

NOTES:

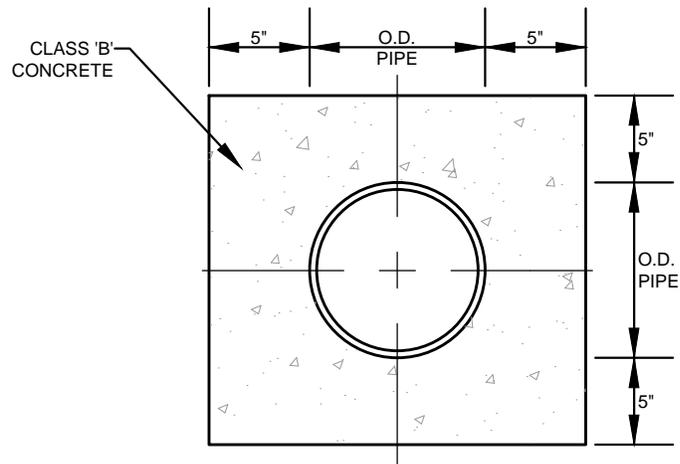
TRENCH WIDTH: UP TO 42" PIPE, I.D. PIPE + 2'-0"
48" & LARGER, O.D. PIPE + 2'-0"

1. BEDDING CLASSIFICATION SHALL MEET OR EXCEED ASTM D2321 CLASS 1 BEDDING FOR FLEXIBLE PIPING, AND ASTM C12, CLASS 'B' BEDDING FOR RIGID PIPING.
2. FORCE MAIN BEDDING SHALL BE SELECT NATURAL SAND WELL COMPACTED IN 6" LIFTS.
3. BACKFILL SHALL BE COMPACTED TO THE REQUIREMENTS OF ITEM 1 IN THE SPECIFICATIONS.
4. CONTRACTOR SHALL FOLLOW ITEM SPECIFICATION 1 - EARTH EXCAVATION. TRENCHES EXCAVATED OUTSIDE EXISTING ROAD AND RAILWAY RIGHTS-OF-WAY SHALL BE BACKFILLED WITH COMMON BACKFILL MATERIAL CONSISTING OF EXCAVATED MATERIALS EXCEPT HIGHLY ORGANIC SILTS AND CLAYS AND TAMPED THOROUGHLY. FILL SHALL BE DEPOSITED IN SUCCESSIVE, UNIFORM, APPROXIMATELY HORIZONTAL LAYERS. MATERIAL SHALL BE FREE OF ROOTS, STONES, AND DEBRIS. ALL MATERIAL SHALL HAVE AN IN-PLACE DENSITY OF AT LEAST 85% OF MAXIMUM DRY DENSITY (STANDARD PROCTOR) OR AS APPROVED BY THE ENGINEER. COMMON BACKFILL SHALL NOT CONTAIN STONE BLOCKS, BROKEN CONCRETE, MASONRY RUBBLE, OR OTHER SIMILAR MATERIALS. IT SHALL HAVE PHYSICAL PROPERTIES SUCH THAT IT CAN BE READILY SPREAD AND COMPACTED DURING FILLING. SNOW, ICE, AND FROZEN SOIL WILL NOT BE PERMITTED.

WHERE EXCAVATED MATERIAL, AFTER REMOVAL OF ROCKS, STUMPS, PLANT MATERIAL, AND OTHER EXTRANEIOUS MATERIAL AND PROPER DEWATERING, DRYING, PROTECTION, AND STORAGE OF THE EXCAVATION BY THE CONTRACTOR, CANNOT BE PREPARED TO MEET THE REQUIREMENTS FOR COMMON BACKFILL, DUE TO THE NATURE OF THE MATERIAL (E.G., EXCESSIVE ROCK, MUCK, ORGANICS, CLAY, SILT, OR OTHER MATERIAL), AND AS DETERMINED BY THE ENGINEER, THE UNACCEPTABLE EXCAVATION SHALL BE REMOVED FROM THE SITE AND DISPOSED OF BY THE CONTRACTOR AND REPLACED BY IMPORTED BACKFILL MEETING THE REQUIREMENTS OF STRUCTURAL BACKFILL. IMPORTED STRUCTURAL BACKFILL SHALL BE FREE OF ORGANICS, ROOTS OR OTHER DELETERIOUS MATERIALS AND SHALL NOT CONTAIN MORE THAN FIVE PERCENT (BY WEIGHT) ORGANIC MATERIAL, HAVE A PLASTICITY INDEX (PI) GREATER THAN 25, OR HAVE A MAXIMUM DRY DENSITY LESS THAN 90 POUNDS PER CUBIC FOOT. IMPORTED STRUCTURAL FILL SHOULD CONSIST OF MATERIAL CLASSIFIED AS ML, CL, SC, OR SM, OR BETTER PER ASTM D-2487 AND BE CAPABLE OF BEING COMPACTED TO 85% STANDARD PROCTOR.

NO SCALE

CITY OF HENDERSONVILLE ENGINEERING DEPARTMENT		
REVISION	DATE	BY
DETAIL DWG. NO. <u> 1 </u> ITEM NO. <u> N/A </u> <u>BEDDING & TRENCH DETAIL FOR</u> <u>CONSTRUCTION OUTSIDE ROADWAYS</u>		

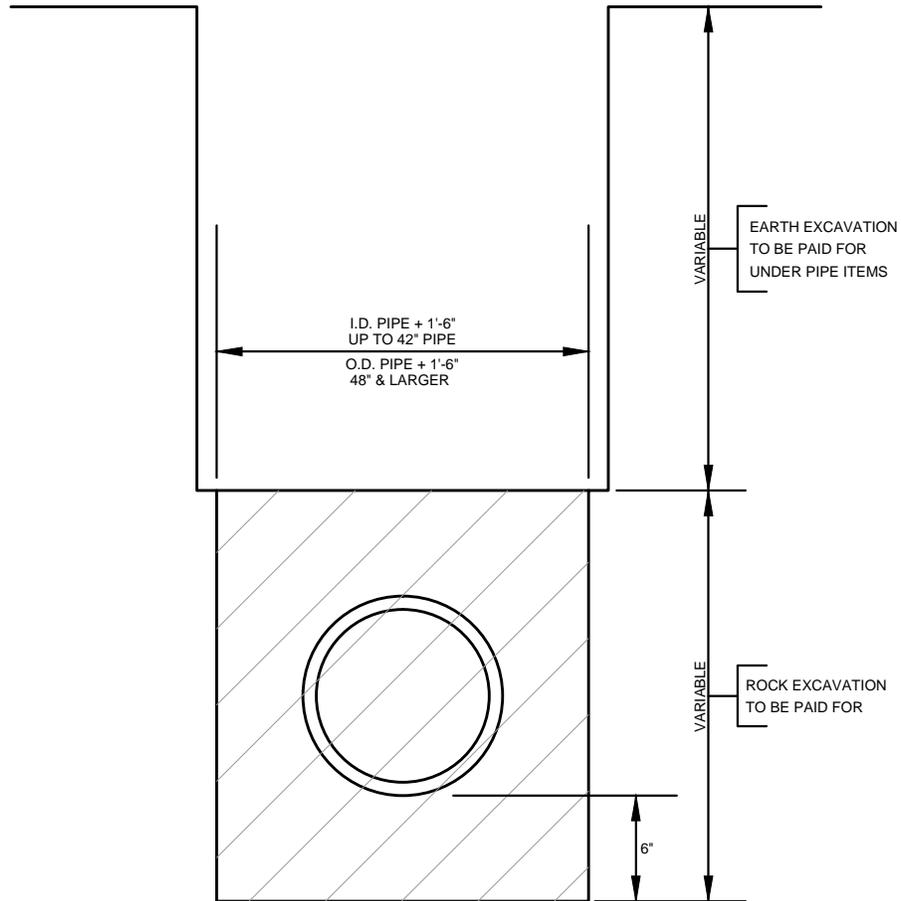


WIDTH OF ENCASEMENT IN ROCK: UP TO 42" PIPE, I.D. PIPE + 1'-6"
 48" & LARGER, O.D. PIPE + 1'-6"

REVISION	DATE	BY

CITY OF HENDERSONVILLE ENGINEERING DEPARTMENT	
DETAIL DWG. NO.	4
ITEM NO.	_____
PIPE ENCASEMENT	

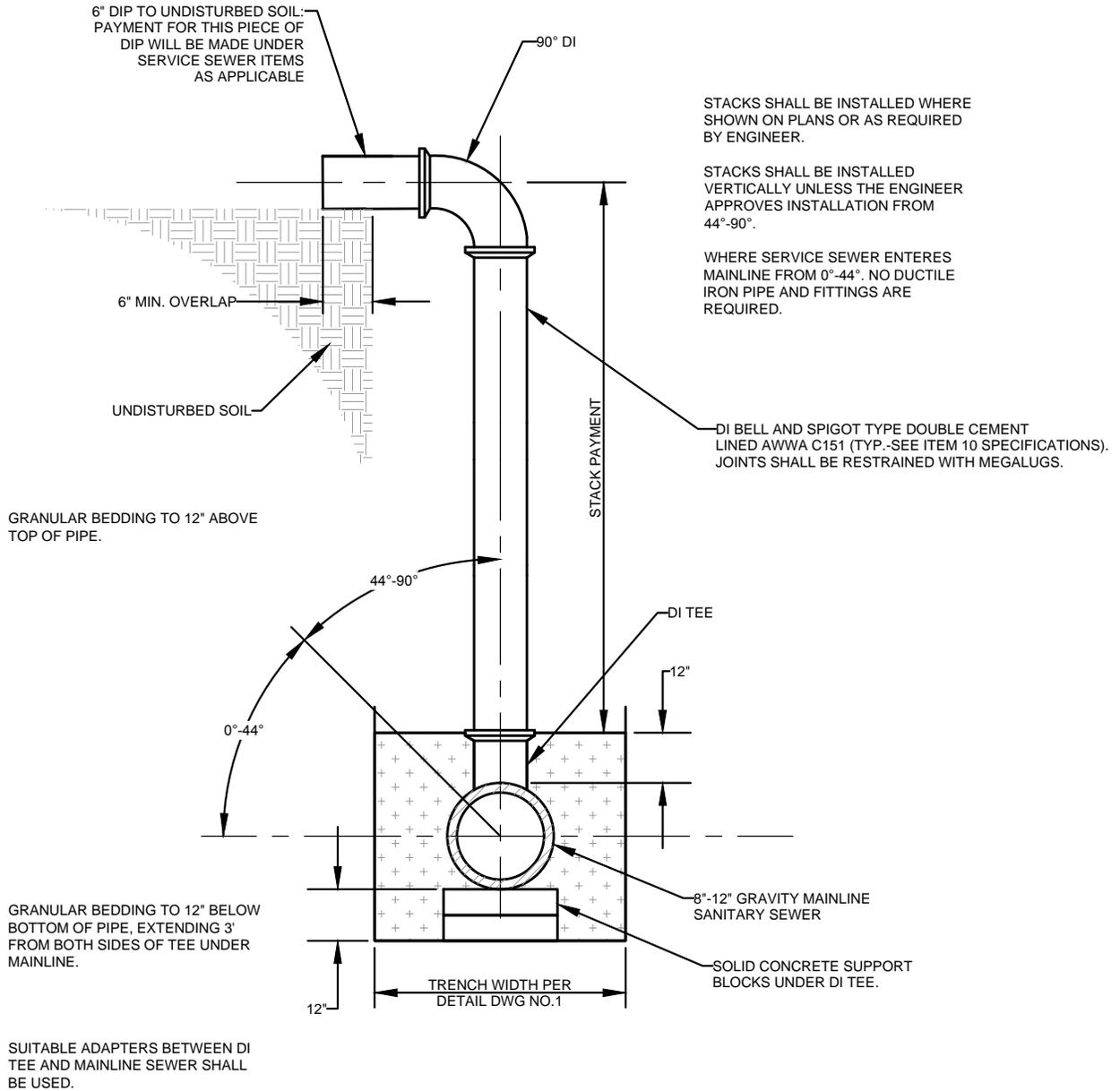
NO SCALE



NO SCALE

REVISION	DATE	BY

CITY OF HENDERSONVILLE ENGINEERING DEPARTMENT	
DETAIL DWG. NO.	5
ITEM NO.	_____
ROCK EXCAVATION	
PAYMENT LIMITS	

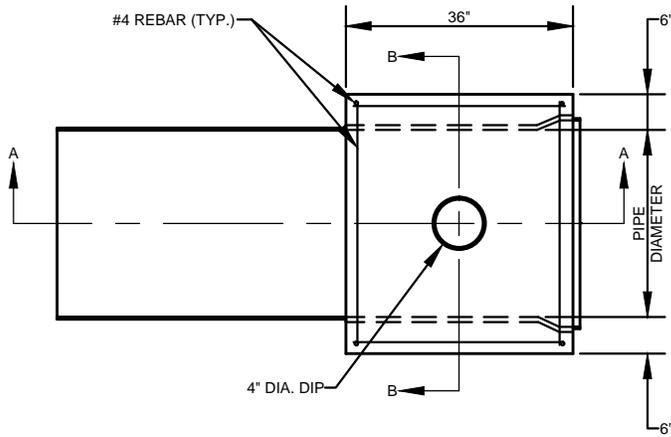


ALL DUCTILE IRON PIPE SHALL BE CLASS 350. JOINTS SHALL BE RESTRAINED WITH MEGALUGS.

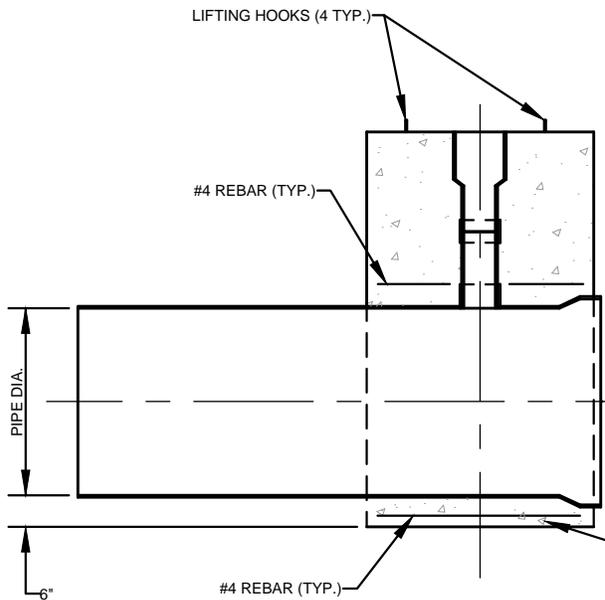
NO SCALE

CITY OF HENDERSONVILLE ENGINEERING DEPARTMENT		
REVISION	DATE	BY
DETAIL DWG. NO. <u>7</u>		
ITEM NO. <u>(SEE PIPE ITEMS)</u>		
<u>SERVICE STACK</u>		
<u>8"-12" MAINLINE</u>		

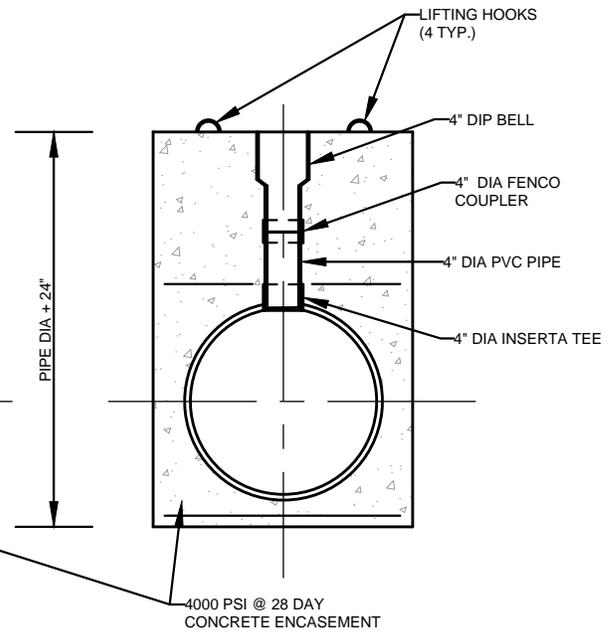
RISER PIPE AND SERVICE SEWER
EXTENDING TO UNDISTURBED SOIL
SHALL BE DUCTILE IRON PIPE PER
DETAIL DWG. NO.7



PLAN VIEW



SECTION "A-A"

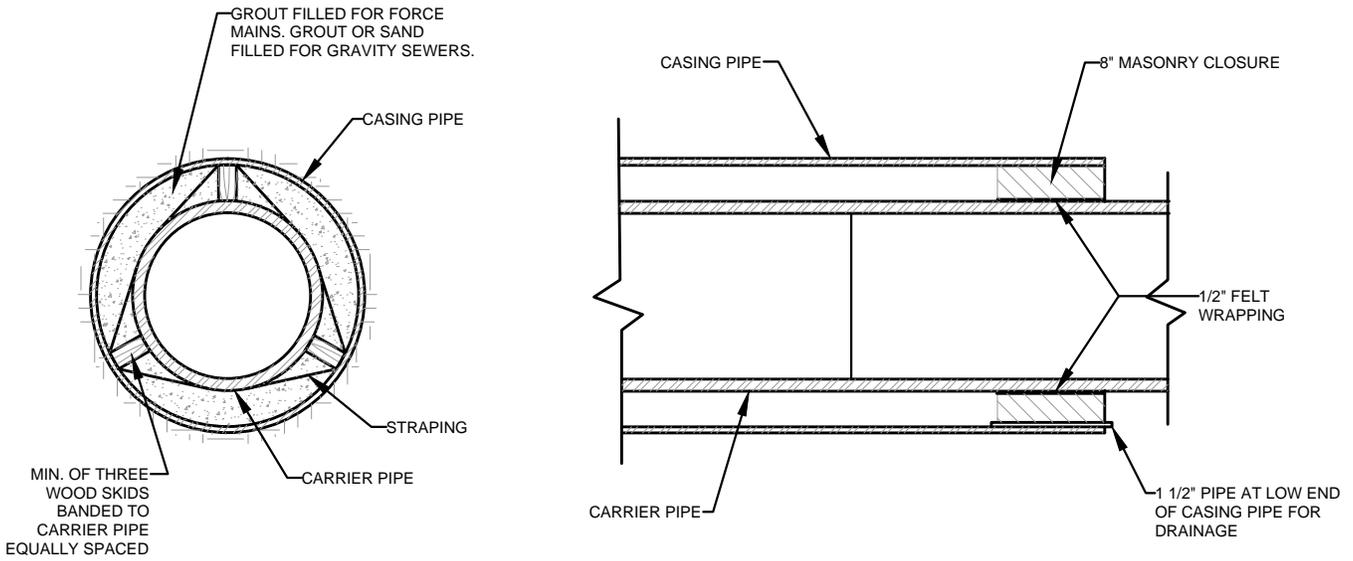


SECTION "B-B"

NO SCALE

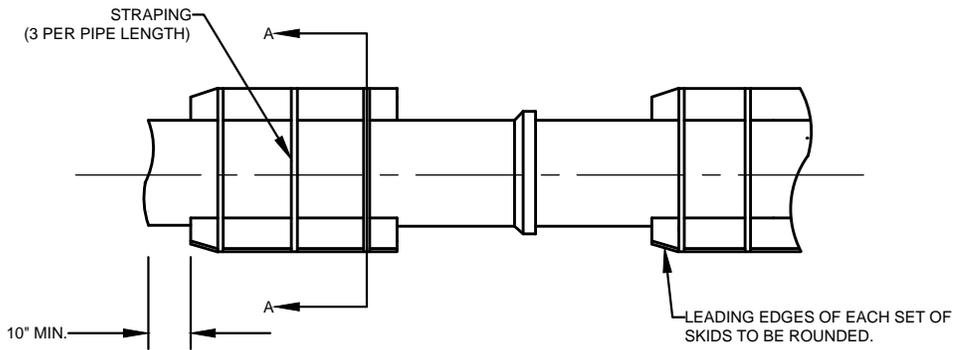
REVISION	DATE	BY

CITY OF HENDERSONVILLE ENGINEERING DEPARTMENT	
DETAIL DWG. NO.	8
ITEM NO.	(SEE PIPE ITEMS)
SERVICE STACK 15" AND	
LARGER MAINLINE	



SECTION 'A-A'

CASING PIPE CLOSURE DETAIL



PIPE SKID DETAIL

CASING PIPE SHALL BE EQUAL TO TWICE THE ID OF CARRIER PIPE FOR PUSH-ON-JOINT PIPE. FOR CARRIER PIPE WITH MECHANICAL JOINTS, CASING PIPE SHALL BE TWO SIZES LARGER THAN TWICE THE CARRIER PIPE ID

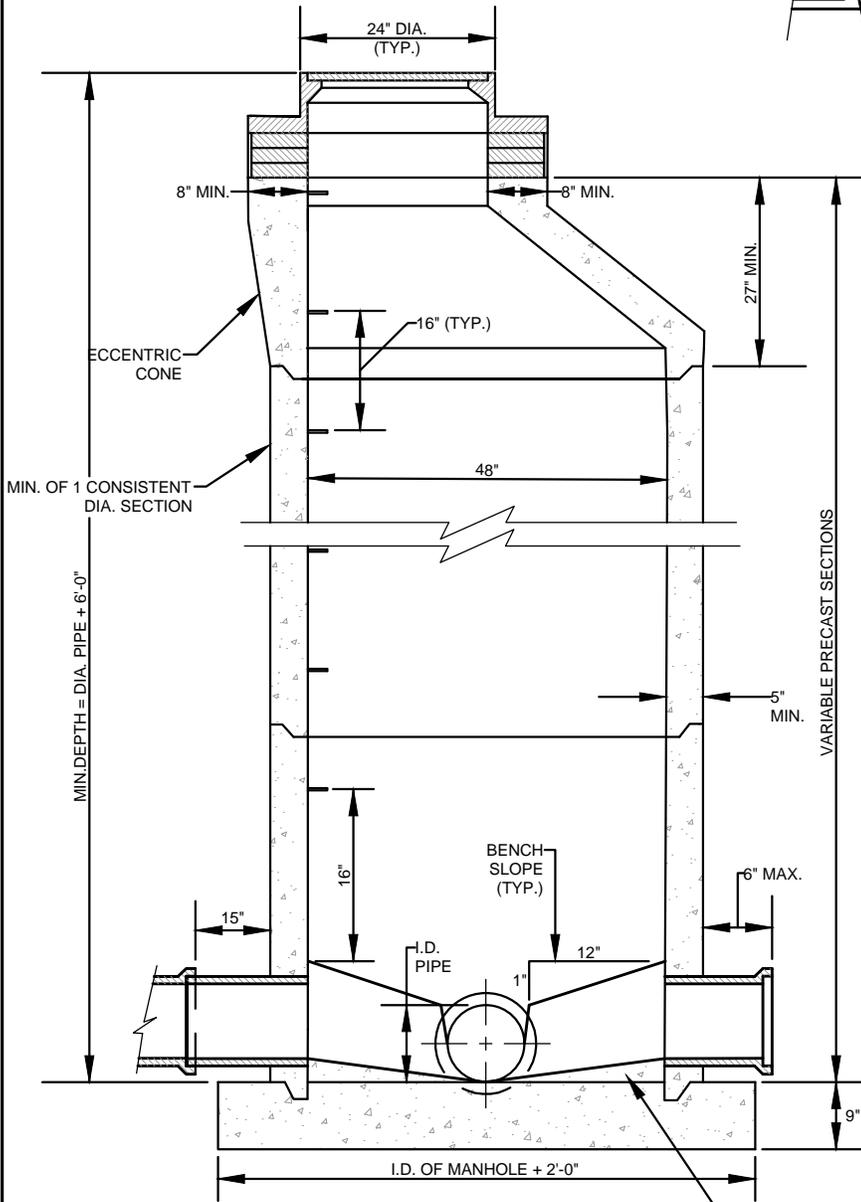
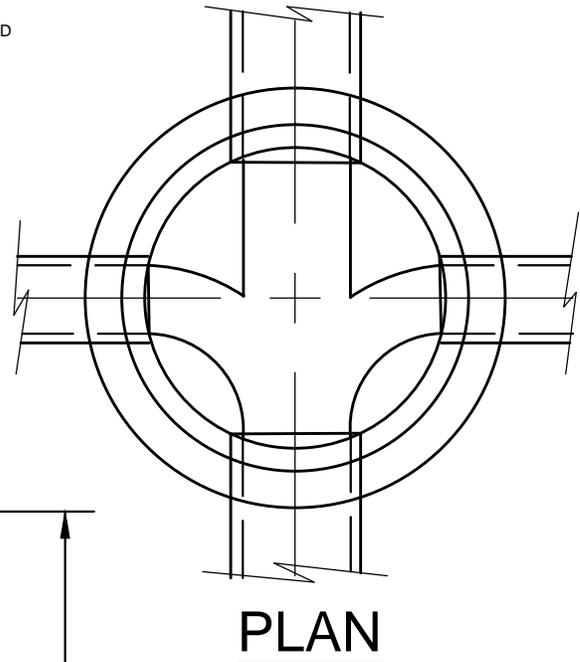
NO SCALE

			CITY OF HENDERSONVILLE ENGINEERING DEPARTMENT	
REVISION	DATE	BY	DETAIL DWG. NO. _____	9
			ITEM NO. _____	
			PIPE BORING	

NOTE:
 IF TOP STEP IS IN 24" DIA.
 OPENING, IT MAY PROJECT NO
 MORE THAN 3-1/2".

