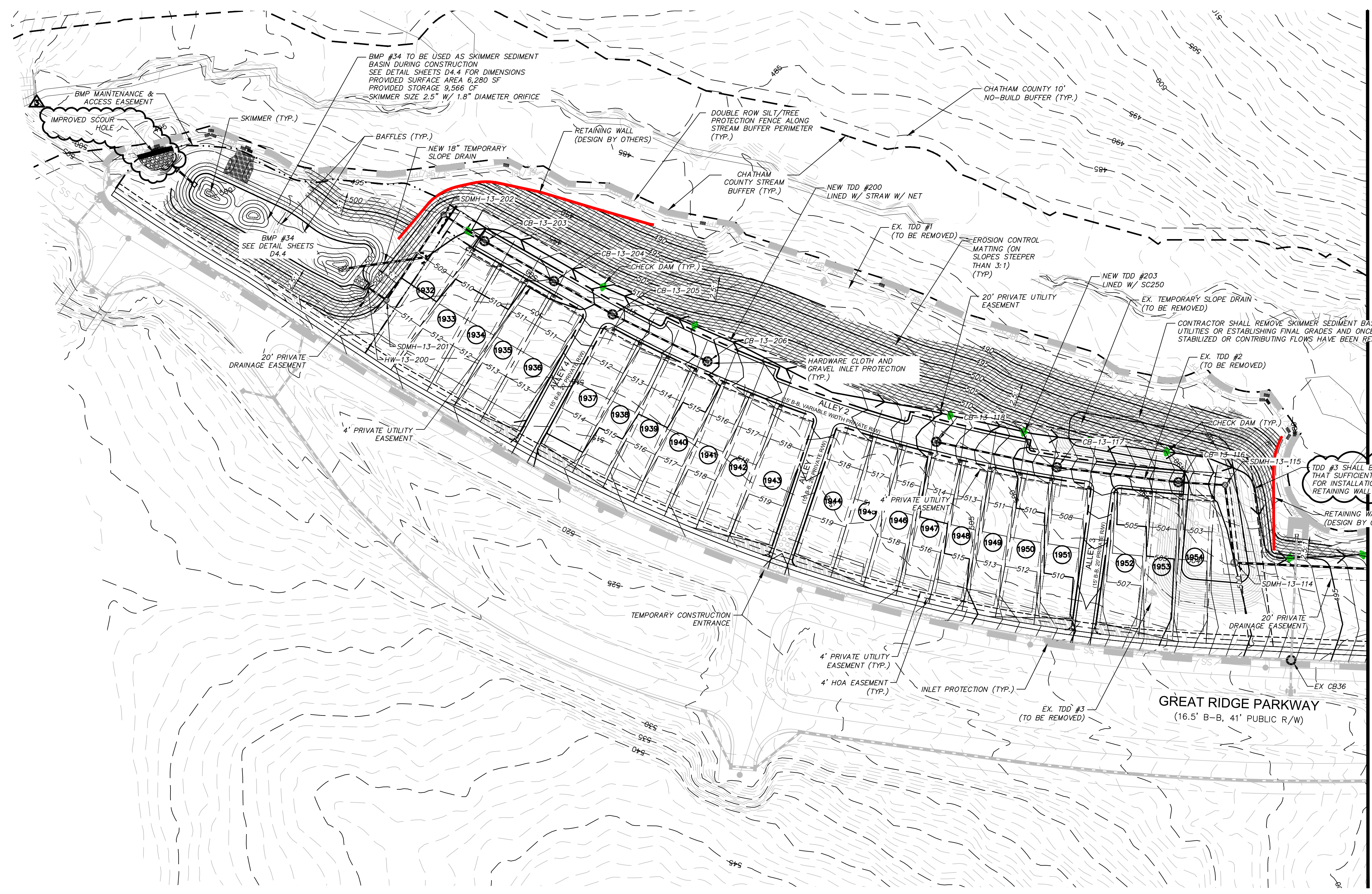
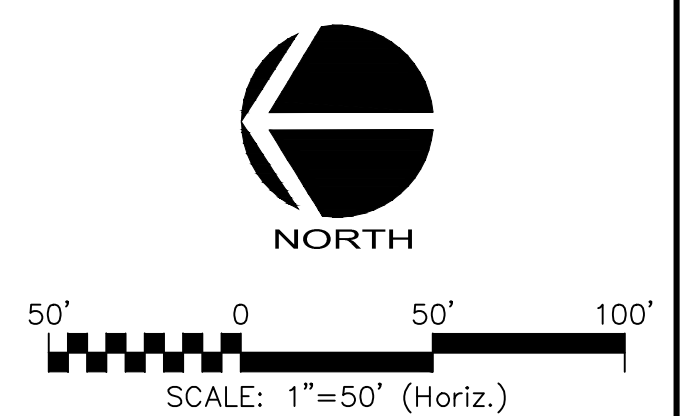


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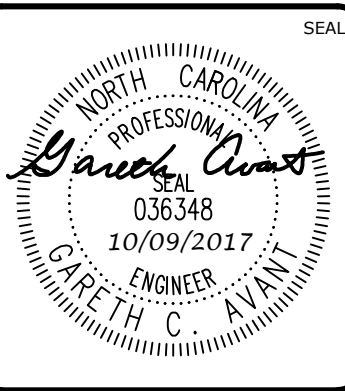
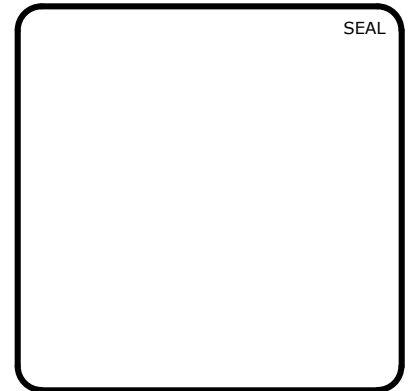
	TEMPORARY CONSTRUCTION ENTRANCE
	RIPRAP OUTLET PROTECTION
	ADDITIONAL DISTURBED AREA
	COMBINATION SILT/TREE PROTECTION FENCE
	TEMPORARY DIVERSION DITCH
	EXISTING CONTOUR
	PROPOSED CONTOUR
	EX. LIMITS OF DISTURBANCE
	LIMITS OF DISTURBANCE
	SEDIMENT BASIN BAFFLE
	HARDWARE CLOTH & GRAVEL INLET PROT.
	ARC PIPE INLET PROTECTION
	CHECK DAM
	EROSION CONTROL MATTING



MATCHLINE - SEE SHEET C3.4



REV. NO.	DESCRIPTIONS	DATE
3	REVISIONS PER COMMENTS RECEIVED FROM COUNTY EROSION CONTROL	2017.10.09
2	REVISIONS PER COMMENTS RECEIVED FROM MCDOT	2017.09.21
1	REVISIONS PER COMMENTS RECEIVED FROM COUNTY EROSION CONTROL	2017.09.13
0	SUBMITTAL TO AGENCIES	2017.07.26



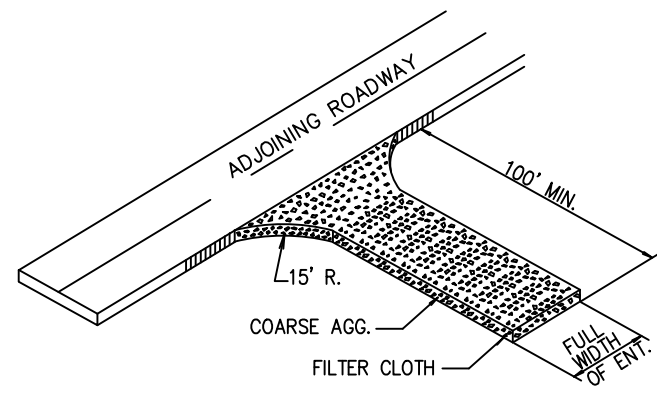
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**BRIAR CHAPEL  
 PHASE 13 - SECTION 1 & 2  
 CHATHAM COUNTY, NORTH CAROLINA  
 STAGE 2  
 GRADING, DRAINAGE & EROSION  
 CONTROL PLAN**

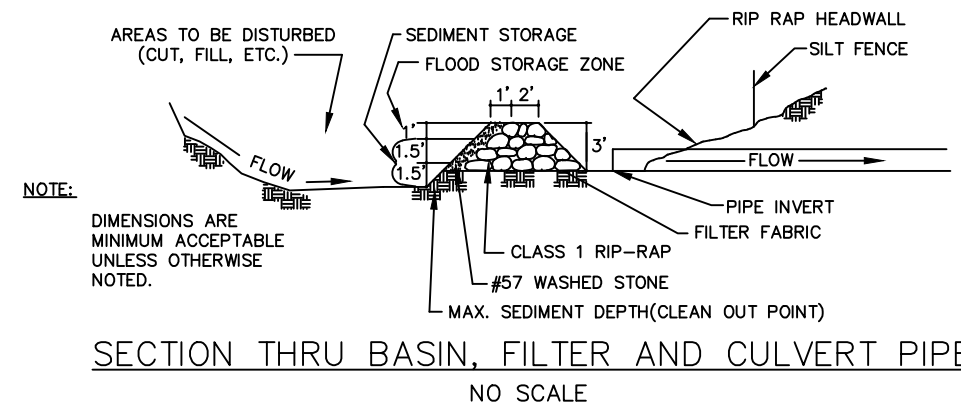
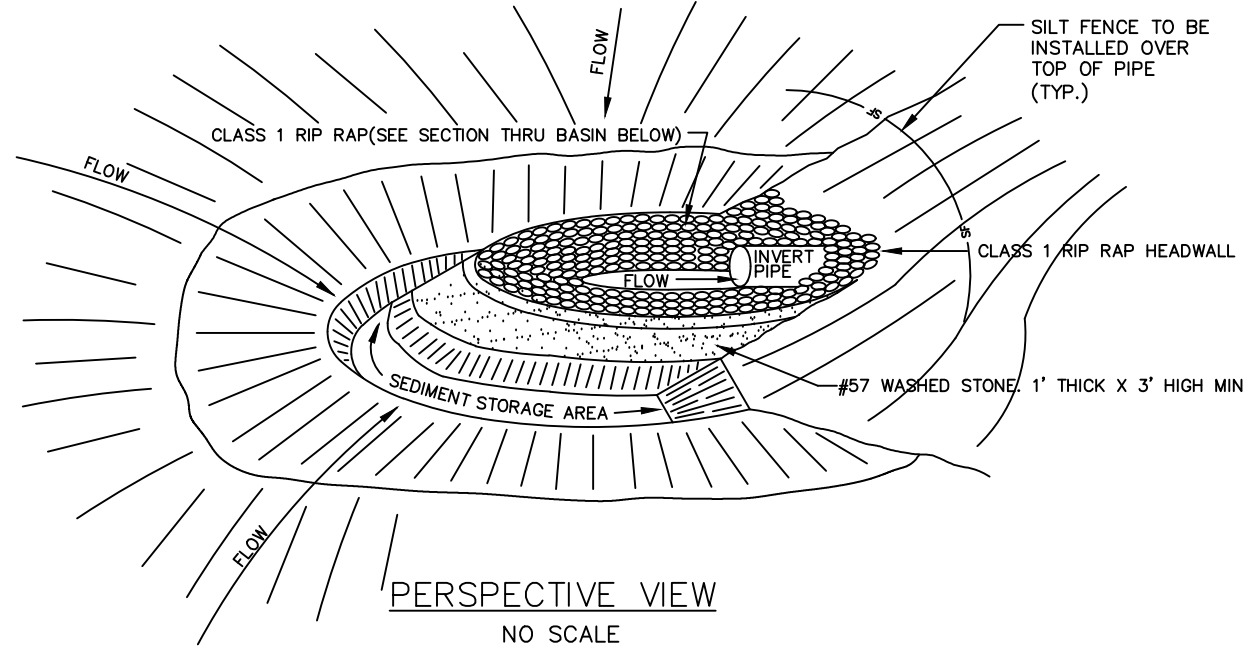
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DESIGNED	BSS	PROJECT MANAGER:	CHS
CHECKED	GCA	REVISION	3
STATUS:	FOR REVIEW PURPOSES ONLY		



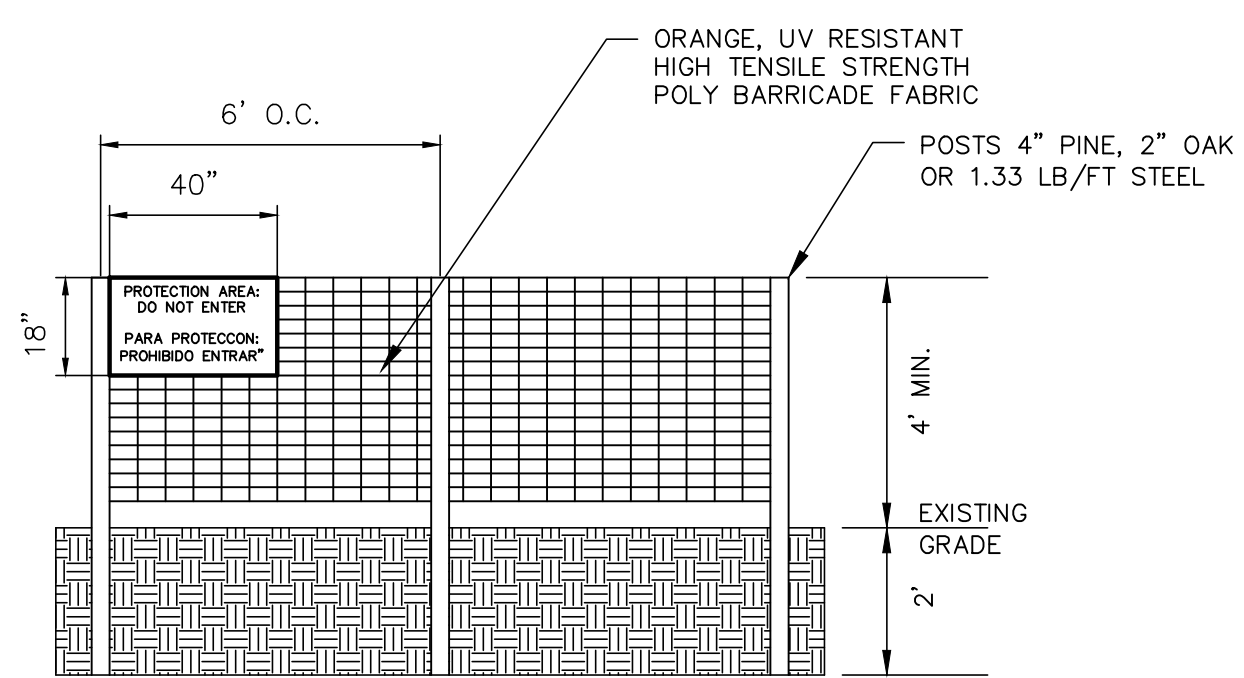


- COARSE AGGREGATE (2"-3" STONE) SHALL BE USED. PAD TO BE 100' X 25' X 6" MIN. PLACE A MINIMUM OF 3" OF STONE IN A CUT SECTION TO HELP SECURE FILTER CLOTH.
- TURNING RADIUS SUFFICIENT TO ACCOMMODATE LARGE TRUCKS IS TO BE PROVIDED.
- ENTRANCES SHOULD BE LOCATED TO PROVIDE FOR MAXIMUM UTILITY BY ALL CONSTRUCTION VEHICLES.
- MUST BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR DIRECT FLOW OF MUD ONTO STREETS. PERIODIC TOP DRESSING MAY BE NECESSARY. AFTER EACH RAINFALL, INSPECT ANY STRUCTURE USED TO TRAP SEDIMENT AND CLEAN IT OUT AS NECESSARY. IMMEDIATELY REMOVE ALL OBJECTIONABLE MATERIALS SPILLED, WASHED, OR TRACKED ONTO PUBLIC ROADWAYS.
- TEMPORARY PADS MUST BE LOCATED ON EACH SIDE OF ADJOINING ROADWAY.

**TEMPORARY CONSTRUCTION ENTRANCE**  
NTS

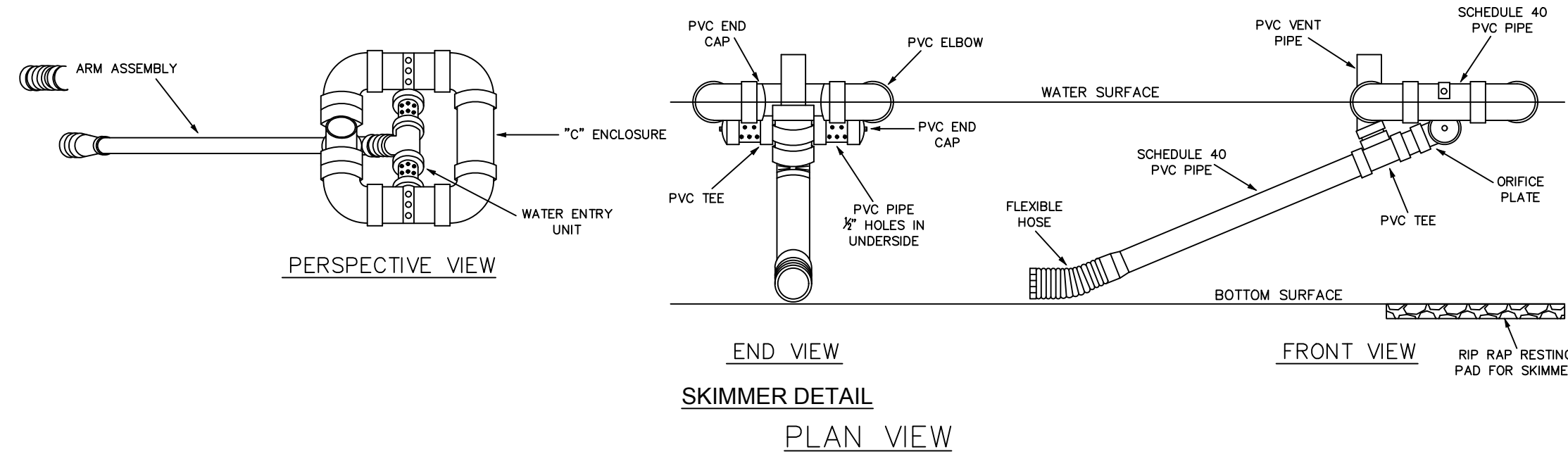


**ARC FILTER INLET PROTECTION**  
NTS



- WARNING SIGNS TO BE MADE OF DURABLE WATERPROOF PLASTIC.
- ALL LETTERS TO BE AT LEAST 3" HIGH, CLEARLY LEGIBLE AND SPACED APPROPRIATELY.
- SIGNS TO BE PLACED AT EACH END OF LINER PROTECTION AREA AND 200' ON CENTER (MAX.) THEREAFTER FOR PROTECTION AREA LESS THAN 200' IN PERIMETER. PROVIDE NO LESS THAN ONE SIGN PER PROTECTION AREA AND/OR SIDE.
- ATTACH SIGNS SECURELY TO FENCE POSTS AND FABRIC. FABRIC MUST BE ATTACHED TO APPROVED POSTS ONLY. DO NOT ATTACH TO TREES.
- ADDITIONAL FENCING MAY BE REQUIRED BASED ON FIELD CONDITIONS.
- FAILURE TO MAINTAIN PROTECTION FENCING MAY RESULT IN CIVIL PENALTIES.

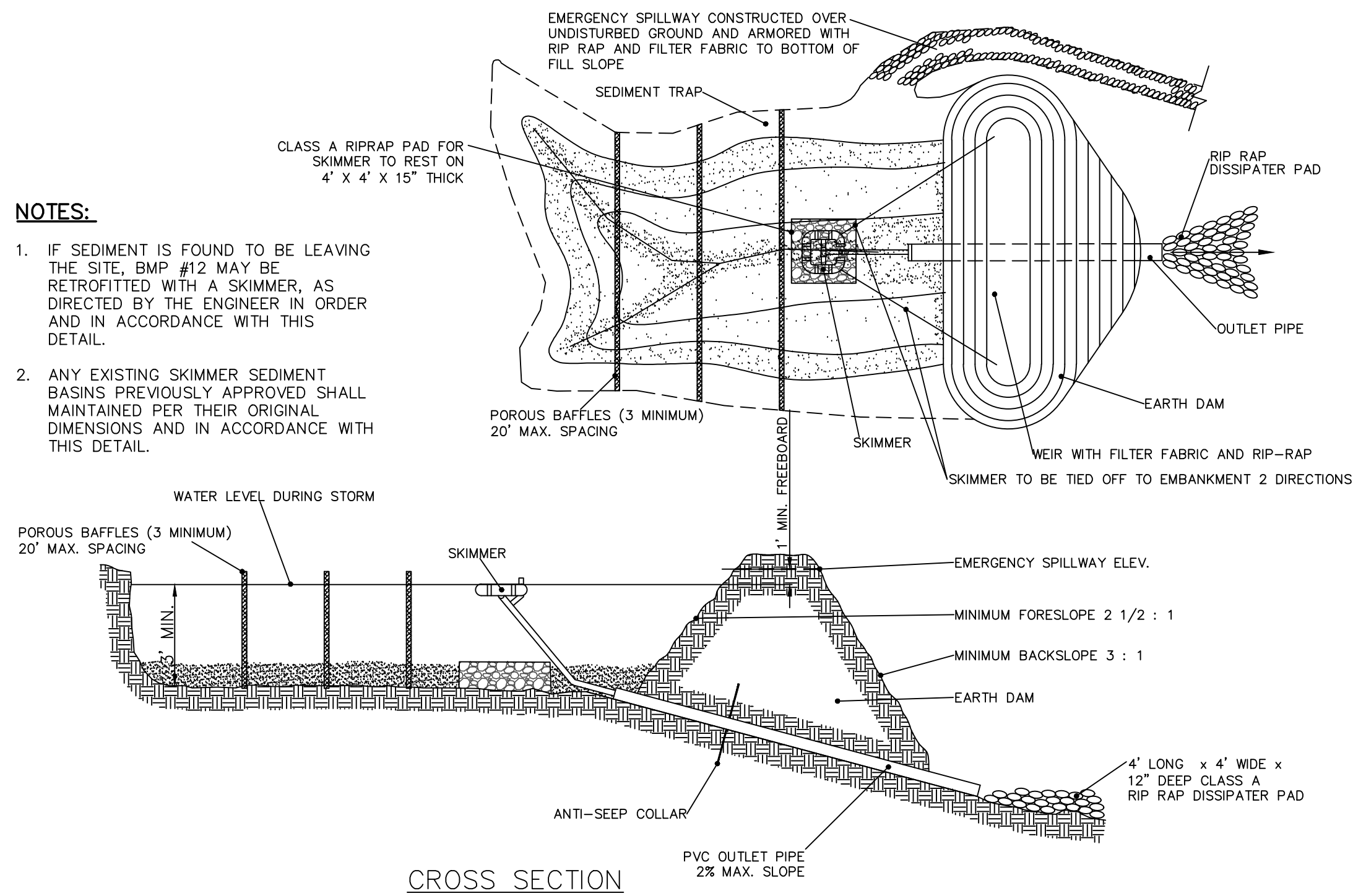
**TREE PROTECTION FENCE**  
NTS



**SKIMMER DETAIL**  
PLAN VIEW

**NOTES:**

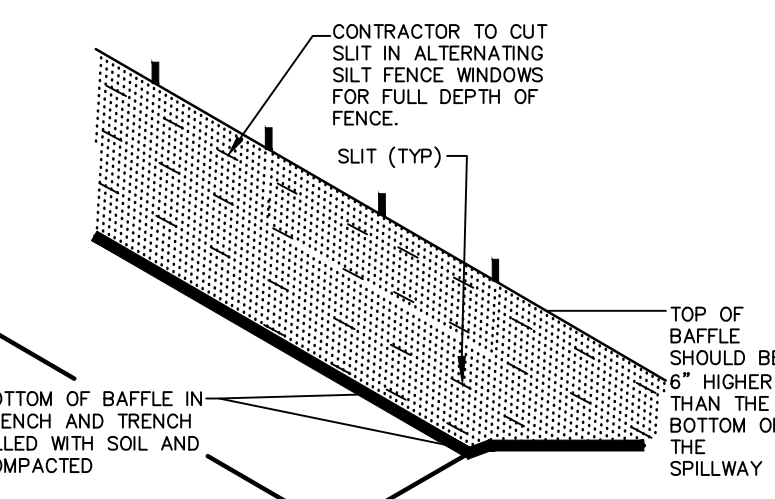
- IF SEDIMENT IS FOUND TO BE LEAVING THE SITE, BMP #12 MAY BE RETROFITTED WITH A SKIMMER, AS DIRECTED BY THE ENGINEER IN ORDER AND IN ACCORDANCE WITH THIS DETAIL.
- ANY EXISTING SKIMMER SEDIMENT BASINS PREVIOUSLY APPROVED SHALL MAINTAINED PER THEIR ORIGINAL DIMENSIONS AND IN ACCORDANCE WITH THIS DETAIL.



