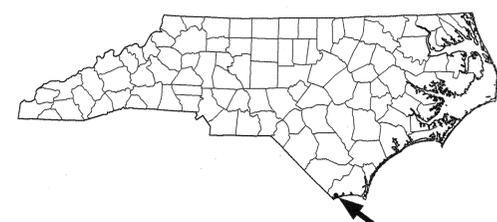


B-0682 SUNSET BEACH DAM BRUNSWICK COUNTY, NORTH CAROLINA

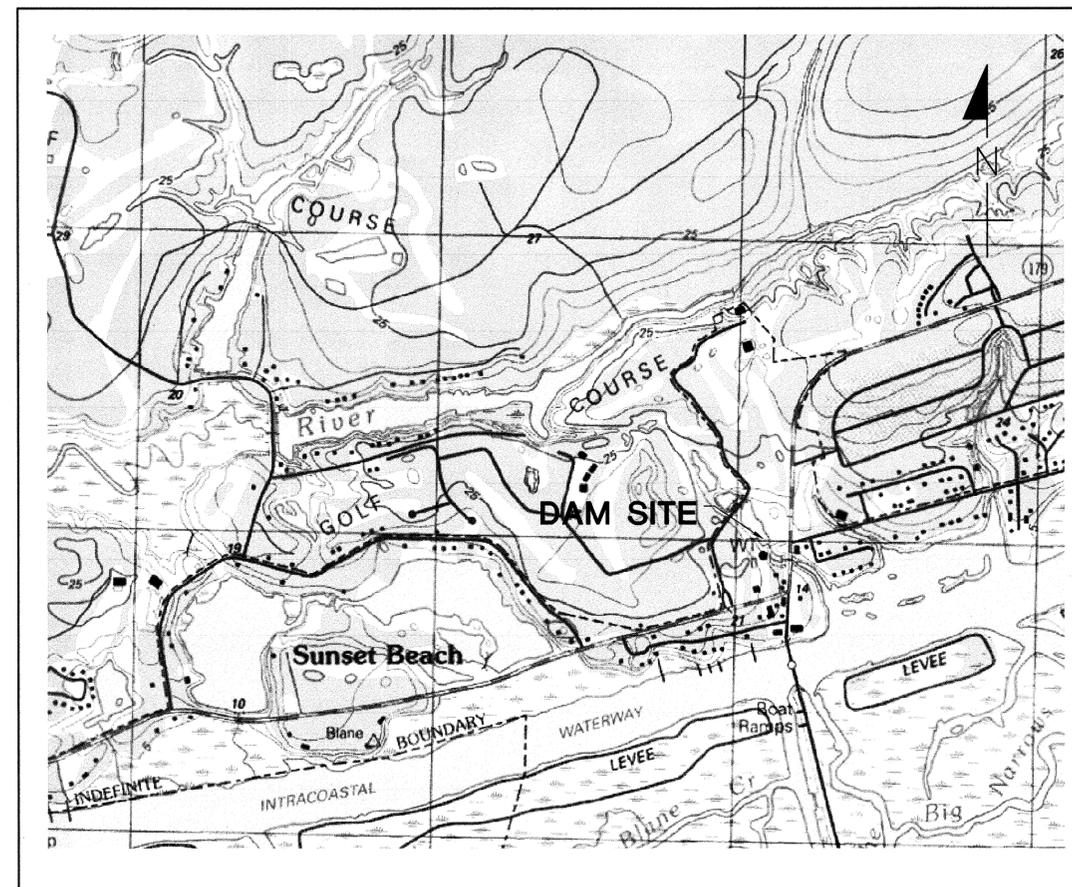
PREPARED FOR
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

BY
SCHNABEL ENGINEERING



SITE LOCATION

SITE LOCATION MAP



INDEX OF DRAWINGS

D-1	.....	COVER SHEET
D-2	.....	EXISTING SITE AND DEWATERING PLAN
D-3	.....	PROPOSED SITE PLAN
D-4	.....	PROPOSED DAM PLAN AND PROFILE
D-5	.....	PRINCIPAL SPILLWAY PLAN AND SECTION
D-6	.....	TRASHGUARD AND ANTI-VORTEX COVER
D-7	.....	SEDIMENT BASIN DETAILS
D-8	.....	SEDIMENT BASIN DETAILS
D-9	.....	PLAN, PROFILE AND CROSS SECTIONS - ϕ OF DAM
D-10	.....	CROSS SECTIONS - ϕ OF DAM

PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF THE DESIGN OF ONE DAM IN BRUNSWICK COUNTY, NORTH CAROLINA.

SITE VICINITY MAP



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	2	ADDRESS NCDOT DESIGN COMMENTS	1-24-07		H. TILLMAN MARSHALL, P.E. <i>H. Tillman Marshall</i> DATE: 4/13/07					SCALE:	DATE:	DRAWING NO.	SHEET
	1	ADDRESS NCDOT DESIGN COMMENTS	12-11-06		NC PROFESSIONAL ENGINEER NUMBER 024831					AS SHOWN	4/13/07	D-1	1 OF 1
	REV.	DESCRIPTION	DATE										

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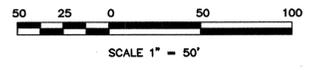
**BILL OF MATERIALS
SUNSET BEACH DAM CONSTRUCTION**

