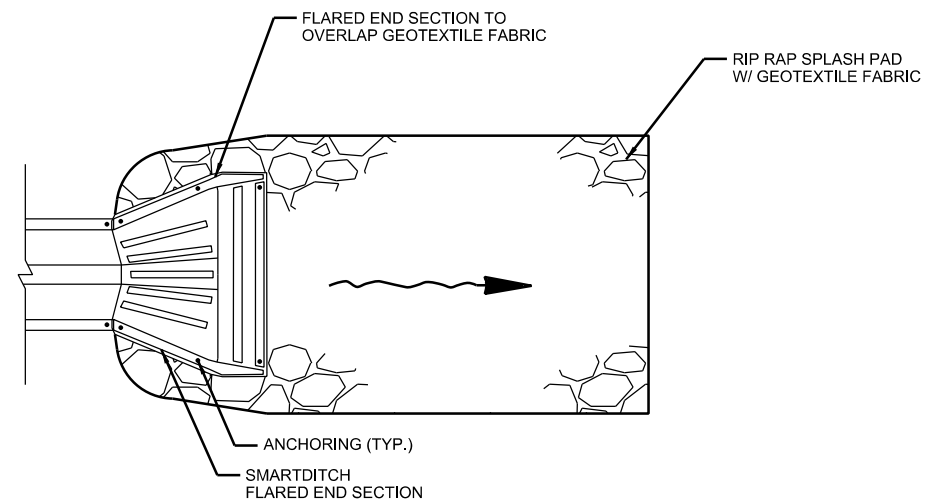
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SCALE: NONE



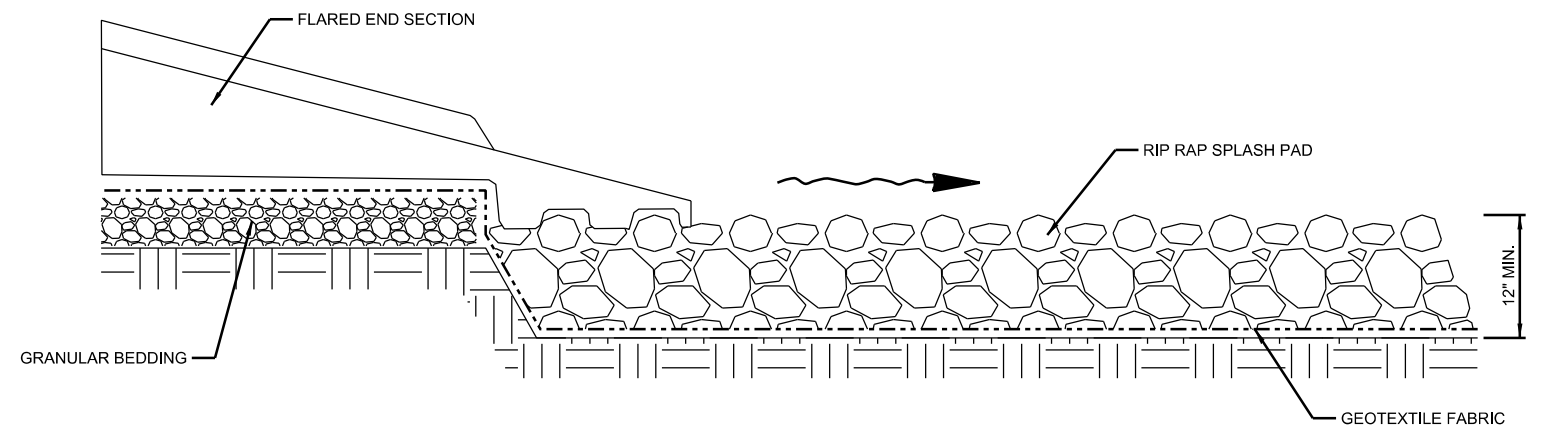
**12" TRAPEZOIDAL FLARED END SECTION - PLAN VIEW**  
NTS



**12" TRAPEZOIDAL FLARED END SECTION - PROFILE VIEW**  
NTS



**DOWNSTREAM FLARED END SECTION AND SPLASH PAD DETAIL**  
SCALE: NONE



NOTE: SPLASH PAD DIMENSIONS, DEPTH, AND SIZE OF RIP RAP IS SITE SPECIFIC.