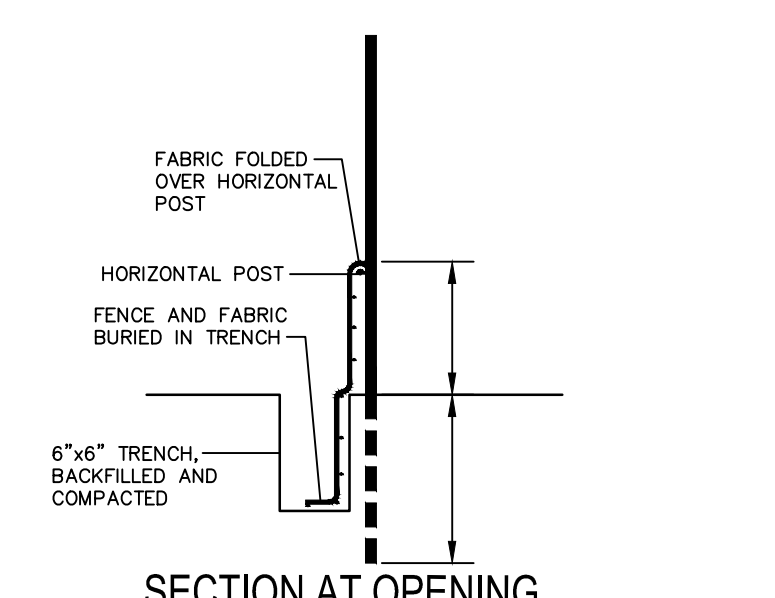
**TEMPORARY SKIMMER SEDIMENT BASIN**  
NTS

BASIN #	DISTURBED AREA (ac)	TOTAL DRAINAGE AREA (ac)	REQUIRED STORAGE	REQUIRED SURFACE AREA	MINIMUM DEPTH	BOTTOM ELEVATION	TOP WIDTH	TOP LENGTH	PROVIDED STORAGE	PROVIDED SURFACE AREA	STORAGE/ SPILLWAY ELEVATION	SPILLWAY WIDTH	TOP OF DAM ELEVATION	SKIMMER SIZE	SKIMMER ORIFICE DIAMETER
STAGE 1															
1	4.51	4.51	16,240 CF	7,380 SF	3.0'	484.0'	184'	46'	17,544 CF	8,464 SF	487.0'	19.0'	489.0'	2.5"	2.4"
2/BMP #33	5.06	5.06	18,220 CF	8,280 SF	5.0'	439.0'	PER PLANNER PLAN	68,404 CF	20,953 SF	448.0'	22.0'	450.0'	5.0"	4.2"	
3	1.40	1.40	5,040 CF	2,290 SF	3.5'	483.5'	62'	24'	5,208 CF	2,775 SF	447.0'	6.0'	489.0'	2.0"	1.4"
STAGE 2															
BMP #34	1.44	1.44	5,180 CF	2,360 SF	3.0'	498.0'	PER PLANNER PLAN	9,956 CF	6,280 SF	501.0'	22.0'	503.0'	2.5"	1.8"	

**BAFFLE INSTALLATION - STEP 1**



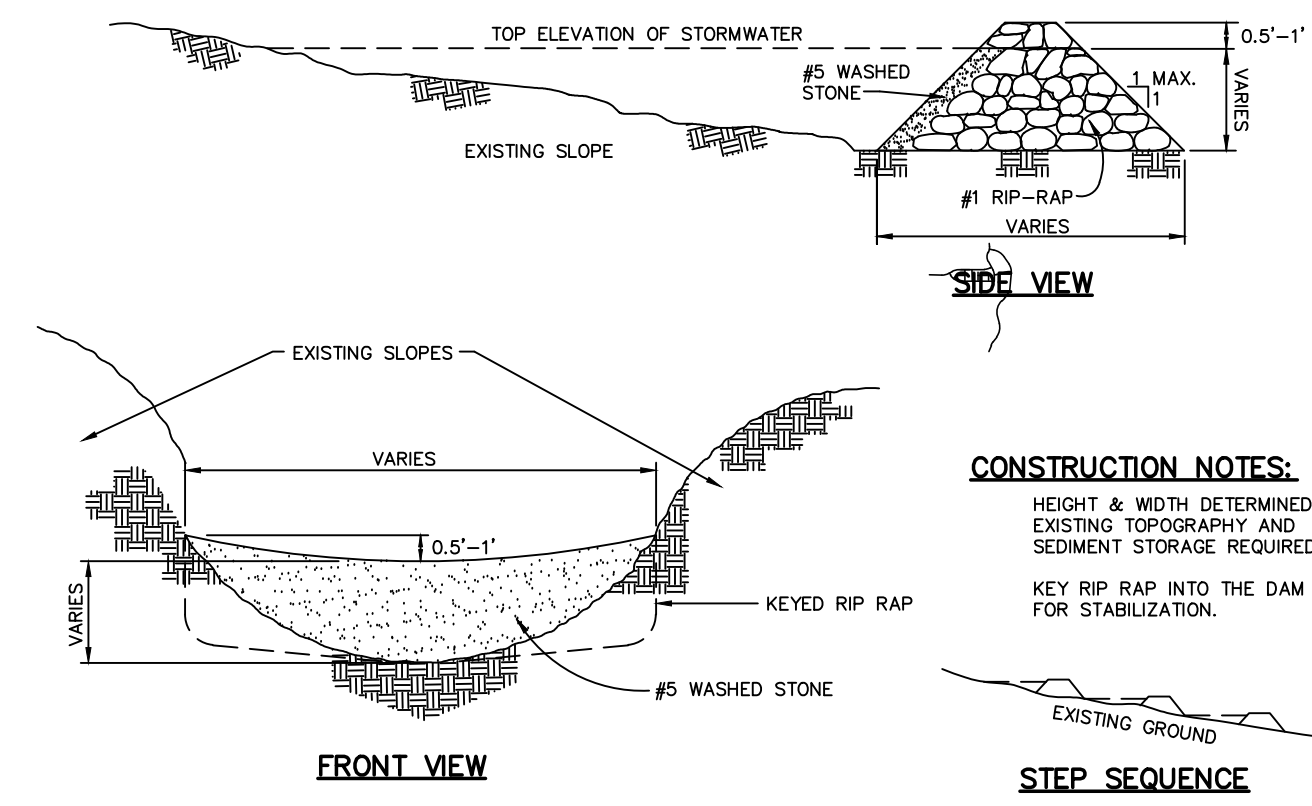
**BAFFLE INSTALLATION - STEP 2**



**SECTION AT OPENING**

- DRIVE STEEL FENCE POST AT LEAST 18" INTO SOLID GROUND.
- WOOD POSTS ARE NOT ACCEPTABLE.
- USE STAPLES 1" APART TO ATTACH FABRIC TO "HOG WIRE".
- BAFFLE SPACED AS PER APPROVED PLAN.

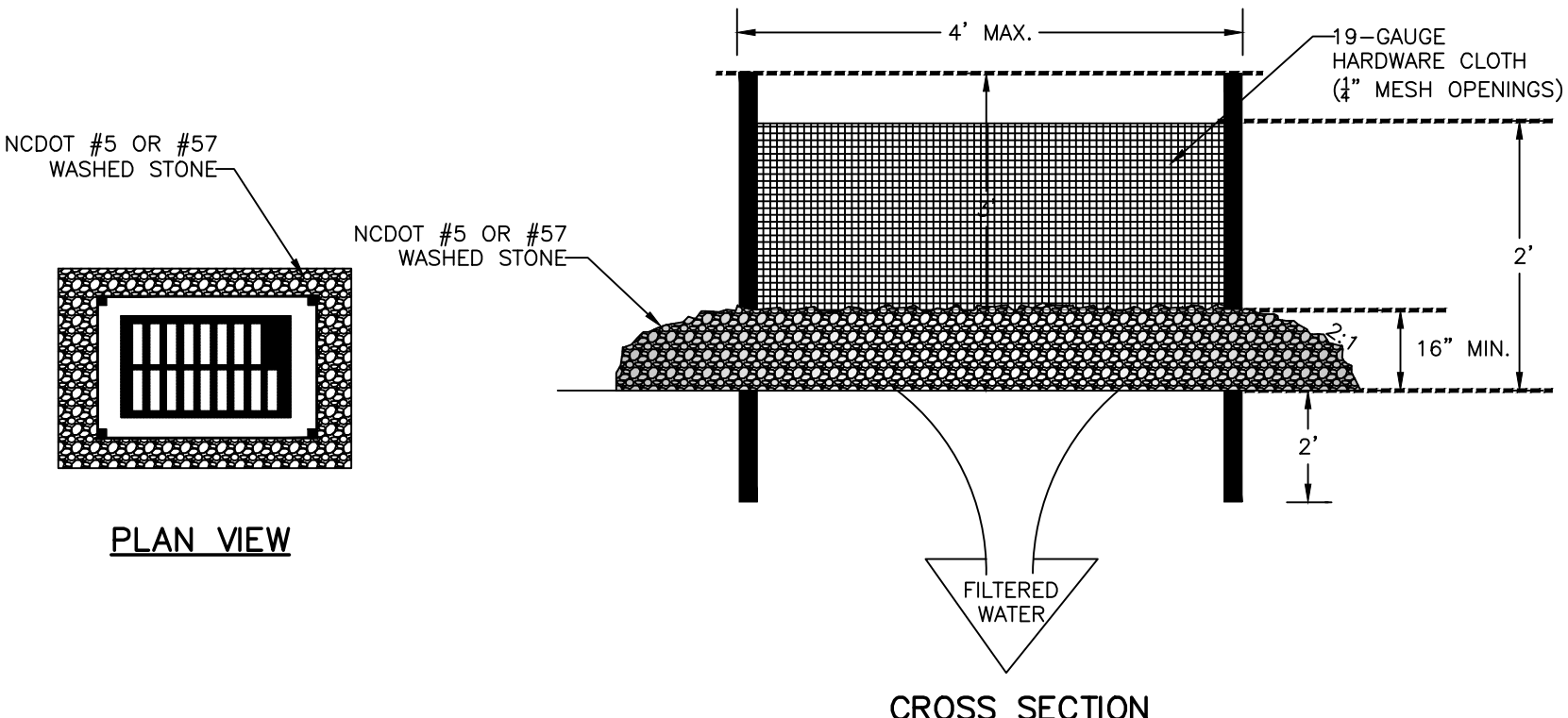
**BAFFLE INSTALLATION DETAIL**



**CHECK DAM**  
NTS

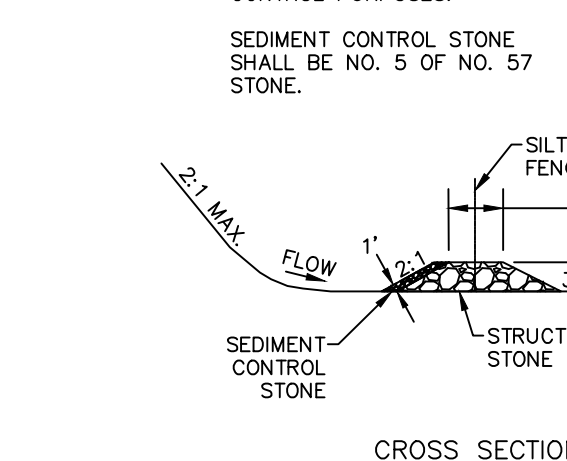
**NOTES:**

- UNIFORMLY GRADE A SHALLOW DEPRESSION APPROACHING THE INLET.
- DRIVE 5-FOOT STEEL POSTS 2 FEET INTO THE GROUND SURROUNDING THE INLET. SPACE POSTS EVENLY AROUND THE PERIMETER OF THE INLET, A MAXIMUM OF 4 FEET APART.
- SURROUND THE POSTS WITH WIRE MESH HARDWARE CLOTH. SECURE THE WIRE MESH TO THE STEEL POSTS AT THE TOP, MIDDLE, AND BOTTOM. PLACING A 2-FOOT FLAP OF THE WIRE MESH UNDER THE GRAVEL (OR #57 STONE) IS RECOMMENDED.
- PLACE CLEAN GRAVEL (NC DOT #5 OR #57 STONE) ON A 2:1 SLOPE WITH A HEIGHT OF 16 INCHES AROUND THE WIRE, AND SMOOTH TO AN EVEN GRADE.
- ONCE THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED, REMOVE ACCUMULATED SEDIMENT, AND ESTABLISH FINAL GRADING ELEVATIONS.
- COMPACT THE AREA PROPERLY AND STABILIZED IT WITH GROUND COVER.

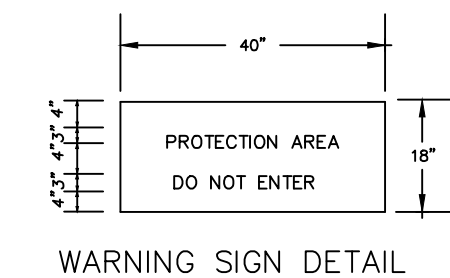
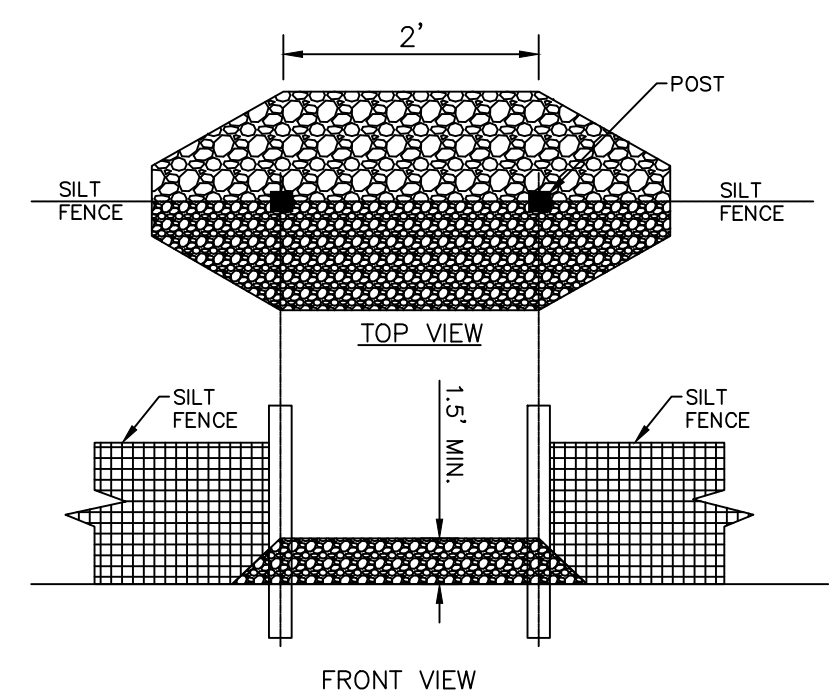


**HARDWARE CLOTH & GRAVEL INLET PROTECTION**  
NTS

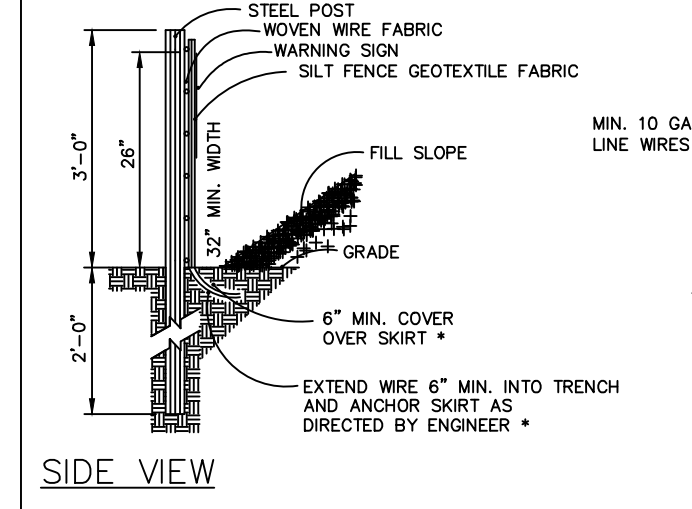
NOTE: STRUCTURAL STONE SHALL BE CLASS B STONE FOR EROSION CONTROL PURPOSES. SEDIMENT CONTROL STONE SHALL BE NO. 5 OF NO. 57 STONE.



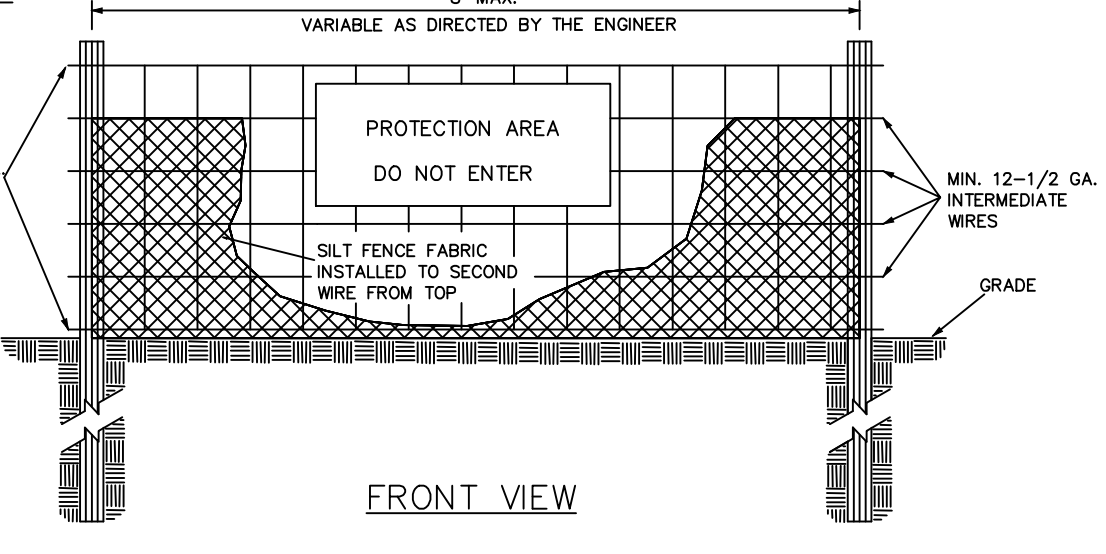
**SILT FENCE OUTLET**  
NTS



**WARNING SIGN DETAIL**



**SIDE VIEW**



**FRONT VIEW**

**COMBINATION SILT/TREE PROTECTION FENCE**  
NTS

**NOTES:**

- WARNING SIGNS TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL.
- LETTERS TO BE 3" HIGH MINIMUM, CLEARLY LEGIBLE AND SPACED AS DETAILED.
- SIGNS SHALL BE PLACED AT 50' MAXIMUM INTERVALS.
- PLACE A SIGN AT EACH END OF LINEAR TREE PROTECTION AND 50' ON CENTER THEREAFTER.
- FOR TREE PROTECTION AREAS LESS THAN 200' IN PERIMETER, PROVIDE NO LESS THAN ONE SIGN PER PROTECTION AREA.
- ATTACH SIGNS SECURELY TO FENCE POSTS AND FABRIC.
- MAINTAIN TREE PROTECTION FENCE THROUGHOUT DURATION OF PROJECT.
- ADDITIONAL SIGNS MAY BE REQUIRED BY CHATHAM COUNTY BASED ON ACTUAL FIELD CONDITIONS.
- PLACE A SIGN AT EACH END OF LINEAR TREE PROTECTION AND 50' ON CENTER THEREAFTER.
- FLOW SHALL NOT RUN PARALLEL WITH THE FENCE.
- END OF SILT FENCE NEEDS TO BE TURNED UP HILL.
- SEE NCDENR PRACTICE & SPECIFICATIONS MANUAL SEDIMENTS FENCE SECTION FOR CONDITIONS WHERE PRACTICE APPLIES AND DESIGN CRITERIA.

REV. NO.	DESCRIPTIONS	DATE
3	REVISIONS PER COMMENTS RECEIVED FROM COUNTY EROSION CONTROL	2017.10.06
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1	REVISIONS PER COMMENTS RECEIVED FROM COUNTY EROSION CONTROL	2017.09.13
0	SUBMITTAL TO AGENCIES	2017.07.26

Professional Engineer Seal for Gary C. Aylant, State of North Carolina, License No. 036348, dated 10/09/2017.

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**PHASE 13 - SECTION 1 & 2**  
**CHATHAM COUNTY, NORTH CAROLINA**  
**EROSION AND SEDIMENTATION**  
**CONTROL DETAILS**

DATE: JULY 26, 2017	SCALE: D1.1	MISC FILE NUMBER: D1.1
MCE PROJ. # 02735-0198	HORIZONTAL: N/A	DRAWING NUMBER: D1.1
DRAWN: BSS	VERTICAL: N/A	
DESIGNED: BSS		
CHECKED: GCA		
PROJ. MGR.: CHS		
STATUS: FOR REVIEW PURPOSES ONLY	REVISION: 3	

**RECOMMENDATIONS FOR LATE WINTER AND EARLY SPRING**

SEEDING MIXTURE  
SPECIES \_\_\_\_\_ RATE (lb/acre)  
TALL FESCUE \_\_\_\_\_ 80  
KOBE LESPEDEZA \_\_\_\_\_ 40

NURSE PLANTS:  
BETWEEN MAY 1 AND AUG. 15, ADD 10 lb/acre GERMAN MILLET OR 15 lb/acre SUDANGRASS. PRIOR TO MAY 1 OR AFTER AUG. 15, ADD 40 lb/acre RYE (GRAIN)

SEEDING DATES:  
BEST: AUG. 15 - SEPT. 15 POSSIBLE: AUG. 20 - OCT. 25  
LATE WINTER: FEB. 15 - MAR. 21 FEB. 1 - APR. 15.

FALL IS BEST FOR TALL FESCUE AND LATER WINTER FOR LESPEDEZAS. OVERSEEDING OF KOBE LESPEDEZA OVER FALL-SEEDED TALL FESCUE IS VERY EFFECTIVE.

SOIL AMENDMENTS:  
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 lb/acre GROUND AGRICULTURAL LIMESTONE AND 750 lb/acre 10-10-10 FERTILIZER

MULCH:  
APPLY 4,000 lb/acre STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE:  
REFERTILIZE IN THE SECOND YEAR UNLESS GROWTH IS FULLY ADEQUATE. MAY BE MOWED ONCE OR TWICE A YEAR, BUT MOWING IS NOT NECESSARY. RESEED, FERTILIZE AND MULCH DAMAGED AREAS IMMEDIATELY.