ITEM	DESCRIPTION	UNIT	QUANTITY
1	DAM CONSTRUCTION DEWATERING	LS	1
2	SILT FENCE	LF	530
3	UNCLASSIFIED EXCAVATION	CY	1,250
4	SEEDING AND MULCH	ACRE	2
5	36-INCH CORRUGATED METAL PIPE	LF	2.5
6	24-INCH CORRUGATED METAL PIPE	LF	216
7	FINE AGGREGATE FILTER DIAPHRAGM w\PVC PIPE	CY	31
8	CLASS B ROCK RIP RAP	TON	240
9	FILTER FABRIC UNDER OUTLET PROTECTION	SY	345
10	SILT EXCAVATION FROM SEDIMENT BASIN	CY	60
11	TEMPORARY SEEDING	LB	150
12	TEMPORARY MULCHING	ACRE	2
13	FERTILIZER FOR TEMPORARY SEEDING	TON	0.5
14	ABC STONE	TON	3,920
15	CONCRETE CLASS AA	CY	14
16	12-INCH CAST IRON GATE	EA	1
17	48-INCH PRECAST MANHOLE	EA	1
18	42-INCH RCP	LF	112
19	30-INCH RCP	LF	64
20	TRASH RACK 30" X 30"	EA	1
21	TRASH GUARD w\ ANTI-VORTEX COVER	EA	1
22	DAM EMBANKMENT EARTHFILL	CY	6,490

NOTE: BILL OF MATERIALS REPRESENTS ESTIMATED QUANTITIES PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR. THESE ITEMS DO NOT REPRESENT PAY ITEMS OR QUANTITIES FOR PAYMENT. MEASUREMENT AND PAYMENT WILL BE DICTATED STRICTLY BY THE CONTRACT SPECIFICATIONS AND SPECIAL PROVISIONS.

ANTICIPATED CONSTRUCTION SEQUENCE:

1. INSTALL SOIL EROSION AND SEDIMENT CONTROL MEASURES IN CONJUNCTION WITH PROJECT MOBILIZATION, INSTALL SEDIMENT BASIN, RISER, AND OUTLET CONDUIT AS SHOWN. PROVIDE ADDITIONAL DEVICES AS SHOWN OR AS REQUIRED BY THE CONDITIONS OF THE PERMIT.
2. DEWATER THE EXISTING IMPOUNDMENT AND INSTALL COFFERDAM AND CONTROL OF WATER DEVICES IN ACCORDANCE WITH PROJECT SPECIFICATIONS, SPECIAL PROVISIONS, AND DEWATERING SEQUENCE SHOWN ON SHEET D-2.
3. PLACE AND COMPACT ABC STONE TO THE LIMITS SHOWN IN THE PLANS AND TO THE REQUIREMENTS OF THE SPECIAL PROVISION.
4. SEDIMENT LADEN WATER CREATED DURING PLACEMENT OF THE ABC STONE SHALL NOT BE DISCHARGED TO DOWNSTREAM AREAS. AT A MINIMUM, THIS WATER SHALL BE PUMPED INTO THE SEDIMENT BASIN PRIOR TO DISCHARGE.
5. PLACE AND COMPACT EMBANKMENT DAM EARTH FILL IN ACCORDANCE WITH SPECIFICATIONS UP TO ELEVATION FOR PROPOSED PRIMARY SPILLWAY BASE SLAB AND OUTLET CONDUIT.
6. PLACE CAST-IN-PLACE CONCRETE FOR BASE SLAB, INSTALL RCP OUTLET CONDUIT, AND CONCRETE CRADLE.
7. SET PRECAST MANHOLE, INSTALL GATE, AND CONSTRUCT AND INSTALL TRASH RACK.
8. PLACE REMAINING EMBANKMENT DAM EARTHFILL AFTER CONCRETE HAS CURED IN ACCORDANCE WITH SPECIFIED DURATIONS FOR CRADLED CONDUITS.
9. INSTALL ROCK RIP RAP PLUNGE POOL.
10. PERFORM EXCAVATION AND GRADING ASSOCIATED WITH EMERGENCY SPILLWAY.
11. PLACE AND COMPACT ABC STONE ALONG PROPOSED GOLF CART PATH.
12. PLACE AND COMPACT ASPHALT PAVING FOR GOLF CART PATH.
13. PLACE TOPSOIL, LIME, FERTILIZER, SEED AND MULCH AS SPECIFIED FOR FINAL STABILIZATION.
14. REMOVE COFFERDAM AND OTHER CONTROL OF WATER DEVICES.
15. REMOVE SOIL EROSION AND SEDIMENT CONTROL DEVICES FOLLOWING PERMANENT TURF ESTABLISHMENT.



PROPOSED SITE PLAN

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	2	ADDRESS NCDOT DESIGN COMMENTS	1-24-07
	1	ADDRESS NCDOT DESIGN COMMENTS	12-11-06
	REV.	DESCRIPTION	DATE