MANHOLE CASTING AND
 COVER NOT SHOWN

SEE DRAWINGS:
 NO. 13 FOR GRADE ADJUSTMENT.
 NOS. 14 AND 15 FOR CASTING DETAILS.
 NOS. 33 AND 34 FOR PAVEMENT DETAIL AROUND CASTING.



SECTION

NOTES:

PRECAST MANHOLE SECTIONS SHALL MEET ASTM C478. MANHOLE JOINTS SHALL UTILIZE BUTYL RUBBER SEALANT, 2 PIECES ALL AROUND OR O-RING GASKETS (ASTM C443). A MINIMUM 6-INCH WIDE BUTYL RUBBER SEAL SHALL BE INSTALLED ON ALL BELOW GRADE EXTERIOR JOINTS. CONCRETE IN MANHOLES SHALL MEET THE SPECIFICATION ITEM NOS. 5 & 14.

MANHOLE STEPS SHALL BE M.A. IND. PS-1-PF REINFORCED PLASTIC STEPS OR APPROVED EQUAL.

FOR PIPE CONNECTIONS USE ASTM C-923 FLEXIBLE GASKET SUCH AS A-LOK, DURA SEAL III, KOR-N-SEAL OR APPROVED EQUAL.

TAR STRIPS SHALL BE USED AT ALL JOINTS. THE CONTRACTOR SHALL APPLY TAR OVER THE CEMENT PARGING ON THE OUTSIDE OF THE ADJUSTMENT RINGS AND OVER THE MANHOLE CASTING EXTERIOR.

CONCRETE WITH STEEL TROWL
 FINISH OR PRECAST INVERT
 CHANNELS AND BENCH.

REVISION	DATE	BY

CITY OF HENDERSONVILLE
 ENGINEERING DEPARTMENT

DETAIL DWG. NO. 10

ITEM NO. _____

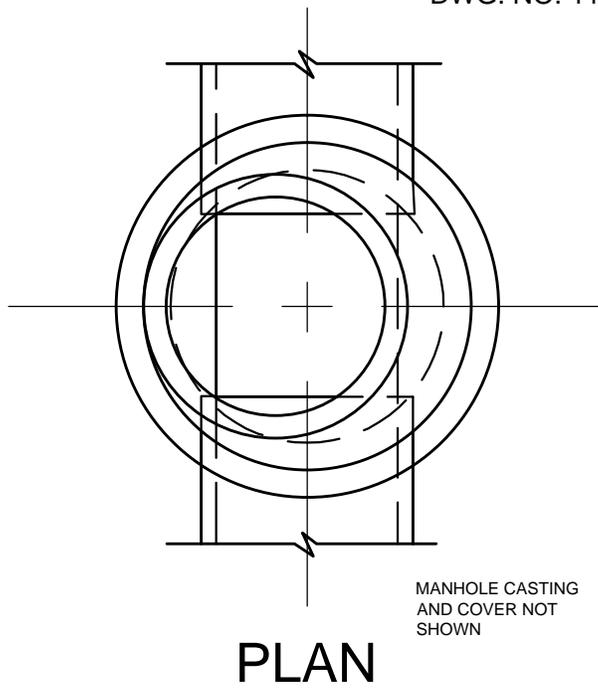
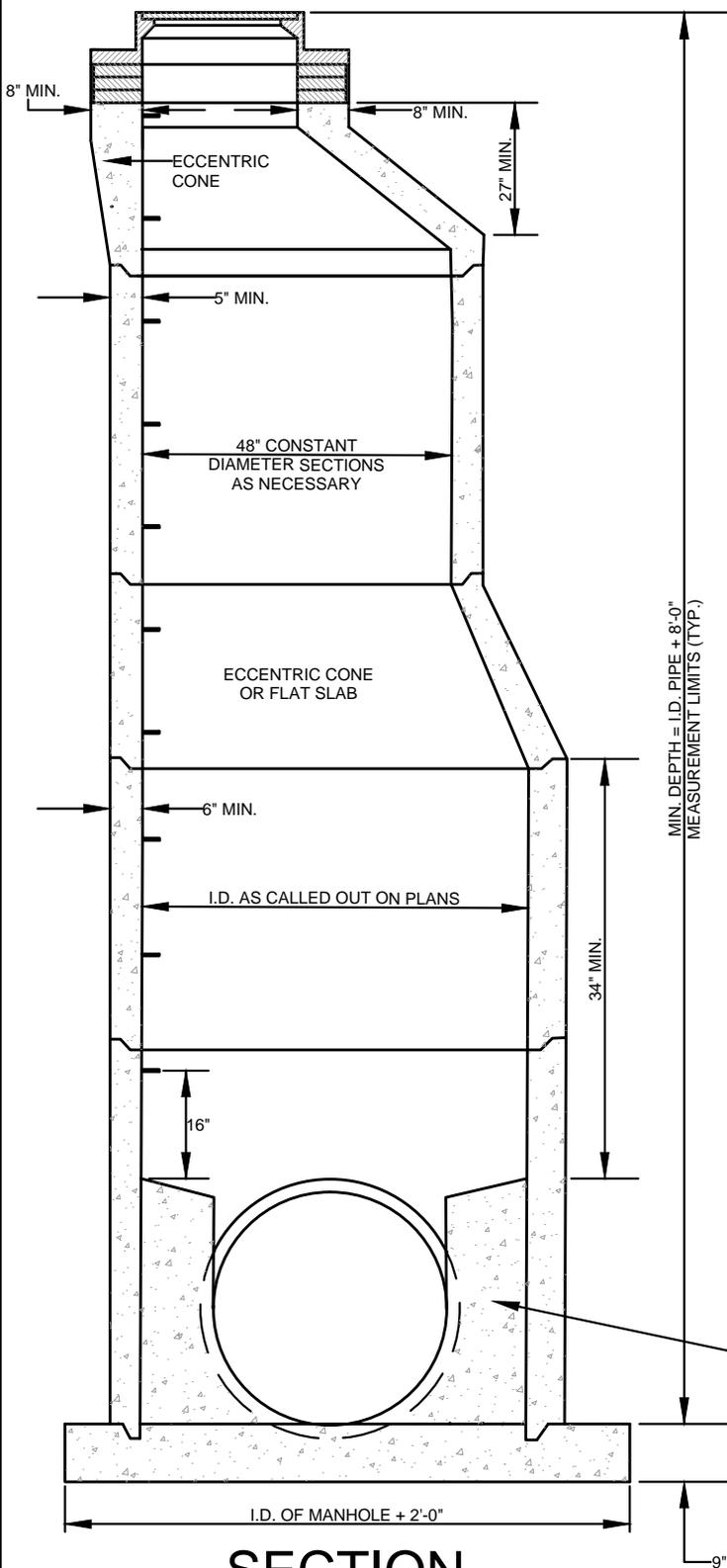
PRECAST MANHOLE

SEWER 8"-21"

NO SCALE

H:_A_ED_DESIGN_2012\12002 - Atkinson Elementary Sewer\bid documents\Standard Details\10 - MH Sewer 8in-21in.dwg, SCSE Detail, 2/5/2014 12:33:45 AM, bdetwiler, DWG To PDF.pc3, 1:0:96

SEE DRAWINGS:
 NO. 13 FOR GRADE ADJUSTMENT
 NOS. 14 AND 15 FOR CASTING DETAILS
 NOS. 33 AND 34 FOR PAVEMENT DETAIL AROUND CASTING



NOTES:

PRECAST MANHOLE SECTIONS SHALL MEET ASTM C478. MANHOLE JOINTS SHALL UTILIZE BUTYL RUBBER SEALANT, 2 PIECES ALL AROUND OR O-RING GASKETS (ASTM C443). A MINIMUM 6-INCH WIDE BUTYL RUBBER SEAL SHALL BE INSTALLED ON ALL BELOW GRADE EXTERIOR JOINTS. CONCRETE IN MANHOLES SHALL MEET THE SPECIFICATION ITEM NOS. 5 & 14.

MANHOLE STEPS SHALL BE M.A. IND. PS-1-PF REINFORCED PLASTIC STEPS OR APPROVED AQUAL. IF TOP STEP IS IN 24\" DIA. OPENING IT MAY PROJECT NO MORE THAN 3-1/2\".

FOR PIPE CONNECTIONS USE ASTM C-923 FLEXIBLE GASKET SUCH AS A-LOK, DURA SEAL III, KOR-N-SEAL OR APPROVED EQUAL.

TAR STRIPS SHALL BE USED AT ALL JOINTS. THE CONTRACTOR SHALL APPLY TAR OVER THE CEMENT PARGING ON THE OUTSIDE OF THE ADJUSTMENT RINGS AND OVER THE MANHOLE CASTING EXTERIOR.

CONCRETE WITH STEEL TROWL FINISH OR PRECAST INVERT CHANNELS AND BENCH.

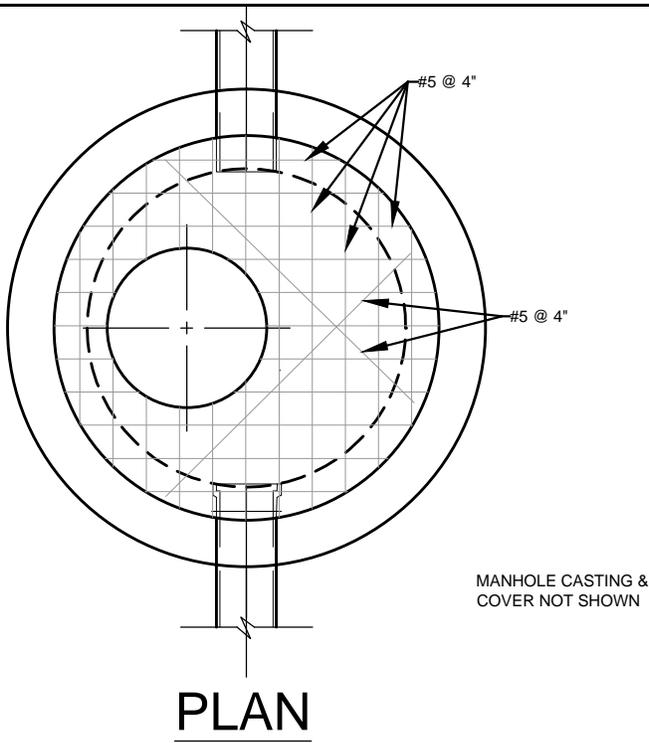
SECTION

REVISION	DATE	BY

CITY OF HENDERSONVILLE ENGINEERING DEPARTMENT	
DETAIL DWG. NO.	11
ITEM NO.	
PRECAST MANHOLE	
SEWERS 24" THRU 48"	

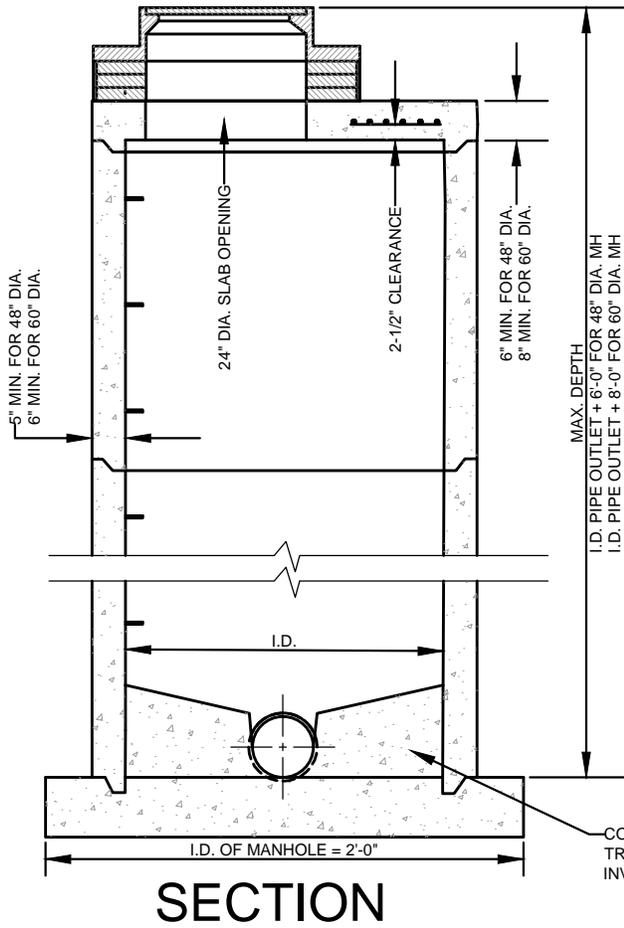
NO SCALE

H:_A_ED_DESIGN_2012\12002 - Atkinson Elementary Sewer\bid documents\Standard Details\11 - MH Sewers 24in-48in.dwg, Detail, 2/5/2014 12:35:44 AM, bdetwiler, DWG To PDF.pc3, 1:0.96



MANHOLE I.D.
 48" FOR SEWERS 8" THRU 21"
 60" FOR SEWERS 24" THRU 36"

SEE DRAWINGS:
 NO. 13 FOR GRADE ADJUSTMENT.
 NOS. 14 AND 15 FOR CASTING DETAILS.
 NOS. 33 AND 34 FOR PAVEMENT DETAIL AROUND CASTING



NOTES:

PRECAST MANHOLE SECTIONS SHALL MEET ASTM C478. MANHOLE JOINTS SHALL UTILIZE BUTYL RUBBER SEALANT, 2 PIECES ALL AROUND OR O-RING GASKETS (ASTM C443). A MINIMUM 6-INCH WIDE BUTYL RUBBER SEAL SHALL BE INSTALLED ON ALL BELOW GRADE EXTERIOR JOINTS. CONCRETE IN MANHOLES SHALL MEET THE SPECIFICATION ITEM NOS. 5 & 14.

MANHOLE STEPS SHALL BE M.A. IND. PS-1-PF REINFORCED PLASTIC STEPS OR APPROVED AQUAL. IF TOP STEP IS IN 24" DIA. OPENING IT MAY PROJECT NO MORE THAN 3-1/2".

FOR PIPE CONNECTIONS USE ASTM C-923 FLEXIBLE GASKET SUCH AS A-LOK, DURA SEAL III, KOR-N-SEAL OR APPROVED EQUAL.

TAR STRIPS SHALL BE USED AT ALL JOINTS. THE CONTRACTOR SHALL APPLY TAR OVER THE CEMENT PARING ON THE OUTSIDE OF THE ADJUSTMENT RINGS AND OVER THE MANHOLE CASTING EXTERIOR.

CONCRETE WITH STEEL TROWL FINISH OR PRECAST INVERT CHANNELS & BENCH.

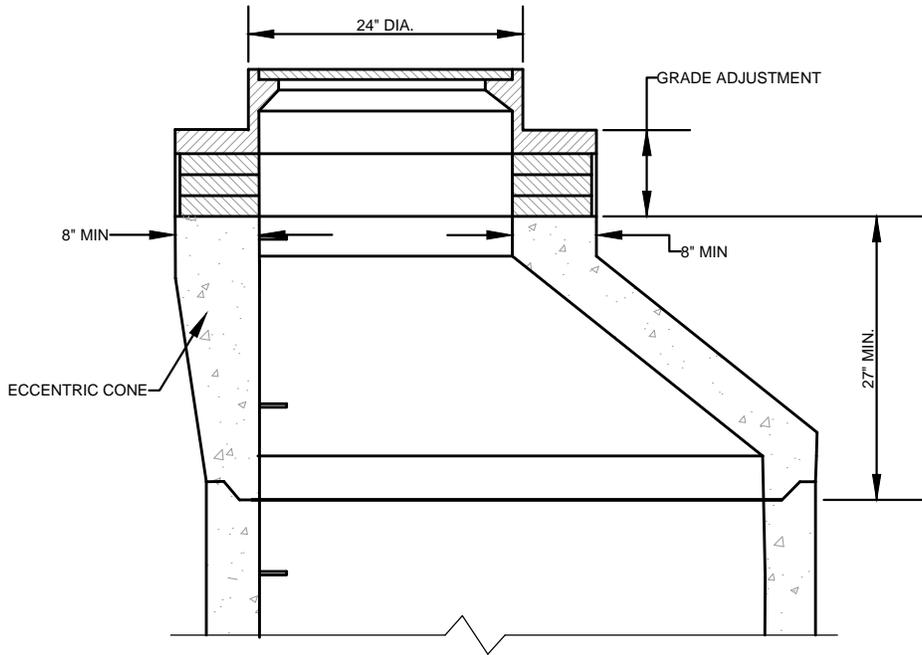
NO SCALE

REVISION	DATE	BY

CITY OF HENDERSONVILLE ENGINEERING DEPARTMENT	
DETAIL DWG. NO.	12
ITEM NO.	
<u>SHALLOW PRECAST MANHOLE</u>	

NOTE:
IF TOP STEP IS IN 24" DIA.
OPENING, IT MAY PROJECT
NO MORE THAN 3-1/2".

PRECAST MANHOLE SECTIONS
SHALL MEET ASTM C478.
MANHOLE JOINTS SHALL MEET
ASTM C443.



MIN. HEIGHT 6" - ANY COMBINATION OF PRECAST
RINGS AND/OR SEWER MANHOLE BRICK.

MAX. HEIGHT 12" - ANY COMBINATION OF
PRECAST RINGS AND/OR SEWER MANHOLE BRICK
- BRICK COURSES NOT TO EXCEED TWO.

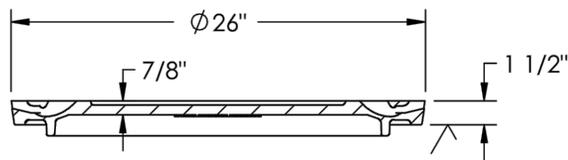
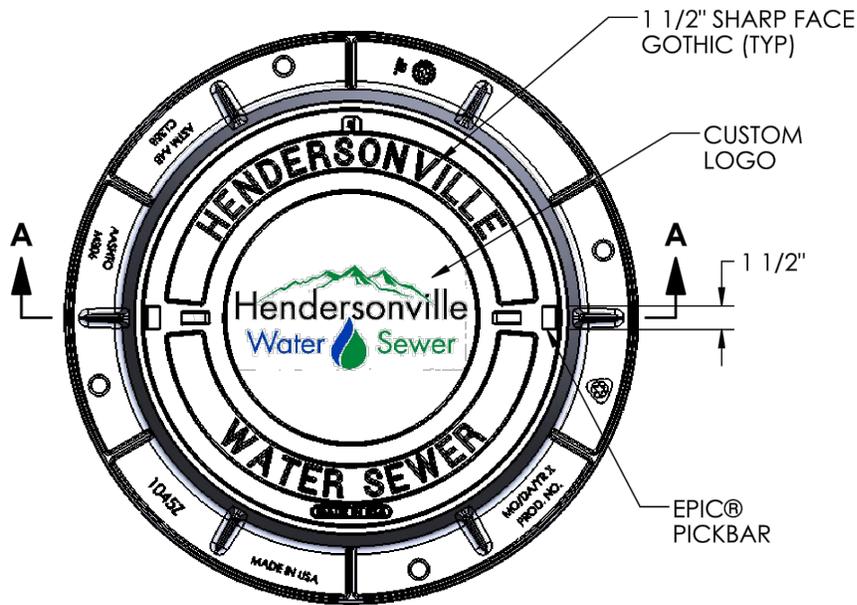
APPLY 3/4" CEMENT MORTAR TO INSIDE OF
PRECAST RINGS AND/OR MANHOLE BRICK. APPLY
1/2" BITUMINOUS SEAL TO OUTSIDE OF PRECAST
RINGS AND/OR MANHOLE BRICK. CONTRACTOR
SHALL APPLY TAR OVER CEMENT PARGING ON
THE OUTSIDE OF THE ADJUSTMENT RINGS AND
OVER THE MANHOLE CASTING EXTERIOR.

NOTE:
THIS DETAIL APPLIES FOR
ECCENTRIC CONE SECTIONS OR
PRECAST FLAT SLAB TOP.

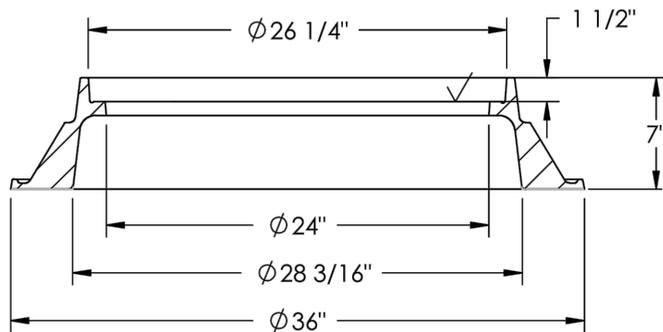
NO SCALE

REVISION	DATE	BY

CITY OF HENDERSONVILLE ENGINEERING DEPARTMENT	
DETAIL DWG. NO.	13
ITEM NO.	_____
MANHOLE GRADE	
ADJUSTMENT DETAIL	



MANHOLE COVER



SECTION A-A

MANHOLE CASTING

NOTE:
COVER SHALL BEAR THE WORDS:
"SANITARY SEWER"

REVISION	DATE	BY

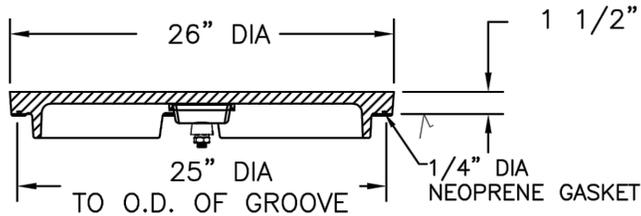
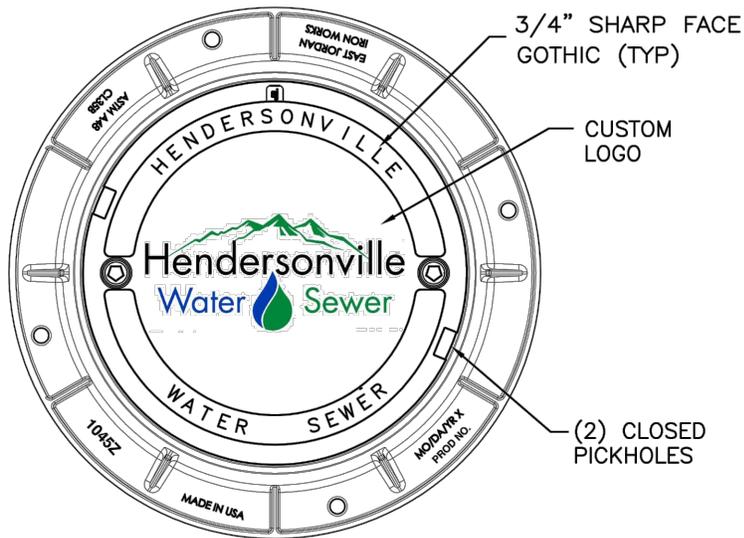
CITY OF HENDERSONVILLE
ENGINEERING DEPARTMENT

DETAIL DWG. NO. 14A

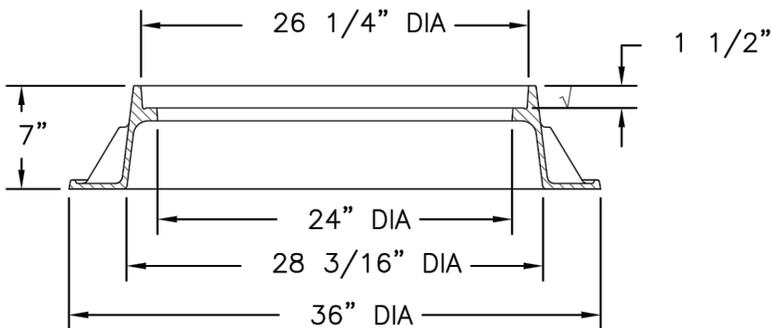
ITEM NO. _____

**STANDARD MANHOLE
CASTING & COVER**

NO SCALE

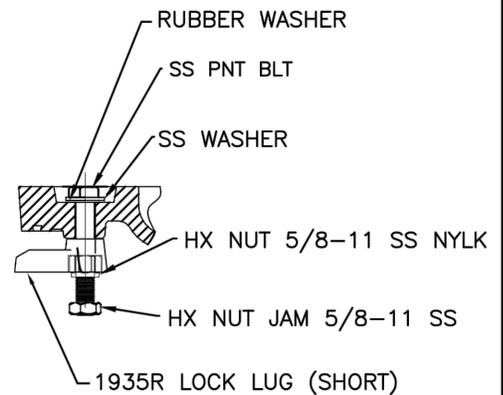


MANHOLE COVER



MANHOLE CASTING

NOTE:
COVER SHALL BEAR THE WORDS:
"SANITARY SEWER"