**RECOMMENDATIONS FOR GRASS-LINED CHANNELS**

SEEDING MIXTURE  
SPECIES \_\_\_\_\_ RATE (lb/acre)  
TALL FESCUE \_\_\_\_\_ 200

NURSE PLANTS:  
BETWEEN MAY 1 AND AUG. 15, ADD 10 lb/acre SUDANGRASS OR 15 lb/acre GERMAN MILLET. PRIOR TO MAY 1 OR AFTER AUG. 15, ADD 40 lb/acre RYE (GRAIN)

SEEDING DATES:  
BEST: AUG. 25 - OCT. POSSIBLE: FEB. - APR. 15

AVOID SEEDING FROM NOV. TO JAN. IF SEEDING MUST BE DONE AT THIS TIME, ADD 40 lb/acre RYE GRAIN AND USE A CHANNEL LINING THAT OFFERS MAXIMUM PROTECTION

SOIL AMENDMENTS:  
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 4,000 lb/acre GROUND AGRICULTURAL LIMESTONE AND 1,000 lb/acre 10-10-10 FERTILIZER

MULCH:  
USE ROLLED EROSION CONTROL PRODUCT TO COVER THE BOTTOM OF THE CHANNELS AND DITCHES, AND STAPLE SECURELY. THE LINING SHOULD EXTEND ABOVE THE HIGHEST CALCULATED DEPTH OF FLOW. ON CHANNEL SIDE SLOPES ABOVE THIS HEIGHT, AND IN DRAINAGES NOT REQUIRING TEMPORARY LININGS, APPLY 4,000 lb/acre GRAIN STRAW, AND ANCHOR STRAW BY STAPLING NETTING OVER THE TOP.

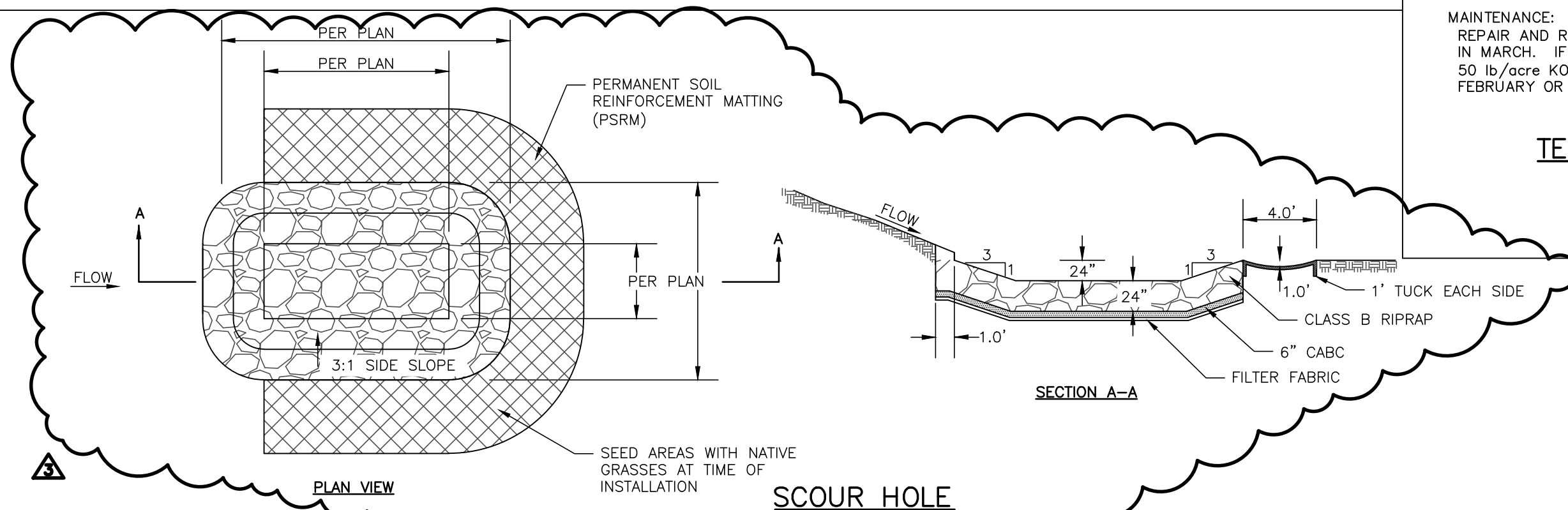
MULCH AND ANCHORING MATERIALS MUST NOT BE ALLOWED TO WASH DOWN SLOPES WHERE THEY CAN CLOG DRAINAGE DEVICES.

MAINTENANCE:  
INSPECT AND REPAIR MULCH FREQUENTLY. REFERTILIZE IN LATE WINTER OF THE FOLLOWING YEAR; USE SOIL TESTS OR APPLY 150 lb/acre 10-10-10. MOW REGULARLY TO A HEIGHT OF 2-4 INCHES.

**NOTE:**  
SEE NCDENR'S EROSION AND SEDIMENT CONTROL PLANNING DESIGN MANUAL SECTION 6.11 FOR ADDITIONAL PERMANENT SEEDING OPTIONS.

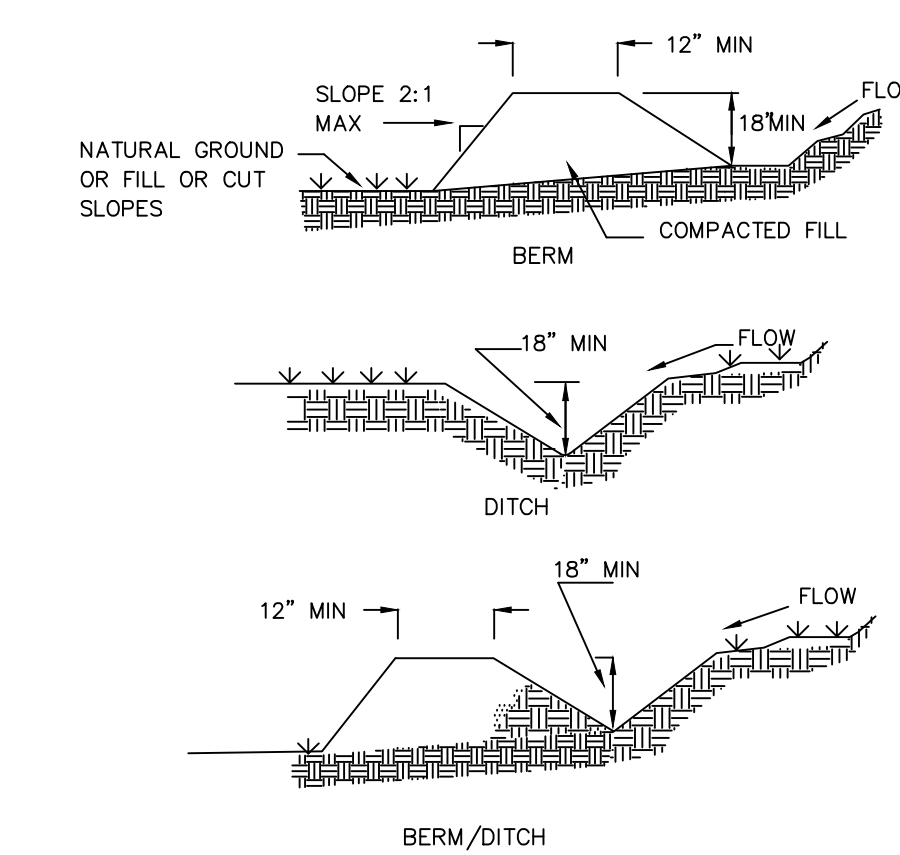
**PERMANENT SEEDING SCHEDULE**

NTS



**TEMPORARY SEEDING SCHEDULE**

NTS



**NOTES:**  
POSITIVE GRADE MUST BE PROVIDED TO ASSURE DRAINAGE. IF SLOPE EXCEEDS 2% SEED AND MULCH DIVERSION. TRY NOT TO EXCEED 5% MAXIMUM D.A. = 5 ACRES WITHOUT SUPPORTING CALC'S.  
DIVERSIONS AT THE TOP OF SLOPES MUST EMPTY INTO AN APPROVED SLOPE DRAIN. BERM/DITCH IS MOST COMMONLY USED.

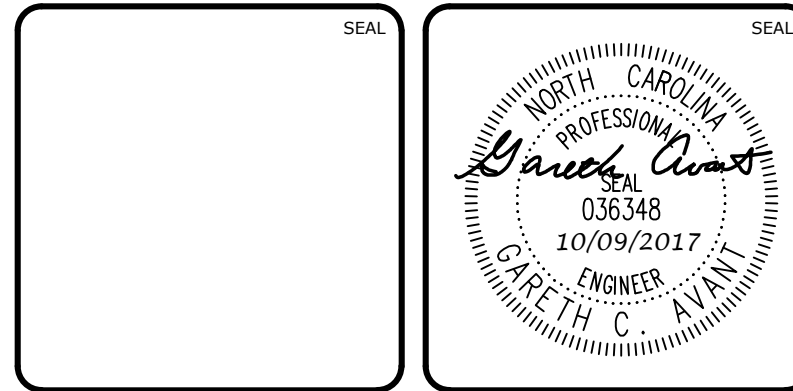
a. MACHINE COMPACTION OF ALL FILL IS REQUIRED. DIVERSIONS SUFFICIENT TO DIRECT ALL SEDIMENT- LADEN STORMWATER INTO A SEDIMENT CONTROL DEVICE MUST BE INSTALLED PRIOR TO CLEARING AND GRUBBING OF THE AREA (OR IN CONJUNCTION WITH THIS OPERATION) IF SEDIMENT CONTROLS AND DIVERSIONS ARE INSTALLED AS EACH CRITICAL POINT IS REACHED).  
b. DIVERSIONS SHOULD BE LOCATED TO MINIMIZE DAMAGES BY CONSTRUCTION OPERATIONS.  
c. DIVERSIONS SHOULD BE SEEDED AND MULCHED IF THEY ARE TO REMAIN IN PLACE OVER 30 DAYS.  
d. CHECK DEVICE AFTER EACH RAIN, BUT ONCE A WEEK REGARDLESS. REPAIR AS NECESSARY.

**MAINTENANCE**  
1. INSPECT TEMPORARY DIVERSIONS ONCE A WEEK AND AFTER EVERY RAINFALL. IMMEDIATELY REMOVE SEDIMENT FROM THE FLOW AREA AND REPAIR THE DIVERSION RIDGE. CAREFULLY CHECK OUTLETS AND MAKE TIMELY REPAIRS AS NEEDED. WHEN THE AREA PROTECTED IS PERMANENTLY STABILIZED, REMOVE THE RIDGE AND THE CHANNEL TO BLEND WITH THE NATURAL GROUND LEVEL AND APPROPRIATELY STABILIZE IT.  
2. ALL TEMPORARY DIVERSION AND CLEAN WATER DIVERSION DITCHES SHALL BE MAINTAINED PER THEIR ORIGINAL DESIGN DIMENSIONS DURING CONSTRUCTION ACTIVITIES. ANY DITCHES THAT REQUIRE REMOVAL OR RELOCATION SHALL RECEIVE APPROVAL FROM CHATHAM COUNTY EROSION CONTROL INSPECTOR.

**TEMPORARY DIVERSION/CLEAN WATER DIVERSION DITCH**

NTS

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**EROSION AND SEDIMENTATION  
CONTROL DETAILS**

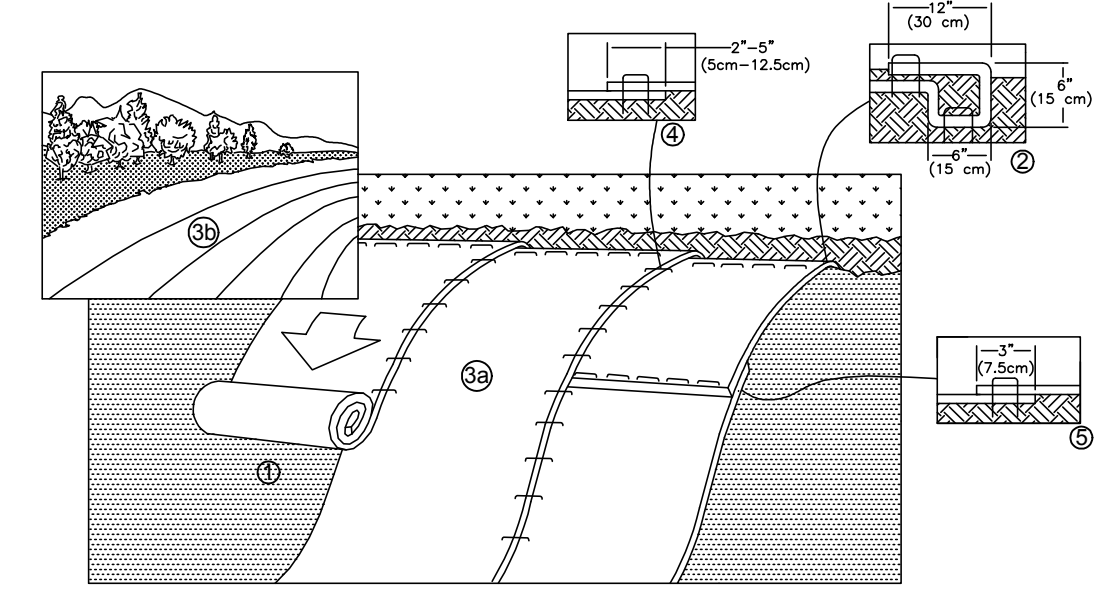
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DRAWN: BSS	VERTICAL: N/A	
DESIGNED: BSS		
CHECKED: GCA		
PROJ. MGR.: CHS		
STATUS: FOR REVIEW PURPOSES ONLY	REVISION: 3	

TDD #	TOTAL LENGTH	SLOPE (%)	LINER	RECEIVING SLOPE DRAIN SIZE (IN.)	RECEIVING SLOPE DRAIN SIZE (IN.)	SIDE SLOPE (H:V:FT)	DEPTH (FT)	TOP WIDTH (FT)
STAGE 1 DIVERSIONS								
1	698'	1.8	STRAW W/NET	24	24	3	0.94	5.67
2	97'	2.1	STRAW W/NET	18	18	3	0.48	2.90
3	412'	3.2	STRAW W/NET	18	18	3	0.24	1.41
4	174'	1.7	STRAW W/NET	18	18	3	0.51	3.04
5	307'	7.2	SYNTHETIC MAT	18	18	3	0.34	2.05
6	654'	3.4	SYNTHETIC MAT	24	24	3	0.74	4.45
7	154'	13.0	SC250	24	24	3	0.30	1.80
8	141'	17.0	SC250	24	24	3	0.24	1.43
9	318'	16.4	SC250	24	24	3	0.28	1.71
STAGE 2 DIVERSIONS								
200	419'	2.6	STRAW W/NET	24	24	3	0.72	4.30
201	750'	3.9	SYNTHETIC MAT	24	24	3	0.70	4.20
202	1370'	4.1	SC250	24	24	3	0.84	5.07

**SEEDBED PREPARATION**

NTS

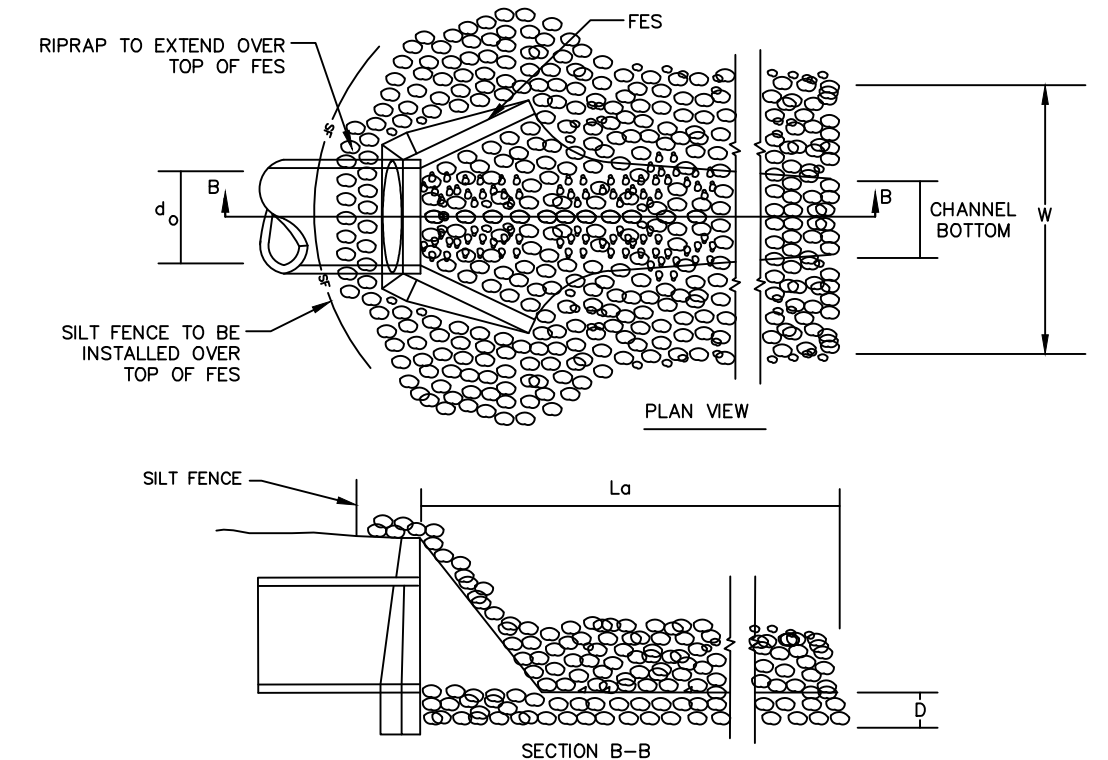
- CHISEL COMPACTED AREAS AND SPREAD TOPSOIL 3 INCHES DEEP OVER ADVERSE SOIL CONDITIONS, IF AVAILABLE.
  - RIP THE ENTIRE AREA TO 6 INCHES DEPTH.
  - REMOVE ALL LOOSE ROCK, ROOTS, AND OTHER OBSTRUCTIONS LEAVING SURFACE REASONABLY SMOOTH AND UNIFORM.
  - APPLY AGRICULTURAL LIME, FERTILIZER, AND SUPERPHOSPHATE UNIFORMLY AND MIX WITH SOIL (SEE BELOW\*).
  - CONTINUE TILLAGE UNTIL A WELL - PULVERIZED, FIRM, REASONABLY UNIFORM SEEDBED IS PREPARED 4 TO 6 INCHES DEEP.
  - SEED ON A FRESHLY PREPARED SEEDBED AND COVER SEED LIGHTLY WITH SEEDING EQUIPMENT OR CULTRIPACK AFTER SEEDING.
  - MULCH IMMEDIATELY AFTER SEEDING AND ANCHOR MULCH.
  - INSPECT ALL SEEDED AREAS AND MAKE NECESSARY REPAIRS OR RESEEDINGS WITHIN THE PLANTING SEASON. IF STAND SHOULD BE OVER 60% DAMAGED REESTABLISH FOLLOWING ORIGINAL LIME, FERTILIZER AND SEEDING RATES.
  - CONSULT CONSERVATION INSPECTOR ON MAINTENANCE TREATMENT AND FERTILIZATION AFTER PERMANENT COVER IS ESTABLISHED.
- \* APPLY: AGRICULTURAL LIMESTONE - 2 TONS/ACRE OR 3 TONS/ACRE IN CLAY SOILS  
FERTILIZER - 1000 LBS/ACRE (10-10-10)  
SUPERPHOSPHATE - 500 LBS/ACRE (20%)  
MULCH - 2 TONS/ACRE (SMALL GRAIN STRAW)ANCHOR - ASPHALT EMULSION AT 450 GAL./ACRE



- PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECPs), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
  - BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECPs IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30 CM) OF RECPs EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECPs WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECPs BACK OVER SEED AND COMPACTED SOIL. SECURE RECPs OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECPs.
  - ROLL THE RECPs (A.) DOWN (FOR SLOPES 3:1 OR GREATER) OR (B.) HORIZONTALLY (FOR SLOPES LESS THAN 3:1) ACROSS THE SLOPE. RECPs WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECPs MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM™, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
  - THE EDGES OF PARALLEL RECPs MUST BE STAPLED WITH APPROXIMATELY 2" -5" (5 CM -12.5 CM) OVERLAP DEPENDING ON RECP'S TYPE.
  - CONSECUTIVE RECPs SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP'S WIDTH.
- NOTE:** \*IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECPs.

**TEMPORARY STABILIZATION FOR SLOPES  
GREATER THAN 10 FEET**

NTS



OUTLET NO.	Do (IN.)	Ls (FT.)	W (FT.)	DEPTH (IN.)	LINING CLASSIFICATION
HW-13-100	30	25	8	36	CLASS 2
HW-13-130	18	12	5	24	CLASS 1
HW-13-200	30	10	4	24	CLASS 1
BMP #33	30	20	8	24	CLASS 1
BMP #34	18	12	5	24	CLASS 1

STONE CLASSIFICATIONS OF CLASS B REQUIRE A SUBLAYER OF FILTER FABRIC OR FS-2 FILTER STONE WITH A BEDDING THICKNESS OF 6".

**RIPRAP OUTLET PROTECTION**

NTS

**INSTALLATION AND MAINTENANCE GUIDELINES**

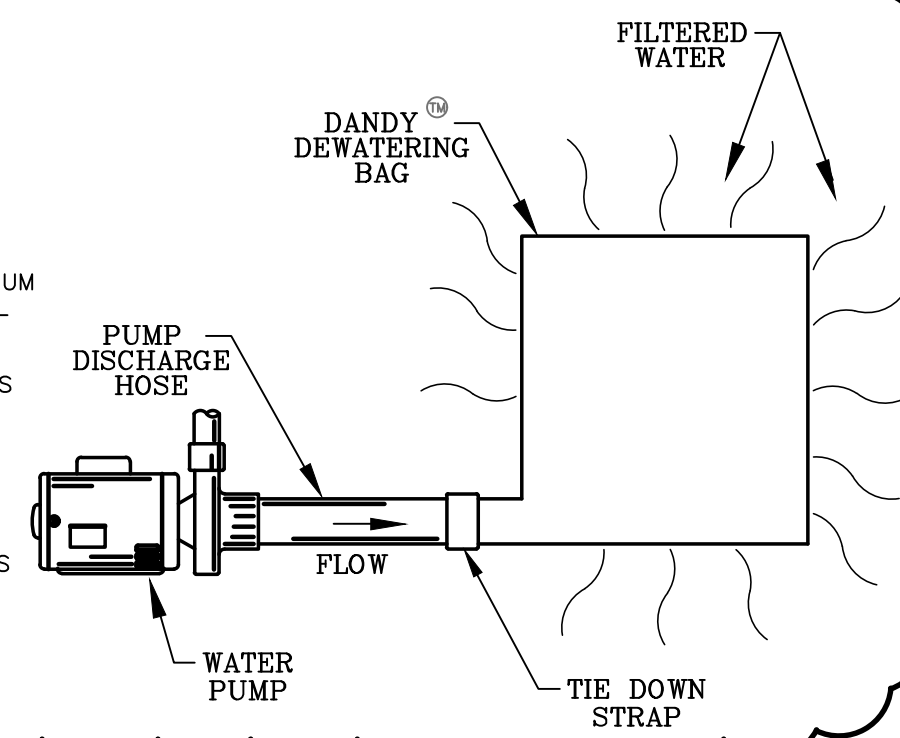
INSERT DISCHARGE HOSE FROM PUMP INTO DANDY DEWATERING BAG. A MINIMUM OF SIX INCHES (6") AND TIGHTLY SECURE WITH THE ATTACHED STRAP TO PREVENT WATER FROM FLOWING OUT OF THE UNIT WITHOUT BEING FILTERED. IF USING OPTIONAL ABSORBENTS, PLACE ABSORBENT BOOM INTO THE DANDY DEWATERING BAG. CLIP ABSORBENT BOOM TO TETHER PROVIDED INSIDE THE UNIT.