DESIGNED BY: HTM	DRAWN BY: KFL/PK	CHECKED BY: HTM
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DATE: 4-13-07		
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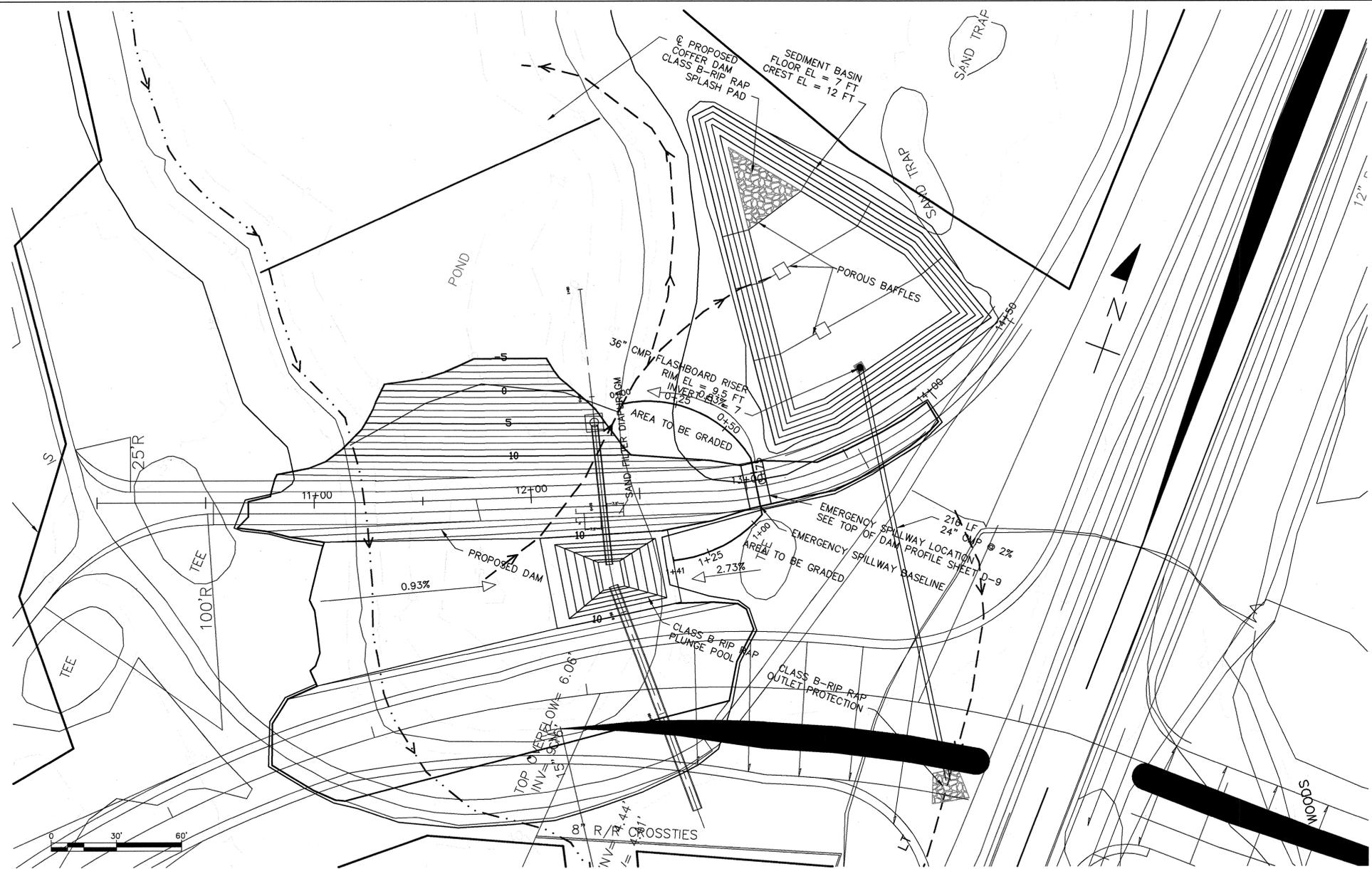
**B-0682 SUNSET BEACH DAM
BRUNSWICK COUNTY, NORTH CAROLINA
N.C. DEPARTMENT OF TRANSPORTATION**

**SCHNABEL PROJECT NUMBER
05210014.02**

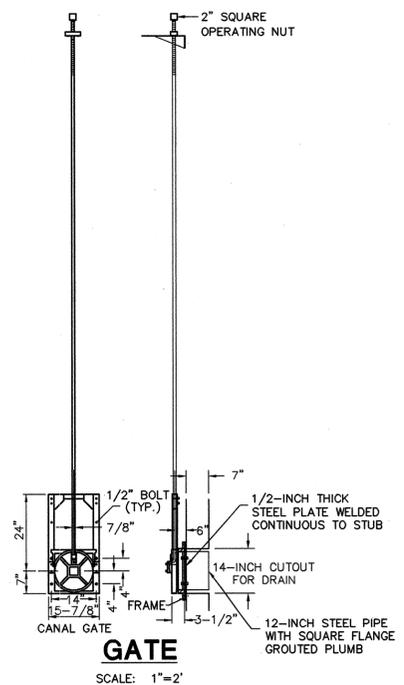
PROPOSED SITE PLAN			
SCALE: AS SHOWN	DATE: 4/13/07	DRAWING NO. D-3	SHEET 1 OF 1

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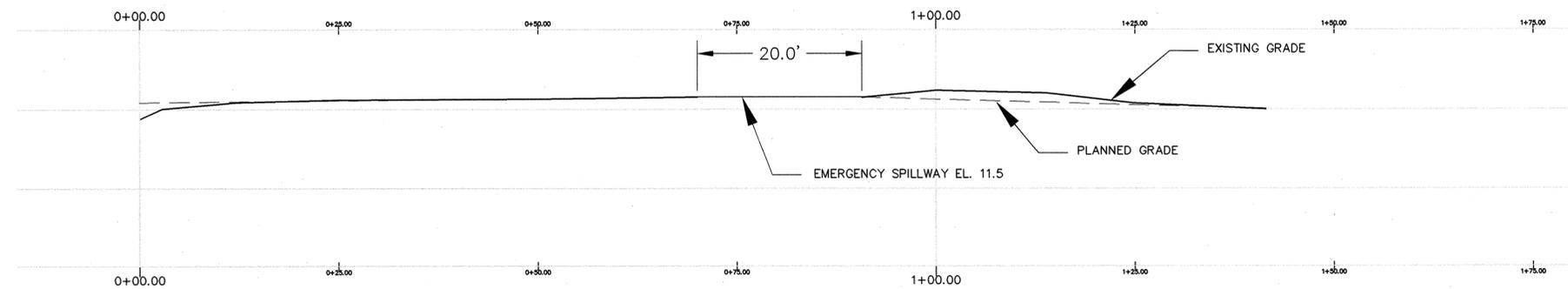
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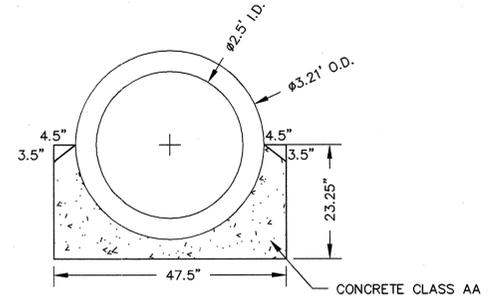
PROPOSED PLAN



- GATE**
SCALE: 1"=2'
- NOTES:**
- GATE SHALL BE 12-INCH DIAMETER, CAST IRON CANAL GATE, FLATBACK, WITH BRONZE SEAT FACINGS, FLAT SQUARE BOTTOM SLIDE, GALVANIZED STEEL FRAME, STAINLESS STEEL RISING STEM, STAINLESS STEEL ANCHOR BOLTS, AND STANDARD SHOPCOAT PAINT, OR EQUIVALENT AS APPROVED BY THE ENGINEER.
 - PROVIDE A 2-INCH SQUARE OPERATING NUT AND A 3-FOOT LENGTH TEE WRENCH TO OPERATE THE GATE.