LOCK LUG ASSEMBLY

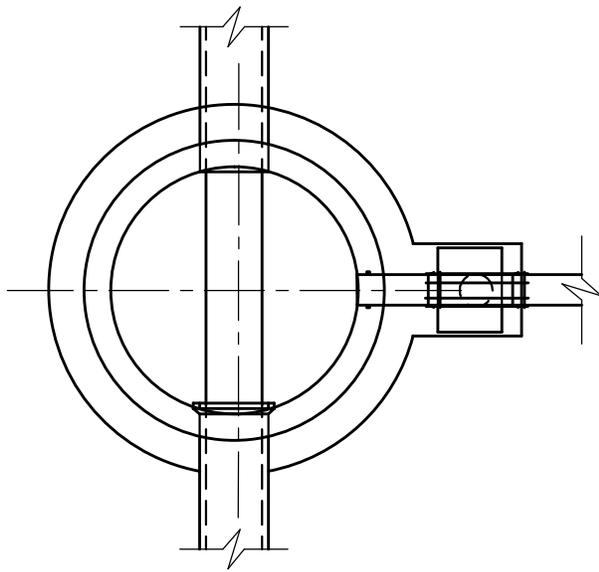
REVISION	DATE	BY

NO SCALE

CITY OF HENDERSONVILLE
ENGINEERING DEPARTMENT

DETAIL DWG. NO. 14B
ITEM NO. _____

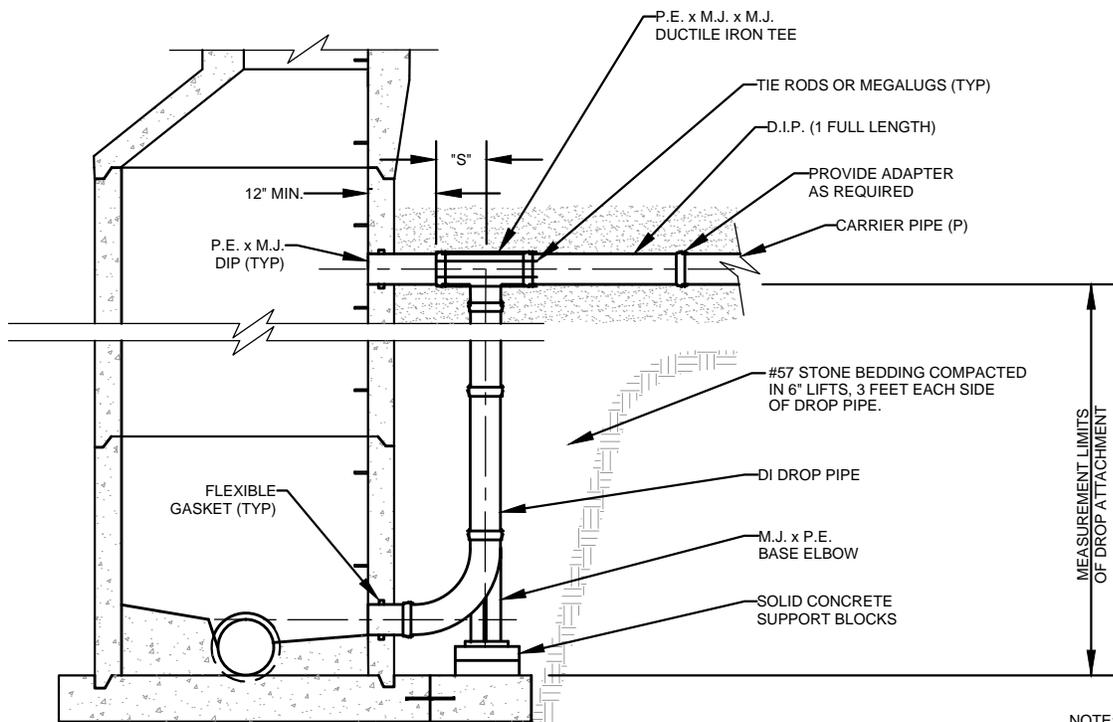
WATERTIGHT, LOCKING
MANHOLE CASTING & COVER



PLAN

SEWER SIZE	DROP SIZE
8"	8"
10"	10"
12", 15", 18"	12"
21", 24"	15"
27", 30", 36"	18"

TABLE OF DIMENSIONS	
"P"	"S"
6"	16"
8"	17"
10"	19"
12"	20"

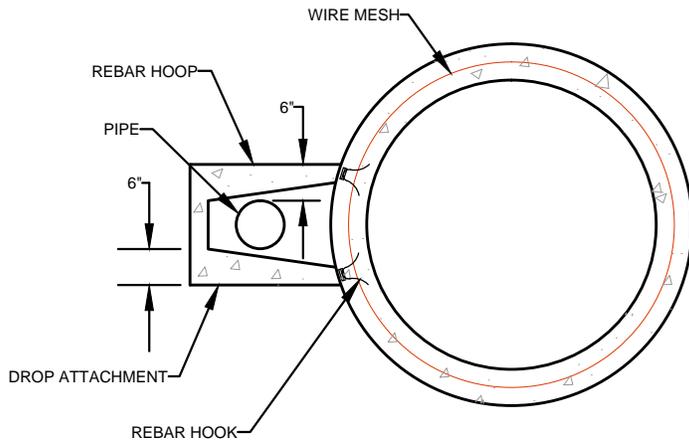


NOTE:
ALL DIP TO BE CLASS 350

SECTION

			CITY OF HENDERSONVILLE ENGINEERING DEPARTMENT	
			DETAIL DWG. NO. _____	15
			ITEM NO. _____	
			DROP ATTACHMENT VCP, PVC & ABS	
			CARRIER PIPE INTO PROP. MANHOLE	
REVISION	DATE	BY		

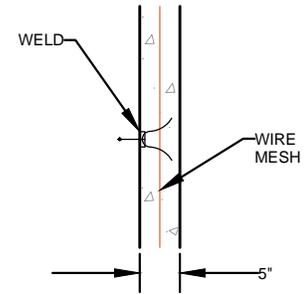
NO SCALE



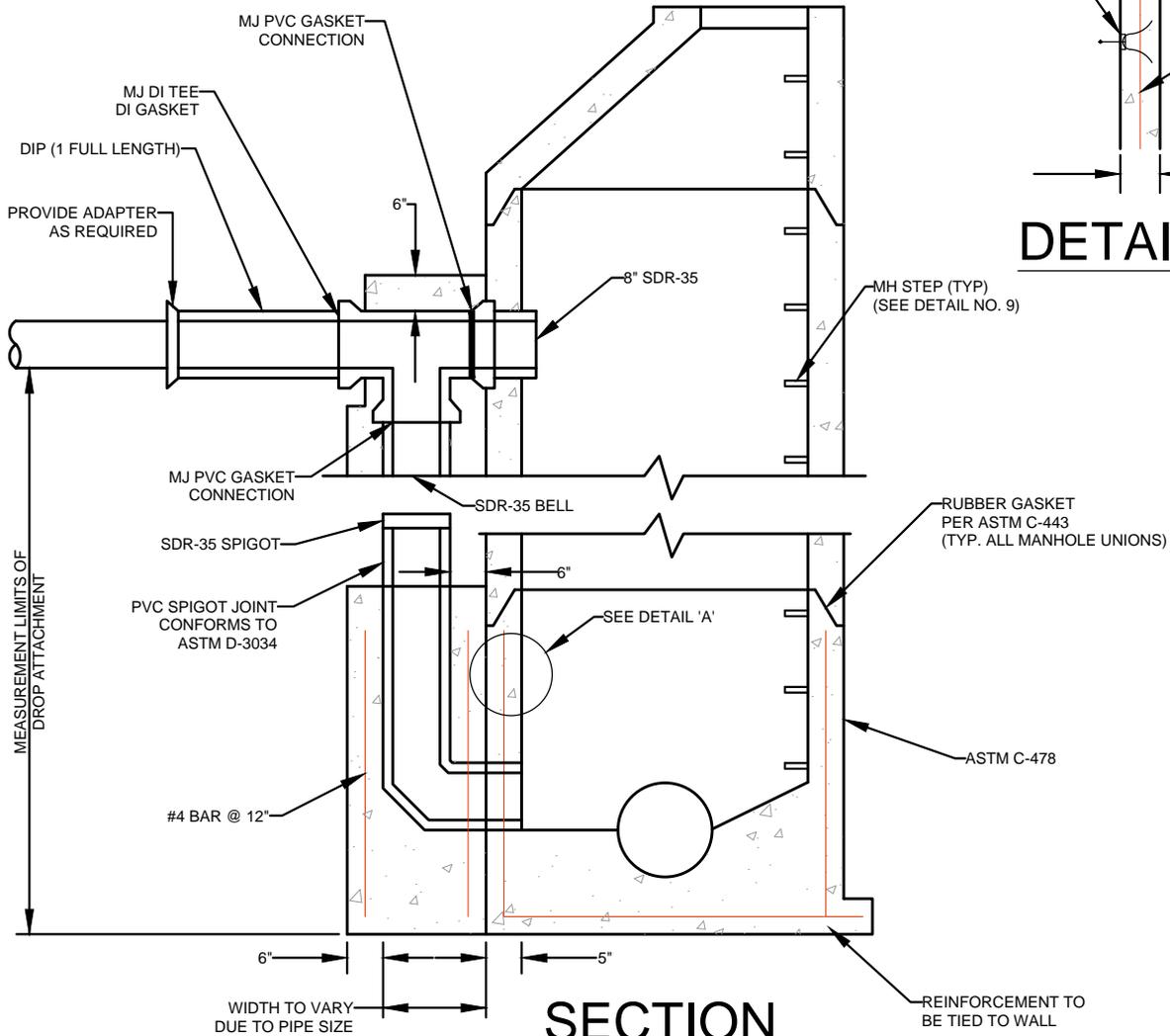
PLAN

SEWER SIZE	DROP SIZE
8"	8"
10"	10"
12", 15", 18"	12"
21", 24"	15"
27", 30", 36"	18"

#4 REBAR HOOPS WELDED TO REBAR HOOKS CAST IN CONCRETE AT 12" CENTERS.



DETAIL 'A'



SECTION

NO SCALE

REVISION	DATE	BY

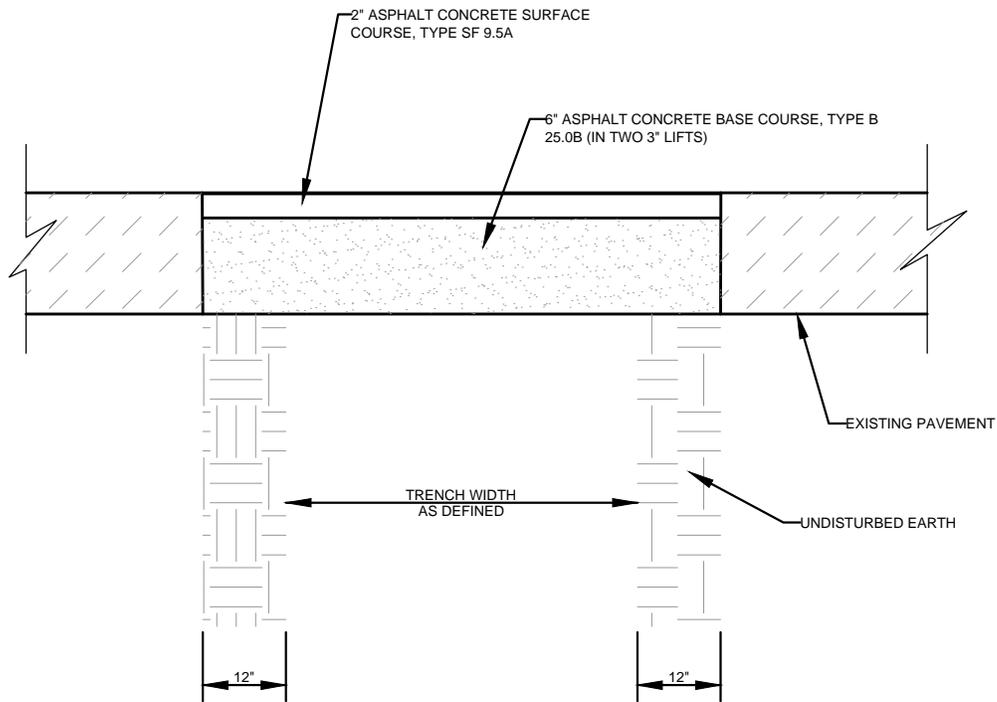
CITY OF HENDERSONVILLE
ENGINEERING DEPARTMENT

DETAIL DWG. NO. 17

ITEM NO. _____

PRECAST CONCRETE

DROP MANHOLE



GENERAL PAVEMENT NOTE:
 WHERE EDGES OF REPLACED SECTIONS EXTENDS WITHIN 2'-0" OF ROADWAY EDGE, PAVEMENT IS TO BE REPLACED TO ROADWAY EDGE AT NO ADDITIONAL COST.

PAYMENT LIMIT FOR ALL PAVEMENT SHALL BE TRENCH WIDTH + 2'-0"

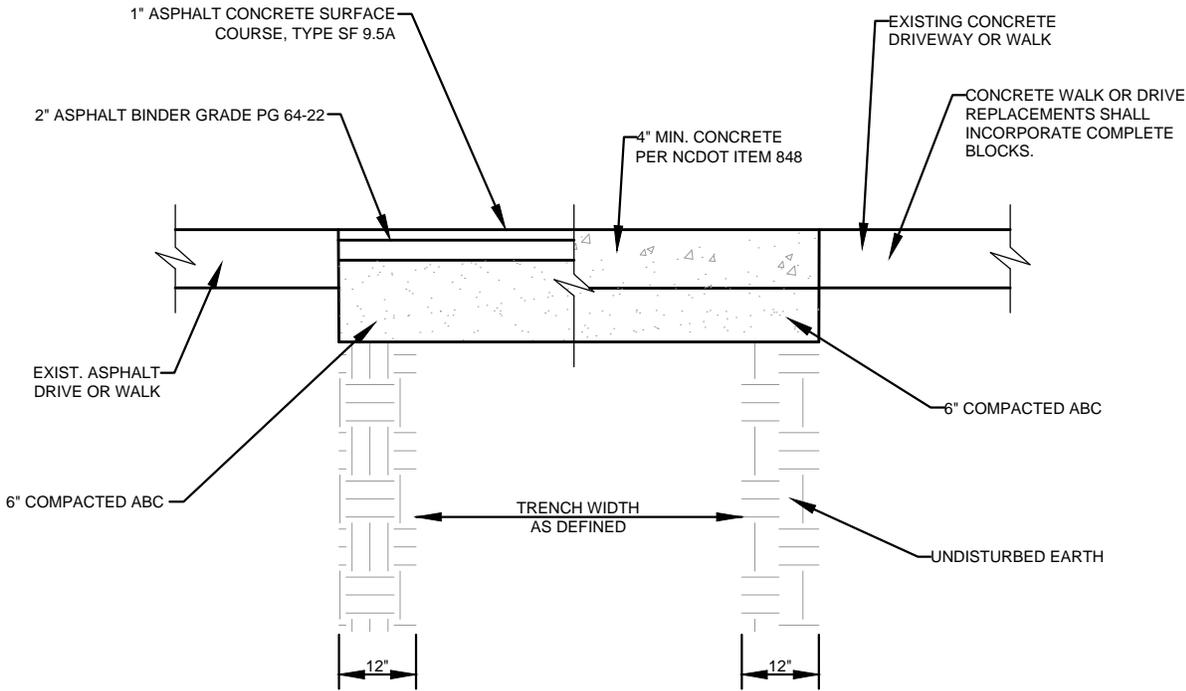
NO SCALE

REVISION	DATE	BY

CITY OF HENDERSONVILLE ENGINEERING DEPARTMENT	
DETAIL DWG. NO.	18
ITEM NO.	
<u>ASPHALT CONC. SURFACE COURSE</u>	
<u>ASPHALT CONC. BASE COURSE</u>	

ASPHALT APPROACHES TO DRIVEWAYS OTHER THAN ASPHALT, SHALL NOT BE PATCHED, AND REPLACED ENTIRELY. INSTEAD, THE 1" SURFACE COURSE SHALL BE CONSTRUCTED AT THE SAME TIME THE ROAD IS PAVED.

PAYMENT LIMIT FOR ALL PAVEMENT SHALL BE TRENCH WIDTH + 2'-0"



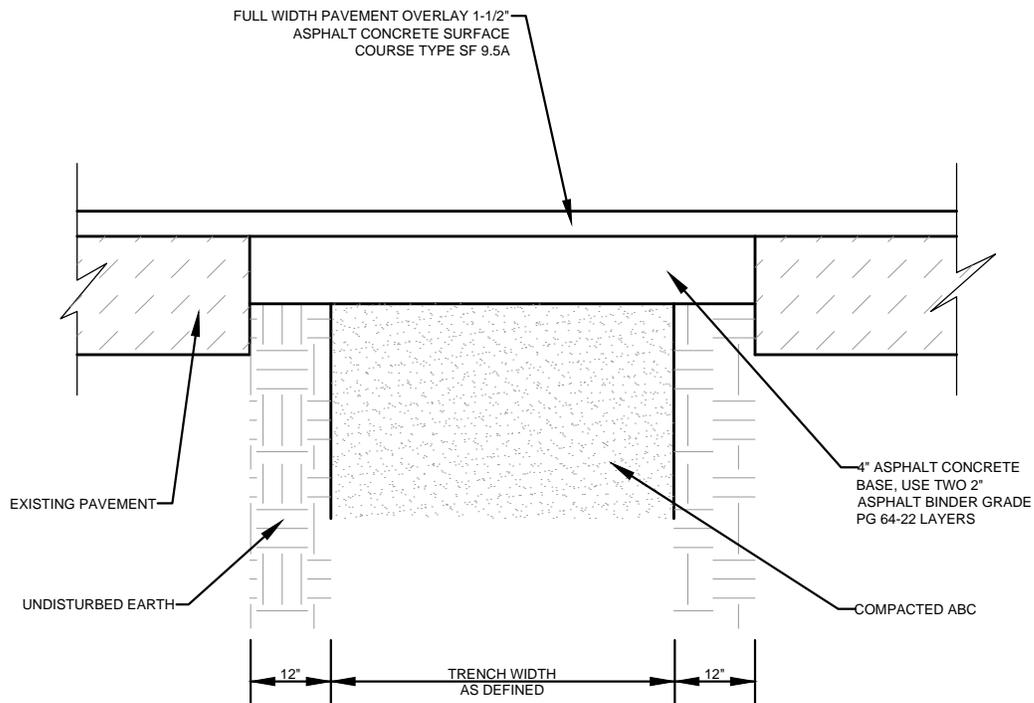
GENERAL PAVEMENT NOTE:
WHERE EDGES OF REPLACED SECTIONS EXTENDS WITHIN 2'-0" OF ROADWAY EDGE, PAVEMENT IS TO BE REPLACED TO ROADWAY EDGE AT NO ADDITIONAL COST.

* 4" MIN FOR CONCRETE SIDEWALK REPLACEMENT, 6" FOR DRIVEWAYS OR DRIVE APRON REPLACEMENT.

NO SCALE

			CITY OF HENDERSONVILLE ENGINEERING DEPARTMENT	
REVISION	DATE	BY	DETAIL DWG. NO. _____	20
			ITEM NO. _____	
			_____ ASPHALT OR CONCRETE _____	
			_____ DRIVEWAY AND WALKWAY _____	

GENERAL PAVEMENT NOTE:
 WHERE EDGES OF REPLACED
 SECTIONS EXTENDS WITHIN 2'-0"
 OF ROADWAY EDGE, 4" ASPHALT
 BINDER GRADE PG 64-22 AND AND
 1-1/2" ASPHALT CONCRETE
 SURFACE COURSE IS TO BE
 REPLACED TO ROADWAY EDGE
 AT NO ADDITIONAL COST.

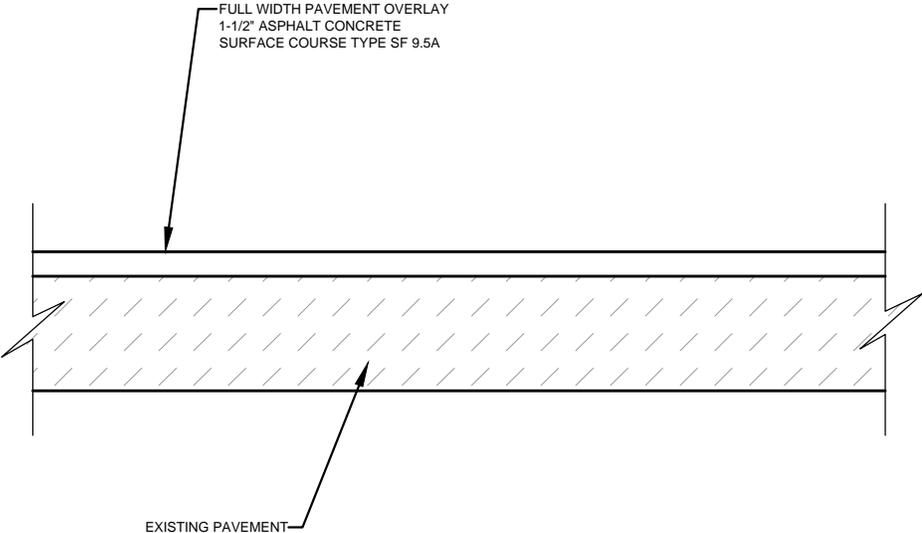


NOTES:

1. THE ENTIRE STREET PAVEMENT SHALL BE MILLED DOWN 1-1/2" PER NCDOT ITEM 607 FOR THE 1-1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF 9.5A OVERLAY PAVEMENT TO MAINTAIN EXISTING ROADWAY ELEVATIONS. THE 1-1/2" LAYER OF ASPHALT CONCRETE SURFACE COURSE SHALL BE APPLIED AS ONE UNIFORM SEAMLESS LAYER ACROSS THE PAVEMENT WIDTH.
2. SEAL BETWEEN ASPHALT CONCRETE SURFACE COURSE OVERLAY AND EXISTING SURFACES PER NCDOT ITEM 605.

NO SCALE

			CITY OF HENDERSONVILLE ENGINEERING DEPARTMENT	
REVISION	DATE	BY	DETAIL DWG. NO.	21
			ITEM NO.	
			<u>ASPHALT CONCRETE PAVEMENT</u>	
			<u>REPLACEMENT W/FULL WIDTH OVERLAY</u>	



- NOTES:
1. THE ENTIRE STREET PAVEMENT SHALL BE MILLED DOWN 1-1/2" PER NCDOT 607 FOR THE 1-1/2" ASPHALT CONCRETE SURFACE COURSE OVERLAY TO MAINTAIN EXISTING ROADWAY ELEVATIONS. THE 1-1/2" LAYER OF ASPHALT CONCRETE SURFACE COURSE SHALL BE APPLIED AS ONE UNIFORM SEAMLESS LAYER ACROSS THE PAVEMENT WIDTH.
 2. SEAL BETWEEN ASPHALT CONCRETE SURFACE COURSE OVERLAY AND EXISTING SURFACES PER NCDOT ITEM 605.