MAINTENANCE: REPLACE THE UNIT WHEN 1/2 FULL OF SEDIMENT OR WHEN SEDIMENT HAS REDUCED THE FLOW RATE OF THE PUMP DISCHARGE TO AN IMPRACTICAL RATE. IF USING OPTIONAL OIL ABSORBENTS, REMOVE AND REPLACE ABSORBENT WHEN NEAR SATURATION.

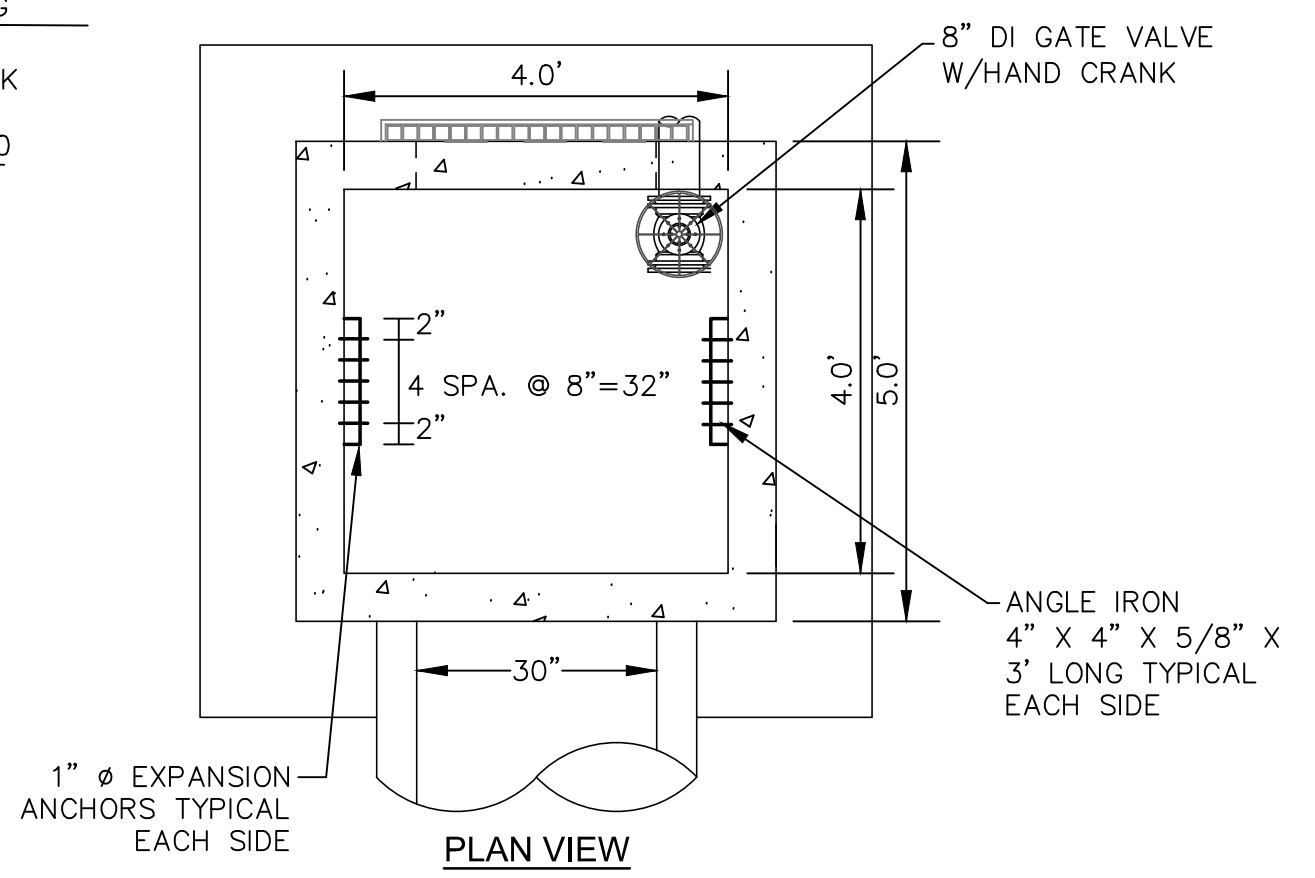
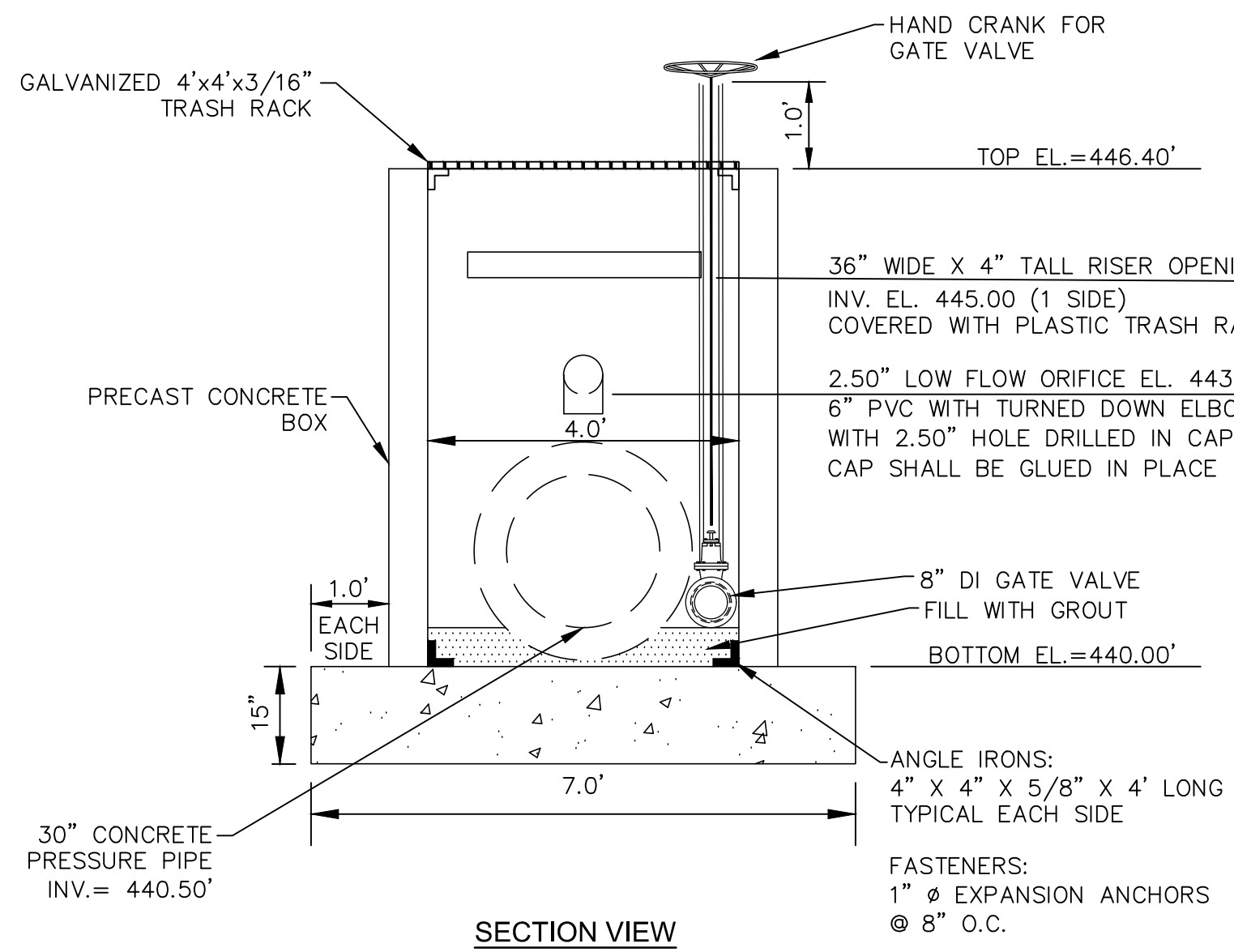
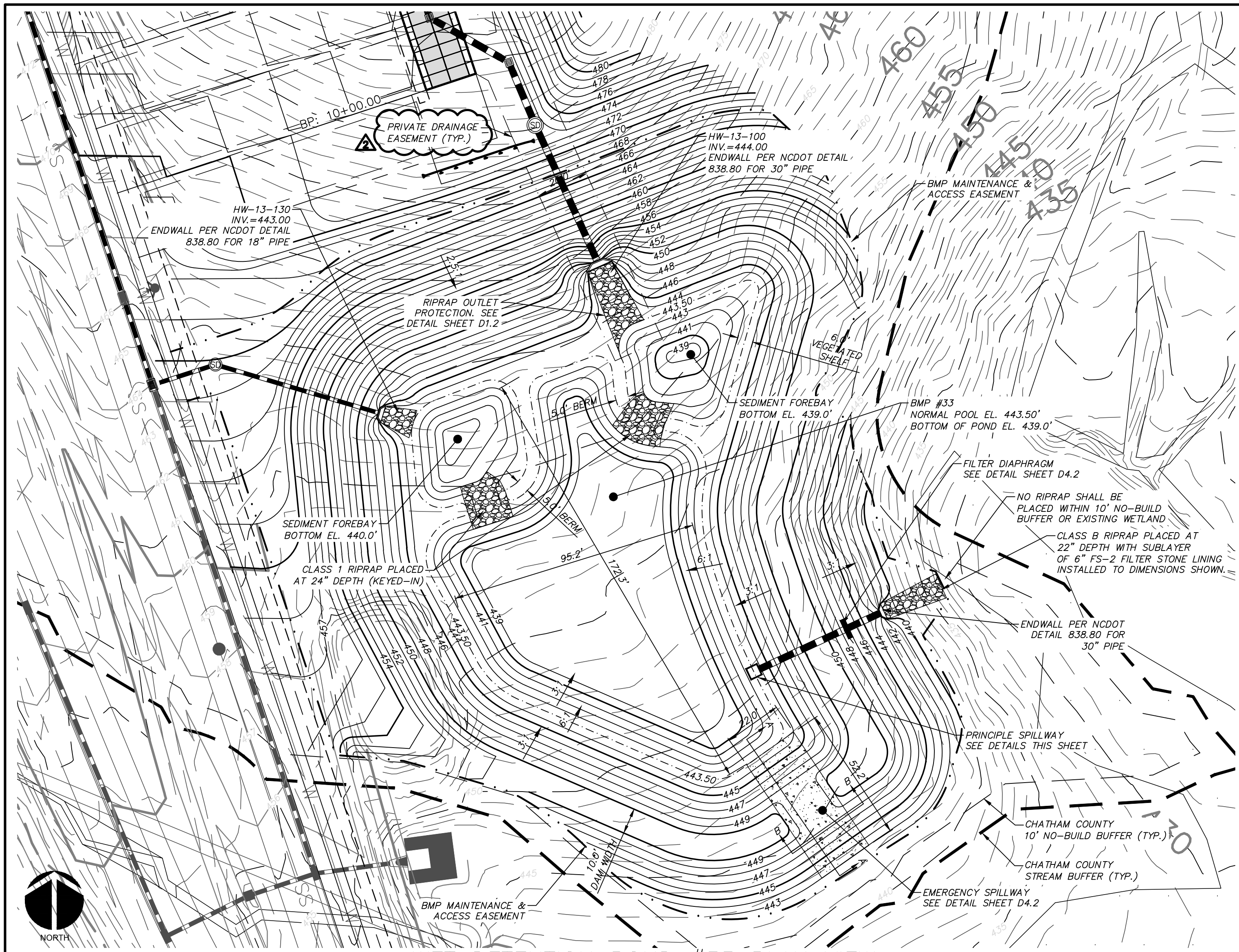
- NOTES:**
- LAY DOWN PLASTIC ON GROUND IN AREA WHERE BAG WILL SIT AND DISCHARGE PATH.
  - PLACE BAG ON PALLETS OR GRAVEL TO ENSURE MAXIMUM DRAINAGE AND ALLOW EQUIPMENT TO PICK UP TO HAUL OFF.
  - PROP BAG UP AT SLIGHT ANGLE SO WATER DISCHARGES TOWARD RIVER AND DOES NOT CREATE A POOL WHEN DRAINING.
  - WHEN INSTALLING NEW BAG MOVE LOCATION OVER AS NOT TO KILL GRASS AND PLANTINGS.
  - CONTRACTOR TO RETURN AREA TO EXISTING CONDITIONS AFTER BAGS ARE NO LONGER NEEDED.

**DEWATERING BAG DETAIL**

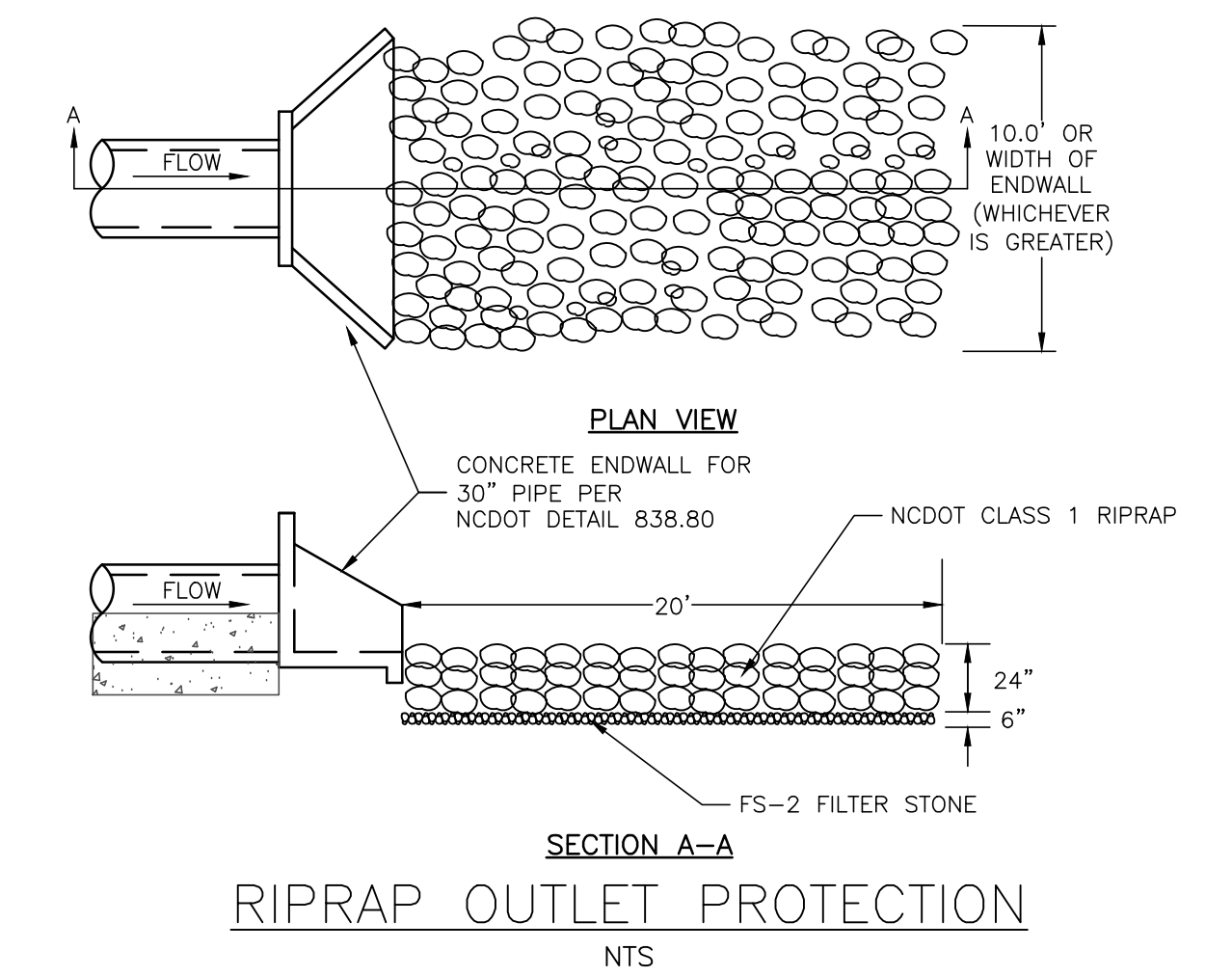
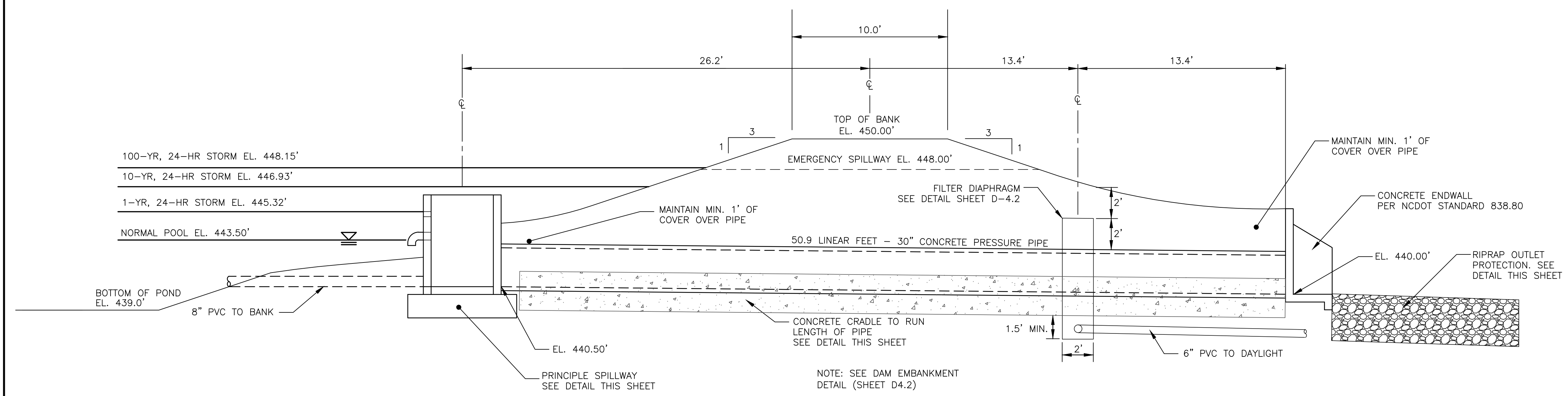
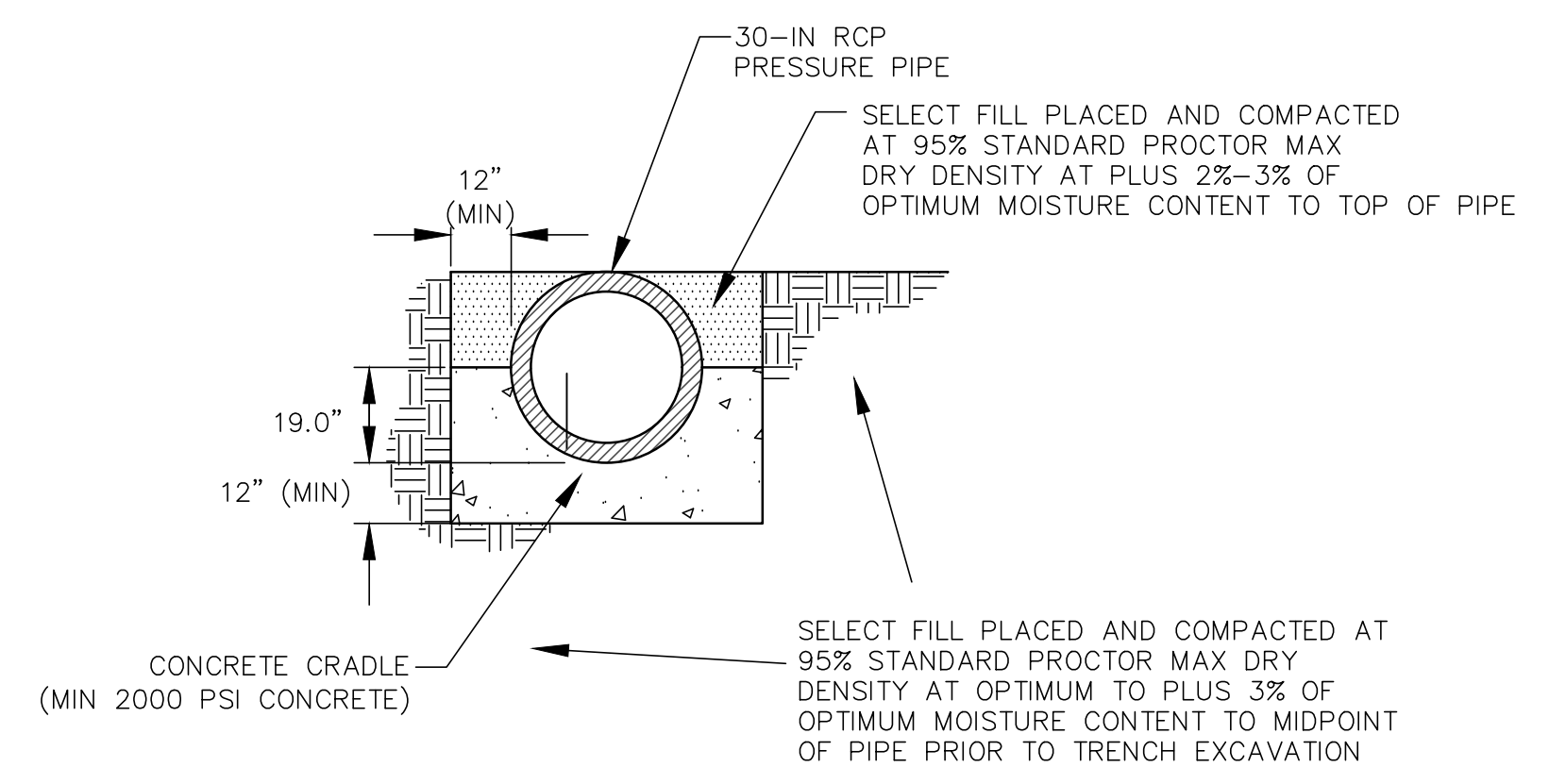
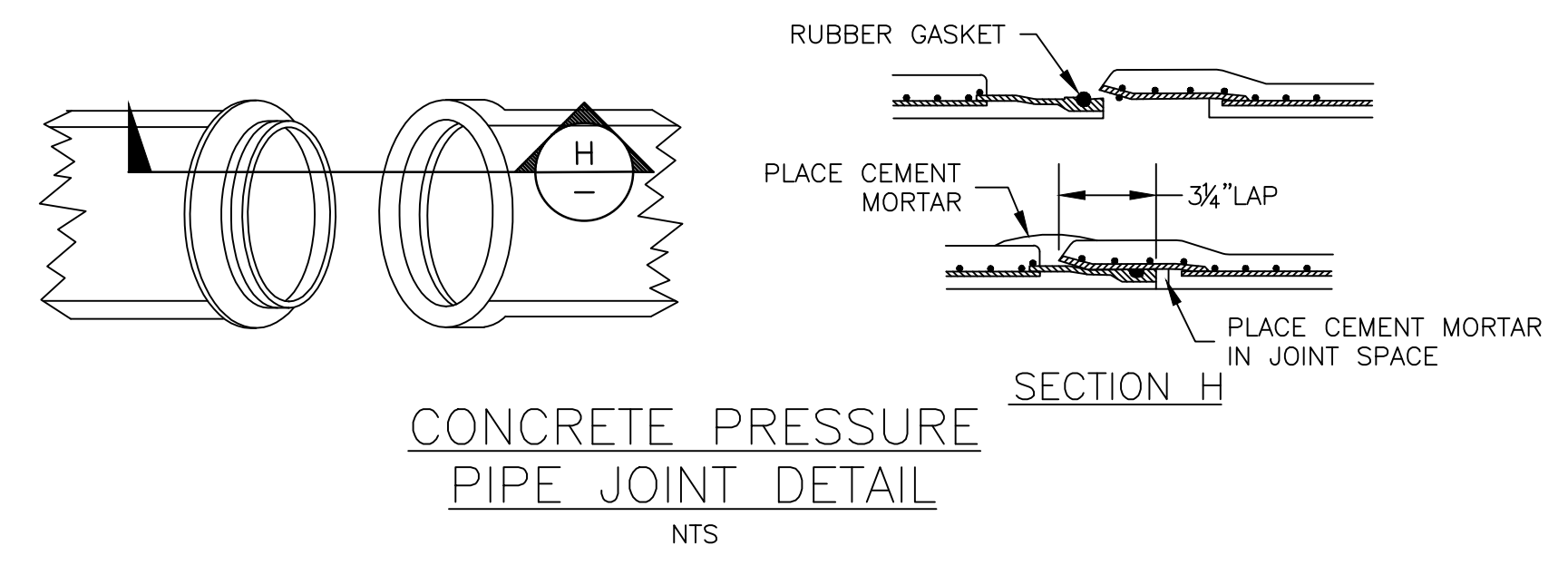
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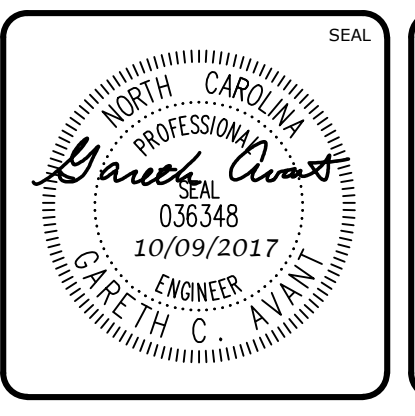
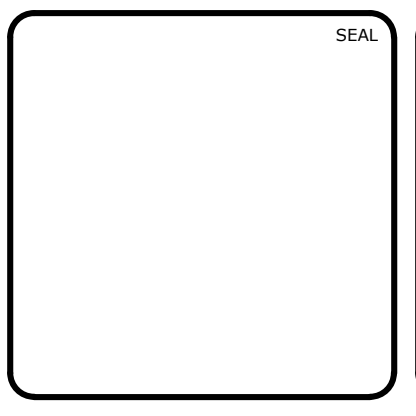