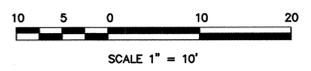
EMERGENCY SPILLWAY PROFILE



DETAIL OF 30" PIPE & CONCRETE CRADLE

NOT TO SCALE

EMERGENCY SPILLWAY PROFILE



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1	ADDRESS NCDOT DESIGN COMMENTS	12-11-06



DESIGNED BY: HTM
DRAWN BY: KFL/VPK
CHECKED BY: HTM

H. TILLMAN MARSHALL, P.E.

H. Tillman Marshall DATE: 4-13-07
NC PROFESSIONAL ENGINEER NUMBER 024831

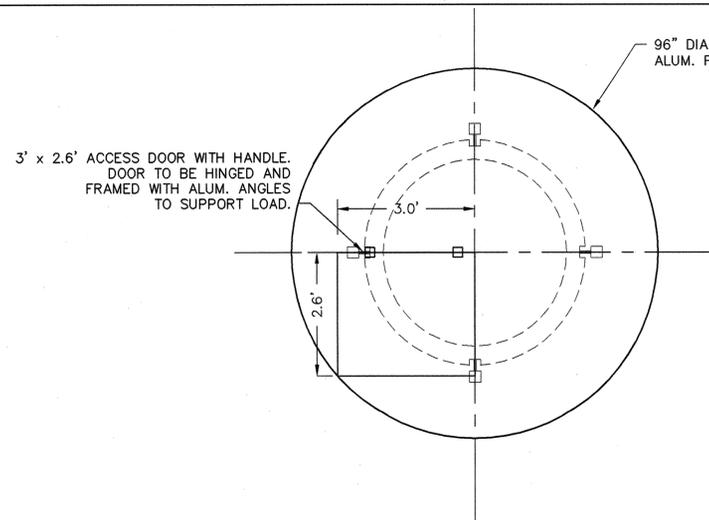


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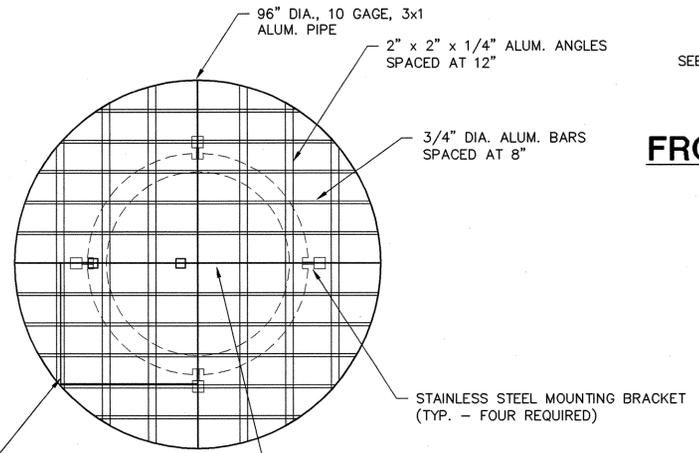
PROPOSED DAM PLAN AND PROFILE			
SCALE: AS SHOWN	DATE: 4/13/07	DRAWING NO. D-4	SHEET 1 OF 1

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COVER DETAIL

SCALE: 1"=2'

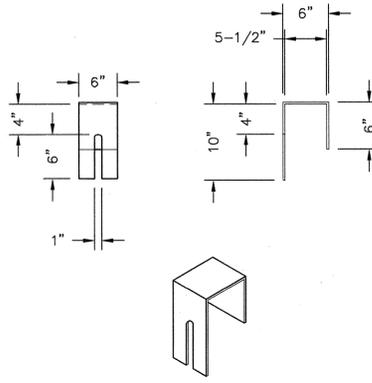


PLAN

3' x 2.6' ACCESS DOOR WITH MECHANISM FOR LOCKING. SHOP DRAWINGS SHALL PROVIDE DETAILS.

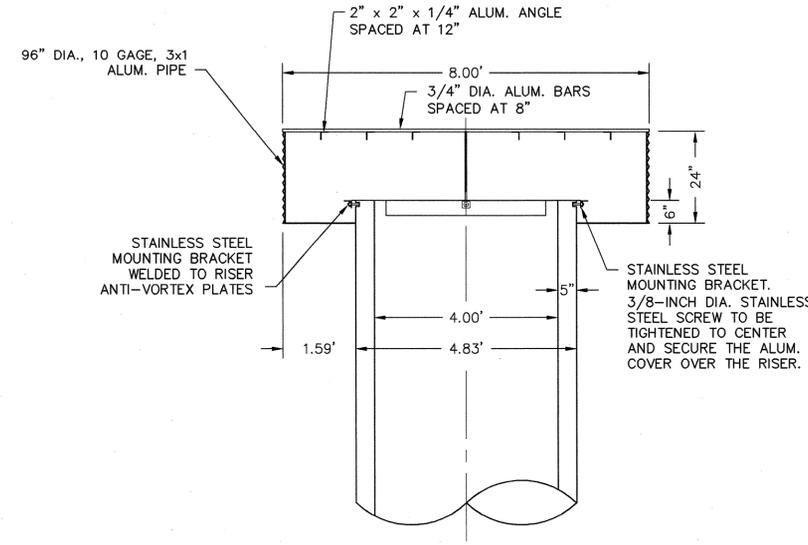
STAINLESS STEEL MOUNTING BRACKET (TYP. - FOUR REQUIRED)