REVISION	DATE	BY

CITY OF HENDERSONVILLE
ENGINEERING DEPARTMENT

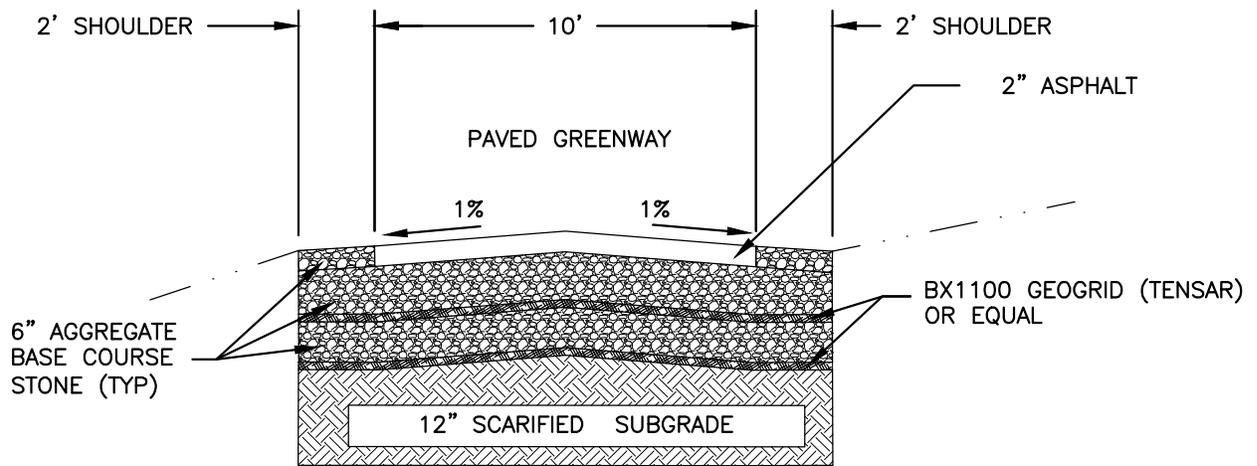
DETAIL DWG. NO. 22

ITEM NO. _____

ASPHALT CONCRETE

FULL WIDTH OVERLAY

NO SCALE



TYPICAL GREENWAY CROSS-SECTION
NTS

REVISION	DATE	BY

CITY OF HENDERSONVILLE
ENGINEERING DEPARTMENT

DETAIL DWG. NO. 23

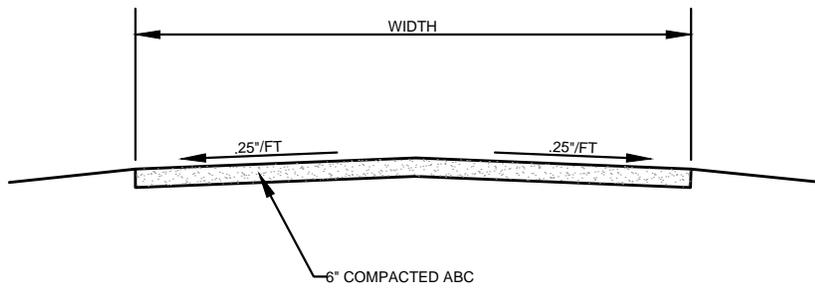
ITEM NO. _____

STANDARD ASPHALT

GREENWAY TRAIL

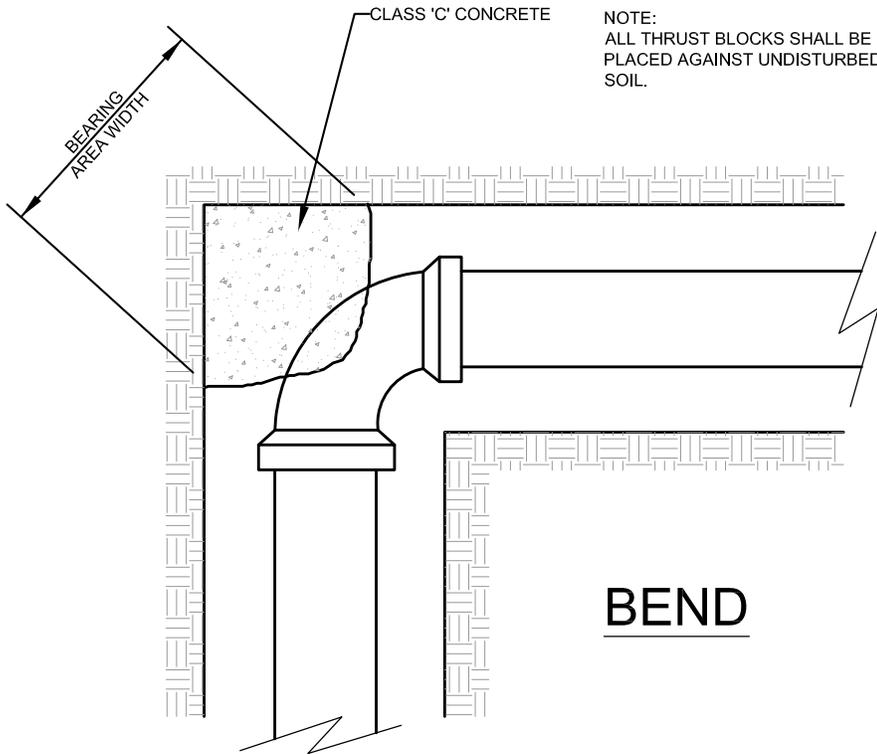
NO SCALE

PAYMENT LIMIT FOR ALL PAVEMENT
SHALL BE TRENCH WIDTH + 2'-0"



NO SCALE

			CITY OF HENDERSONVILLE ENGINEERING DEPARTMENT	
REVISION	DATE	BY	DETAIL DWG. NO.	25
			ITEM NO.	
			GRAVEL DRIVE	

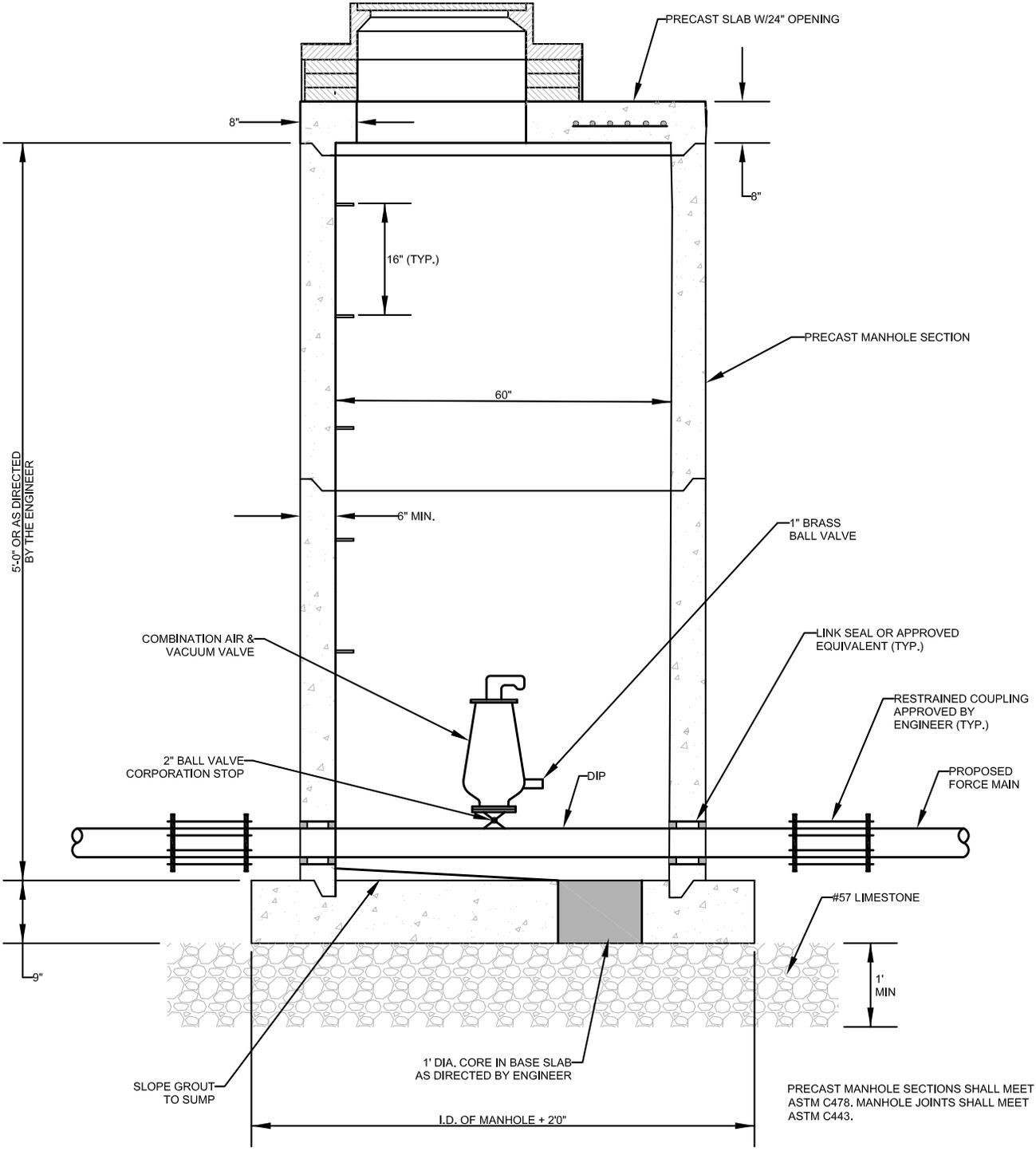


MIN. BEARING AREAS IN SQUARE FT. FOR FORCE MAIN				
MAIN SIZE	TEE P.E.	90° BEND	45° BEND	22 1/2° BEND
4"	2	3	2	1
6"	5	7	4	2
8"	8	11	6	3
10"	12	17	9	5
12"	17	24	13	7

CITY OF HENDERSONVILLE ENGINEERING DEPARTMENT		
REVISION	DATE	BY
DETAIL DWG. NO. <u>27</u> ITEM NO. _____ <u>THRUST BLOCK SCHEDULE</u> _____		

NO SCALE

SEE DRAWINGS:
 NO. 12 FOR CHAMBER DETAILS
 NO. 13 FOR GRADE ADJUSTMENT
 NO. 14 FOR CASTING DETAILS



REVISION	DATE	BY

CITY OF HENDERSONVILLE
 SANITARY ENGINEERING DEPT

DETAIL DWG. NO. 28

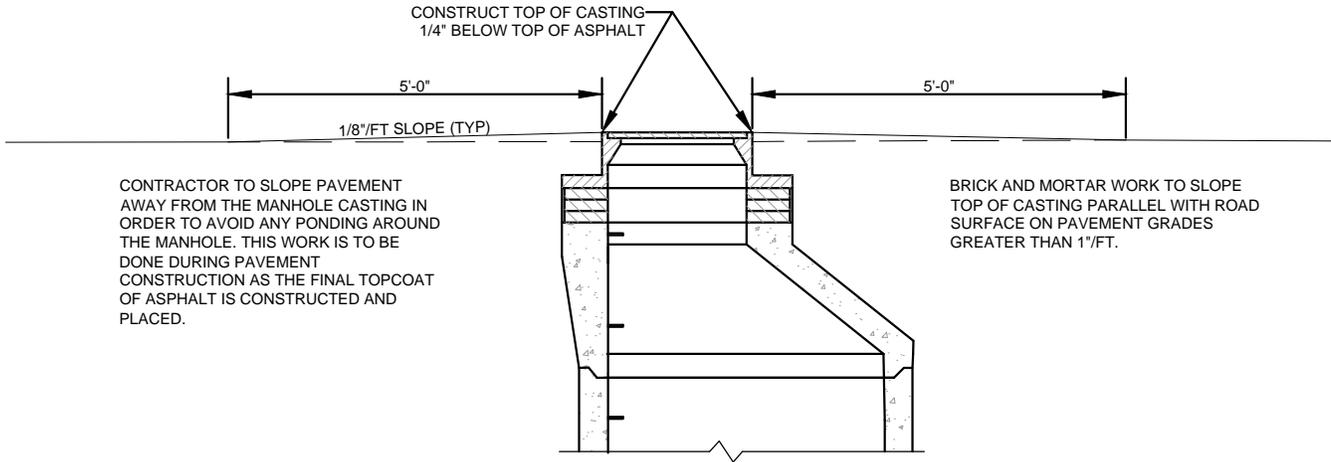
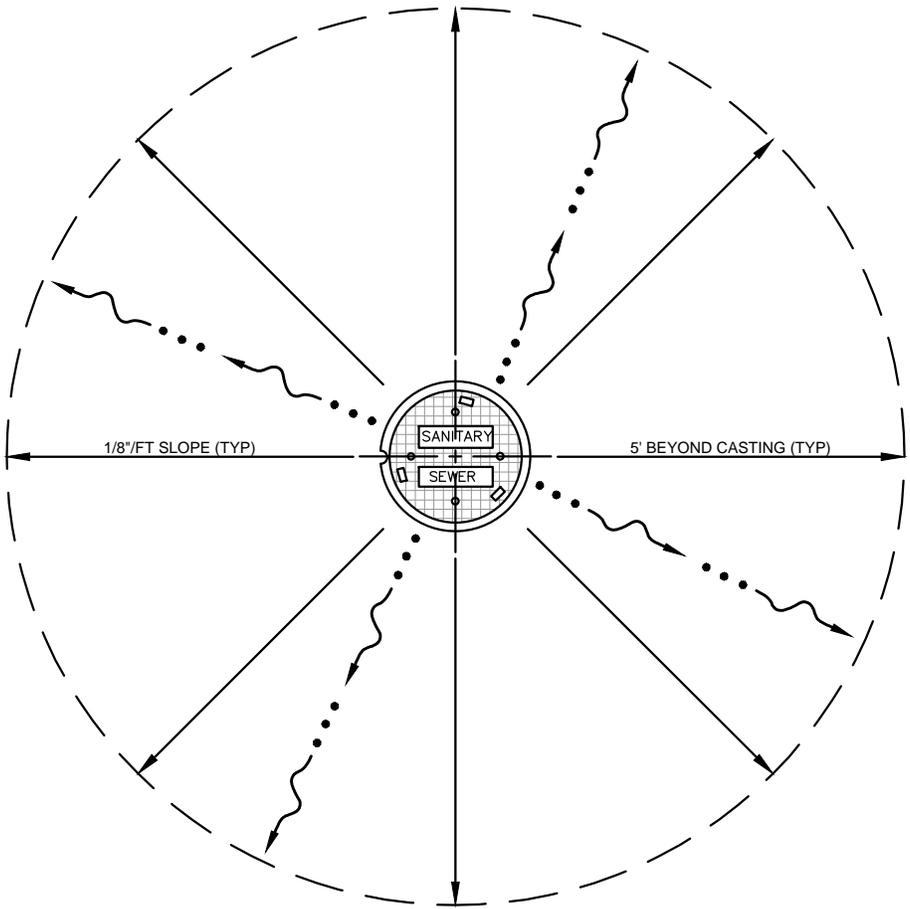
ITEM NO. _____

COMBINATION AIR RELEASE &
AIR VACUUM VALVE CHAMBER

NO SCALE

H:_A_ED_DESIGN_2012\12002 - Atkinson Elementary Sewer\bid documents\Standard Details\28 - Combination Air Release.dwg, Detail: 12/11/2012 4:42:33 PM, Adobe PDF.pc3

THIS DRAWING IS FOR ROAD GRADES LESS THAN 1" PER FOOT (i.e. LEVEL ±). SEE DRAWING 34 FOR ROAD GRADES GREATER THAN 1" PER FOOT.



REVISION	DATE	BY

CITY OF HENDERSONVILLE
ENGINEERING DEPARTMENT

DETAIL DWG. NO. 33

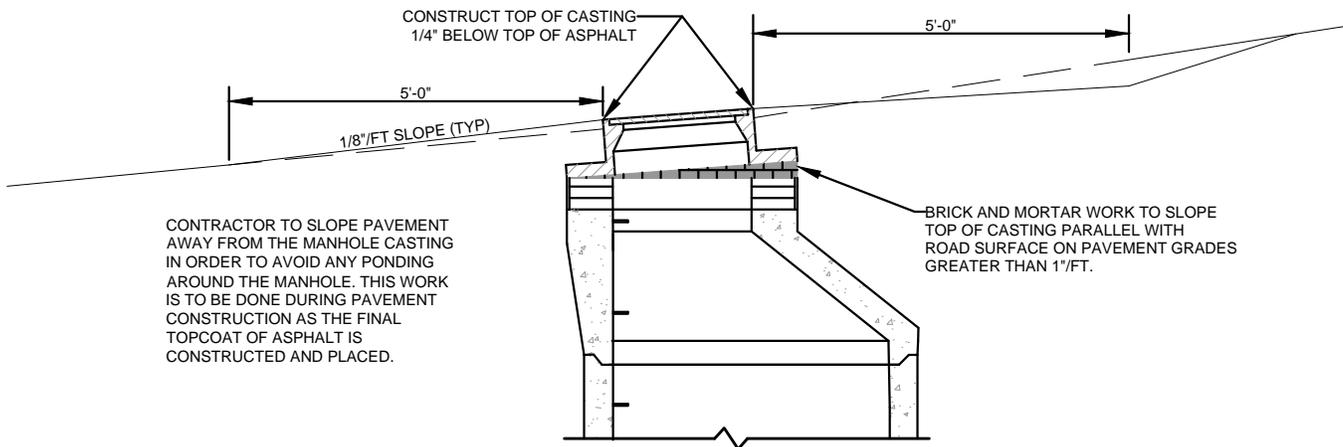
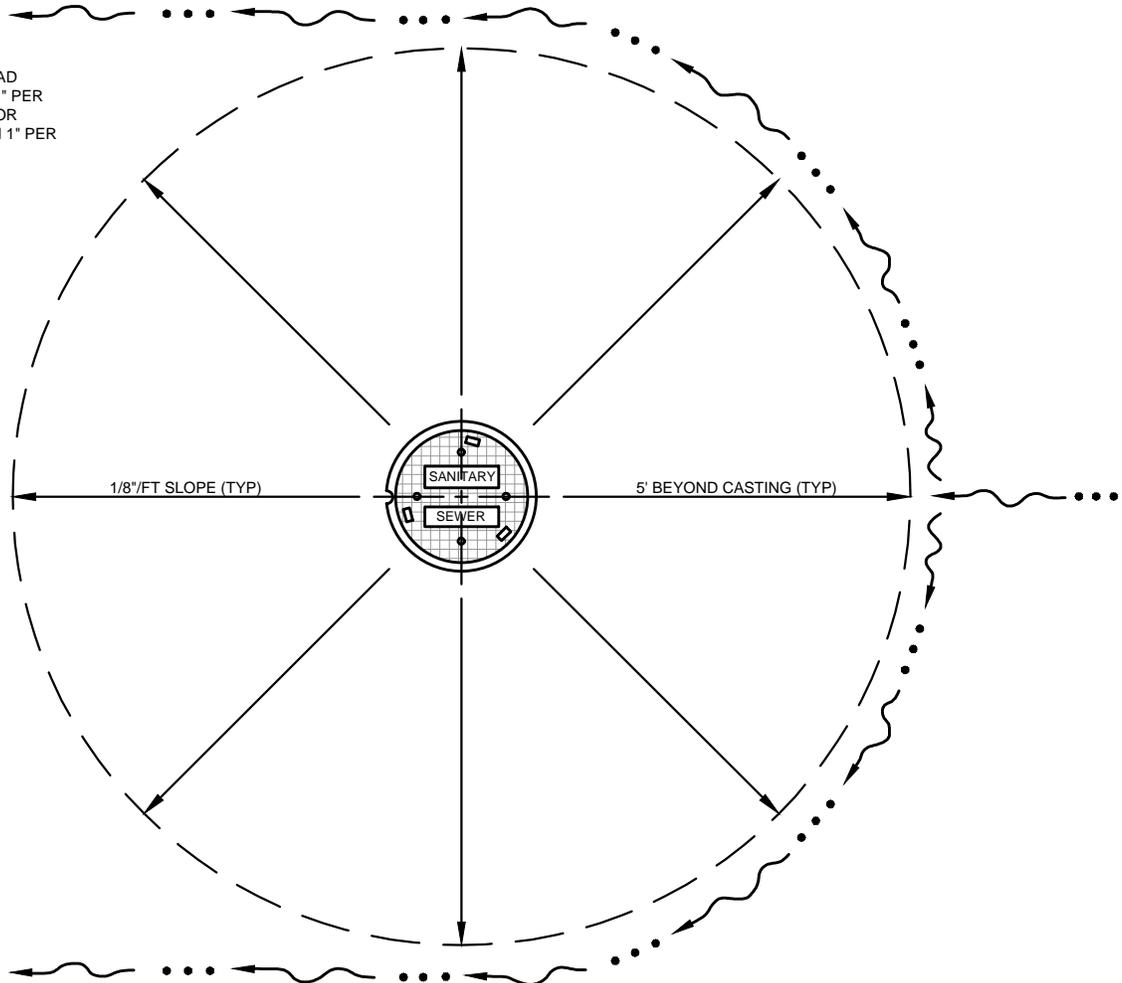
ITEM NO. _____

MH CASTING SET IN NEW ASPHALT PAVEMENT

ROAD GRADES LESS THAN 1" PER FOOT

NO SCALE

THIS DRAWING IS FOR ROAD GRADES GREATER THAN 1" PER FOOT. SEE DRAWING 33 FOR ROAD GRADES LESS THAN 1" PER FOOT (i.e. LEVEL ±)



CONTRACTOR TO SLOPE PAVEMENT AWAY FROM THE MANHOLE CASTING IN ORDER TO AVOID ANY PONDING AROUND THE MANHOLE. THIS WORK IS TO BE DONE DURING PAVEMENT CONSTRUCTION AS THE FINAL TOPCOAT OF ASPHALT IS CONSTRUCTED AND PLACED.

BRICK AND MORTAR WORK TO SLOPE TOP OF CASTING PARALLEL WITH ROAD SURFACE ON PAVEMENT GRADES GREATER THAN 1"/FT.

NO SCALE

REVISION	DATE	BY

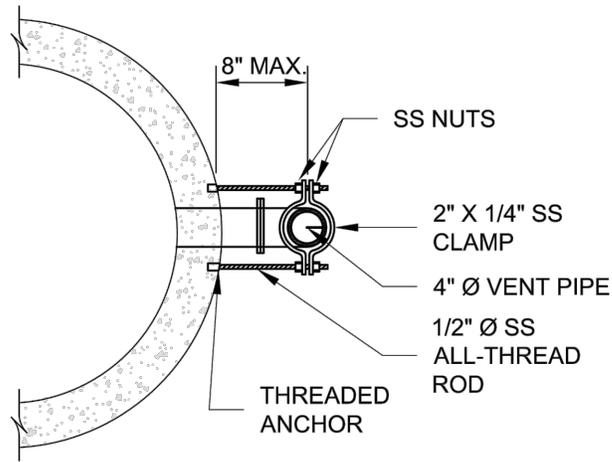
CITY OF HENDERSONVILLE
ENGINEERING DEPARTMENT

DETAIL DWG. NO. 34

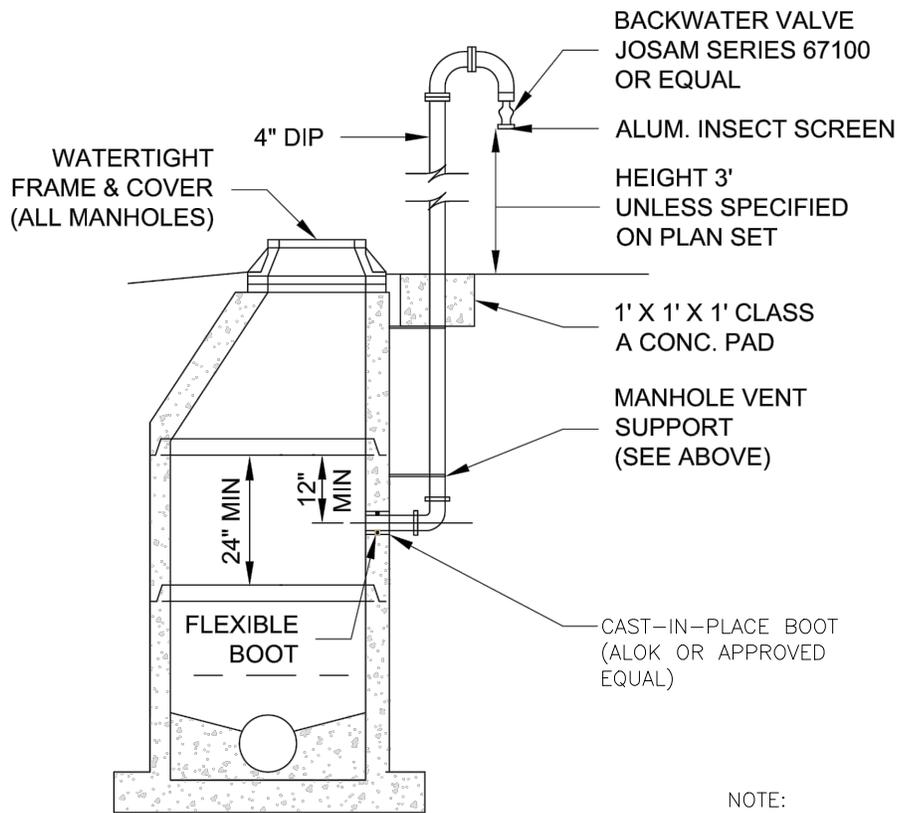
ITEM NO. _____

MH CASTING SET IN NEW ASPHALT PAVEMENT

ROAD GRADES GREATER THAN 1" PER FOOT



NOTE:
1. ANCHOR HOLES SHALL NOT EXTEND THROUGH MANHOLE WALL.



NOTE:
DIP MAY BE UNLINED.