PRINCIPLE SPILLWAY  
SCALE = 1" = 2'



REV. NO.	DESCRIPTIONS	DATE
3	REVISIONS PER COMMENTS RECEIVED FROM COUNTY EROSION CONTROL	2017.10.06
2	REVISIONS PER COMMENTS RECEIVED FROM NCDOT	2017.09.21
1	REVISIONS PER COMMENTS RECEIVED FROM COUNTY EROSION CONTROL	2017.09.13
0	SUBMITTAL TO AGENCIES	2017.07.26

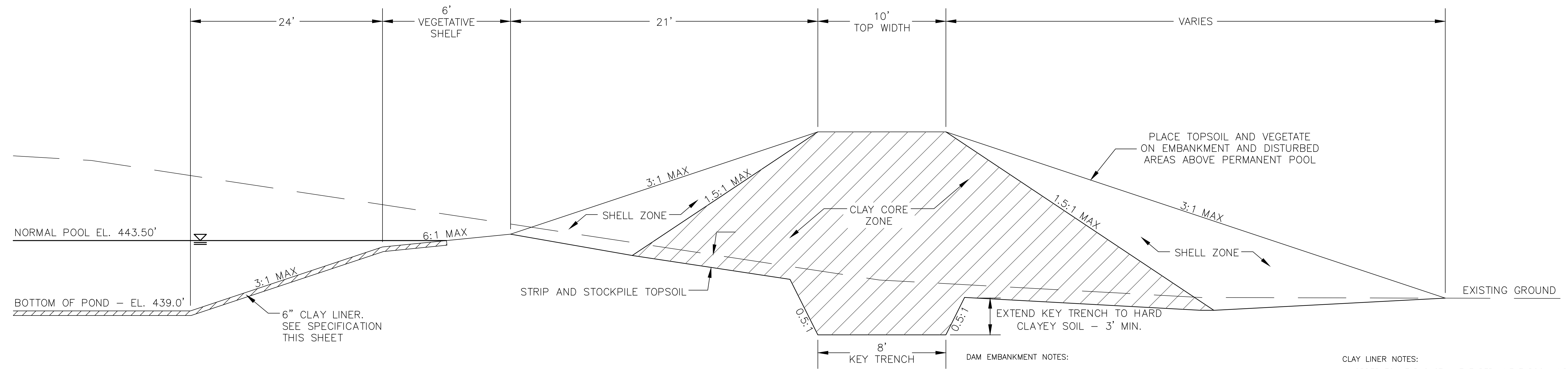


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PHASE 13 - SECTION 1 & 2  
CHATHAM COUNTY, NORTH CAROLINA**  
**BMP #33 PLAN & DETAILS**

DATE: JULY 26, 2017	SCALE: HORIZONTAL: AS NOTED	MAC FILE NUMBER: D4.X
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CHECKED: GCA		
PROJ. MGR.: CHS		
STATUS: FOR REVIEW PURPOSES ONLY		
REVISION: 3		



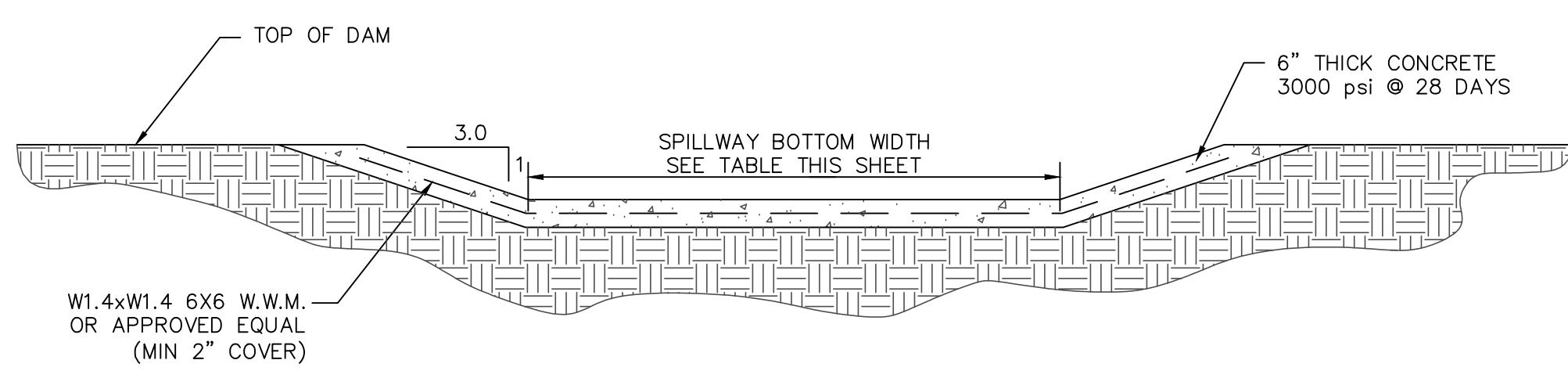
**DAM EMBANKMENT DETAIL**  
NTS

**DAM EMBANKMENT NOTES:**

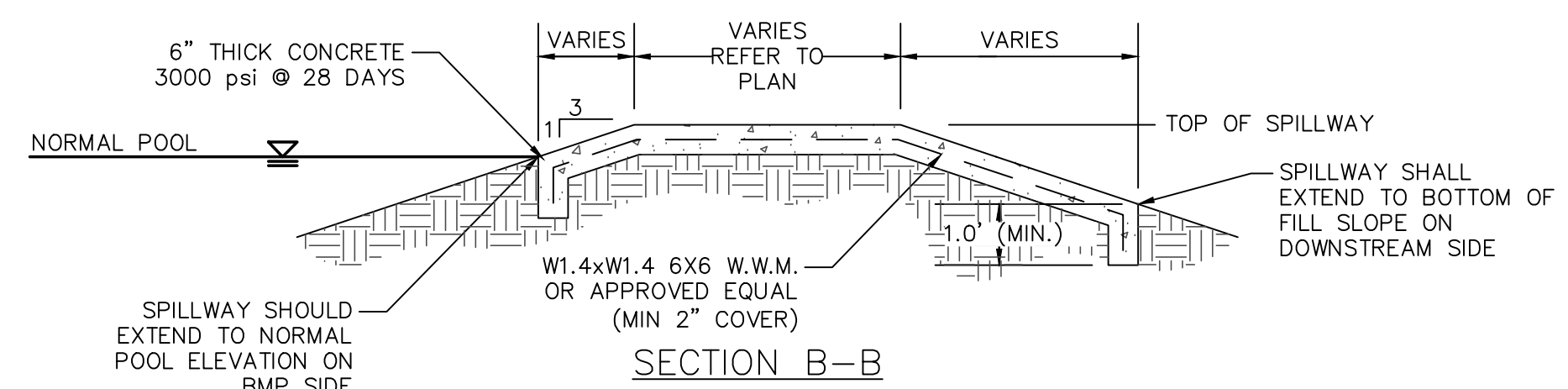
- 1) TOPSOIL BENEATH THE EMBANKMENT SHALL BE REMOVED AND STOCKPILED. THE FOUNDATION WILL BE PROOF ROLLED AND ANY SOFT OR ORGANIC MATERIALS WILL BE REMOVED.
- 2) ALL MATERIAL SHALL BE COMPACTED IN 6-8 INCH LIFTS TO 95% OF MAXIMUM STANDARD PROCTOR DRY DENSITY OR HIGHER (ASTM D-698). THE CLAY CORE ZONE WILL HAVE A MOISTURE CONTENT OF OPTIMUM TO 4 PERCENT ABOVE OPTIMUM MOISTURE CONTENT. THE SHELL ZONE FILL WILL HAVE A MOISTURE CONTENT FROM 2 PERCENT BELOW OPTIMUM MOISTURE CONTENT TO 4 PERCENT ABOVE OPTIMUM.
- 3) EMBANKMENT FILL:  
SHELL ZONE: SOILS WITH LESS THAN 30% PASSING THE NO. 200 SIEVE OR A PI OF LESS THAN 10 WHEN THE PERCENTAGE OF MATERIAL PASSING THE NO. 200 SIEVE IS GREATER THAN 30 PERCENT. SOILS WHICH ARE CLASSIFIED AS CLAYS (CH OR CL) SHOULD NOT BE USED AT THE FACE OF THE SHELL ZONES.  
CLAY CORE ZONE: CH, CL OR SC MATERIAL WITH A PI RANGING BETWEEN 15 AND 60
- 4) NO FILL SHALL CONTAIN ROCKS OR GRAVEL LARGER THAN 4 INCHES IN DIAMETER.
- 5) A PROFESSIONAL GEOTECHNICAL ENGINEER SHALL APPROVE ALL MATERIALS USED FOR THE EMBANKMENT AND SUPERVISE CONSTRUCTION.
- 6) ALL DISTURBED AREAS ABOVE PERMANENT POOL SHALL BE SEEDED USING THE FOLLOWING GRASS SEED MIX MANUFACTURED BY ERNST SEED COMPANY: Carolina FACW Meadow Mix ERNMX-182

**CLAY LINER NOTES:**

IN ORDER TO HELP SUSTAIN THE PERMANENT POOL AND TO PREVENT WATER FROM INFILTRATING TOO QUICKLY INTO THE UNDERLYING SOIL, THE CONTRACTOR SHALL INSTALL A 6" THICK CLAY LINER ON THE BOTTOM OF THE BMP AREA UP TO THE NORMAL POOL ELEVATION. THE LINER CAN BE ACCOMPLISHED BY BLENDING EXISTING SITE SOILS WITH CLAY TO ACHIEVE A LOW PERMEABILITY MIXTURE OR BY INSTALLING A GEOSYNTHETIC LINER MADE OF A BENTOMAT CL. IF THE CONTRACTOR CHOOSES TO BLEND THE EXISTING SITE SOILS WITH CLAY, THE ONSITE GEOTECHNICAL ENGINEER SHALL DETERMINE THE AMOUNT OF CLAY TO ADD, THE DEGREE OF COMPACTION, AND WILL OVERSEE THE INSTALLATION OF THE CLAY LINER. THE MAXIMUM PERMEABILITY RATE FOR THE LINER SHALL BE 0.01 IN/HR IN ACCORDANCE WITH THE NCDENR BMP MANUAL. THE PROPOSED MATERIAL FOR THIS LINER SHALL BE TESTED BY THE ONSITE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT. THE RESULTS OF THIS TESTING SHALL BE SUBMITTED TO THE DESIGN ENGINEER FOR REVIEW PRIOR TO PLACEMENT. UPON COMPLETION OF LINER INSTALLATION, A 4" MINIMUM LAYER OF TOPSOIL SHALL BE ADDED OVER THE LINER TO PROVIDE A HEALTHY MEDIA FOR VEGETATION GROWTH.



**SECTION A-A**

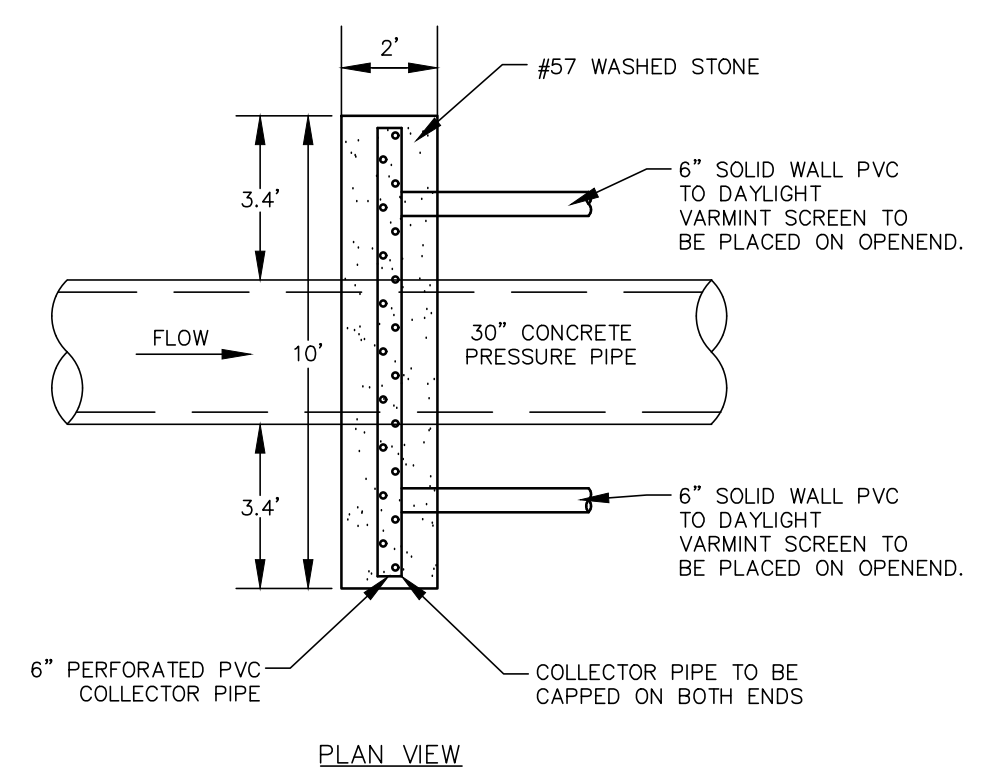


**SECTION B-B**

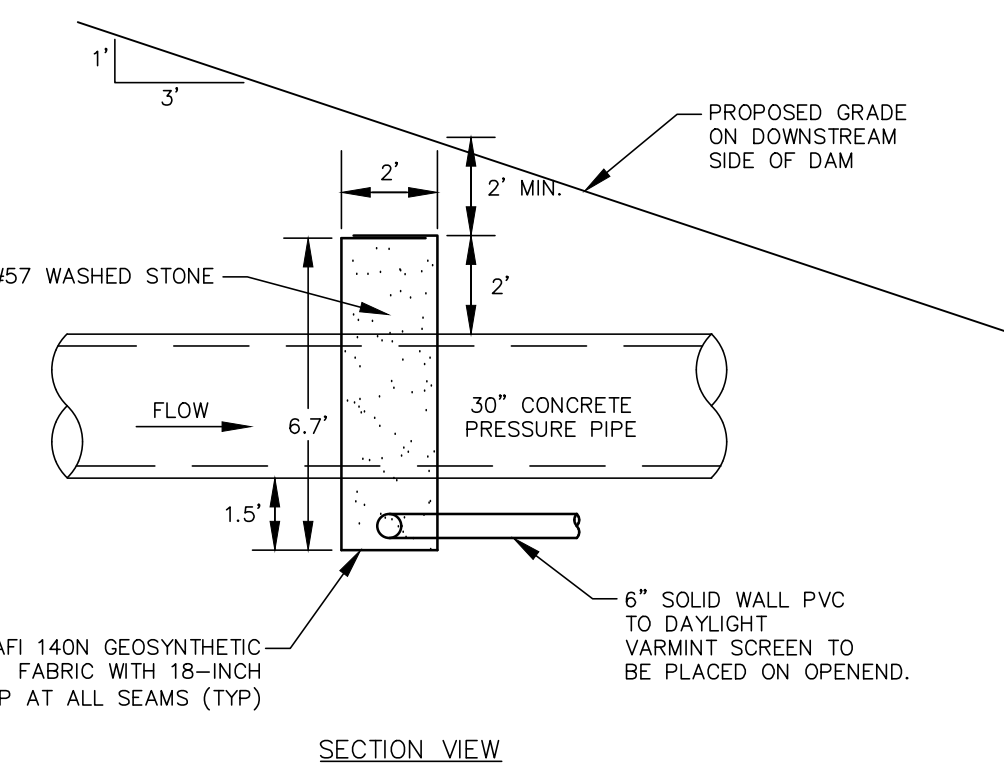
BMP #33	NORMAL POOL EL.	TOP DAM EL.	SPILLWAY BOTTOM EL.	SPILLWAY BOTTOM WIDTH
	443.50	450.00	448.00	10'

NOTE: EXPANSION/CONTRACTION JOINTS PER AMERICAN CONCRETE INSTITUTE (ACI) STANDARDS FOR SLABS ON GRADE.

**EMERGENCY SPILLWAY DETAIL**  
NTS



**PLAN VIEW**



**SECTION VIEW**

**FILTER DIAPHRAGM DETAIL**  
NTS

STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR  
**PRECAST CONCRETE ENDWALL**  
FOR SINGLE 12" THRU 72" PIPE - 90° SKEW

SHEET 1 OF 1  
**838.80**

**ELEVATION**

**SIDE**

**PLAN**

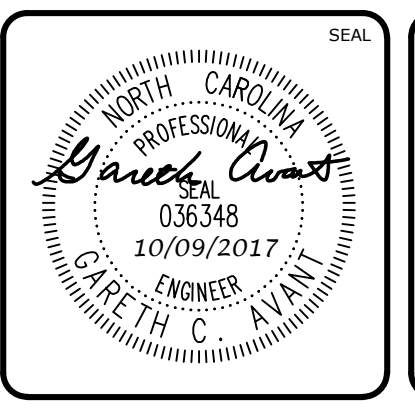
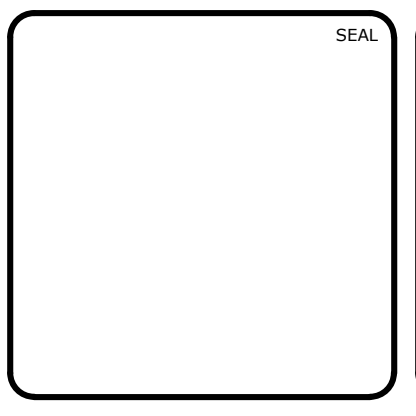
NOTES:

- THIS PRECAST ENDWALL MAY BE USED FOR THE FOLLOWING STANDARDS: 838.01, 838.11, 838.21, 838.27, 838.33, 838.39, 838.51, 838.57, 838.63 AND 838.69.
- INSTALL PRECAST ENDWALLS WITH WINGS AND PAY FOR IN ACCORDANCE WITH SPECIFICATION SECTION 838.
- USE 4000 PSI CONCRETE.
- PROVIDE ALL REINFORCING STEEL WHICH MEETS ASTM A615 FOR GRADE 60 AND WELDED WIRE FABRIC CONFORMING TO ASTM A185 WITH 2" MIN. CLEARANCE.
- PLACE LIFT HOLES OR PINS IN ACCORDANCE WITH OSHA STANDARD 1926.704.
- PIPE TO BE GROUDED INTO HEADWALL AT JOB SITE BY CONTRACTOR
- ALL ELEMENTS PRECAST TO MEET ASTM C913.
- WELDED WIRE FABRIC MAY BE SUBSTITUTED FOR REBAR AS LONG AS THE SAME AREA OF STEEL IS PROVIDED.
- CHAMFER ALL CORNERS 1" OR HAVE A RADIUS OF 1".

NOTE: THE MINIMUM BAR SIZE SHALL BE #5 BARS AT 6" CTS. THE CONTRACTOR WILL HAVE THE OPTION TO INCREASE THIS BAR SIZE AS NEEDED.