3/16" THICK SUPPORT PLATE WELDED TO 108" DIA. PIPE



MOUNTING BRACKETS

SCALE: 1"=1'

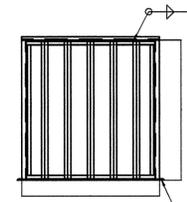


PROFILE

TRASH GUARD AND ANTI-VORTEX COVER

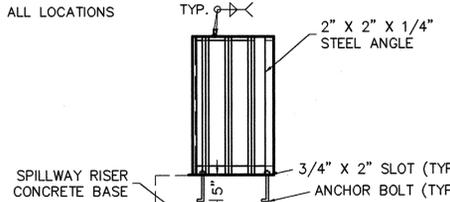
SCALE: 1"=2'

(CROSS SECTION THROUGH PIPE AND VERTICAL PLATE)



FRONT ELEVATION

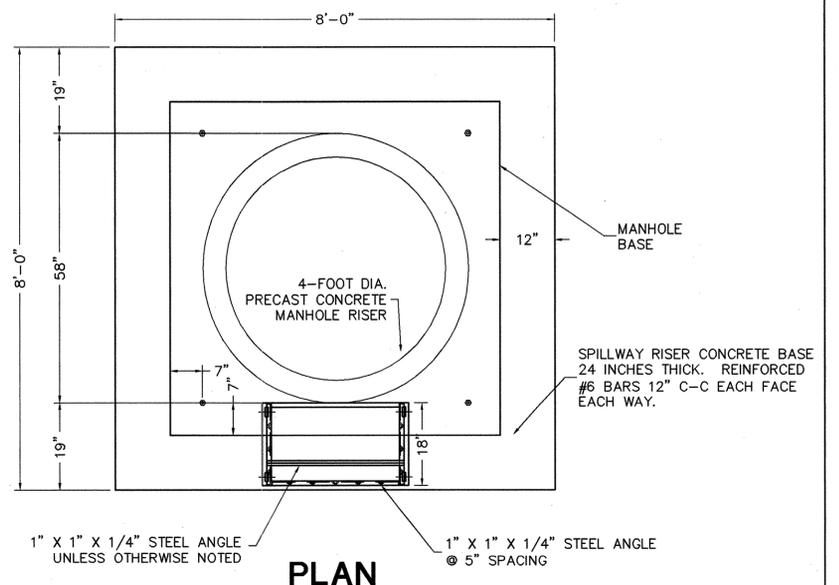
2" x 2" x 1/4" STEEL ANGLE SEE DETAIL A FOR SLOT DETAILS



SIDE ELEVATION

NOTE:

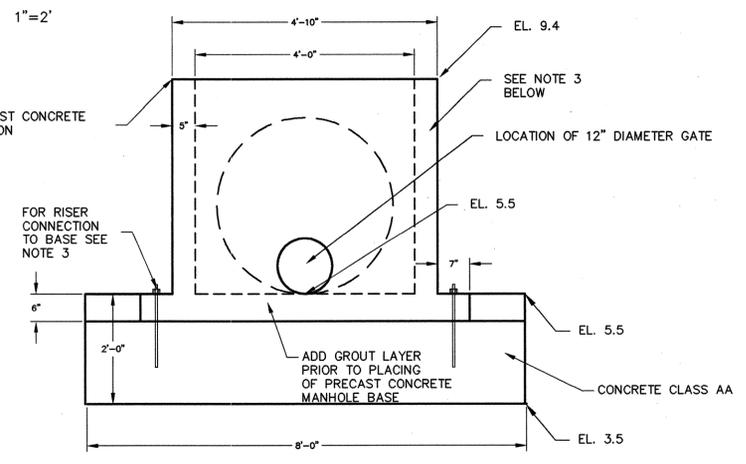
CONTRACTOR SHALL PROVIDE SHOP FABRICATION DRAWINGS WITH DETAILS FOR REVIEW AND APPROVAL. UNLESS OTHERWISE APPROVED, ENTIRE TRASH RACK SHALL BE GALVANIZED AFTER FABRICATION IS COMPLETED.



PLAN

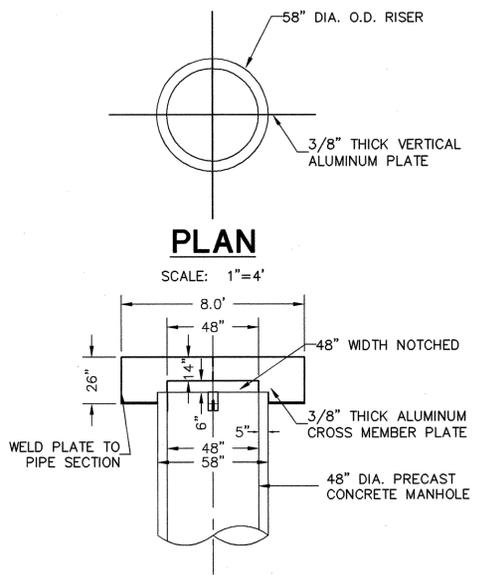
TRASH RACK

SCALE: 1"=2'



ELEVATION - RISER

SCALE: 1"=2'



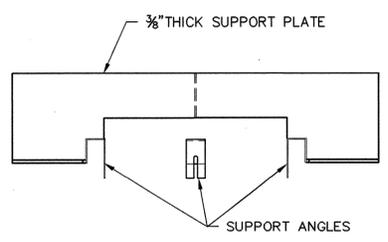
SUPPORT PLATE

PLAN

SCALE: 1"=4'