REVISION	DATE	BY

CITY OF HENDERSONVILLE
ENGINEERING DEPARTMENT

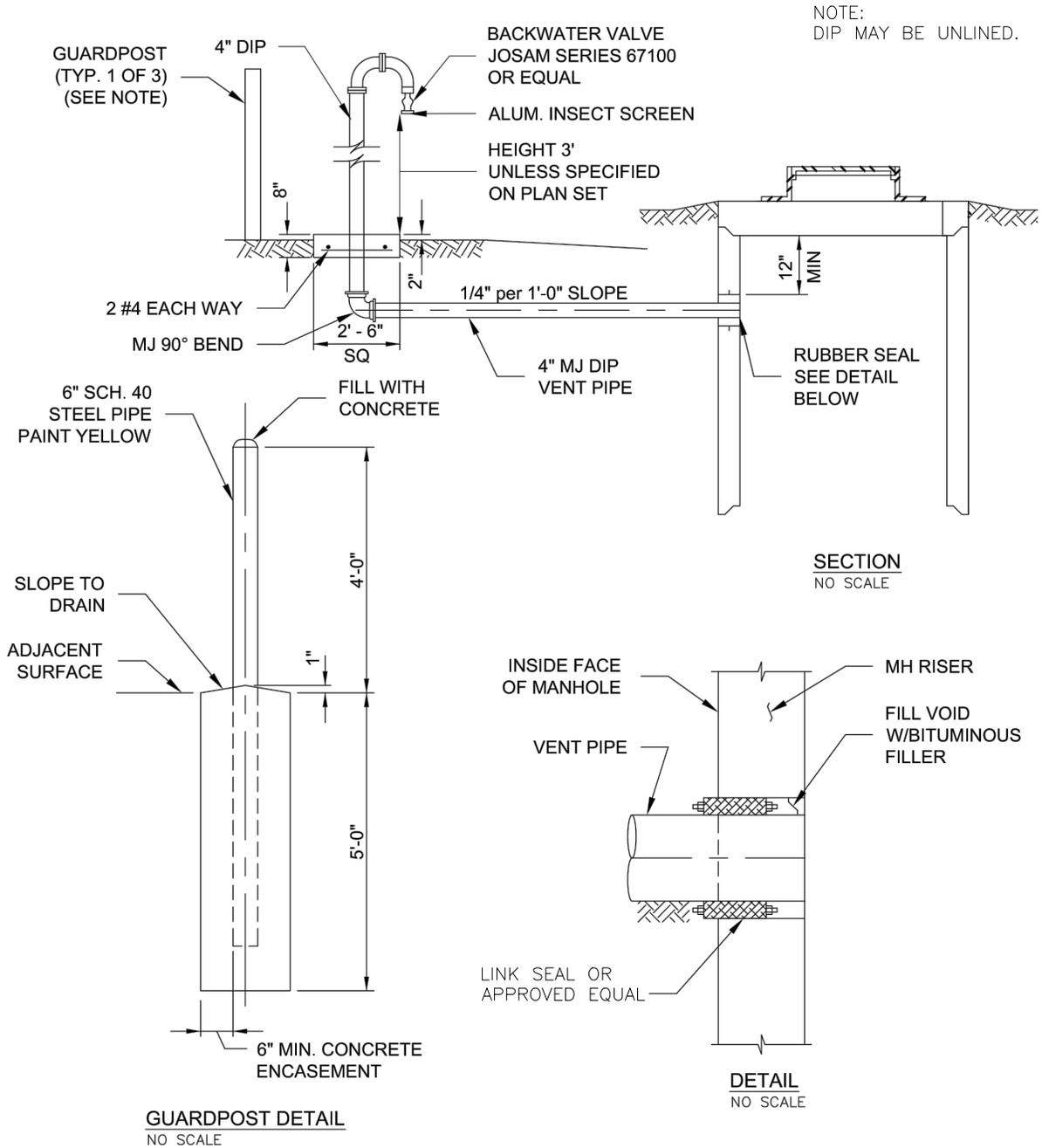
DETAIL DWG. NO. 35

ITEM NO. _____

VENTED MANHOLE

NO SCALE

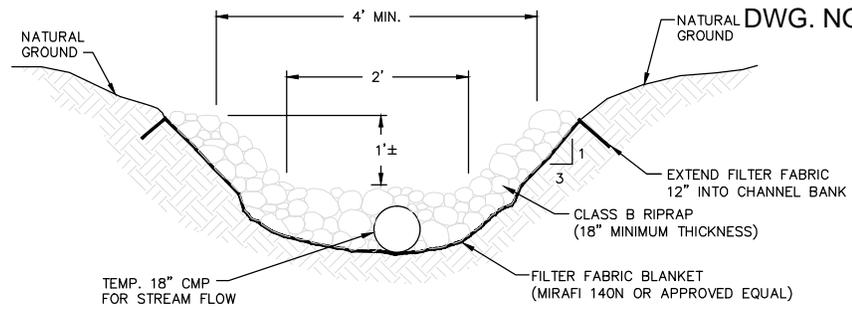
1. PLACE THREE GUARDPOSTS 2'-6" UPSTREAM OF CENTERLINE OF VALVE ASSEMBLY SPACED 2'-0" ON CENTERS.



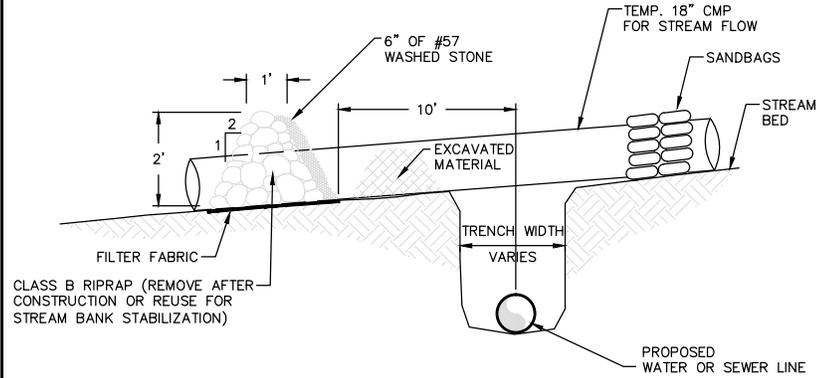
NO SCALE

REVISION			DATE	BY

CITY OF HENDERSONVILLE ENGINEERING DEPARTMENT	
DETAIL DWG. NO.	35A
ITEM NO.	
VENTED MANHOLE (OFFSET)	

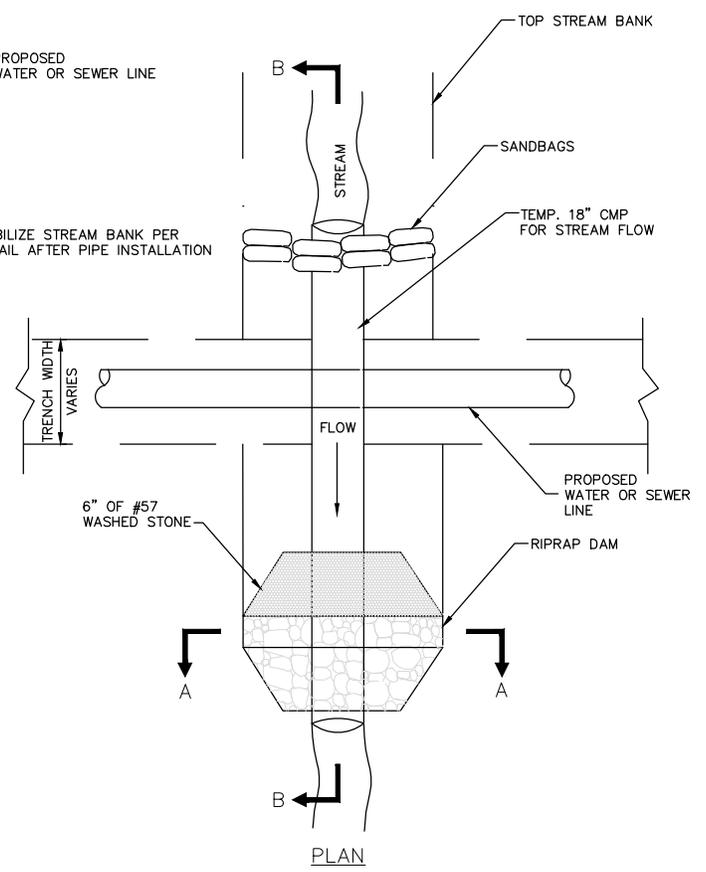


SECTION AA



SECTION BB

NOTE: STABILIZE STREAM BANK PER DETAIL AFTER PIPE INSTALLATION



PLAN

NOTE: ALL DISCHARGE FROM DEWATERING THE WORK AREA SHALL BE PUMPED TO EITHER A TEMPORARY SEDIMENT TRAP OR DEWATERING SILT BAG PER DETAILS

REVISION	DATE	BY

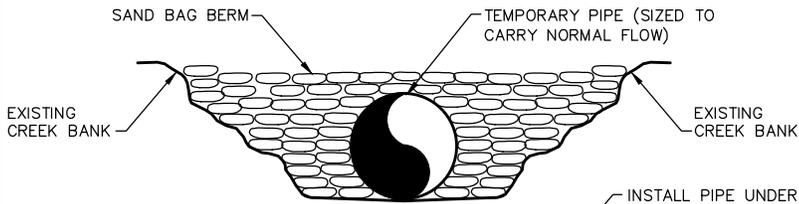
CITY OF HENDERSONVILLE
ENGINEERING DEPARTMENT

DETAIL DWG. NO. 36A

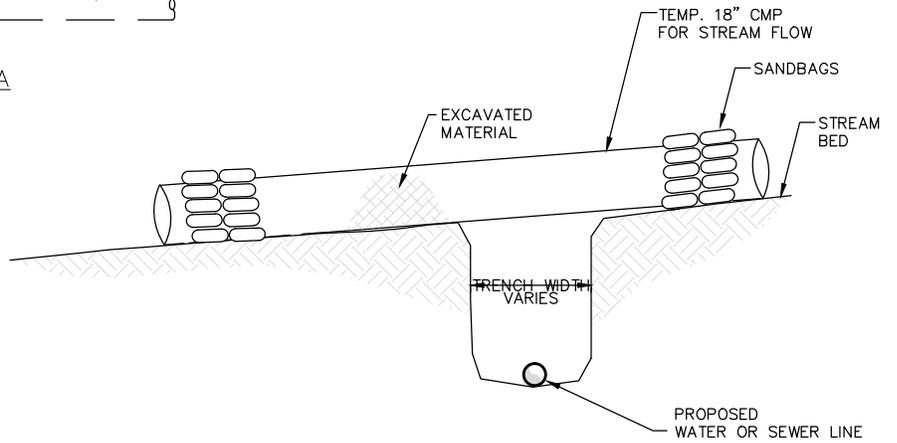
ITEM NO. _____

SMALL CREEK CROSSING

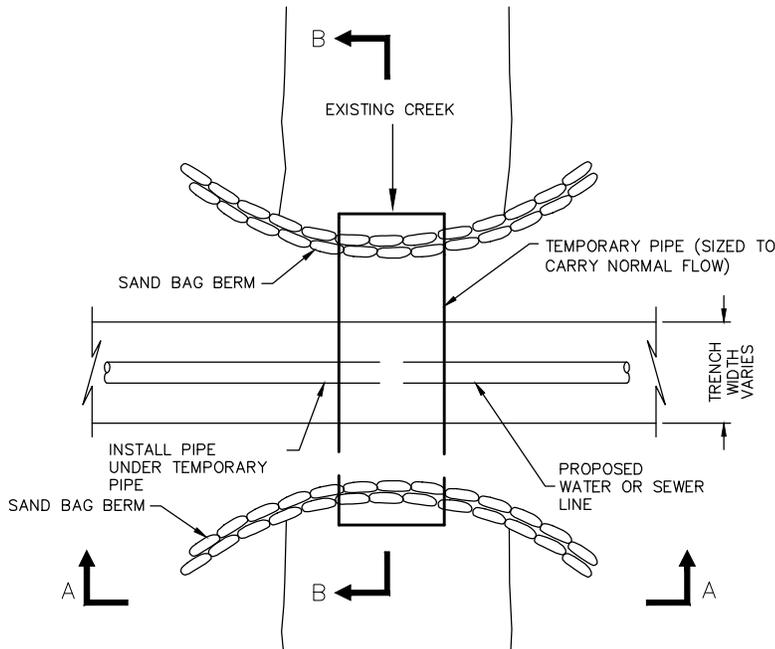
NO SCALE



SECTION AA



SECTION BB



PLAN

NOTE: ALL DISCHARGE FROM DEWATERING THE WORK AREA SHALL BE PUMPED TO EITHER A TEMPORARY SEDIMENT TRAP OR DEWATERING SILT BAG PER DETAILS

NO SCALE

REVISION	DATE	BY

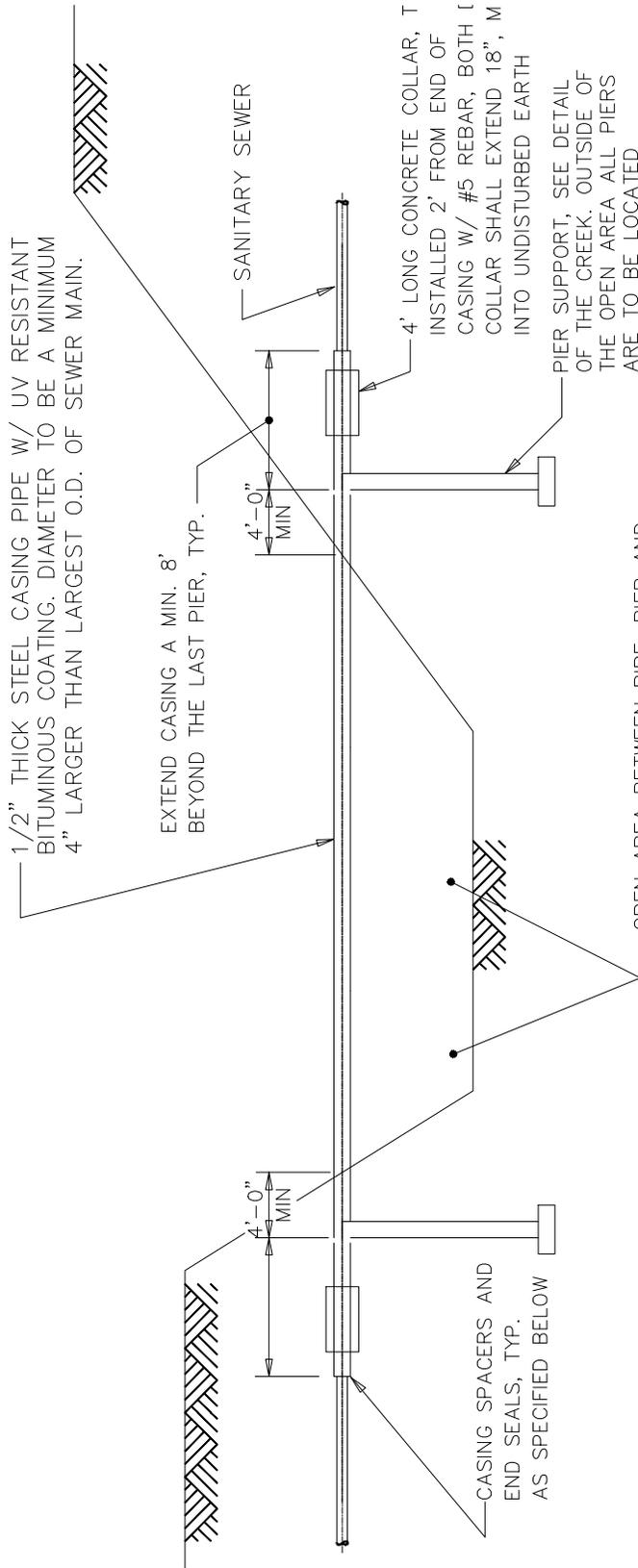
CITY OF HENDERSONVILLE
ENGINEERING DEPARTMENT

DETAIL DWG. NO. 36B

ITEM NO. _____

MEDIUM CREEK CROSSING

NO SCALE



OPEN AREA BETWEEN PIER AND CREEK BED MUST BE LARGE ENOUGH TO ALLOW UNOBSTRUCTED FLOW OF 50 YEAR STORM RUNOFF. PROVIDE CALCULATIONS TO CCWRD FOR REVIEW. AERIAL CROSSING TO BE PERPENDICULAR TO STREAM.

APPROVED CASING SPACERS:
 MODEL CCS, CASCADE WATERWORKS
 MODEL BWM-SS, BWM COMPANY

APPROVED END SEALS:
 MODEL CCES, CASCADE WATERWORKS
 MODEL BWM-PO, BWM COMPANY

ELEVATION

REVISION	DATE	BY

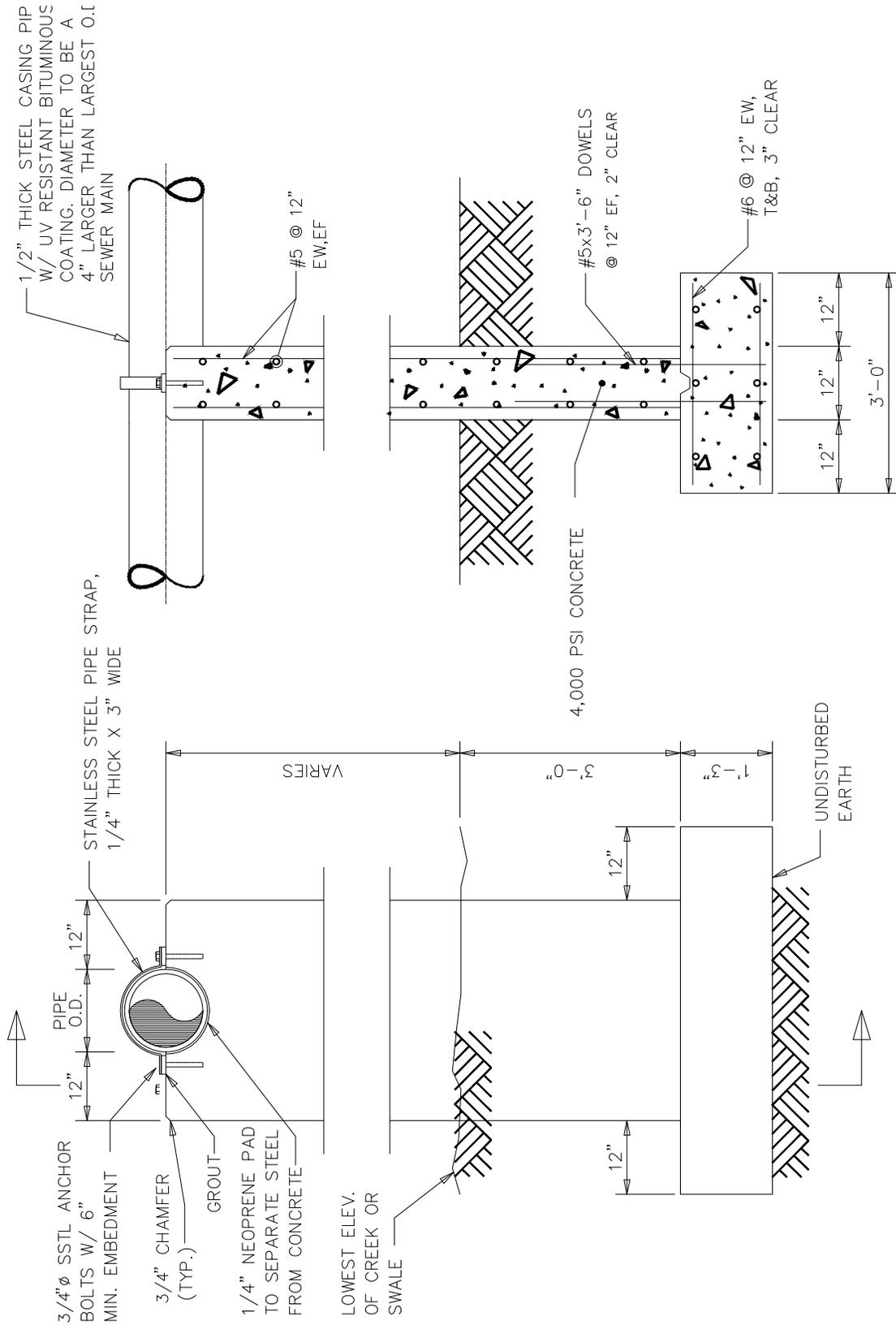
**CITY OF HENDERSONVILLE
ENGINEERING DEPARTMENT**

DETAIL DWG. NO. 37A

ITEM NO. N/A

AERIAL SEWER CROSSING (1 OF 2)

NO SCALE



ELEVATION

SECTION

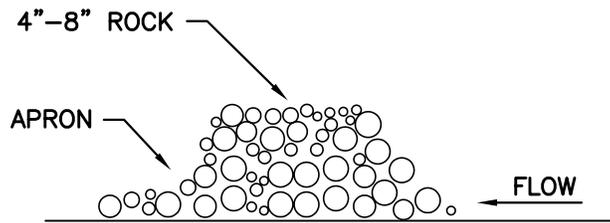
REVISION	DATE	BY

CITY OF HENDERSONVILLE
ENGINEERING DEPARTMENT

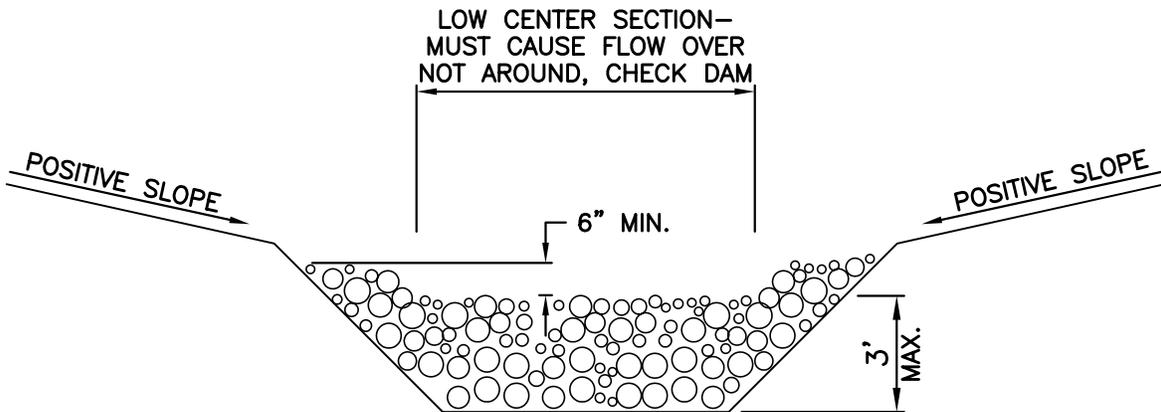
DETAIL DWG. NO. 37B

ITEM NO. N/A

AERIAL SEWER CROSSING (2 OF 2)



PROFILE



CROSS SECTION

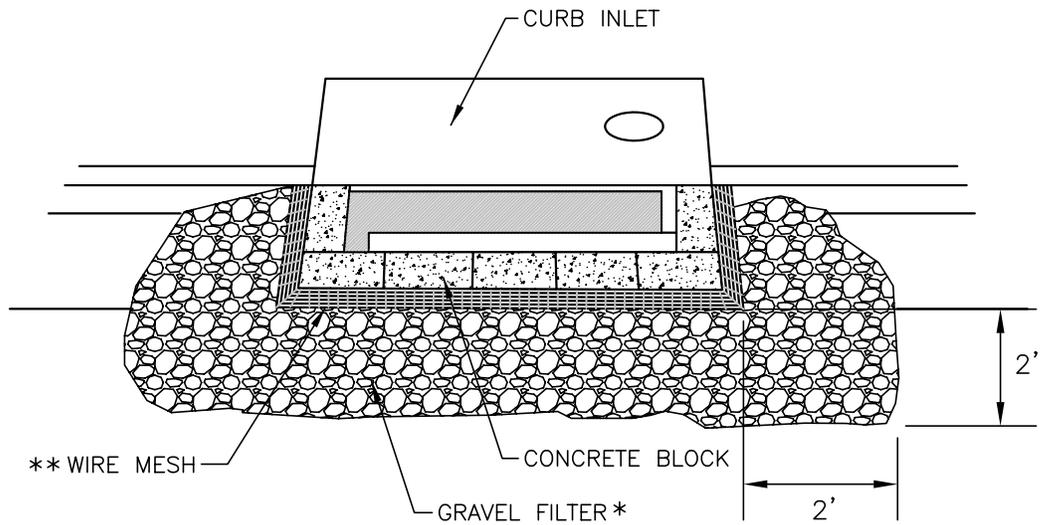
1. THE CHECK DAM SHALL BE CONSTRUCTED OF 4 IN. TO 8 IN. DIAMETER STONE, PLACED SO THAT IT COMPLETELY COVERS THE WIDTH OF THE CHANNEL.
2. THE TOP OF THE CHECK DAM SHALL BE CONSTRUCTED SO THAT THE CENTER IS APPROXIMATELY 6 IN. LOWER THAN THE OUTER EDGES, SO WATER WILL FLOW ACROSS THE CENTER AND NOT AROUND THE ENDS.
3. THE MAXIMUM HEIGHT OF THE CHECK DAM AT THE CENTER OF THE WEIR SHALL NOT EXCEED 3 FT.
4. SPACING BETWEEN DAMS SHALL BE AS SHOWN IN THE PLANS OR BY THE FOLLOWING TABLE:

CHECK DAM SPACING				
DAM HEIGHT (FT.)	CHANNEL SLOPE			
	< 5%	5-10%	10-15%	15-20%
1	65 FT.	30 FT.	20 FT.	15 FT.
2	130 FT.	65 FT.	40 FT.	30 FT.
3	200 FT.	100 FT.	65 FT.	50 FT.