ENDWALL DIMENSIONS						
PIPE DIA.	MINIMUM BAR SIZE	MIN./MAX.	MIN./MAX.	MIN./MAX.	MIN./MAX.	MIN./MAX.
1.0	#5 @ 8"	1.25/2.00	2.00/3.75	1.25/1.75	3.00/3.75	5.50/6.00
1.25	#5 @ 8"	1.25/2.00	3.00/3.75	1.25/2.00	3.50/3.75	6.50/6.75
1.50	#5 @ 8"	1.25/2.00	3.00/4.25	1.50/2.50	3.50/3.75	6.50/6.75
2.0	#5 @ 8"	1.50/2.50	4.00/4.75	1.75/2.50	4.00/4.25	7.50/8.25
2.5	#5 @ 8"	2.50/3.50	4.00/6.00	2.00/3.00	4.50/5.50	10.00/11.50
3.0	#5 @ 8"	3.00/3.50	5.00/6.00	2.75/3.50	5.25/5.75	11.50/11.75
3.5	#5 @ 8"	3.25/4.50	6.00/6.75	3.25/3.50	6.00/6.75	12.00/13.25
4.0	#5 @ 8"	3.50/4.50	6.50/7.00	3.25/3.50	6.50/6.75	13.00/13.25
4.5	#5 @ 8"	4.00/5.00	6.50/8.50	3.25/4.00	7.00/9.25	13.50/15.75
5.0	#5 @ 8"	4.50/5.00	7.00/8.50	3.25/4.00	7.25/9.25	13.75/15.75
5.5	#5 @ 8"	4.50/5.00	7.50/8.50	3.25/4.00	7.25/9.25	14.00/15.75
6.0	#5 @ 8"	4.50/5.00	7.50/8.50	3.25/4.00	7.75/9.25	14.75/16.75

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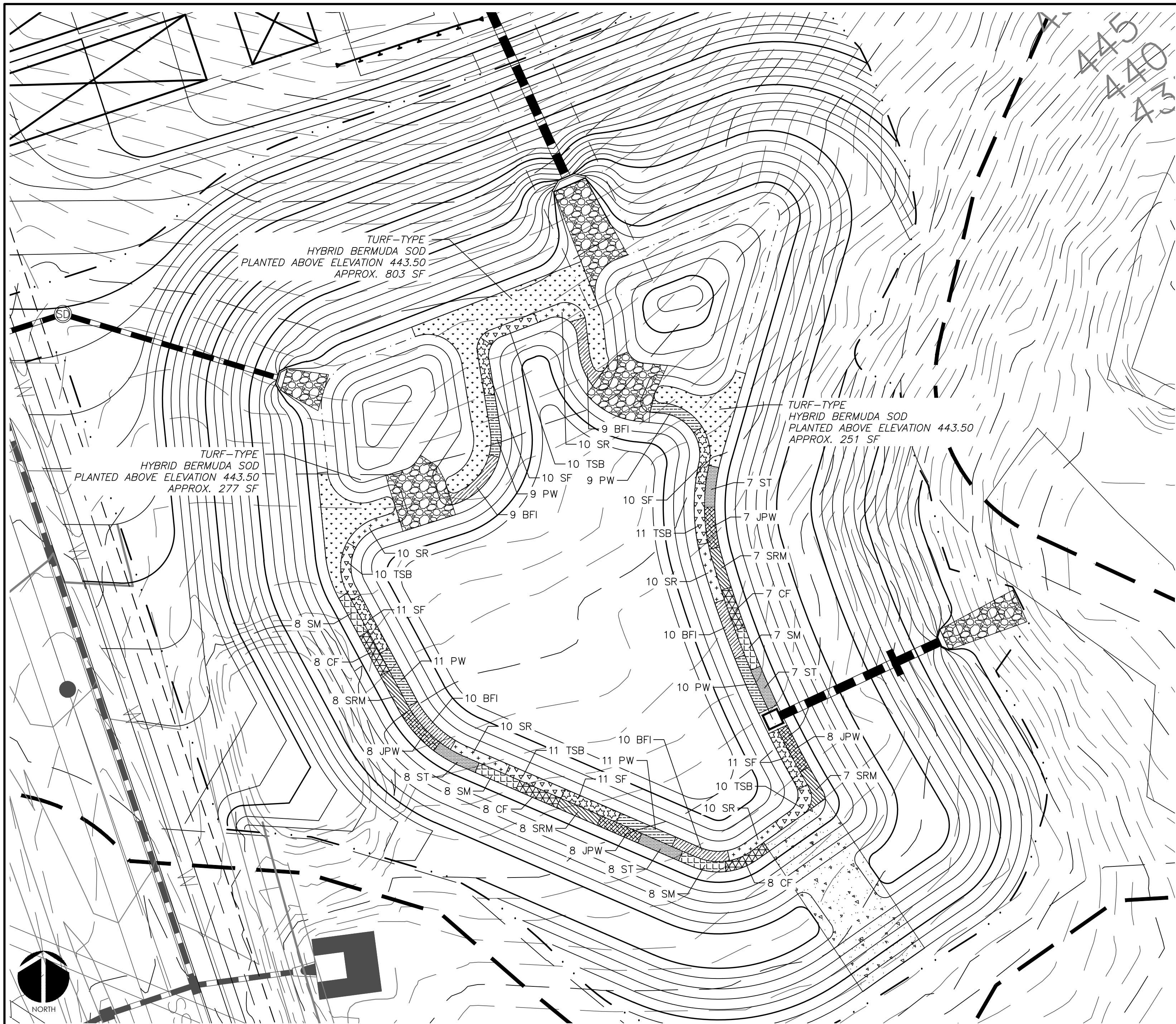
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DESIGNED: BSS  
CHECKED: GCA  
PROJ. MGR.: CHS

SCALE: HORIZONTAL: AS NOTED  
VERTICAL: N/A

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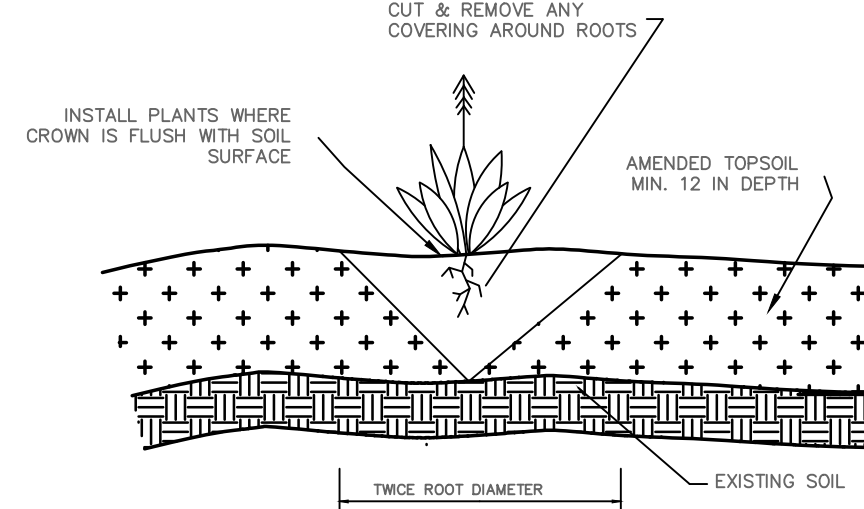
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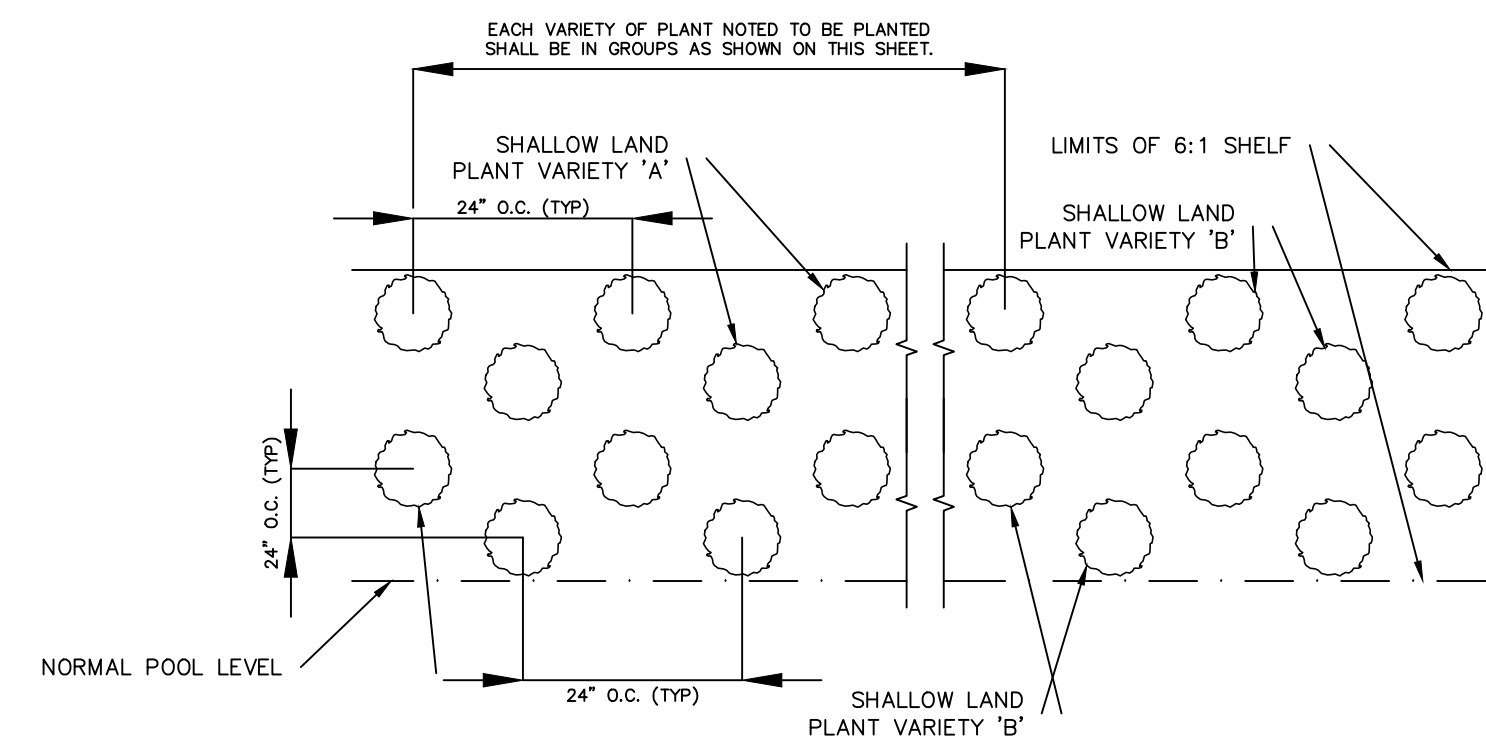


WET DETENTION POND #33 PLANTING PLAN  
SCALE = 1" = 20'

PLANTING SCHEDULE						
SYM.	ABB.	COMMON NAME	BOTANICAL NAME	QUANTITY	SPACING	CONTAINER SIZE AT PLANTING
SHALLOW WATER PLANTINGS						
[Symbol]	SF	SWEETFLAG	<i>Acorus subcordatum</i>	53	24"-30" O.C.	1 QT.
[Symbol]	PW	PICKERELWEED	<i>Pontederia cordata</i>	50	24"-30" O.C.	1 QT.
[Symbol]	BFI	BLUE FLAG IRIS	<i>Iris virginica</i>	48	24"-30" O.C.	1 QT.
[Symbol]	SR	SOFT RUSH	<i>Juncus effusus var. pygmaei or solutus</i>	50	24"-30" O.C.	1 QT.
[Symbol]	TSB	THREE SQUARE BULRUSH	<i>Schoenoplectus americanus</i>	52	24"-30" O.C.	1 QT.
SHALLOW LAND PLANTINGS						
[Symbol]	SM	SWAMP MILKWEED	<i>Asclepias incarnata</i>	31	24"-30" O.C.	1 QT.
[Symbol]	CF	CARDINAL FLOWER	<i>Lobelia cardinalis</i>	31	24"-30" O.C.	1 QT.
[Symbol]	SRM	SCARLET ROSE MALLOW	<i>Hibiscus coccineus</i>	30	24"-30" O.C.	1 QT.
[Symbol]	JPW	DWARF JOE PYE WEED	<i>Eupatoriadelphus dubius</i>	31	24"-30" O.C.	1 QT.
[Symbol]	ST	SPOTTED TRUMPETWEED	<i>Eupatoriadelphus maculatus</i>	30	24"-30" O.C.	1 QT.



GENERAL PLANTING DETAIL  
NTS



VEGETATED PLANTING SHELF DETAIL  
NTS

NOTES:  
1. CONTINUE PLANTING SCHEME SHOWN FOR EACH OF THE 6 PLANT VARIETIES NOTED BELOW AROUND ENTIRE LENGTH OF THE SHALLOW LAND PLANTING-ZONE  
2. OTHER SPECIES WITH SIMILAR GROWTH HABITS AND MAY BE APPROVED AS LISTED IN THE "NCDEQ STORMWATER DESIGN MANUAL" TABLE 3.

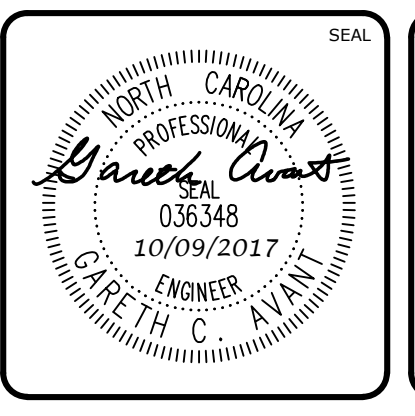
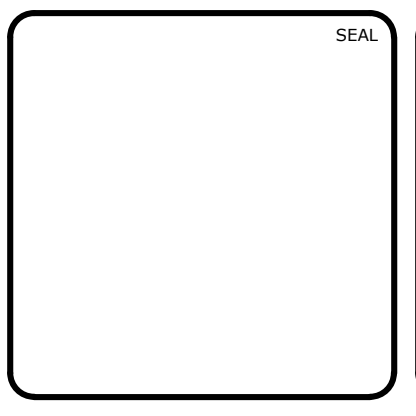
GENERAL PLANTING NOTES:

1. AVOID COMPACTING TOPSOIL TO PROMOTE HEALTHY ENVIRONMENTAL CONDITIONS FOR THE PLANTS.
2. ALL PLANTS SHOULD BE PLANTED IN THE INDICATED RANGE TO ENSURE SURVIVAL.
3. SHALLOW WATER AND SHALLOW LAND AREAS TO BE PLANTED WITH BARE ROOT, PLUGS, OR CONTAINER LIVE PLANTINGS AS SPECIFIED.
4. EXCAVATE A HOLE TWICE THE DIAMETER OF ROOT BALL AND EQUAL TO THE ROOT DEPTH OF THE INDIVIDUAL PLANT. PLACE PLANT IN HOLE WITH CROWN FLUSH WITH SOIL SURFACE. BACKFILL WITH TOPSOIL AND LIGHTLY PLANT.
5. BEGIN PLANTING DURING LOCAL GROWING SEASON IN ORDER TO ENSURE THAT PLANTS HAVE ADEQUATE TIME TO ESTABLISH BEFORE WINTER MONTHS.
6. OBTAIN PLANTS FROM: COASTAL PLAIN CONSERVATION NURSERY (252-482-5707), MELLOW MARSH FARMS (919-742-1200), CURE NURSERY (919-542-6186) OR ENGINEER APPROVED SUBSTITUTE.
7. REFER TO EROSION CONTROL DETAIL SHEET D1.2 FOR SEEDBED PREPARATION AND SEEDING SCHEDULES FOR AREAS NOT SPECIFIED IN THIS PLAN.

SHALLOW LAND PLANTING NOTES:

1. PLANTS IN THIS GROUP SHOULD NOT BE PLANTED IN AREAS THAT ARE INUNDATED FOR EXTENDED PERIODS.

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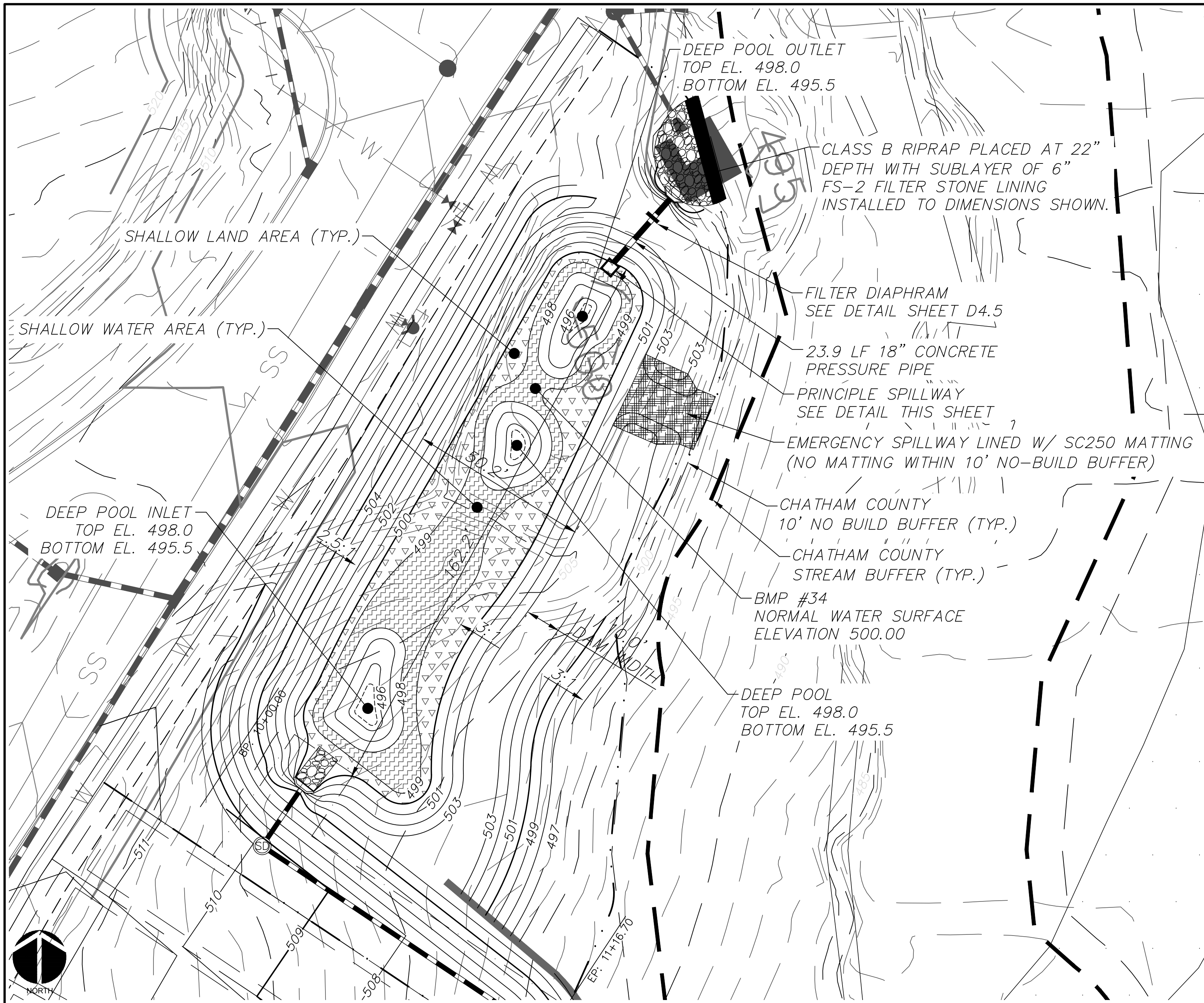
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**BMP #33 PLAN & DETAILS**

DATE: JULY 26, 2017	SCALE: D4.X	M&C FILE NUMBER: D4.X
M&C PROJ. #: 02735-0198	HORIZONTAL: AS NOTED	DRAWING NUMBER: D4.3
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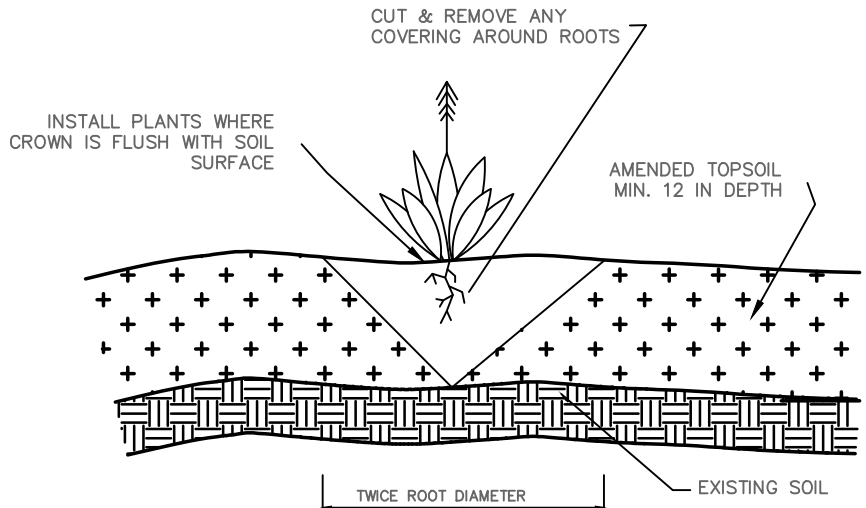
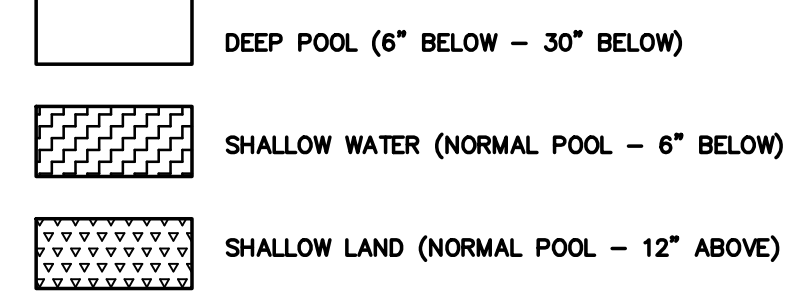
STORMWATER WETLAND PLANTING SCHEDULE

DEEP POOL ZONE: ALLOWABLE PLANT SPECIES						
COMMON NAME	BOTANICAL NAME	DEPTH RANGE (INCHES BELOW NORMAL POOL)	SPACING (O.C., FT)	QUANTITY	PERCENTAGE	SIZE
SPATTERDOCK	NUPHAR POLYSPALMUM	6-18	5	60	33%	2 IN PLUG (MIN)
FRAGRANT WHITE LILY	NYMPHAEA LUTEA	6-18	5	60	33%	2 IN PLUG (MIN)
AMERICAN LOTUS	NELUMBO LUTEA	6-18	5	60	33%	2 IN PLUG (MIN)

SHALLOW WATER ZONE: ALLOWABLE PLANT SPECIES						
COMMON NAME	BOTANICAL NAME	DEPTH RANGE (INCHES BELOW NORMAL POOL)	SPACING (O.C., FT)	QUANTITY	PERCENTAGE	SIZE
ARROW ARUM	PELTANDRA VIRGINICA	0-6	3.0	48	10%	PINT
PICKERELWEED	PONTERDERIA CORDATA	0-6	3.0	48	10%	2 IN PLUG (MIN)
DUCK POTATO	SAGITTARIA LATIFOLIA	0-6	3.0	48	10%	BARE ROOT
SOFTSTEM BULRUSH	SCHENOPLECTUS TABERNAMONTANI	0-6	3.0	48	10%	2 IN PLUG (MIN)
SWEETFLAG	ACORUS CALAMUS	0-6	3.0	48	10%	BARE ROOT
THREE WAY SEDGE	DULICHUM ARUNDINACEUM	0-6	3.0	48	10%	BARE ROOT
SPIKERUSH	ELEOCHARIS OBUSA	0-6	3.0	48	10%	2 IN PLUG (MIN)
SOUTHERN BLUE FLAG IRIS	IRIS VIRGINICA	0-6	3.0	48	10%	2 IN PLUG (MIN)
LIZARD'S TAIL	SAURURUS CERNUUS	0-6	3.0	48	10%	3 IN PLUG (MIN)
SOFT RUSH	JUNCUS EFFUSUS	0-6	3.0	48	10%	2 IN PLUG (MIN)