NOTES:

- CONTRACTOR MAY PROPOSE ALTERNATE DETAILS FOR APPROVAL BY ENGINEER.
- DRILL 3/4-INCH DIA. 3-INCH DEPTH INTO RISER WALL AT EACH MOUNTING BRACKET LOCATION AND ADJUST THE SET SCREWS INTO THE OVERSIZED HOLES TO CENTER AND SECURE THE ALUMINUM COVER ON THE RISER.
- USE FOUR 1/2" DIA. STAINLESS STEEL BOLTS 15" LONG WITH 3" OF THREADS TO SECURE THE RISER BASE TO THE ANTI-FLOTATION SLAB. USE 4" X 4" X 3/8" STAINLESS STEEL WASHERS.
- THE MANHOLE SLAB SHOULD HAVE 1.25" DIA. HOLES AT SAME SPACING AS ABOVE TO ACCOMMODATE THE ANCHOR CONNECTIONS.
- SHOP DRAWINGS SHOWING ALL DETAILS SHALL BE PROVIDED TO ENGINEER FOR REVIEW AND APPROVAL. ALTERNATIVE DESIGNS MAY BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.



SUPPORT PLATES

SCALE: 1"=2'

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H. TILLMAN MARSHALL, P. E.		
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NC PROFESSIONAL ENGINEER NUMBER 024831		

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05210014-02

TRASH GUARDS AND ANTI-VORTEX COVER

SCALE: AS SHOWN	DATE: 1/24/07	DRAWING NO. D-6	SHEET 1 OF 1
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SILT FENCE CONSTRUCTION SPECIFICATIONS

MATERIALS

- USE A SYNTHETIC FILTER FABRIC OR A PERVIOUS SHEET OF POLYPROPYLENE, NYLON, POLYESTER, OR POLYETHYLENE YARN, WHICH IS CERTIFIED BY THE MANUFACTURER OR SUPPLIER AS CONFORMING TO THE REQUIREMENTS SHOWN IN THE TABLE BELOW.

PHYSICAL PROPERTY	REQUIREMENTS
FILTERING EFFICIENCY	85% (MIN)
TENSILE STRENGTH AT 20% (MAX)	STAN. STRENGTH—30 LB/LIN IN (MIN)
ELONGATION	EX. STRENGTH—50LB/LIN IN (MIN)
SLURRY FLOW RATE	0.3 GAL/SQ FT/MIN (MIN)

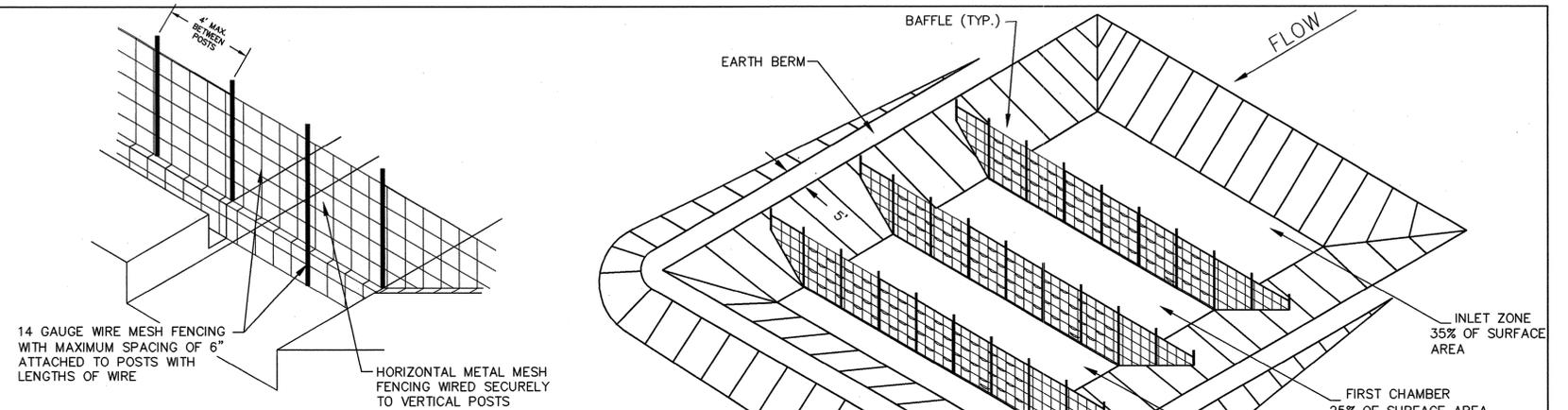
- POSTS FOR SILT FENCES SHALL BE 1.33 LB/LINEAR FT STEEL WITH A MINIMUM LENGTH OF 5 FT. POSTS SHALL HAVE PROJECTIONS TO FACILITATE FASTENING THE FABRIC.
- FOR REINFORCEMENT OF STANDARD STRENGTH FILTER FABRIC, USE WIRE FENCE WITH A MINIMUM 14 GAUGE AND A MAXIMUM MESH SPACING OF 6 INCHES.