**DOWNSTREAM FLARED END SECTION AND SPLASH PAD DETAIL - PROFILE VIEW**  
SCALE: NONE

PROJECT NO.: 13024002	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE: JANUARY 2012	DRAWN BY: BSR				
CHECKED BY:					
PLOT DATE: TRAP Detail Sheet 5 - DS Flared End.dgn 4/9/2012 4:39:27 PM kpschul					

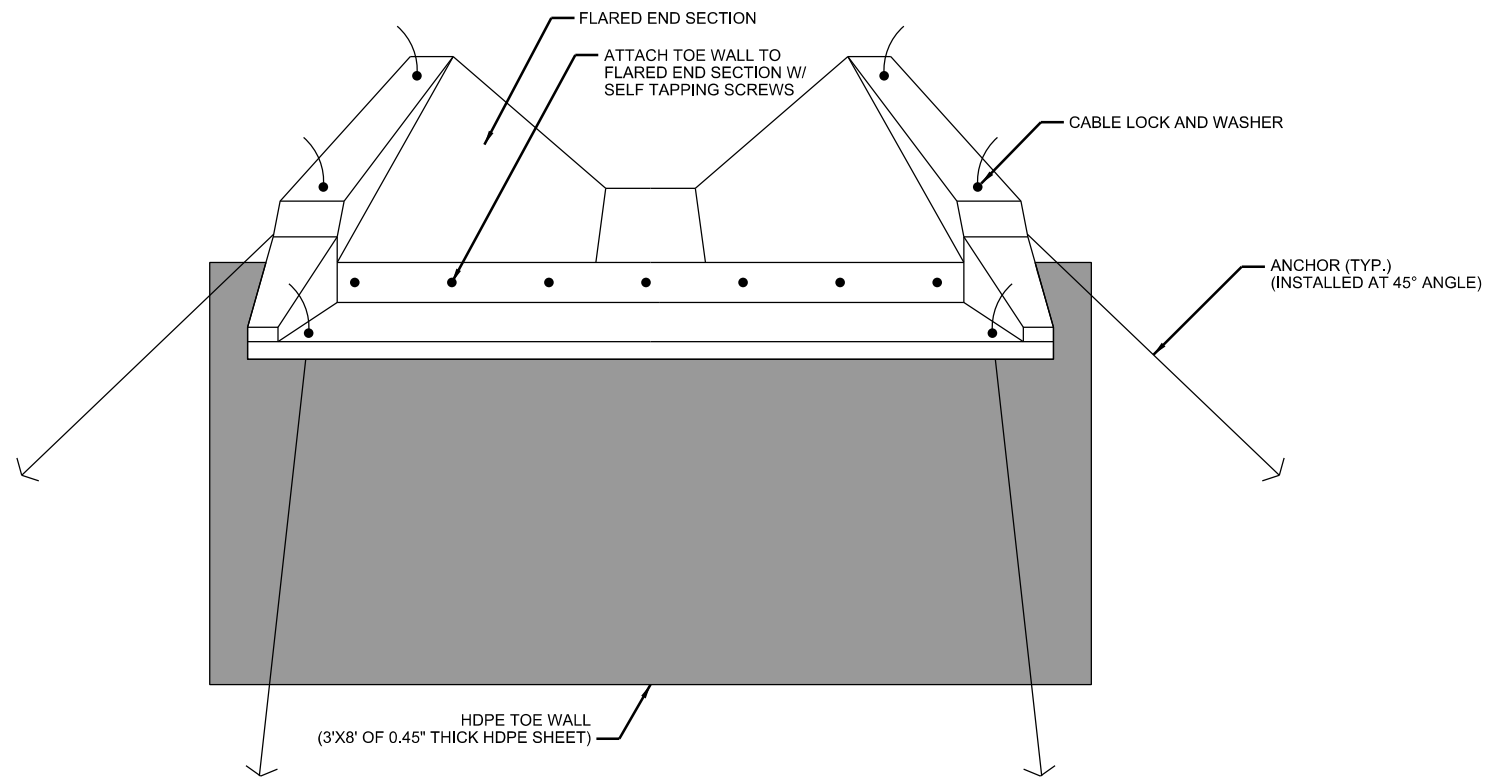


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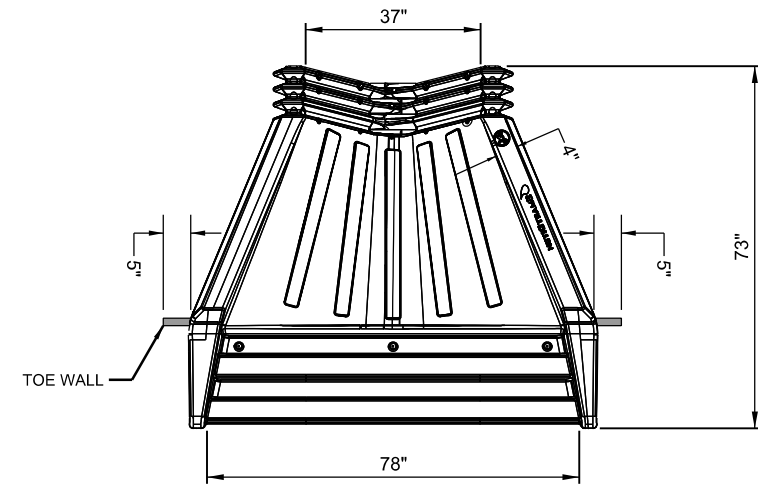
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FILE NO.  
13024002  
SHEET  
1 OF 1

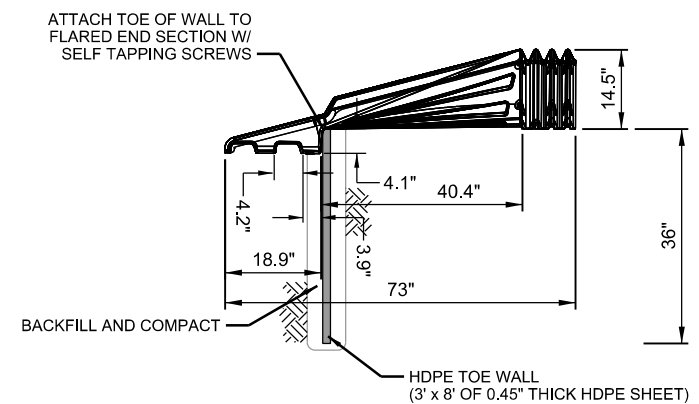




**DOWNSTREAM FLARED END SECTION - CROSS SECTION**  
SCALE: NONE



**12" TRAPEZOIDAL FLARED END SECTION - PLAN VIEW**  
NTS



**12" TRAPEZOIDAL FLARED END SECTION - PROFILE VIEW**  
NTS

PROJECT NO.: 13024002	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE: SEPTEMBER 2012	DRAWN BY: BSR				
CHECKED BY:					
PLOT DATE: TRAP Detail Sheet 9 Flared End w Toe Wall.dgn 9/10/2012 12:53:22 PM hrcs					



SmartDitch  
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2344 W. WISCONSIN STREET  
PORTAGE, WI, 53901  
(866) 576-2783

12" FLARED END SECTION WITH TOE WALL

FILE NO.  
13024002  
SHEET  
1 OF 1