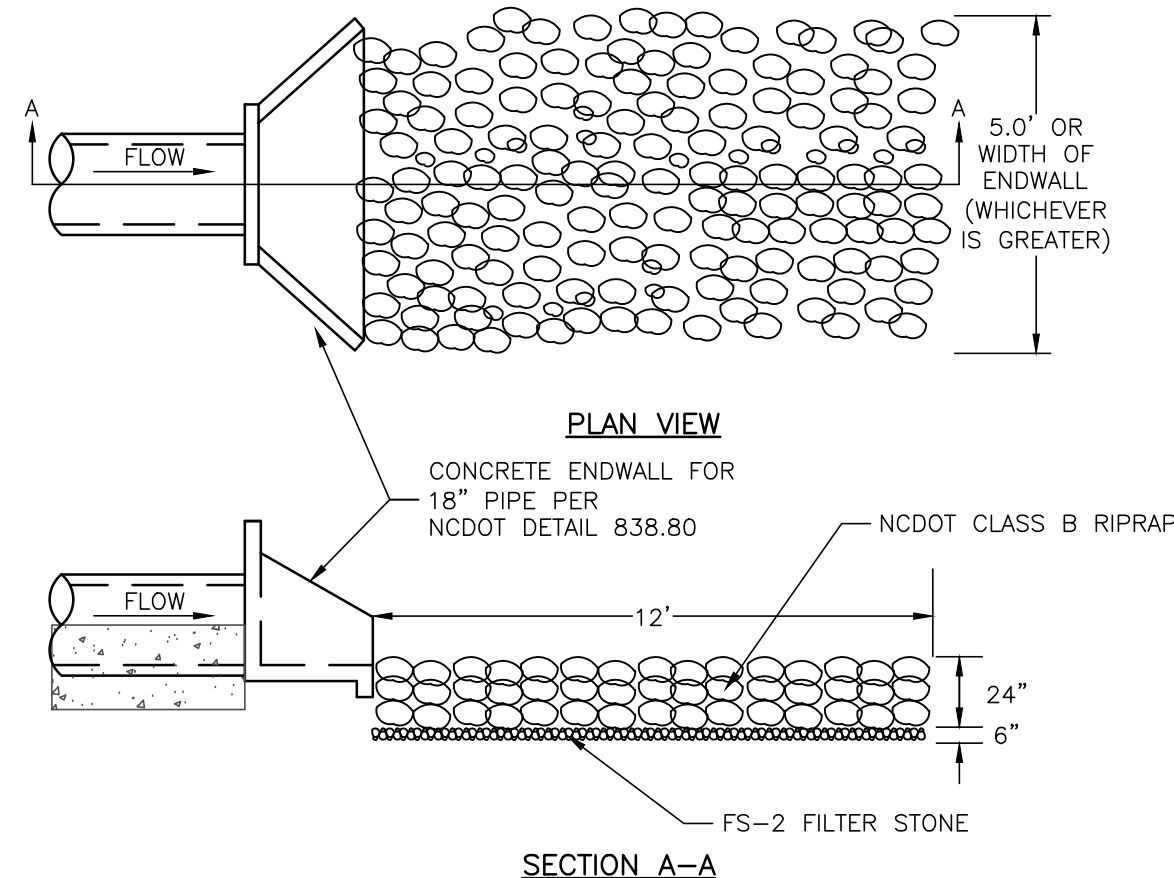
SHALLOW LAND ZONE: ALLOWABLE PLANT SPECIES						
COMMON NAME	BOTANICAL NAME	DEPTH RANGE (INCHES ABOVE NORMAL POOL)	SPACING (O.C., FT)	QUANTITY	PERCENTAGE	SIZE
SWAMP MILKWEED	ASCLEPIAS INCARNATA	0-12	3.0	48	9.0%	2 IN PLUG (MIN)
FRINGED SEDGE	CAREX CRINITA	0-12	3.0	48	9.0%	2 IN PLUG (MIN)
GREAT BLADDER SEDGE	CAREX INTUMESCENS	0-12	3.0	48	9.0%	2 IN PLUG (MIN)
HOP SEDGE	CAREX LUPULINA	0-12	3.0	48	9.0%	2 IN PLUG (MIN)
SHALLOW SEDGE	CAREX LURIDA	0-12	3.0	48	9.0%	2 IN PLUG (MIN)
SCARLET ROSE MALLOW	HIBISCUS COCCINEUS	0-12	3.0	48	9.0%	2 IN PLUG (MIN)
ROSE MALLOW	HIBISCUS MOSCHEUTOS	0-12	3.0	48	9.0%	2 IN PLUG (MIN)
SPIDER LILY	HYMENOCALLIS EULAE	0-12	3.0	48	9.0%	2 IN PLUG (MIN)
SWAMP LILY	CRINUM ERUBESCENS	0-12	3.0	48	9.0%	2 IN PLUG (MIN)
CARDINAL FLOWER	LOBELIA CARDINALIS	0-12	3.0	48	9.0%	2 IN PLUG (MIN)
SWAMP SUNFLOWER	HELIANTHUS ANGUSTRIFOLIUS	0-12	3.0	48	9.0%	2 IN PLUG (MIN)

STORMWATER WETLAND PLANTING LEGEND:



GENERAL PLANTING DETAIL

NTS



RIPRAP OUTLET PROTECTION

NTS

STORMWATER WETLAND PLANTING NOTES

GENERAL PLANTING NOTES

1. AVOID COMPACTING TOPSOIL TO PROMOTE HEALTHY ENVIRONMENTAL CONDITIONS FOR THE PLANTS.
2. PLANTS OF THE SAME SPECIES SHOULD BE PLANTED IN CLUSTERS, THESE CLUSTERS SHOULD CONTAIN MIN. 4-6 PLANTS OF THAT SPECIES.
3. ALL PLANTS SHOULD BE PLANTED IN THE INDICATED RANGE TO ENSURE SURVIVAL.
4. AVOID PLANTING INDIVIDUAL SPECIES IN LARGE GROUPS BY SPACING CLUSTERS A MIN. OF 5' APART.
5. SHALLOW WATER AND SHALLOW LAND AREAS TO BE PLANTED WITH BARE ROOT, PLUGS, OR CONTAINER LIVE PLANTINGS AS SPECIFIED.
6. EXCAVATE A HOLE TWICE THE DIAMETER OF ROOT BALL AND EQUAL TO THE ROOT DEPTH OF THE INDIVIDUAL PLANT. PLACE PLANT IN HOLE WITH CROWN FLUSH WITH SOIL SURFACE. BACKFILL WITH TOPSOIL AND LIGHTLY PLANT.
7. BEGIN PLANTING DURING LOCAL GROWING SEASON IN ORDER TO ENSURE THAT PLANTS HAVE ADEQUATE TIME TO ESTABLISH BEFORE WINTER MONTHS.
8. OBTAIN PLANTS FROM: COASTAL PLAIN CONSERVATION NURSERY (252-482-5707), MELLOW MARSH FARMS (919-742-1200), CURE NURSERY (919-542-6186) OR ENGINEER APPROVED SUBSTITUTE.

SHALLOW WATER PLANTING NOTES:

1. 70% OF SOFT STEM BULRUSH SHOULD BE PLANTED WITHIN 3-4 INCHES BELOW NORMAL POOL.
2. 70% OF PICKERELWEED AND 70% OF ARROW ARUM SHOULD BE PLANTED WITHIN 5-6 INCHES BELOW NORMAL POOL.
3. SEDGES SHOULD BE PLANTED WITHIN 0-2 INCHES BELOW NORMAL POOL.
4. 70% OF SWEETFLAG, 70% OF LIZARD'S TAIL, AND 70% OF SOUTHERN BLUE FLAG IRIS SHOULD BE PLANTED IN THE 2-3 INCHES BELOW NORMAL POOL.
5. 70% OF SOFT RUSH SHOULD BE PLANTED AT THE NORMAL POOL ELEVATION.

SHALLOW LAND PLANTING NOTES:

1. PLANTS IN THIS GROUP SHOULD NOT BE PLANTED IN AREAS THAT ARE INUNDATED FOR EXTENDED PERIODS.
2. 70% OF CARDINAL FLOWER AND 70% OF BLUE LOBELIA SHOULD BE PLANTED WITHIN 0-1 INCH OF THE NORMAL POOL ELEVATION.

DEEP POOL PLANTING NOTES:

1. ENSURE ALL PLANTS ARE PLACED IN WATER NO DEEPER THAN 24 INCHES BELOW NORMAL POOL

GRADING PLAN NOTES:

1. WETLAND MUST BE STABILIZED WITHIN 14 DAYS OF CONSTRUCTION
2. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR LOCATING AND PROTECTION OF EXISTING ABOVE AND BELOW GROUND UTILITIES AND STRUCTURES. ANY AND ALL MAINS OR INDIVIDUAL SERVICES LINES PRESENTLY IN SERVICE WHICH ARE DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED IMMEDIATELY AT NO ADDITIONAL EXPENSE TO THE UTILITY OWNER.
3. CONTRACTOR SHALL KEEP ALL PARKING AREAS AND STREETS ADJACENT TO THE CONSTRUCTION SITE CLEAN AND OPEN AT ALL TIMES DURING CONSTRUCTION.
4. ALL SHALLOW WATER AND SHALLOW LAND AREAS WITHIN THE WETLAND CELL SHALL BE TOP DRESSED WITH A MINIMUM OF 12 IN OF TOPSOIL.
5. ALL ITEMS WHICH ARE SHOWN FOR REMOVAL SHALL BE REMOVED FROM THE CONSTRUCTION SITE AND LEGALLY DISPOSED OF OFF SITE.
6. CONTRACTOR SHALL AT ALL TIMES MAINTAIN ADEQUATE SAFETY MEASURES, ACTIVITIES, AND BARRICADES FOR THE PROTECTION OF ALL PERSONS ON OR ABOUT THE LOCATION OF THE SITE.
7. GRADE TO ELEVATIONS AND DIMENSIONS SHOWN ON DRAWINGS. ELEVATIONAL GRADING TOLERANCE IS ±0.1 FT.
8. NO GRADING IS TO OCCUR IN THE DEEP POOL AREAS BEYOND THE SPECIFIED GRADING LIMITS.

TOPSOIL SPECIFICATION:

1. TOPSOIL TO BE ADDED TO TOP OF WETLAND SHELF IS TO MEET CRITERIA SPECIFIED BELOW.
2. TOPSOIL SHALL BE WELL MIXED, FREE OF TRASH AND DEBRIS, UNCOMPACTED, AND VOID OF LARGE STONES (> 2 INCHES) AND WOODY MATERIAL (>3 INCHES).
3. TOPSOIL SHALL MEET THE FOLLOWING SPECIFICATIONS:  
SOIL TYPE: CLAY < 60%, SAND < 80%, SILT < 80%  
ORGANIC CONTENT: 5-8%  
P-I: 20<50  
PH: 6.0-7.0
4. IN THE EVENT THAT SELECTED TOPSOIL DOES NOT MEET SPECIFICATION LISTED ABOVE, SOIL CAN BE AMENDED BY ADDITION OF APPROPRIATE MATERIALS (MASON SAND OR MATURE STABLE COMPOST, OR LIME).
5. UPON PLACEMENT OF TOPSOIL, AREA SHOULD BE LIGHTLY COMPACTED TO ENSURE STABILIZATION OF MATERIAL.
6. EXCESSIVE TRAFFICKING OF EQUIPMENT OVER WETLAND PLANTING AREAS SHOULD BE AVOIDED.
7. MINIMUM DEPTH OF TOPSOIL SHOULD BE 12 INCHES.

EARTHWORK SPECIFICATIONS

1. GRADE TO ELEVATIONS AND DIMENSIONS SHOWN ON DRAWINGS. GRADED ELEVATIONAL TOLERANCE SHALL BE ±0.1 FT.
2. TOPSOIL MATERIAL SHALL BE APPROVED BY ENGINEER PRIOR TO USE BASED ON SOIL PROPERTY TEST SUBMITTALS THAT INCLUDE STANDARD TEST METHOD FOR PARTICLE-SIZE ANALYSIS (ASTM D422), PARTICLE SIZE ANALYSIS OF SOILS (AASHTO T88), AND NCDCA SOIL ANALYSIS.
3. INSTALL FINAL COVER IN ACCORDANCE WITH PERMANENT SEEDING SPECIFICATIONS WHEN APPLICABLE.

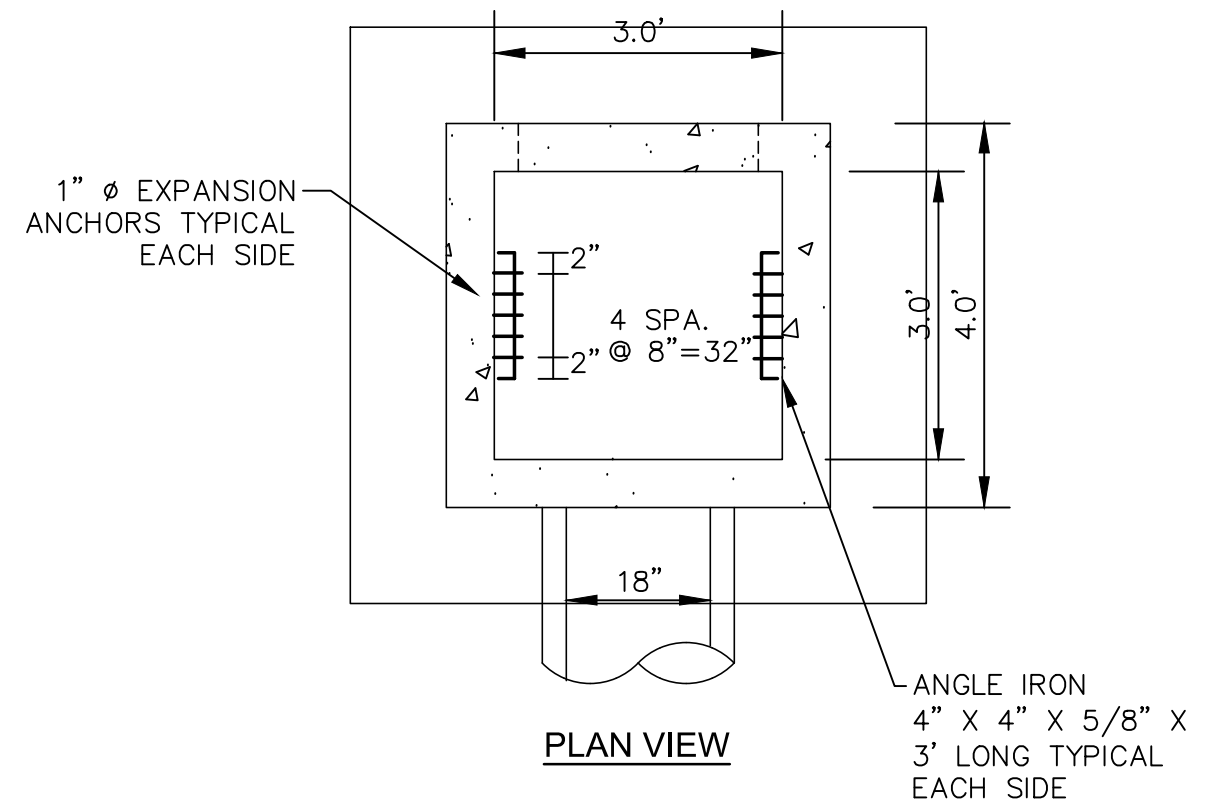
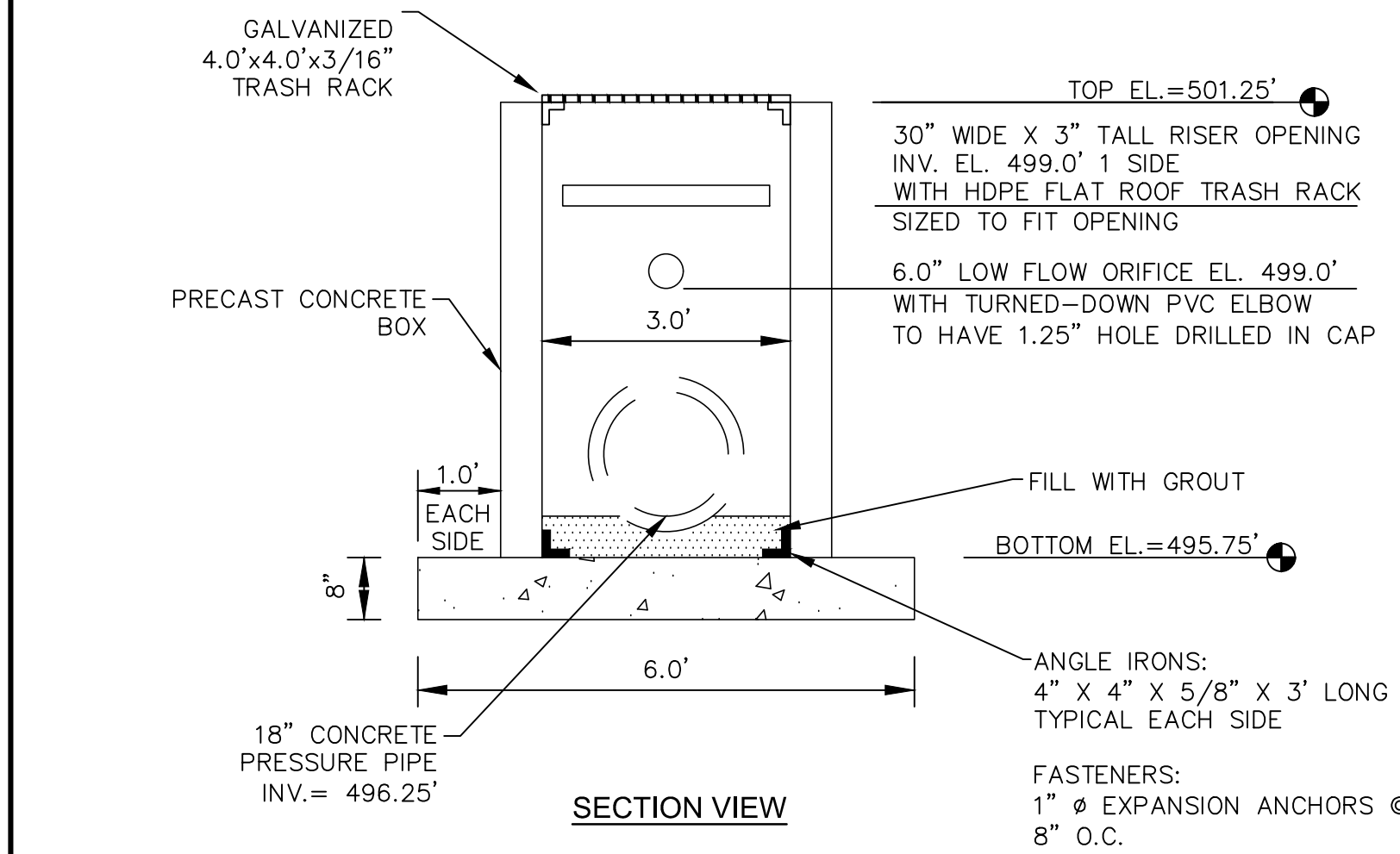
CLAY LINER SPECIFICATIONS

IN ORDER TO HELP SUSTAIN THE PERMANENT POOL AND TO PREVENT WATER FROM INFILTRATING TOO QUICKLY INTO THE UNDERLYING SOIL, THE CONTRACTOR SHALL INSTALL A 6" THICK CLAY LINER ON THE BOTTOM OF THE BMP AREA UP TO THE NORMAL POOL ELEVATION. THE LINER CAN BE ACCOMPLISHED BY BLENDING EXISTING SITE SOILS WITH CLAY TO ACHIEVE A LOW PERMEABILITY MIXTURE OR BY INSTALLING A GEOSYNTHETIC LINER MADE OF A BENTONITE CL. IF THE CONTRACTOR CHOOSES TO BLEND THE EXISTING SITE SOILS WITH CLAY, THE ONSITE GEOTECHNICAL ENGINEER SHALL DETERMINE THE AMOUNT OF CLAY TO ADD, THE DEGREE OF COMPACTION, AND WILL OVERSEE THE INSTALLATION OF THE CLAY LINER. THE MAXIMUM PERMEABILITY RATE FOR THE LINER SHALL BE 0.01 IN/HR OR LESS IN ACCORDANCE WITH THE NCDENR BMP MANUAL. THE PROPOSED MATERIAL FOR THIS LINER SHALL BE TESTED BY THE ONSITE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT. THE RESULTS OF THIS TESTING SHALL BE SUBMITTED TO THE DESIGN ENGINEER FOR REVIEW PRIOR TO PLACEMENT. UPON COMPLETION OF LINER INSTALLATION, A 4" MINIMUM LAYER OF TOPSOIL SHALL BE ADDED OVER THE LINER TO PROVIDE A HEALTHY MEDIA FOR VEGETATION GROWTH.

DESIGNER'S CERTIFICATION:

THE DESIGN OF STORMWATER MANAGEMENT FACILITIES AND PRACTICES WILL CONTROL AND TREAT THE RUNOFF FROM THE 1-YEAR, 4-HOUR STORM OF THE ASSOCIATED DRAINAGE AREA. THESE DESIGNS AND PLANS ARE SUFFICIENT TO COMPLY WITH THE APPLICABLE STANDARDS AND POLICIES FOUND IN THE NCDENR STORMWATER BMP DESIGN MANUAL AND CHATHAM COUNTY'S STORMWATER ORDINANCE.