CONSTRUCTION

- CONSTRUCT THE SILT FENCE OF STANDARD STRENGTH OR EXTRA STRENGTH SYNTHETIC FILTER FABRICS.
- ENSURE THAT THE HEIGHT OF THE SILT FENCE DOES NOT EXCEED 18 INCHES ABOVE THE GROUND SURFACE.
- CONSTRUCT THE FILTER FABRIC FROM A CONTINUOUS ROLL CUT TO THE LENGTH OF THE FENCE TO AVOID JOINTS. WHEN JOINTS ARE NECESSARY, SECURELY FASTEN THE FILTER FABRIC ONLY AT A SUPPORT POST WITH OVERLAP TO THE NEXT POST.
- SUPPORT STANDARD STRENGTH FILTER FABRIC BY WIRE MESH FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY DUTY WIRE STAPLES AT LEAST 1 INCH LONG, OR TIE WIRES. EXTEND THE WIRE MESH SUPPORT TO THE BOTTOM OF THE TRENCH.
- SPACE POSTS A MAXIMUM OF 8 FT APART. SUPPORT POSTS SHOULD BE DRIVEN SECURELY INTO THE GROUND TO A MINIMUM OF 18 INCHES.
- EXCAVATE A TRENCH APPROXIMATELY 4 INCHES WIDE AND 8 INCHES DEEP ALONG THE PROPOSED LINE OF POSTS AND UPSLOPE FROM THE FENCE.
- PLACE 12 INCHES OF THE FABRIC ALONG THE BOTTOM AND SIDE OF THE TRENCH.
- BACKFILL THE TRENCH WITH COMPACTED SOIL OR GRAVEL PLACED OVER THE FILTER FABRIC.
- DO NOT ATTACH FILTER FABRIC TO EXISTING TREES.

SILT FENCE MAINTENANCE

- INSPECT SILT FENCES AT LEAST ONCE A WEEK AND AFTER EACH SIGNIFICANT RAINFALL EVENT (1/2 INCH OR GREATER). MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
- SHOULD THE FABRIC OF A SILT FENCE COLLAPSE, TEAR, DECOMPOSE OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.
- REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT.
- REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

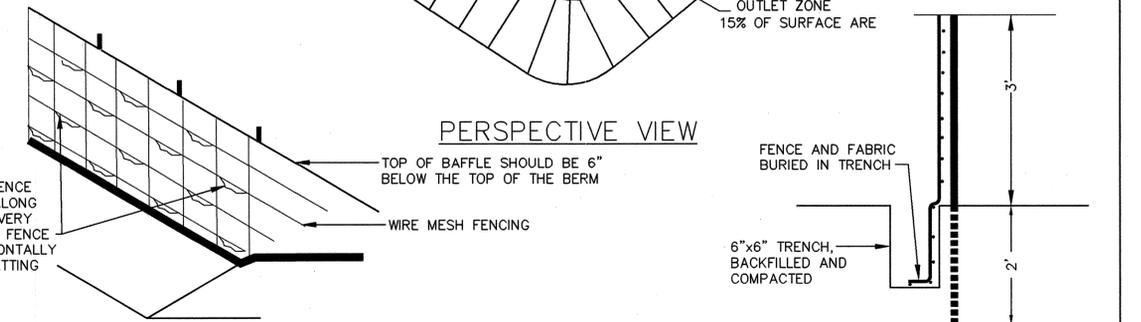


BAFFLE INSTALLATION — STEP 1

NOTES:

- DRIVE 5' STEEL POST AT LEAST 24" INTO SOLID GROUND.
- USE STAPLES 1' APART HORIZONTALLY AND VERTICALLY TO ATTACH THE FABRIC TO THE FENCE.
- SPACE THE BAFFLES ACCORDING TO THE APPROVED PLAN.
- THE BERMS SHOULD BE SEDED IMMEDIATELY AFTER THE BASIN IS CONSTRUCTED

CUT 6" SLITS IN THE FENCE FABRIC WITH A KNIFE ALONG THE BOTTOM WIRE IN EVERY OTHER SQUARE OF THE FENCE VERTICALLY AND HORIZONTALLY OR USE COIR FIBER MATTING



BAFFLE INSTALLATION — STEP 2

OUTLET PROTECTION INSTALLATION:

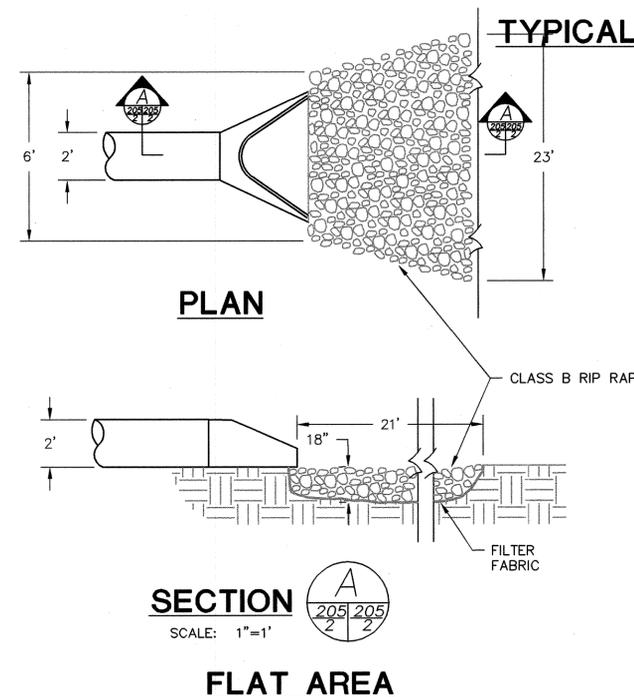
- COMPACT ANY FILL REQUIRED IN THE SUB GRADE TO THE DENSITY OF THE SURROUNDING UNDISTURBED MATERIAL. LOW AREAS IN THE SUB GRADE ON UNDISTURBED SOIL MAY ALSO BE FILLED BY INCREASING THE RIP RAP THICKNESS.
- FILTER FABRIC, WHEN USED, MUST MEET DESIGN REQUIREMENTS AND BE PROPERLY PROTECTED FROM PUNCHING OR TEARING DURING INSTALLATION. REPAIR ANY DAMAGE BY REMOVING THE RIP RAP AND PLACING ANOTHER PIECE OF FILTER FABRIC OVER THE DAMAGED AREA. ALL CONNECTING JOINTS SHOULD OVERLAP A MINIMUM OF 1 FOOT. IF THE DAMAGE IS EXTENSIVE, REPLACE THE ENTIRE FILTER FABRIC.
- RIP RAP MAY BE PLACED BY EQUIPMENT, BUT TAKE CARE TO AVOID DAMAGING THE FILTER FABRIC.
- THE MINIMUM THICKNESS OF THE RIP RAP SHOULD BE 1.5 TIMES THE MAXIMUM STONE DIAMETER.
- RIP RAP MAY BE FIELD STONE OR ROUGH QUARRY STONE. IT SHOULD BE HARD, ANGULAR, HIGHLY WEATHER-RESISTANT AND WELL GRADED.
- CONSTRUCT THE APRON ON ZERO GRADE WITH NO OVERFILL AT THE END. MAKE THE TOP OF THE RIP RAP AT THE DOWNSTREAM END LEVEL WITH THE RECEIVING AREA OR SLIGHTLY BELOW IT.
- ENSURE THAT THE APRON IS PROPERLY ALIGNED WITH THE RECEIVING STREAM AND PREFERABLY STRAIGHT THROUGHOUT ITS LENGTH. IF A CURVE IS NEEDED TO FIT SITE CONDITIONS, PLACE IT IN THE UPPER SECTION OF THE APRON.
- IMMEDIATELY AFTER CONSTRUCTION, STABILIZE ALL DISTURBED AREAS WITH VEGETATION.