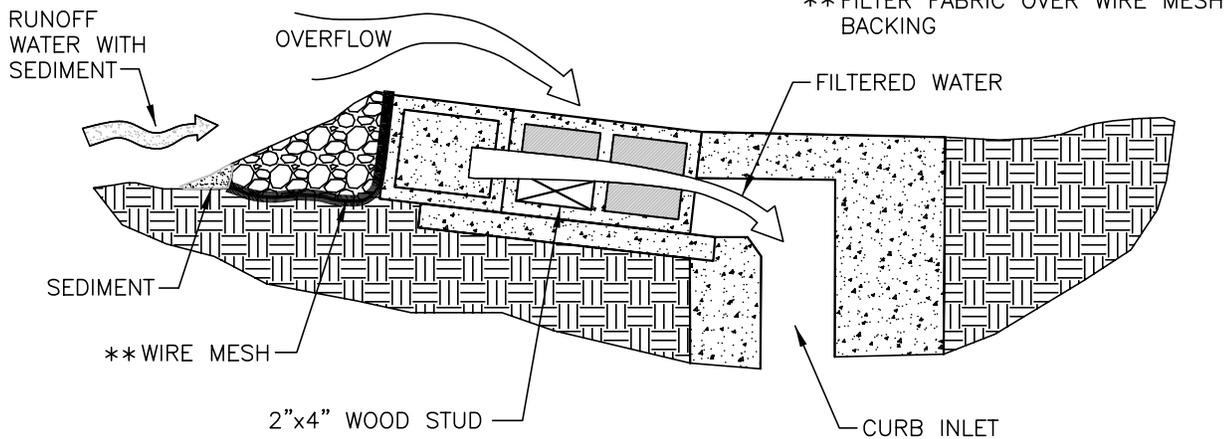
10/01/04

CHECK DAM

CHECKDAM.DWG



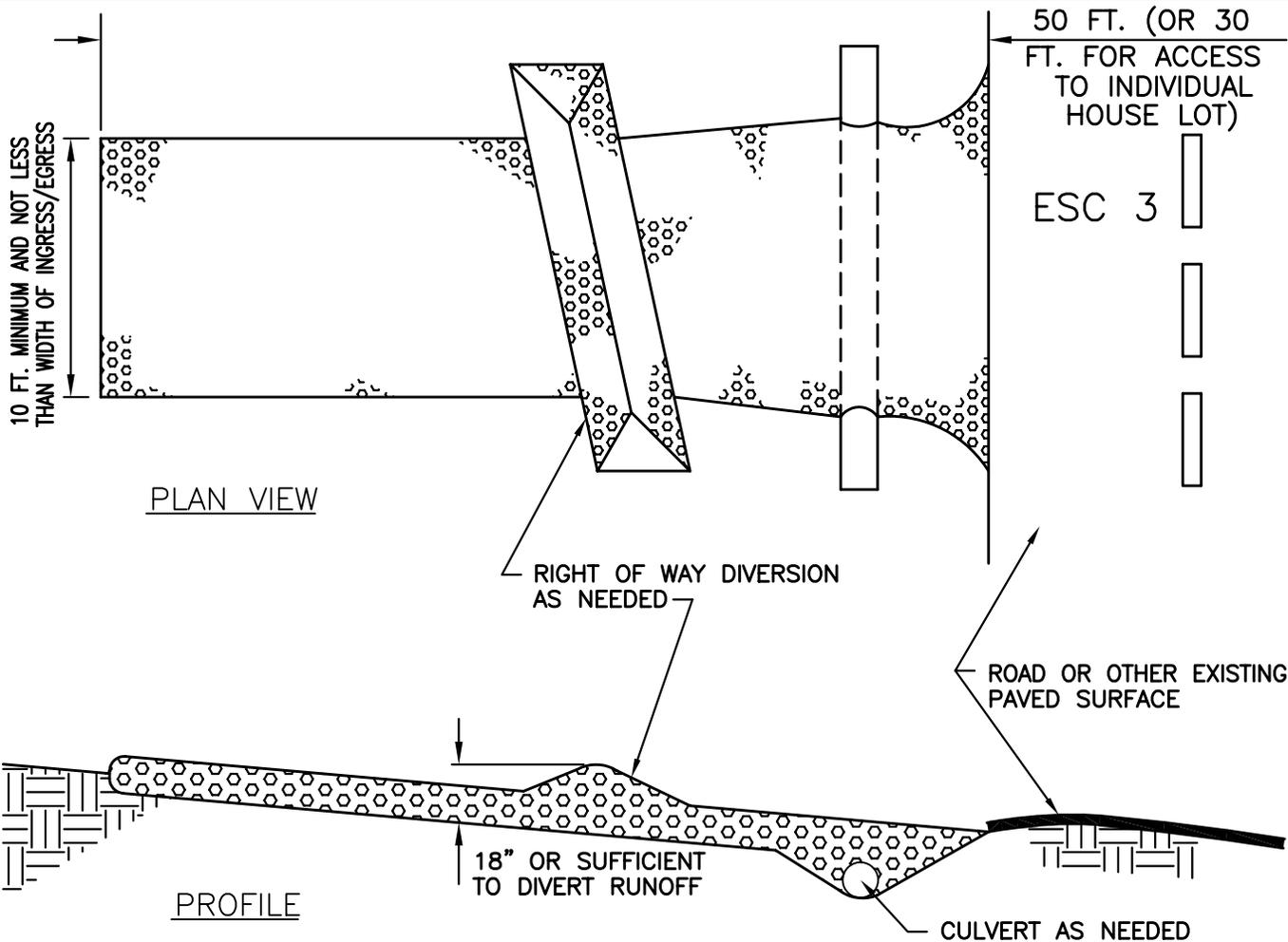
* GRAVEL SHALL BE #57 GRAVEL



NOTES:

1. INLET PROTECTION SHALL BE CONSTRUCTED EITHER BEFORE UPSLOPE LAND DISTURBANCE BEGINS OR BEFORE THE STORM DRAIN BECOMES OPERATIONAL.
2. THE WIRE MESH SHALL BE OF SUFFICIENT STRENGTH TO SUPPORT FABRIC AND STONE.
3. FILTER FABRIC, IF REQUIRED, SHALL HAVE AN EQUIVALENT OPENING SIZE (EOS) OF 20-40 SIEVE AND BE RESISTANT TO SUNLIGHT. IT SHALL BE AT LEAST THE SAME SIZE AS THE WIRE MESH.

CURB INLET PROTECTION



1. STONE SIZE – TWO-INCH STONE SHALL BE USED, OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH – THE CONSTRUCTION ENTRANCE SHALL BE AS LONG AS REQUIRED TO STABILIZE HIGH TRAFFIC AREAS BUT NOT LESS THAN 50 FT. (EXCEPT ON SINGLE RESIDENCE LOT WHERE A 30-FT. MINIMUM LENGTH APPLIES).
3. THICKNESS – THE STONE LAYER SHALL BE AT LEAST 6 IN. THICK.
4. WIDTH – THE ENTRANCE SHALL BE AT LEAST 10 FT. WIDE, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. BEDDING – A GEOTEXTILE SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE. IT SHALL HAVE A GRAB TENSILE STRENGTH OF AT LEAST 200 LB. AND A MULLEN BURST STRENGTH OF AT LEAST 190 LB.
6. CULVERT – A PIPE OR CULVERT SHALL BE CONSTRUCTED UNDER THE ENTRANCE IF NEEDED TO PREVENT SURFACE WATER FLOWING ACROSS THE ENTRANCE FROM BEING DIRECTED OUT ONTO PAVED SURFACES.
7. WATER BAR – A WATER BAR SHALL BE CONSTRUCTED AS PART OF THE CONSTRUCTION ENTRANCE IF NEEDED TO PREVENT SURFACE RUNOFF FROM FLOWING THE LENGTH OF THE CONSTRUCTION ENTRANCE AND OUT ONTO PAVED SURFACES.
8. MAINTENANCE – TOP DRESSING OF ADDITIONAL STONE WALL SHALL BE APPLIED AS CONDITIONS DEMAND. MUD SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADS, OR ANY SURFACE WHERE RUNOFF IS NOT CHECKED BY SEDIMENT CONTROLS, SHALL BE REMOVED IMMEDIATELY. REMOVAL SHALL BE ACCOMPLISHED BY SCRAPING OR SWEEPING.
9. CONSTRUCTION ENTRANCES SHALL NOT BE RELIED UPON TO REMOVE MUD FROM VEHICLES AND PREVENT OFF-SITE TRACKING. VEHICLES THAT ENTER AND LEAVE THE CONSTRUCTION SITE SHALL BE RESTRICTED FROM MUDDY AREAS.

CONSTRUCTION ENTRANCE

10/01/04

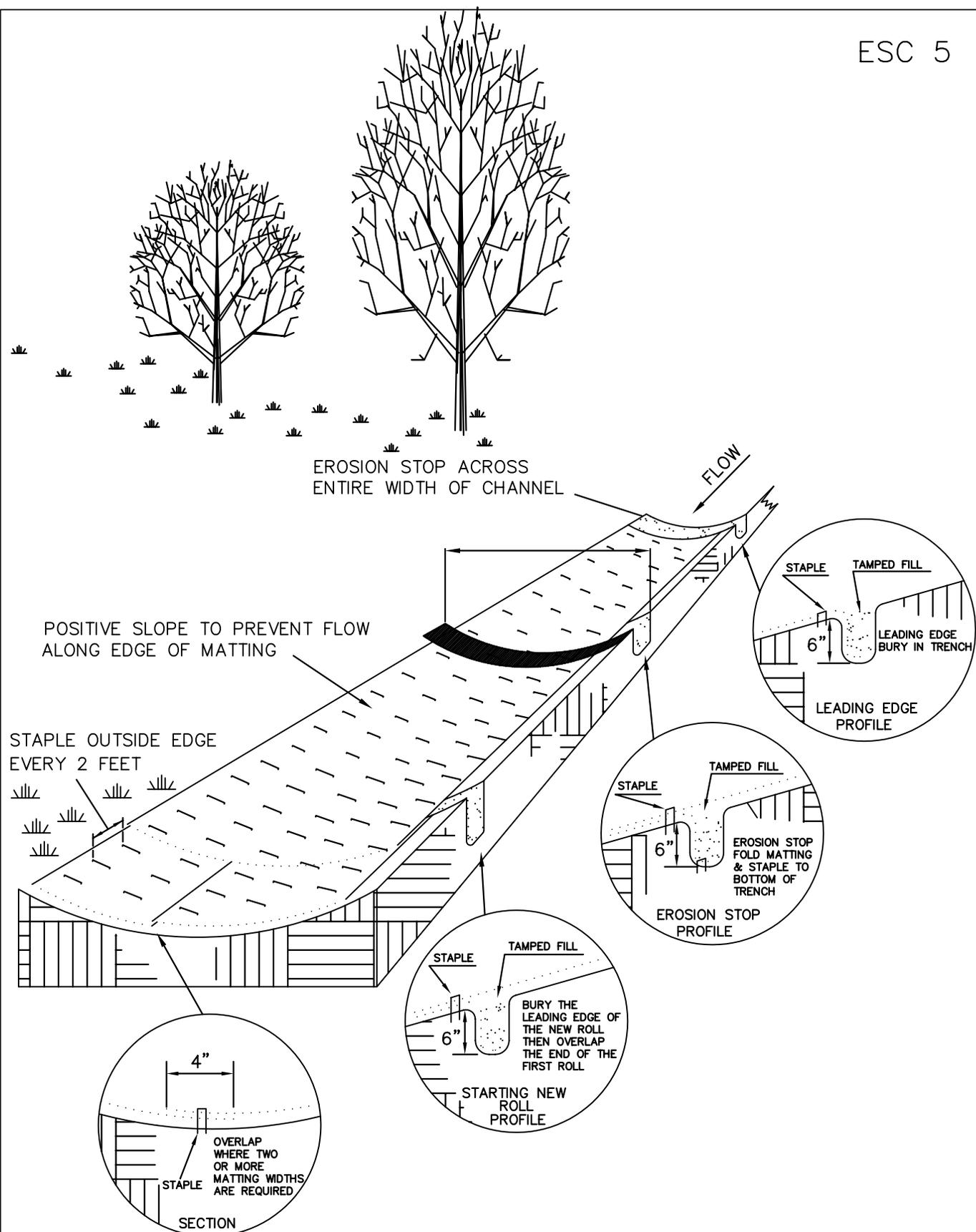
N.T.S.

(RCE)

ENTRANCE.DWG

SPECIFICATIONS FOR MATTING

1. MATERIAL – EXCELSIOR MATTING SHALL BE 48 IN. WIDE AND WEIGH AN AVERAGE OF 0.75 LB./SQ. YD. OR GREATER, JUTE MATTING SHALL BE 48 IN. WIDE AND WEIGH AN AVERAGE OF 1.2 LB./YD. OR GREATER. MATTING MADE OF OTHER MATERIAL AND PROVIDING EQUAL OR GREATER STABILIZATION THAN THE ABOVE MAY BE SUBSTITUTED.
2. SITE PREPARATION – AFTER THE SITE HAS BEEN SHAPED AND GRADED, A SEEDBED SHALL BE PREPARED THAT IS RELATIVELY FREE OF FOREIGN MATERIAL, CLODS OR ROCKS THAT ARE GREATER THAN 1.5 IN. IN DIAMETER. THE SITE SHALL BE PREPARED TO ENSURE THAT THE MATTING HAS GOOD SOIL CONTACT AND THE MATTING WILL NOT "BRIDGE" OR "TENT" OVER OBSTRUCTIONS.
3. MATTING SHALL BE HELD IN PLACE AS RECOMMENDED BY THE MANUFACTURER AS ADEQUATE FOR THE SITE CONDITIONS OR WITH SOD STAPLES. SOD STAPLES ARE U-SHAPED WIRE STAPLES USED FOR FASTENING SOD, JUTE OR EXCELSIOR MATTING AND OTHER EROSION-CONTROL MATERIALS TO THE SOILS SURFACE. SOD STAPLES SHALL BE NO. 11 GAUGE OR HEAVIER AND BE 6-10 IN. IN LENGTH. IN LOOSE OR SANDY SOILS LONGER STAPLES SHALL BE USED.
4. PLANTING – LIME AND FERTILIZER SHALL BE USED ACCORDING TO THE RECOMMENDATION OF A SOIL TEST OR THE SEEDING PLAN. SEED ACCORDING TO THE MATTING MANUFACTURER'S RECOMMENDATIONS; OR, FOR EXCELSIOR MATTING, SEED AREA TO BE PROTECTED BEFORE INSTALLATION; OR, WHEN USING JUTE MATTING, APPLY HALF THE SEED BEFORE AND HALF THE SEED AFTER INSTALLATION.
5. MATTING SHALL BE INSTALLED AS SPECIFIED BY THE MANUFACTURER AS APPROPRIATE FOR THE SITE CONDITIONS OR THE FOLLOWING PROCEDURE MAY BE USED:
 - AFTER THE SITE IS PREPARED AND EROSION STOPS ARE INSTALLED, START LAYING THE MAT FROM THE TOP OF THE SLOPE OR CHANNEL AND UNROLL THE MATTING ALLOWING 4-IN. OVERLAPS AT THE EDGES.
 - SECURE THE MATTING BY BURYING THE TOP ENDS IN A TRENCH 6 IN. DEEP AND STAPLE THE FOLDED ENDS TO THE BOTTOM OF THE TRENCH. BACKFILL AND TAMP FIRMLY TO THE ESTABLISHED GRADE.
6. EROSION STOPS SHALL BE USED WHERE RECOMMENDED BY THE MATTING MANUFACTURER AND ON AREAS SPECIFIED WHERE HIGH-EROSION POTENTIAL MAY CAUSE UNDERMINING AND GULLIES TO FORM BENEATH THE MATTING.
 - STAPLE MATTING EVERY 12 IN. ACROSS THE WIDTH BEGINNING AT THE EDGES AND EVERY 2 FT. IN ROWS THE ENTIRE LENGTH OF THE MATTING. EVERY OTHER ROW OF STAPLES RUNNING THE LENGTH OF THE MATTING SHOULD BE STAGGERED.
 - TO JOIN TWO ROLLS TOGETHER, CUT A TRENCH TO ANCHOR THE END OF THE NEW ROLL AND SECURE IT THE SAME AS THE TOP ROLL. OVERLAP THE END OF THE PREVIOUS ROLL 18 IN. OVER THE NEW ROLL. CONTINUE TO STAPLE AS DESCRIBED ABOVE.
 - WHEN USING EXCELSIOR MATTING, THE PLASTIC NETTING SHALL BE ON TOP OF THE WOOD FIBER.
 - EROSION STOPS SHALL BE MADE OF STRIPS OF MATTING PLACED IN NARROW TRENCHES 6-12 IN. DEEP THAT COVER THE FULL CROSS SECTION OF THE CHANNEL. THEY SHALL BE SPACED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS OR BY THE FOLLOWING: – 3 FT. DOWN THE CHANNEL FROM EACH POINT OF ENTRY OF CONCENTRATED FLOW AT POINTS WHERE GRADIENT OR DIRECTION OR CHANNEL OCCUR, ON LONG SLOPES AT SPACING FROM 20 – 100 FT. DEPENDING ON THE ERODIBILITY OF THE SOIL, VELOCITY AND VOLUME OF FLOW.
 - EROSION STOPS SHALL EXTEND BEYOND THE CHANNEL LINER TO THE FULL DESIGN WIDTH OF THE CHANNEL, THIS WILL CHECK ANY RILLS THAT MIGHT FORM OUTSIDE OR ALONG THE EDGE OF THE CHANNEL LINING.
 - EROSION STOPS SHALL BE CONSTRUCTED WITH 6 IN. DEEP TRENCH, STAPLED TO THE BOTTOM OF THE TRENCH, BACKFILLED AND TAMPED FIRMLY TO CONFORM WITH THE CROSS SECTION OF THE CHANNEL.
 - IF SEEDING HAS BEEN DONE PRIOR TO INSTALLATION OF EROSION STOPS, RESEED DISTURBED AREAS PRIOR TO PLACEMENT OF CHANNEL LINER.



EROSION STOP ACROSS ENTIRE WIDTH OF CHANNEL

POSITIVE SLOPE TO PREVENT FLOW ALONG EDGE OF MATTING

STAPLE OUTSIDE EDGE EVERY 2 FEET

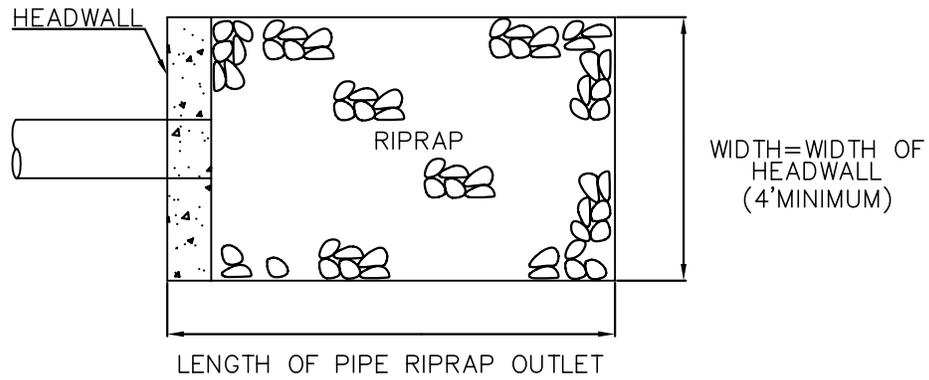
STAPLE
TAMPED FILL
6"
LEADING EDGE BURY IN TRENCH
LEADING EDGE PROFILE

STAPLE
TAMPED FILL
6"
EROSION STOP FOLD MATTING & STAPLE TO BOTTOM OF TRENCH
EROSION STOP PROFILE

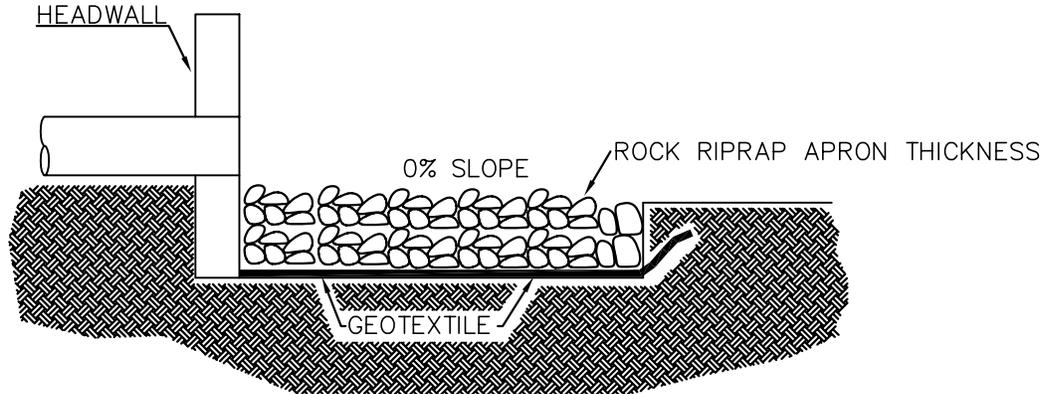
STAPLE
TAMPED FILL
6"
BURY THE LEADING EDGE OF THE NEW ROLL THEN OVERLAP THE END OF THE FIRST ROLL
STARTING NEW ROLL PROFILE

4"
OVERLAP WHERE TWO OR MORE MATTING WIDTHS ARE REQUIRED
STAPLE
SECTION

JUTE MATTING



PLAN VIEW



PROFILE

1. THE SUBGRADE FOR THE FILTER AND RIPRAP SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES AS SHOWN ON THE PLAN.
2. THE RIPRAP SHALL CONFORM TO THE GRADING LIMITS AS SHOWN ON THE PLANS.
3. GEOTEXTILE SHALL BE WOVEN OR NON-WOVEN MONOFILAMENT YARN AND SHALL MEET THE FOLLOWING:

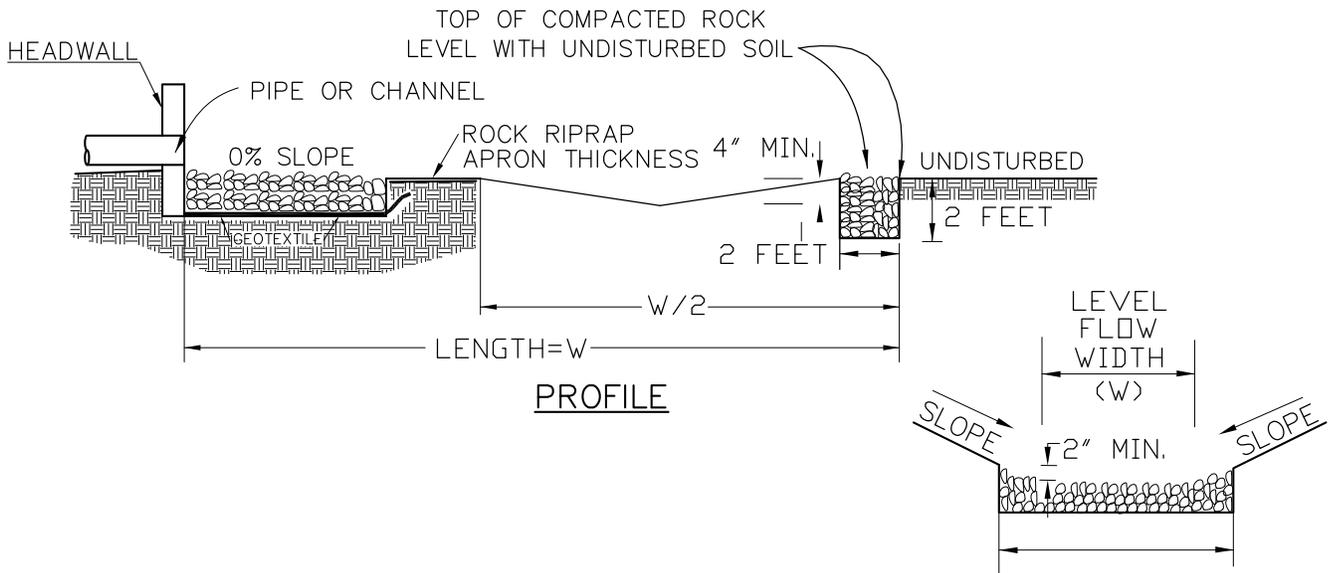
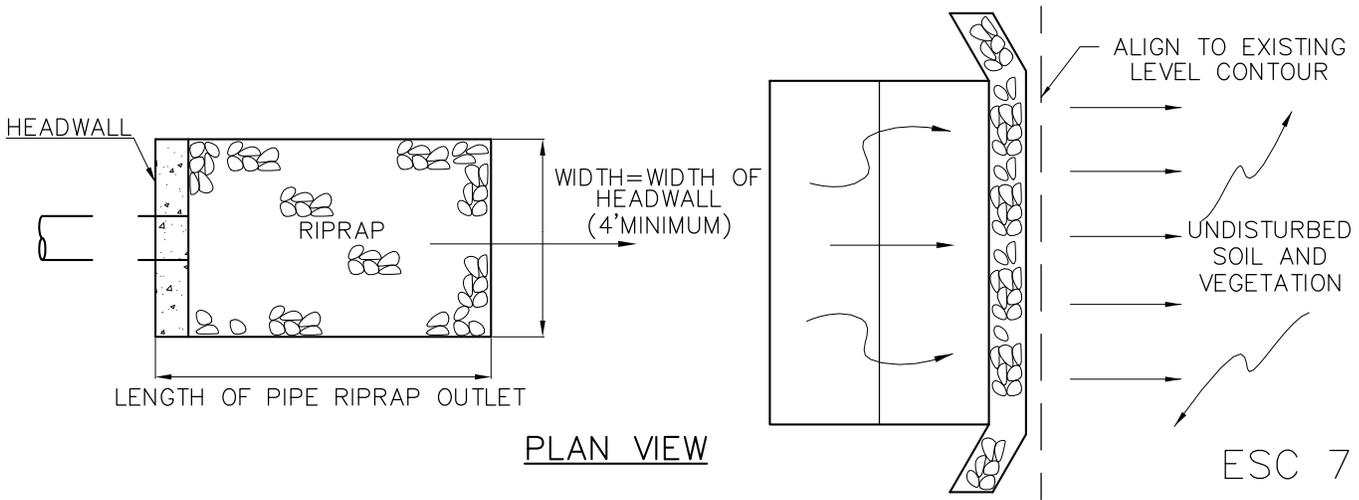
THICKNESS 20-60 MILS
 GRAB STRENGTH 90-120 LB
 ASTM D-1777 AND ASTM D-1682

4. RIPRAP MAY BE PLACED BY EQUIPMENT BUT SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE GEOTEXTILE.

TYPE OF ROCK OR RIPRAP	SIZE OF ROCK	
	50% BY WEIGHT	85% BY WEIGHT
TYPE C	> 6 IN.	3 - 12 IN.
TYPE B	> 12 IN.	6 - 18 IN.
TYPE A	> 18 IN.	12 - 24 IN.