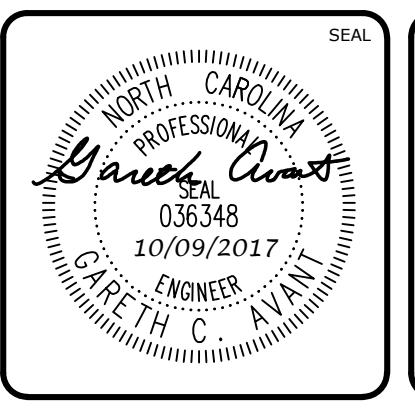
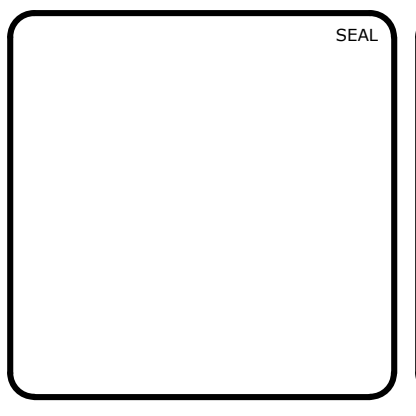
036348  
06/17/2015  
GARETH C. AYNT  
ENGINEER



PRINCIPLE SPILLWAY

SCALE = 1" = 2'

REV. NO.	DESCRIPTIONS	DATE
3	REVISIONS PER COMMENTS RECEIVED FROM COUNTY EROSION CONTROL	2017.10.09
2	REVISIONS PER COMMENTS RECEIVED FROM NCDOT	2017.09.21
1	REVISIONS PER COMMENTS RECEIVED FROM COUNTY EROSION CONTROL	2017.09.13
0	SUBMITTAL TO AGENCIES	2017.07.26



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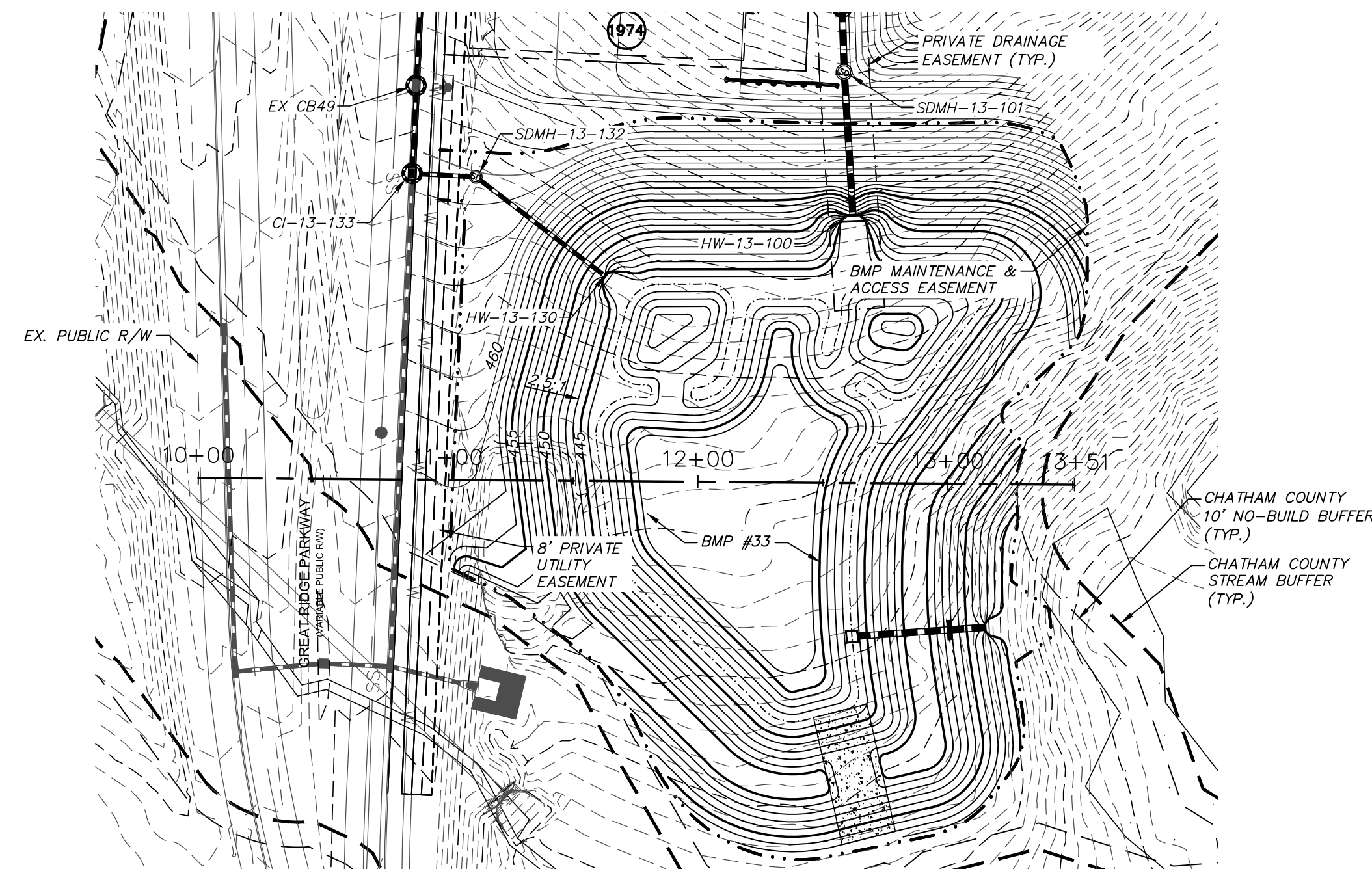
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PHASE 13 - SECTION 1 & 2  
CHATHAM COUNTY, NORTH CAROLINA**

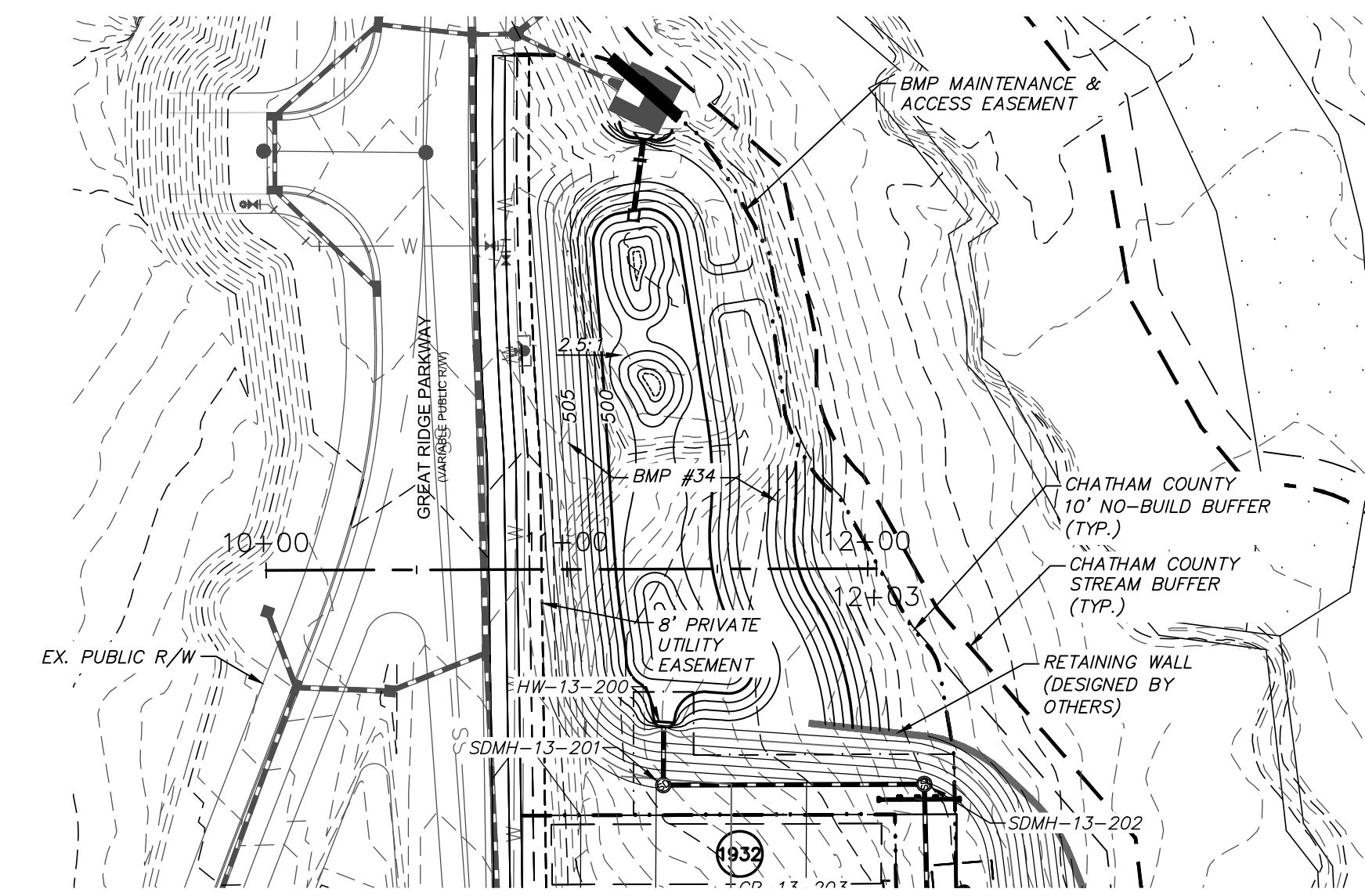
**BMP #34 PLAN & DETAILS**

DATE: JULY 26, 2017	SCALE: HORIZONTAL: AS NOTED	MISC FILE NUMBER: D4.X
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DRAWN: BSS		
DESIGNED: BSS		
CHECKED: GCA		
PROJ. MGR.: CHS		
STATUS: FOR REVIEW PURPOSES ONLY	REVISION: 3	

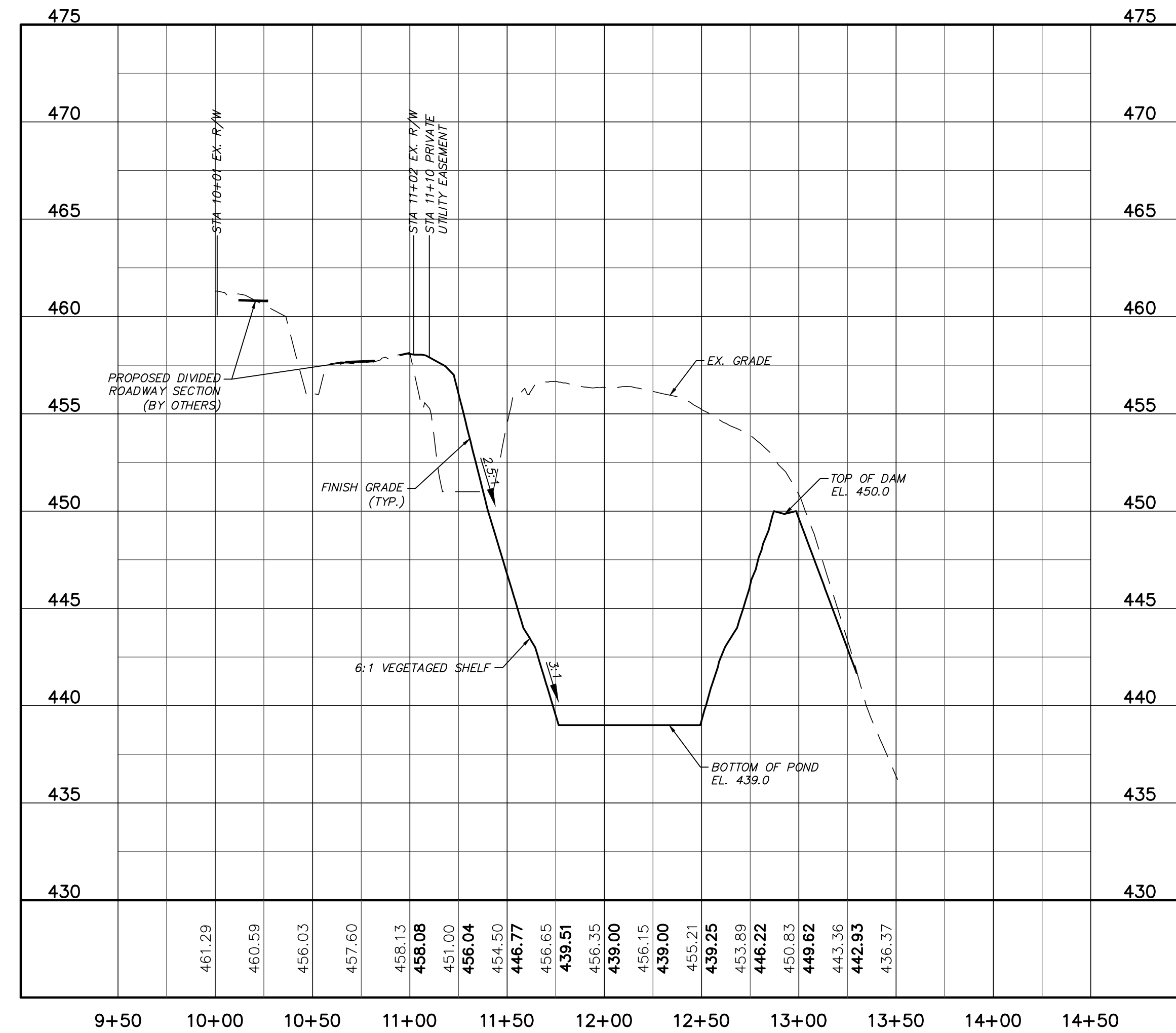
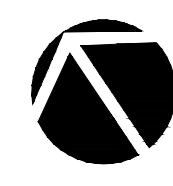




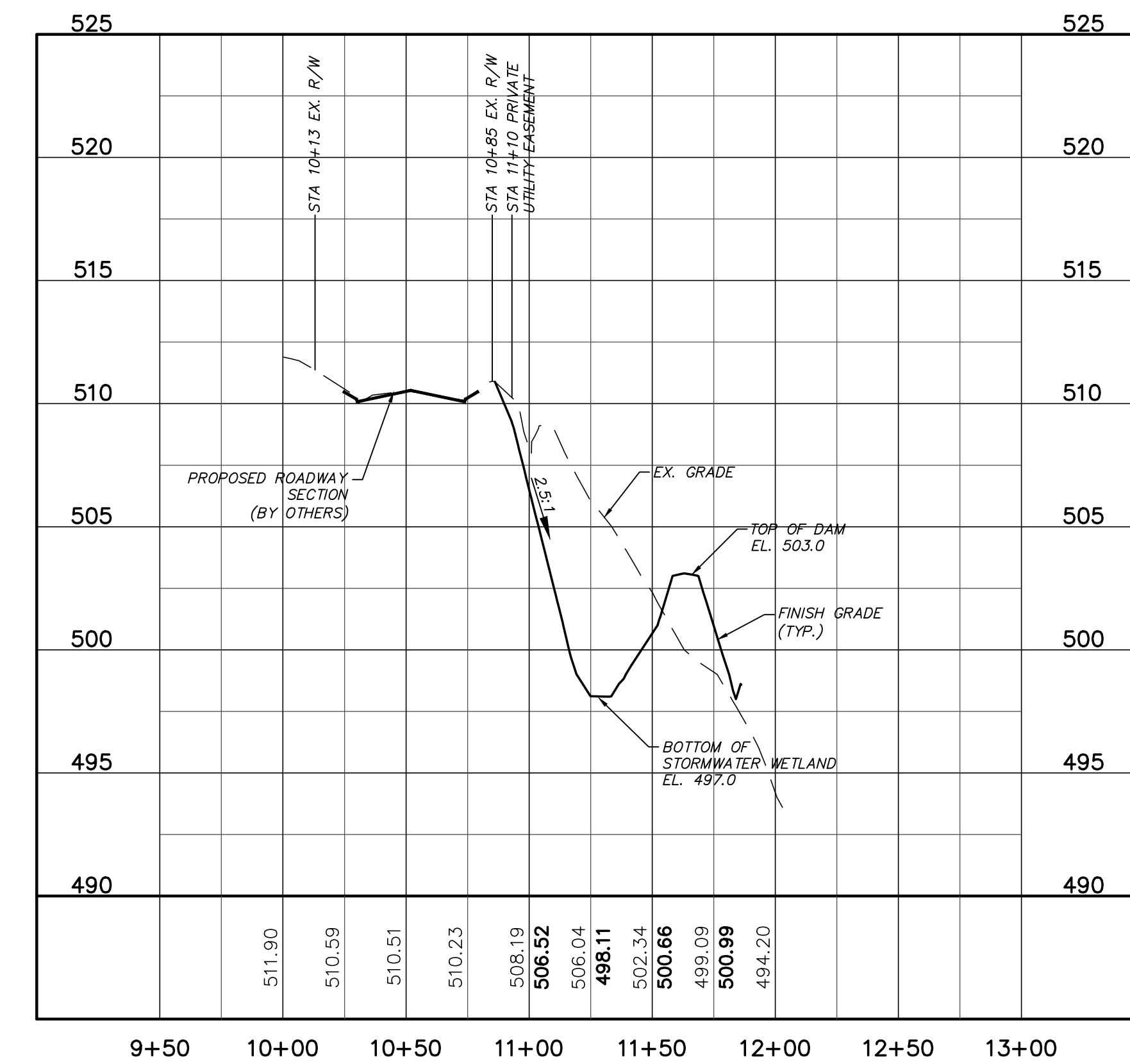
GREAT RIDGE PARKWAY @ BMP #33 PLAN  
 (STA. 10+00.00 TO 13+50.68)  
 SCALE: 1"=50'



GREAT RIDGE PARKWAY @ BMP #34 PROFILE  
 (STA. 10+00.00 TO 12+02.94)  
 SCALE: 1"=50'

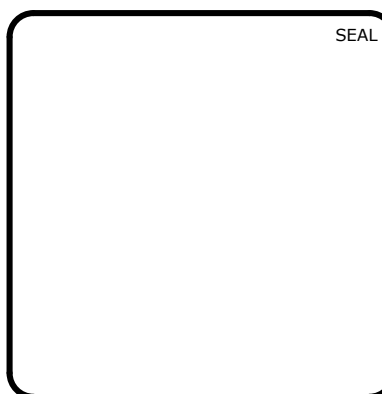


GREAT RIDGE PARKWAY @ BMP #33 PROFILE  
 (STA. 10+00.00 TO 13+50.68)  
 SCALE: (Horiz.) 1"=50'; (Vert.) 1"=5'



GREAT RIDGE PARKWAY @ BMP #34 PROFILE  
 (STA. 10+00.00 TO 12+02.94)  
 SCALE: (Horiz.) 1"=50'; (Vert.) 1"=5'

REV. NO.	DESCRIPTIONS	DATE
3	REVISIONS PER COMMENTS RECEIVED FROM COUNTY EROSION CONTROL	2017.10.06
2	REVISIONS PER COMMENTS RECEIVED FROM NCDOT	2017.09.21
1	REVISIONS PER COMMENTS RECEIVED FROM COUNTY EROSION CONTROL	2017.09.13
0	SUBMITTAL TO AGENCIES	2017.07.26



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 CHATHAM COUNTY, NORTH CAROLINA

PLAN & PROFILE  
 BMP #33 CROSS SECTION  
 BMP #34 CROSS SECTION

DATE: JULY 26, 2017	SCALE: 1" = 50'	MAC FILE NUMBER: D4.4A
MCE PROJ. # 02735-0198	HORIZONTAL: 1" = 50'	DRAWING NUMBER: D4.4A
DRAWN: BSS	VERTICAL: N/A	
DESIGNED: BSS		
CHECKED: GCA		
PROJ. MGR.: CHS		
STATUS: FOR REVIEW PURPOSES ONLY		REVISION: 3



SANITARY SEWER SUMMARY TABLE							
UPSTREAM STRUCTURE	DOWNSTREAM STRUCTURE	UPSTREAM INVERT	DOWNSTREAM INVERT	PIPE DIAMETER	PIPE MATERIAL	LENGTH (ft)	SLOPE
SSMH 131	EX SSMH 210	491.22	490.37	8"	PVC	170.0	0.50%
SSMH 132	SSMH 131	498.27	491.42	8"	DIP	294.2	2.33%
SSMH 133	SSMH 132	499.54	498.47	8"	DIP	214.0	0.50%
SSMH 134	SSMH 133	500.58	499.74	8"	PVC	167.7	0.50%

SANITARY SEWER RIM TABLE	
STRUCTURE	RIM ELEVATION
EX SSMH 210	497.27
EX. SSMH 209	481.94
SSMH 131	498.27
SSMH 132	516.18
SSMH 133	512.65
SSMH 134	508.27

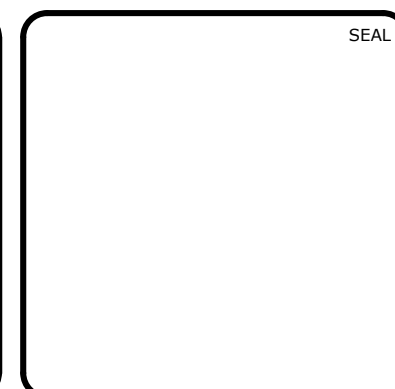
STORM DRAINAGE SUMMARY TABLE							
UPSTREAM STRUCTURE	DOWNSTREAM STRUCTURE	UPSTREAM INVERT	DOWNSTREAM INVERT	PIPE DIAMETER	PIPE MATERIAL	LENGTH (ft)	SLOPE
CB-13-102	SDMH-13-101	454.41	452.32	30"	RCP	26.1	8.00%
CB-13-103	CB-13-102	459.80	457.41	30"	RCP	34.9	6.85%
CB-13-104	CB-13-103	463.30	460.00	30"	RCP	77.1	4.28%
CB-13-105	CB-13-104	467.30	463.50	30"	RCP	82.5	4.61%
CB-13-106	CB-13-105	471.80	467.50	30"	RCP	106.5	4.04%
CB-13-107	CB-13-106	475.25	472.00	30"	RCP	118.3	2.75%
CB-13-108	CB-13-107	478.30	477.20	15"	RCP	130.7	0.84%
CB-13-109	CB-13-107	478.50	475.45	30"	RCP	67.3	4.53%
CB-13-116	SDMH-13-115	496.10	493.25	15"	RCP	39.5	7.21%
CB-13-117	CB-13-116	501.58	496.30	15"	RCP	103.6	5.10%
CB-13-118	CB-13-117	508.56	501.78	15"	RCP	104.3	6.50%
CB-13-203	SDMH-13-202	503.10	502.60	15"	RCP	41.2	1.21%
CB-13-204	CB-13-203	504.00	503.30	15"	RCP	67.8	1.03%
CB-13-205	CB-13-204	505.60	504.20	15"	RCP	57.0	2.46%
CB-13-206	CB-13-205	509.80	505.80	15"	RCP	89.6	4.46%
CI-13-133	SDMH-13-132	456.80	455.90	18"	RCP	25.5	3.53%
CI-13-134	EX CB49	469.40	462.42	18"	RCP	142.1	4.91%
CI-13-135	CI-13-134	470.72	469.60	15"	RCP	22.3	5.01%
EX CB24	EX CB25	495.03	483.09	18"	RCP	150.6	7.93%
EX CB36	EX. FES	488.70	488.51	18"	RCP	100.7	0.19%

STORM DRAINAGE SUMMARY TABLE							
UPSTREAM STRUCTURE	DOWNSTREAM STRUCTURE	UPSTREAM INVERT	DOWNSTREAM INVERT	PIPE DIAMETER	PIPE MATERIAL	LENGTH (ft)	SLOPE
EX CB39	EX CB40	484.70	479.74	18"	RCP	147.2	3.37%
EX CB40	EX CB41	479.51	477.96	18"	RCP	124.4	1.25%
EX CB41	EX CB42	477.89	476.37	18"	RCP	98.0	1.55%
EX CB42	EX CB43	476.27	473.97	18"	RCP	104.5	2.20%
EX CB43	CI-13-134	473.80	469.60	18"	RCP	90.2	4.66%
EX CB49	CI-13-133	462.22	459.80	18"	RCP	35.2	6.87%
SDMH-13-101	HW-13-100	448.90	444.00	30"	RCP	57.2	8.57%
SDMH-13-110	CB-13-109	481.00	478.70	30"	RCP	87.9	2.62%
SDMH-13-110B	SDMH-13-110	482.30	481.20	30"	RCP	84.1	1.31%
SDMH-13-111	SDMH-13-110B	485.30	483.30	30"	RCP	76.8	2.60%
SDMH-13-112	SDMH-13-111	486.50	485.50	30"	RCP	133.6	0.75%
SDMH-13-114	SDMH-13-110B	485.45	482.50	18"	RCP	183.8	1.60%
SDMH-13-115	SDMH-13-114	493.00	491.50	18"	RCP	66.2	2.27%
SDMH-13-132	HW-13-130	449.20	444.00	18"	RCP	65.1	7.99%
SDMH-13-201	HW-13-200	501.00	500.00	15"	RCP	19.3	5.19%
SDMH-13-202	SDMH-13-201	502.40	501.50	15"	RCP	86.8	1.04%

STORM SEWER RIM TABLE	
STRUCTURE	RIM ELEVATION
CB-13-102	472.88
CB-13-103	473.29
CB-13-104	477.14
CB-13-105	481.11
CB-13-106	484.17
CB-13-107	485.83
CB-13-108	482.80
CB-13-109	486.78
CB-13-116	501.52
CB-13-117	507.74
CB-13-118	514.00
CB-13-203	508.03
CB-13-204	509.06
CB-13-205	510.69
CB-13-206	514.51
CI-13-133	463.96
CI-13-134	474.97
CI-13-135	475.80
EX CB24	499.45
EX CB25	487.50
EX CB36	496.75

STORM SEWER RIM TABLE	
STRUCTURE	RIM ELEVATION
EX CB39	488.50
EX CB40	483.45
EX CB41	481.67
EX CB42	480.45
EX CB43	478.60
EX CB49	466.13
EX. FES	492.72
HW-13-100	447.79
HW-13-130	446.71
HW-13-200	502.44
SDMH-13-101	472.71
SDMH-13-110	487.05
SDMH-13-110B	488.80
SDMH-13-111	491.40
SDMH-13-112	497.93
SDMH-13-114	500.03
SDMH-13-115	499.34
SDMH-13-132	464.85
SDMH-13-201	510.64
SDMH-13-202	508.01

REV. NO.	DESCRIPTIONS	DATE
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0	SUBMITTAL TO AGENCIES	2017.07.26



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**STORM DRAINAGE &  
 SANITARY SEWER TABLES**

DATE:	JULY 26, 2017
MCE PROJ. #	02735-0198
DRAWN	BSS
DESIGNED	BSS
CHECKED	GCA
PROJ. MGR.	CHS

SCALE	N/A
HORIZONTAL:	N/A
VERTICAL:	N/A

MAC FILE NUMBER	D4.6
DRAWING NUMBER	D4.5

STATUS:	FOR REVIEW PURPOSES ONLY
REVISION	3