OUTLET PROTECTION

NOT TO SCALE



ADJUST ENDS OF SPREADER TO TIE INTO HIGHER GROUND TO PREVENT FLOW AROUND THE LEVEL SPREADER

1. CONSTRUCT LEVEL ROCK WEIR ON A LEVEL CONTOUR TO ENSURE UNIFORM SPREADING OF STORM RUNOFF, TO FLOW.
2. ROCK SHALL BE NCDOT TYPE C WHERE 50% OF THE MATERIAL BY WEIGHT IS GREATER THAN 12 INCHES AND 85% IS 6-18 INCHES.
3. LEVEL SPREADERS MUST BE CONSTRUCTED ON UNDISTURBED SOIL, NOT ON FILL.
4. STORM RUNOFF PASSING OVER THE LEVEL SPREADER MUST OUTLET TO EROSION-RESISTANT AREAS WITH ESTABLISHED EXISTING VEGETATION.
5. ROCK IN LEVEL SPREADER SHALL BE COMPACTED WITH AT LEAST TWO PASSES OF HEAVY MACHINERY TO PREVENT FURTHER SETTLING.

RIPRAP LEVEL SPREADER

10/01/04

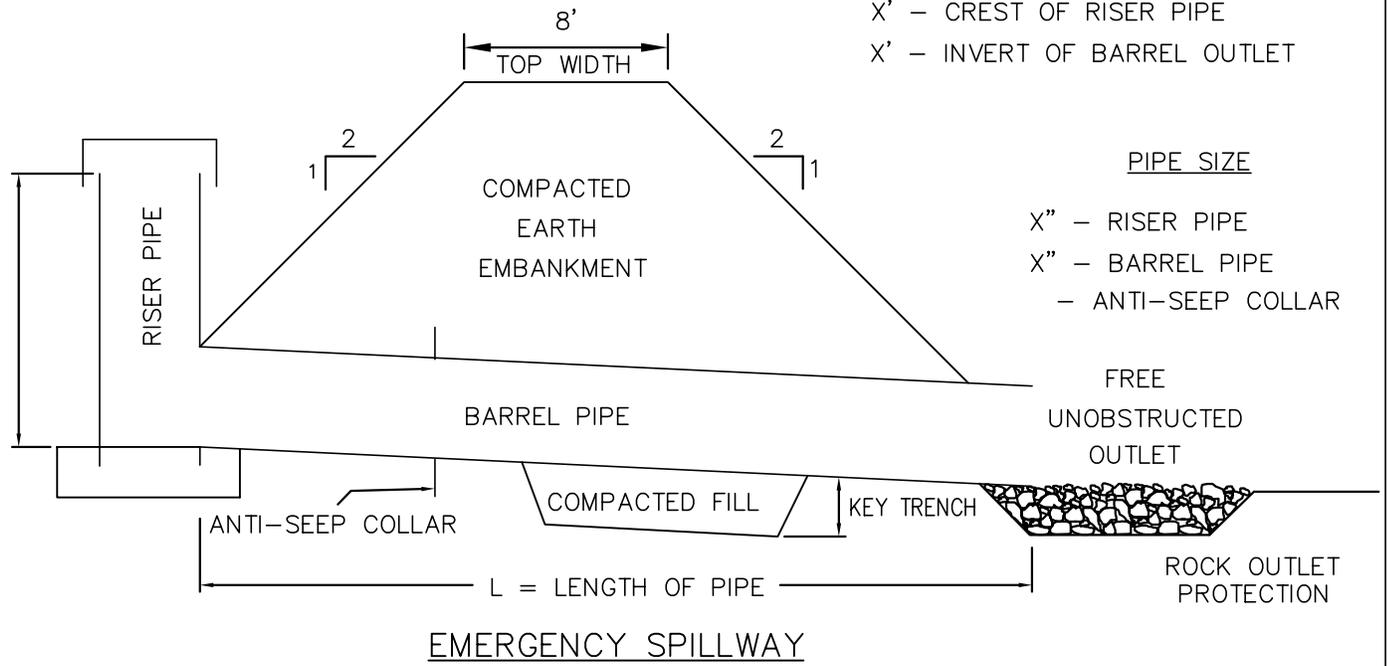
NOT TO SCALE

RIPLEVSP.DWG

SPECIFICATIONS FOR SEDIMENT BASINS

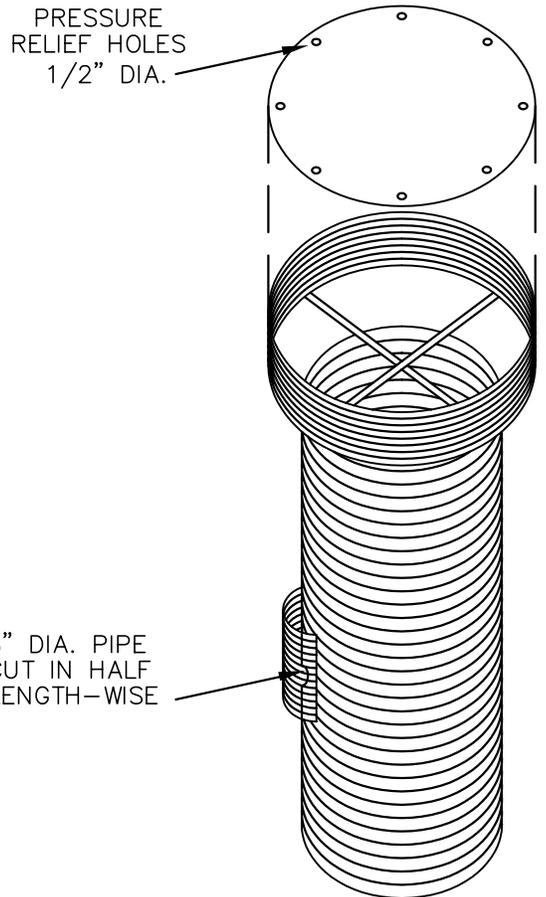
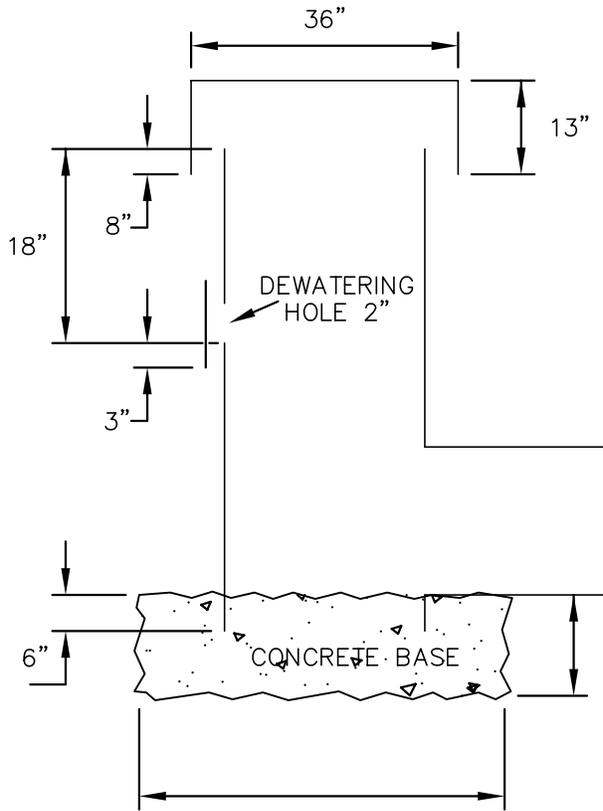
1. SEDIMENT BASINS SHALL BE CONSTRUCTED AND OPERATIONAL BEFORE UPSLOPE LAND DISTURBANCE BEGINS.
2. SITE PREPARATION -- THE AREA UNDER THE EMBANKMENT SHALL BE CLEARED, GRUBBED, AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED AS NEEDED TO FACILITATE SEDIMENT CLEAN OUT. GULLIES AND SHARP BREAKS SHALL BE SLOPED TO NO STEEPER THAN 1:1. THE SURFACE OF THE FOUNDATION AREA WILL BE THOROUGHLY SCARIFIED BEFORE PLACEMENT OF THE EMBANKMENT MATERIAL.
3. CUTOFF TRENCH -- THE CUTOFF TRENCH SHALL BE EXCAVATED ALONG THE CENTERLINE OF THE EMBANKMENT. THE MINIMUM DEPTH SHALL BE 2 FT. UNLESS SPECIFIED DEEPER ON THE PLANS OR AS A RESULT OF THE SITE CONDITIONS. THE MINIMUM BOTTOM WIDTH SHALL BE 4 FT., BUT WIDE ENOUGH TO PERMIT OPERATION OF COMPACTING EQUIPMENT. THE TRENCH SHALL BE KEPT FREE OF STANDING WATER DURING BACK FILL OPERATIONS.
4. EMBANKMENT -- THE FILL MATERIAL SHALL BE FREE OF ALL SOD, ROOTS, FROZEN SOIL, STONES OVER 6 INCHES IN DIAMETER, AND OTHER OBJECTIONABLE MATERIAL. THE PLACING AND SPREADING OF THE FILL MATERIAL SHALL BE STARTED AT THE LOWEST POINT OF THE FOUNDATION AND THE FILL SHALL BE BROUGHT UP IN APPROXIMATELY 6 INCH HORIZONTAL LAYERS OR OF SUCH THICKNESS THAT THE REQUIRED COMPACTION CAN BE OBTAINED WITH THE EQUIPMENT USED. CONSTRUCTION EQUIPMENT SHALL BE OPERATED OVER EACH LAYER IN A WAY THAT WILL RESULT IN THE REQUIRED COMPACTION. SPECIAL EQUIPMENT SHALL BE USED WHEN THE REQUIRED COMPACTION CANNOT BE OBTAINED WITHOUT IT. THE MOISTURE CONTENT OF FILL MATERIAL SHALL BE SUCH THAT THE REQUIRED DEGREE OF COMPACTION CAN BE OBTAINED WITH THE EQUIPMENT USED.
5. PIPE SPILLWAY -- THE PIPE CONDUIT BARREL SHALL BE PLACED ON A FIRM FOUNDATION TO THE LINES AND GRADES SHOWN ON THE PLANS, CONNECTIONS BETWEEN THE RISER AND BARREL, THE ANTI-SEEP COLLARS AND BARREL AND ALL PIPE JOINTS SHALL BE WATERTIGHT. SELECTED BACK FILL MATERIAL SHALL BE PLACED AROUND THE CONDUIT IN LAYERS AND EACH LAYER SHALL BE COMPACTED TO AT LEAST THE SAME DENSITY AS THE ADJACENT EMBANKMENT. ALL COMPACTING WITHIN 2 FT. OF THE PIPE SPILLWAY WILL BE ACCOMPLISHED WITH HAND OPERATED TAMPING EQUIPMENT.
6. RISER PIPE BASE -- THE RISER PIPE SHALL BE SET A MINIMUM OF 6 INCHES IN THE CONCRETE BASE.
7. TRASH RACKS -- BOTH THE TOP OF THE RISER AND THE DEWATERING ORIFICE SHALL BE FITTED WITH TRASH RACKS FIRMLY FASTENED TO THE RISER PIPE.
8. EMERGENCY SPILLWAY -- THE EMERGENCY SPILLWAY SHALL BE CUT IN UNDISTURBED GROUND. ACCURATE CONSTRUCTION OF THE SPILLWAY ELEVATION AND WIDTH IS CRITICAL AND SHALL BE WITHIN A TOLERANCE OF 0.2 FT.
9. SEED AND MULCH -- THE SEDIMENT BASIN SHALL BE STABILIZED IMMEDIATELY FOLLOWING ITS CONSTRUCTION. IN NO CASE SHALL THE EMBANKMENT OR THE EMERGENCY SPILLWAY REMAIN BARE FOR MORE THAN 7 DAYS.
10. SEDIMENT CLEANOUT -- SEDIMENT SHALL BE REMOVED AND THE SEDIMENT BASIN RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS FILLED TO 50% OF THE POND'S ORIGINAL DEPTH OR AS INDICATED ON THE PLANS. SEDIMENT REMOVED FROM THE BASIN SHALL BE PLACED SO THAT IT WILL NOT ERODE.
11. FINAL REMOVAL -- SEDIMENT BASINS SHALL BE REMOVED AFTER THE UPSTREAM DRAINAGE AREA IS STABILIZED OR AS INDICATED IN THE PLANS. DEWATERING AND REMOVAL SHALL NOT CAUSE SEDIMENT TO BE DISCHARGED. THE SEDIMENT BASIN SITE AND SEDIMENT REMOVED FROM THE BASIN SHALL BE STABILIZED.

- X' - TOP OF EMBANKMENT
- X' - CREST OF EMERGENCY SPILLWAY
- X' - CREST OF RISER PIPE
- X' - INVERT OF BARREL OUTLET

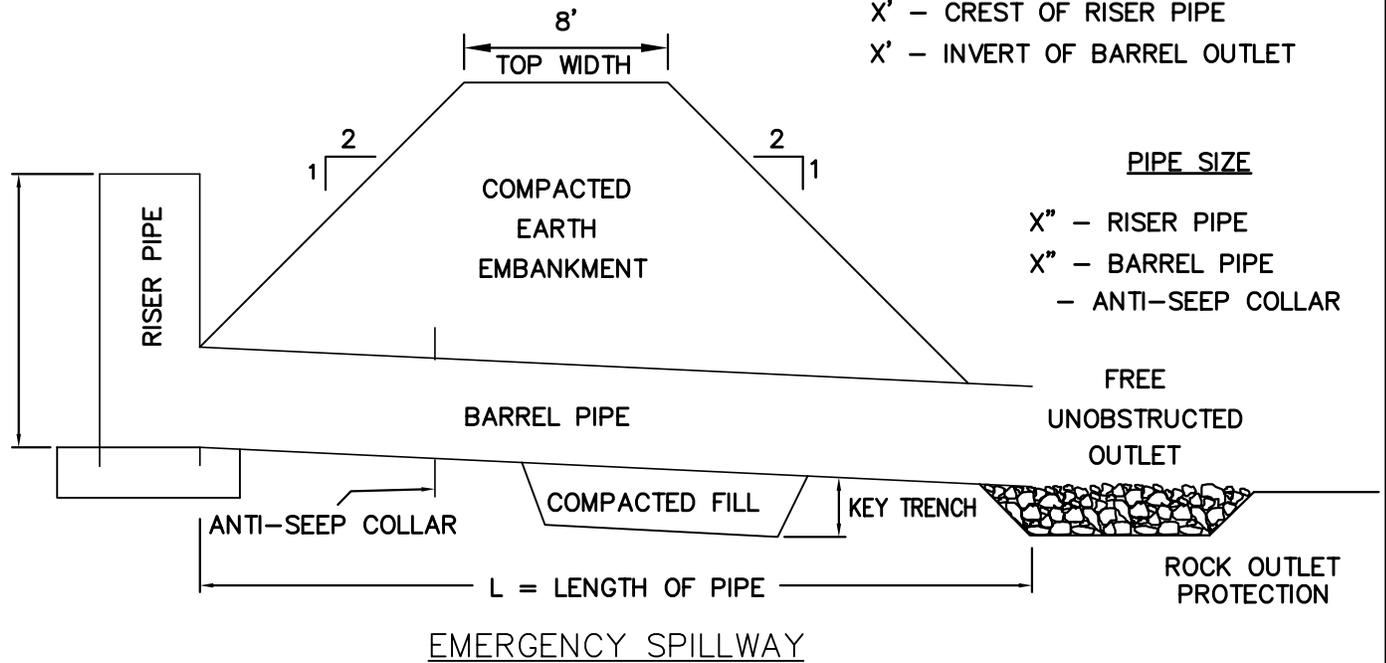


PIPE SIZE

- X" - RISER PIPE
- X" - BARREL PIPE
- ANTI-SEEP COLLAR



- X' - TOP OF EMBANKMENT
- X' - CREST OF EMERGENCY SPILLWAY
- X' - CREST OF RISER PIPE
- X' - INVERT OF BARREL OUTLET



PIPE SIZE

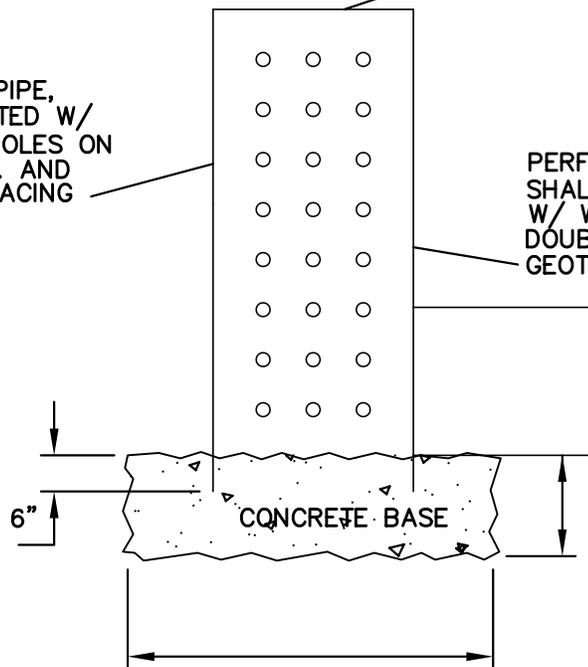
- X" - RISER PIPE
- X" - BARREL PIPE
- ANTI-SEEP COLLAR

FREE
UNOBSTRUCTED
OUTLET

CAP AND SECURE W/
WIRE MESH AND TWO
LAYERS OF GEOTEXTILE

X" DIA. PIPE,
PERFORATED W/
1" DIA. HOLES ON
4" HORIZ. AND
VERT. SPACING

PERFORATED RISER
SHALL BE WRAPPED
W/ WIRE MESH, THEN
DOUBLE WRAPPED W/
GEOTEXTILE



SECTION
RISER PIPE & BASE

TEMPORARY SEEDING SPECIES SELECTION			
SEEDING DATES	SPECIES	LB./1,000 FT. ²	PER ACRE
MARCH 1 TO AUGUST 15	OATS	3	4 BUSHEL
	TALL FESCUE	1	40 LB.
	ANNUAL RYEGRASS	1	40 LB.
	PERENNIAL RYGRASS	1	40 LB.
	TALL FESCUE	1	40 LB.
	ANNUAL RYEGRASS	1	40 LB.
AUGUST 16 TO NOVEMBER 1	RYE	3	2 BUSHEL
	TALL FESCUE	1	40 LB.
	ANNUAL RYEGRASS	1	40 LB.
	WHEAT	3	2 BUSHEL
	TALL FESCUE	1	40 LB.
	ANNUAL RYEGRASS	1	40 LB.
	PERENNIAL RYGRASS	1	40 LB.
	TALL FESCUE	1	40 LB.
	ANNUAL RYEGRASS	1	40 LB.
NOVEMBER 1 TO SPRING SEEDING	USE MULCH ONLY, SODDING PRACTICES OR DORMANT SEEDING.		
NOTE: OTHER APPROVED SEED SPECIES MAY BE SUBSTITUTED.			

ESC 11

1. STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SUCH AS DIVERSIONS AND SEDIMENT TRAPS SHALL BE INSTALLED AND STABILIZED WITH TEMPORARY SEEDING PRIOR TO GRADING THE REST OF THE CONSTRUCTION SITE.
2. TEMPORARY SEED SHALL BE APPLIED BETWEEN CONSTRUCTION OPERATIONS ON SOIL THAT WILL NOT BE GRADED OR RE-WORKED FOR 45 DAYS OR MORE. THESE IDLE AREAS SHOULD BE SEED AS SOON AS POSSIBLE AFTER GRADING OR SHALL BE SEED AS WITHIN 7 DAYS. SEVERAL APPLICATIONS OF TEMPORARY SEEDING ARE NECESSARY ON TYPICAL CONSTRUCTION PROJECTS.
3. THE SEED BED SHOULD BE PULVERIZED AND LOOSE TO ENSURE THE SUCCESS OF ESTABLISHING VEGETATION. HOWEVER, TEMPORARY SEEDING SHALL NOT BE POSTPONED IF IDEAL SEED BED PREPARATION IS NOT POSSIBLE.
4. SOIL AMENDMENTS – APPLICATIONS OF TEMPORARY VEGETATION SHALL ESTABLISH ADEQUATE STANDS OF VEGETATION WHICH MAY REQUIRE THE USE OF SOIL AMENDMENTS. SOIL TESTS SHOULD BE TAKEN ON THE SITE TO PREDICT THE NEED FOR LIME AND FERTILIZER.
5. SEEDING METHOD – SEED SHALL BE APPLIED UNIFORMLY WITH A CYCLONE SEEDER, DRILL, CULTIPACKER SEEDER, OR HYDROSEEDER. WHEN FEASIBLE, SEED THAT HAS BEEN BROADCAST SHALL BE COVERED BY RAKING OR DRAGGING AND THEN LIGHTLY TAMPED INTO PLACE USING A ROLLER OR OF CULTIPACKER. IF HYDROSEEDING IS USED, THE SEED AND FERTILIZER WILL BE MIXED ON-SITE AND THE SEEDING SHALL BE DONE IMMEDIATELY AND WITHOUT INTERRUPTION.

10/01/04

TEMPORARY SEEDING

TS

TEMPSEED.DWG

PERMANENT SEEDING			
SEED MIX	SEEDING RATE		NOTES:
	LB./AC.	LB./1,000 FT. ²	
GENERAL USE			
CREeping RED FESCUE	20-40	1/2-1	
DOMESTIC RYEGRASS	10-20	1/4-1/2	
KENTUCKY BLUEGRASS	10-20	1/4-1/2	
TALL FESCUE	40	1	
DWARF FESCUE	40	1	
STEEP BANKS OR CUT SLOPES			
TALL FESCUE	40	1	
CROWN VETCH	10	1/4	DO NOT SEED LATER THAN AUGUST.
TALL FESCUE	20	1/2	
FLAT PEA	20	1/2	DO NOT SEED LATER THAN AUGUST.
TALL FESCUE	20	1/2	
ROAD DITCHES AND SWALES			
TALL FESCUE	40	1	
DWARF FESCUE	90	2 1/4	
KENTUCKY BLUEGRASS	5		
LAWNS			
KENTUCKY BLUEGRASS	60	1 1/2	
PERENNIAL RYEGRASS	60	1 1/2	
KENTUCKY BLUEGRASS	60	1 1/2	FOR SHADED AREAS.
CREeping RED FESCUE	60	1 1/2	
NOTE: OTHER APPROVED SEED SPECIES MAY BE SUBSTITUTED.			

PERMANENT SEEDING



1. PERMANENT SEEDING SHALL NOT BE CONSIDERED ESTABLISHED FOR AT LEAST 1 FULL YR. FROM THE TIME OF PLANTING. SEEDED AREAS SHALL BE INSPECTED FOR FAILURE AND VEGETATION RE-ESTABLISHED AS NEEDED. DEPENDING ON SITE CONDITIONS, IT MAY BE NECESSARY TO IRRIGATE, FERTILIZE, OVER SEED, OR RE-ESTABLISH PLANTINGS IN ORDER TO PROVIDE PERMANENT VEGETATION FOR ADEQUATE EROSION CONTROL.

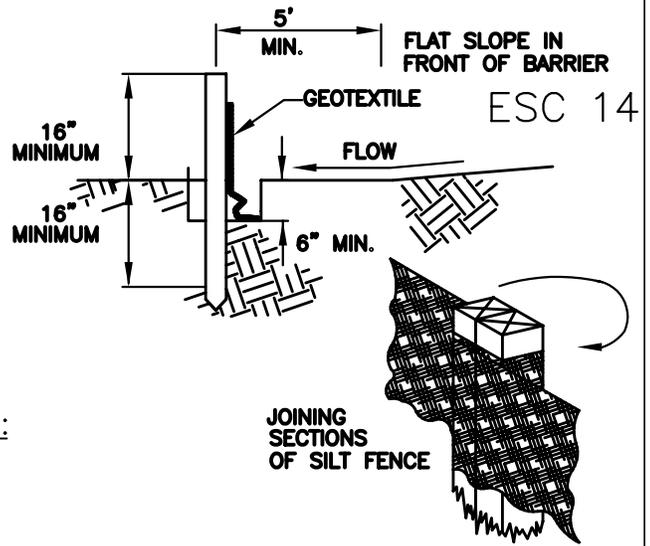
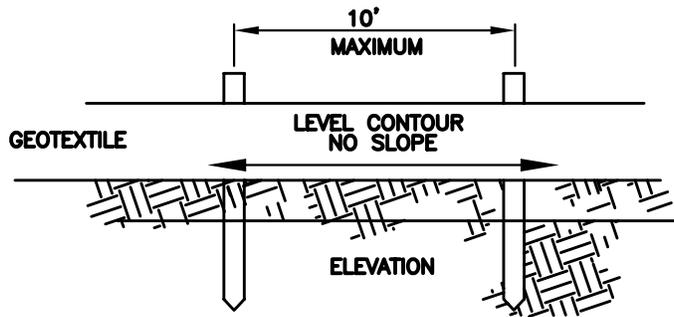
2. MAINTENANCE FERTILIZATION RATES SHALL BE ESTABLISHED BY SOIL TEST RECOMMENDATIONS OR BY USING THE RATES SHOWN IN THE FOLLOWING

MAINTENANCE FOR PERMANENT SEEDINGS FERTILIZATION AND MOWING TABLE.					
MIXTURE	FORMULA	LB./AC.	LB./1,000 FT. ²	TIME	MOWING
CREeping RED FESCUE RYEGRASS KENTUCKY BLUEGRASS	10-10-10	500	12	FALL, YEARLY OR AS NEEDED.	NOT CLOSER THAN 3"
TALL FESCUE	10-10-10	500	12		NOT CLOSER THAN 4"
DWARF FESCUE	10-10-10	500	12		NOT CLOSER THAN 2"
CROWN VETCH FESCUE	0-20-20	400	10	SPRING, YEARLY FOLLOWING ESTABLISH- MENT AND EVERY 4-7 YR. THEREAFTER	DO NOT MOW
FLAT PEA FESCUE	0-20-20	400	10		DO NOT MOW

NOTE: FOLLOWING SOIL TEST RECOMMENDATIONS IS PREFERRED TO FERTILIZER RATES SHOWN ABOVE.

MAINTENANCE OF PERMANENT SEEDING





DETAILS:

NOTES:

1. SILT FENCE SHALL BE CONSTRUCTED BEFORE UPSLOPE LAND DISTURBANCE BEGINS.
2. ALL SILT FENCE SHALL BE PLACED AS CLOSE TO THE CONTOUR AS POSSIBLE SO THAT WATER WILL NOT CONCENTRATE AT LOW POINTS IN THE FENCE AND SO THAT SMALL SWALES OR DEPRESSIONS WHICH MAY CARRY SMALL CONCENTRATED FLOWS TO THE SILT FENCE ARE DISSIPATED ALONG ITS LENGTH.
3. TO PREVENT WATER PONDED BY THE SILT FENCE FROM FLOWING AROUND THE ENDS, EACH END SHALL BE CONSTRUCTED UPSLOPE SO THAT THE ENDS ARE AT A HIGHER ELEVATION.
4. WHERE POSSIBLE, SILT FENCE SHALL BE PLACED ON THE FLATTEST AREA AVAILABLE.
5. WHERE POSSIBLE, VEGETATION SHALL BE PRESERVED FOR 5 ft. (OR AS MUCH AS POSSIBLE) UPSLOPE FROM THE SILT FENCE. IF VEGETATION IS REMOVED, IT SHALL BE RE-ESTABLISHED WITHIN 7 DAYS FROM THE INSTALLATION OF THE FENCE.
6. SOIL STOCKPILES OR OTHER SOURCES OF SEDIMENT SHALL HAVE SILT FENCE PROTECTION.
7. THE SILT FENCE SHALL BE PLACED IN A TRENCH CUT A MINIMUM OF 6" DEEP. THE TRENCH SHALL BE CUT WITH A TRENCHER, CABLE LAYING MACHINE, OR OTHER SUITABLE DEVICE WHICH WILL ENSURE AN ADEQUATELY UNIFORM TRENCH DEPTH.
8. THE SILT FENCE SHALL BE PLACED WITH THE STAKES ON THE DOWNSLOPE SIDE OF THE GEOTEXTILE AND SO THAT 8" OF CLOTH ARE BELOW THE GROUND SURFACE. EXCESS MATERIAL SHALL LAY ON THE BOTTOM OF THE 6" DEEP TRENCH. THE TRENCH SHALL BE BACKFILLED AND COMPACTED.
9. SEAMS BETWEEN SECTION OF SILT FENCE SHALL BE OVERLAPPED WITH THE END STAKES OF EACH SECTION WRAPPED TOGETHER BEFORE DRIVING INTO THE GROUND.
10. MAINTENANCE--- SILT FENCE SHALL ALLOW RUNOFF TO PASS ONLY AS DIFFUSE FLOW THROUGH THE GEOTEXTILE. IF RUNOFF OVERTOPS THE SILT FENCE, FLOWS UNDER OR AROUND THE ENDS, OR IN ANY OTHER WAY BECOMES A CONCENTRATED FLOW, ONE OF THE FOLLOWING SHALL BE PERFORMED, AS APPROPRIATE:
 - 1) THE LAYOUT OF THE SILT FENCE SHALL BE CHANGED,
 - 2) ACCUMULATED SEDIMENT SHALL BE REMOVED,
 - 3) OTHER PRACTICES SHALL BE INSTALLED.

CRITERIA FOR SILT FENCE MATERIALS

1. FENCE POSTS - THE LENGTH SHALL BE A MINIMUM OF 32" LONG. WOOD POST WILL BE 2" X 2" HARDWOOD OF SOUND QUALITY. THE MAXIMUM SPACING BETWEEN POSTS SHALL BE 10 FT.
2. SILT FENCE FABRIC (SEE CHART BELOW):

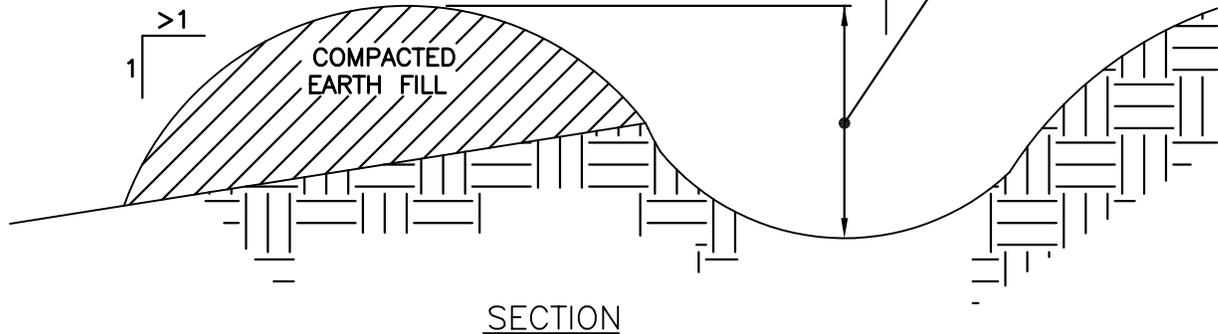
FABRIC PROPERTIES	VALUES	TEST METHOD
GRAB TENSILE STRENGTH	90 LB. MINIMUM	ASTM D 1682
MULLEN BURST STRENGTH	190 P.S.I. MINIMUM	ASTM D 3786
SLURRY FLOW RATE	0.3 GAL./MIN./FT. ² MAXIMUM	
EQUIVALENT OPENING SIZE	40-80	US STD. SIEVE CW-02215
ULTRAVIOLET RADIATION STABILITY	90% MINIMUM	ASTM-G-26



DIVERSION SLOPES SHALL NOT BE STEEPER THAN 1:1

SEED AND MULCH ENTIRE DIVERSION

18" FOR DRAINAGE AREA < 5 ACRES
24" FOR DRAINAGE AREA > 5 ACRES



1. DIVERSION SHALL BE COMPACTED BY TRAVERSING WITH TRACKED EARTH-MOVING EQUIPMENT.
2. DIVERSIONS SHALL NOT BE BREACHED OR LOWERED TO ALLOW CONSTRUCTION TRAFFIC TO CROSS; INSTEAD THE TOP WIDTH MAY BE MADE WIDER AND SIDE SLOPES MADE FLATTER THAN SPECIFIED ABOVE.
3. DIVERSIONS SHALL BE STABILIZED WITH VEGETATION AND CHECK DAMS OR THE FOLLOWING TREATMENTS.

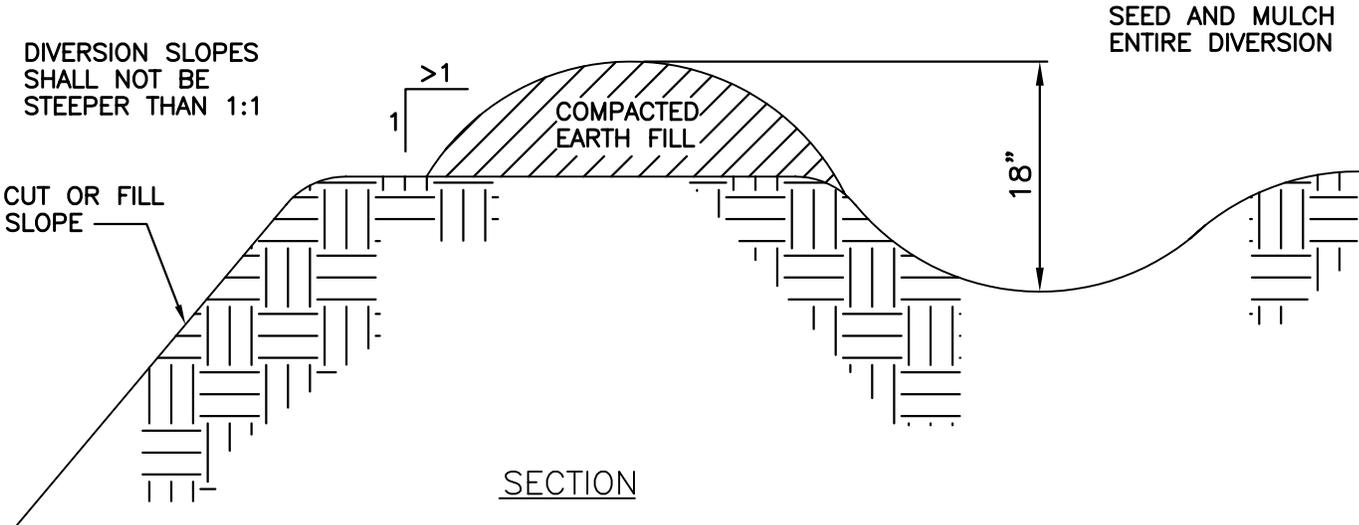
TEMPORARY DIVERSION STABILIZATION TREATMENT			
DIVERSION SLOPE	< 2 ACRES	2-5 ACRES	5-10 ACRES
0-3%	SEED AND STRAW	SEED AND STRAW	SEED AND STRAW
3-5%	SEED AND STRAW	SEED AND STRAW	MATTING
5-8%	SEED AND STRAW	MATTING	MATTING
8-20%	SEED AND STRAW	MATTING	ENGINEERED

NOTE: DIVERSIONS WITH STEEPER SLOPES OR GREATER DRAINAGE AREAS ARE BEYOND THE SCOPE OF THIS STANDARD AND MUST BE DESIGNED FOR STABILITY. SEED, STRAW AND MATTING USED SHALL MEET THE SPECIFICATIONS FOR TEMPORARY SEEDING, MULCHING AND MATTING.

TEMPORARY DIVERSION

N.T.S.





DIVERSIONS FOR THE TEMPORARY PROTECTION OF CUT OR FILL SLOPES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING CRITERIA FOR DRAINAGE AREAS OF 5 ACRES OR LESS. LARGER AREAS REQUIRE A DIVERSION DESIGN.

1. DIVERTED RUNOFF SHALL OUTLET INTO STABILIZED UNDISTURBED AREAS, SETTLING POND, OR INTO A DROP STRUCTURE.
2. DIVERSIONS SHALL BE COMPACTED BY TRAVERSING WITH TRACKED EARTH-MOVING EQUIPMENT AND STABILIZED WITH SEED AND MULCH.

TEMPORARY DIVERSION ABOVE STEEP SLOPES

TD

N.T.S.

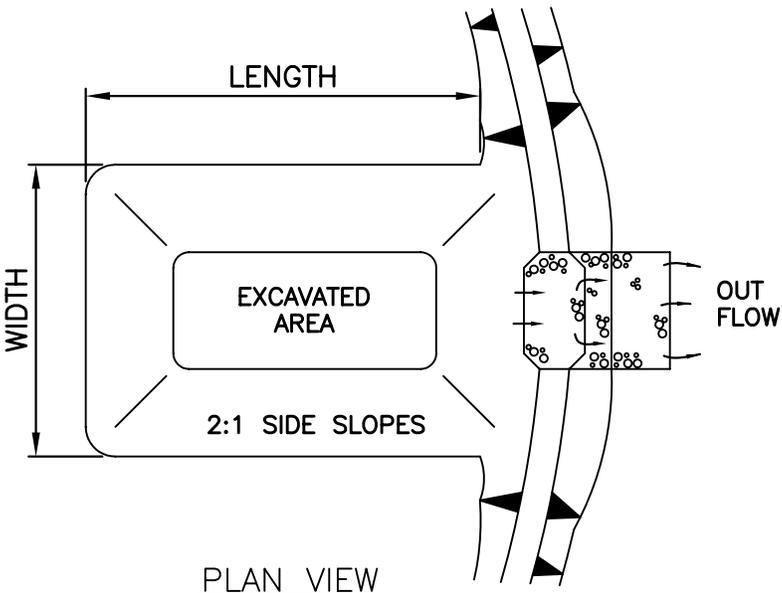
SEDIMENT TRAP NOTES:

ESC 17

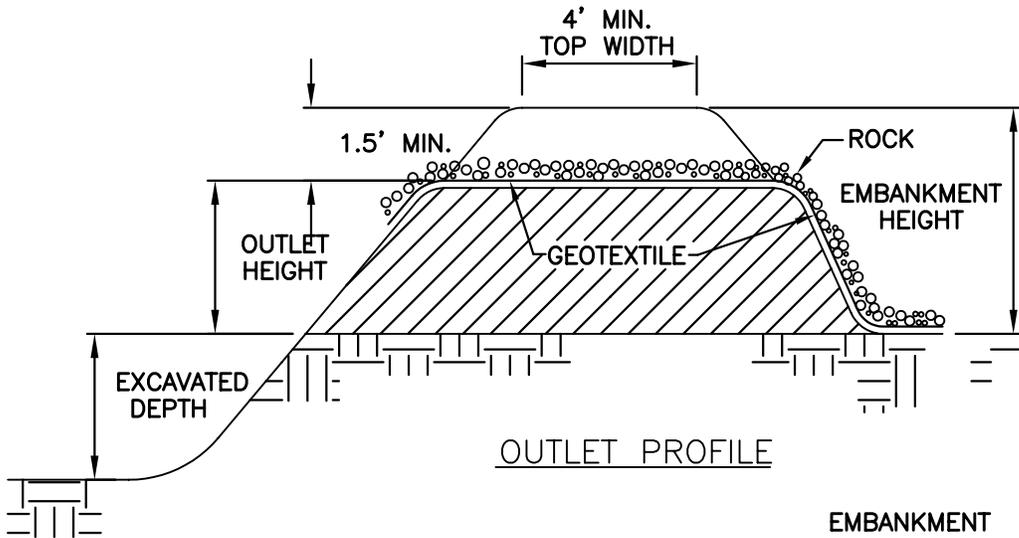
1. SEDIMENT TRAPS SHALL BE CONSTRUCTED AND OPERATIONAL BEFORE UPSLOPE LAND DISTURBANCE BEGINS.
2. THE AREA UNDER THE EMBANKMENT SHALL BE CLEARED, GRUBBED, AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED AS NEEDED TO FACILITATE SEDIMENT CLEANOUT.
3. FILL MATERIAL USED FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION AS WELL AS OVERSIZED STONES, ROCKS, ORGANIC MATERIAL OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED. MAXIMUM HEIGHT OF THE EMBANKMENT SHALL BE 5 FT. AS MEASURED FROM THE SURROUNDING GROUND.
4. CUT-AND-FILL SLOPES SHALL BE 2:1 OR FLATTER.
5. DIKES DIRECTING WATER TO THE TRAP SHALL BE HIGHER THAN THE HEIGHT OF THE EMBANKMENT.
6. TEMPORARY SEEDING SHALL BE ESTABLISHED ON ALL NON-SUBMERGED AREAS OF THE SEDIMENT TRAP.
7. THE STORAGE VOLUME SHALL BE ACHIEVED TO THE DIMENSIONS SHOWN IN THE PLANS TO ACHIEVE 67 CY OF STORAGE VOLUME BELOW THE CREST OF THE OUTLET FOR EVERY ACRE OF CONTRIBUTING DRAINAGE AREA.
8. THE OUTLET SPILLWAY SHALL BE CONSTRUCTED TO THE DIMENSIONS SHOWN IN THE PLANS.
9. GEOTEXTILE SHALL BE PLACED OVER THE BOTTOM AND SLOPES OF THE OUTLET SPILLWAY. GEOTEXTILE SHALL CONTINUE DOWNSTREAM OF THE EMBANKMENT TO FORM AN APRON ON THE SURROUNDING GROUND. TO PREVENT RUNOFF FROM FLOWING UNDER THE GEOTEXTILE, THE SECTIONS PLACED NEAREST THE FRONT SHALL OVERLAP FOLLOWING SECTIONS. SECTIONS OF GEOTEXTILE SHALL OVERLAP AT LEAST 2 FT.
10. ROCK USED IN THE OUTLET SPILLWAY SHALL BE PLACED 1 FT. THICK ON THE GEOTEXTILE. THE ROCK SHALL BE BETWEEN TYPE C AND TYPE D ROCK WHERE D_{50} IS ABOUT 8 IN.
11. SEDIMENT SHALL BE REMOVED AND THE SEDIMENT TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS FILLED TO 40% OF THE POND'S ORIGINAL DEPTH. REMOVED SEDIMENT SHALL BE SPREAD IN A SUITABLE AREA AND STABILIZED SO IT WILL NOT ERODE.
12. THE STRUCTURE AND ACCUMULATED SEDIMENT SHALL BE PERMANENTLY STABILIZED WHEN THE DRAINAGE AREA HAS BEEN STABILIZED.

10/01/04

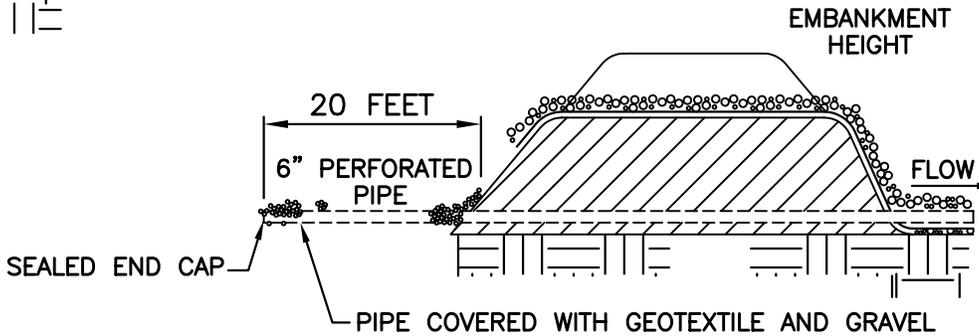
TRAPNOTE.DWG



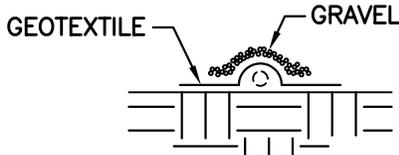
PLAN VIEW



OUTLET PROFILE



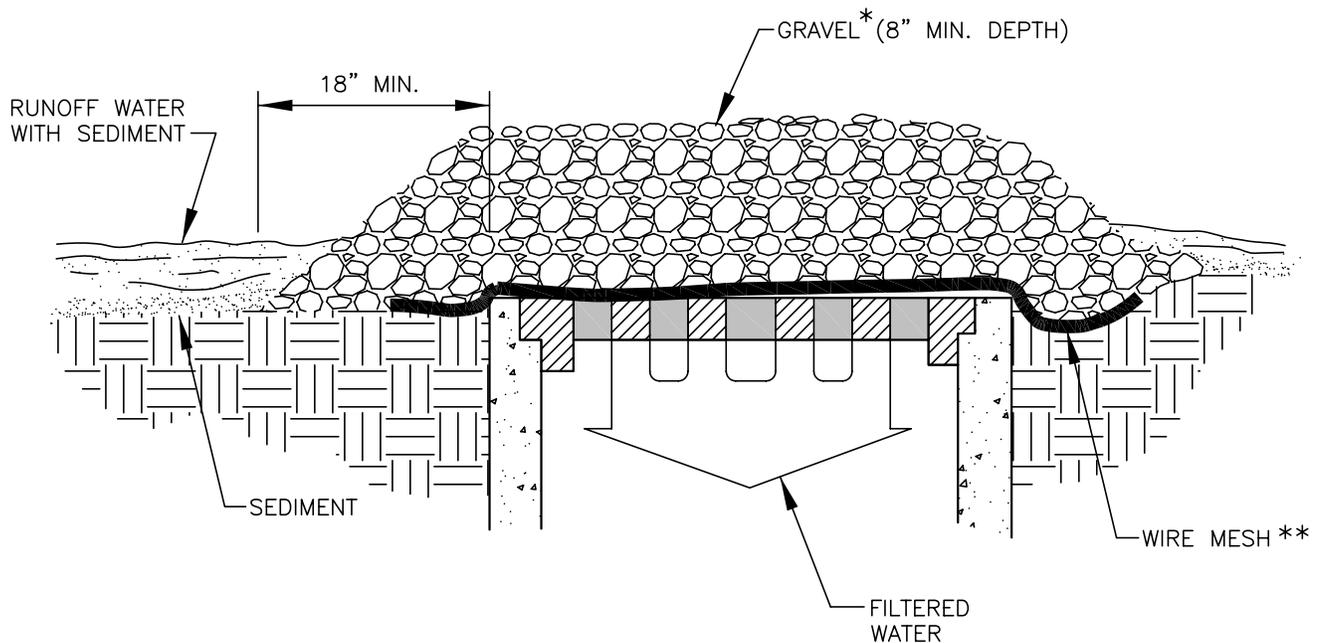
OUTLET PROFILE



DEWATERING PIPE SECTION

SEDIMENT TRAPS





* GRAVEL SHALL BE #57 GRAVEL.

** FILTER FABRIC OVER WIRE MESH BACKING

1. INLET PROTECTION SHALL BE CONSTRUCTED EITHER BEFORE UPSLOPE LAND DISTURBANCE BEGINS OR BEFORE THE STORM DRAIN BECOMES OPERATIONAL.
2. WIRE MESH SHALL BE OF SUFFICIENT STRENGTH TO SUPPORT FABRIC AND GRAVEL. IT SHALL BE STRETCHED TIGHTLY OVER THE GRATE AND EXTEND A MINIMUM OF 12 INCHES BEYOND EACH SIDE OF INLET.
3. FILTER FABRIC, IF REQUIRED, SHALL HAVE AN EQUIVALENT OPENING OF SIZE 20 - 40 SIEVE AND SHALL BE RESISTANT TO SUNLIGHT.
4. A COMPACTED EARTH DIKE OR CHECK DAM SHALL BE CONSTRUCTED IN THE DITCH LINE BELOW THE INLET IF THE INLET IS NOT IN A DEPRESSION AND IF RUNOFF BYPASSING THE INLET WILL NOT FLOW TO A SETTLING POND. THE TOP OF EARTH DIKES SHALL BE AT LEAST 6 INCHES HIGHER THAN THE TOP OF THE FRAME.

INLET PROTECTION IN SWALES, DITCH LINES OR YARD INLETS