MAINTENANCE:

- INSPECT RIP RAP OUTLET STRUCTURES WEEKLY AND AFTER SIGNIFICANT (1/2 INCH OR GREATER) RAINFALL EVENTS TO SEE IF ANY EROSION AROUND OR BELOW THE RIP RAP HAS TAKEN PLACE, OR IF STONES HAVE BEEN DISLODGED. IMMEDIATELY MAKE ALL NEEDED REPAIRS TO PREVENT FURTHER DAMAGE.

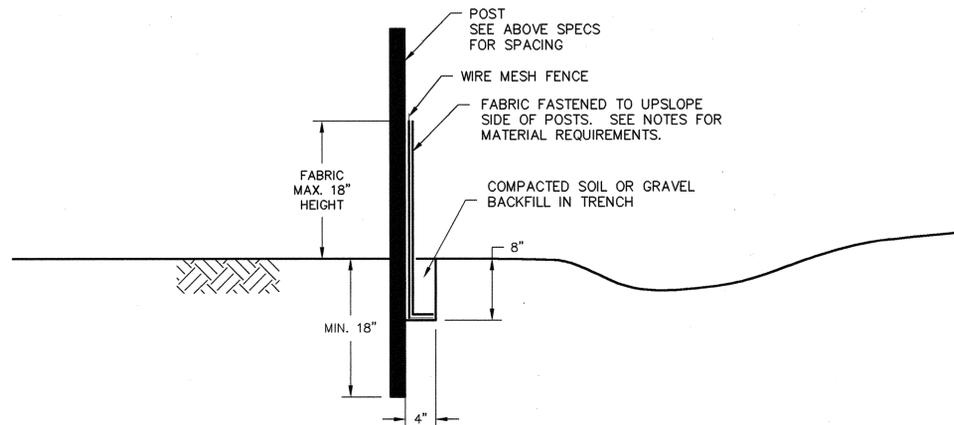
TYPICAL POROUS BAFFLE DETAILS

N.T.S



OUTLET PROTECTION

SCALE: 1"=1'



SILT FENCE DETAIL

SCALE: 1" = 1'

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<i>H. Tillman Marshall</i> DATE: 4/17/07		
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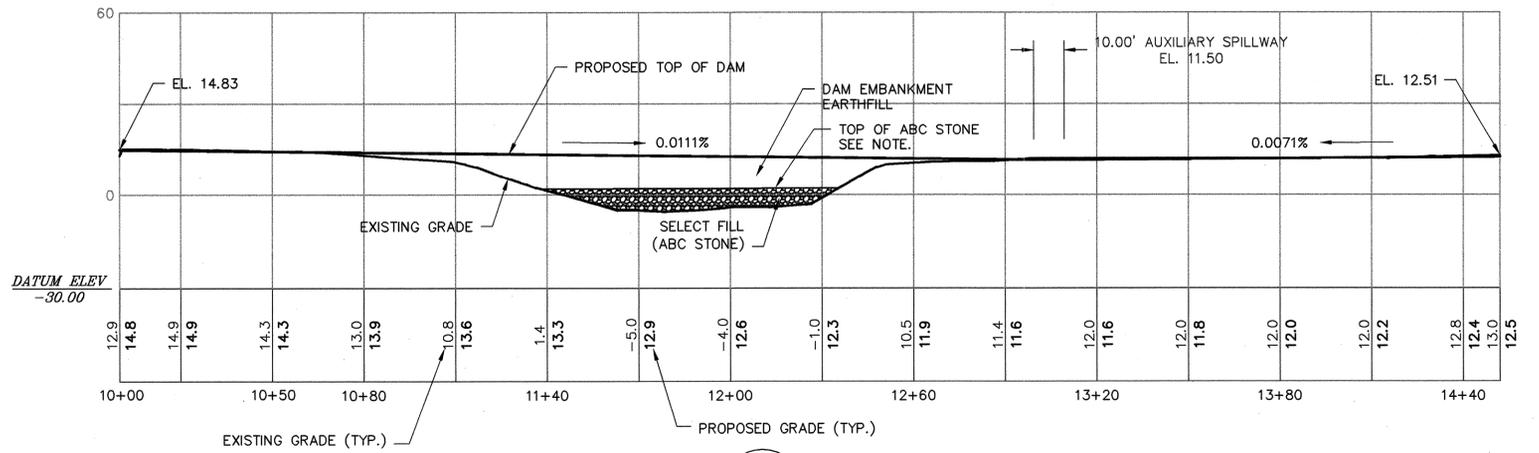
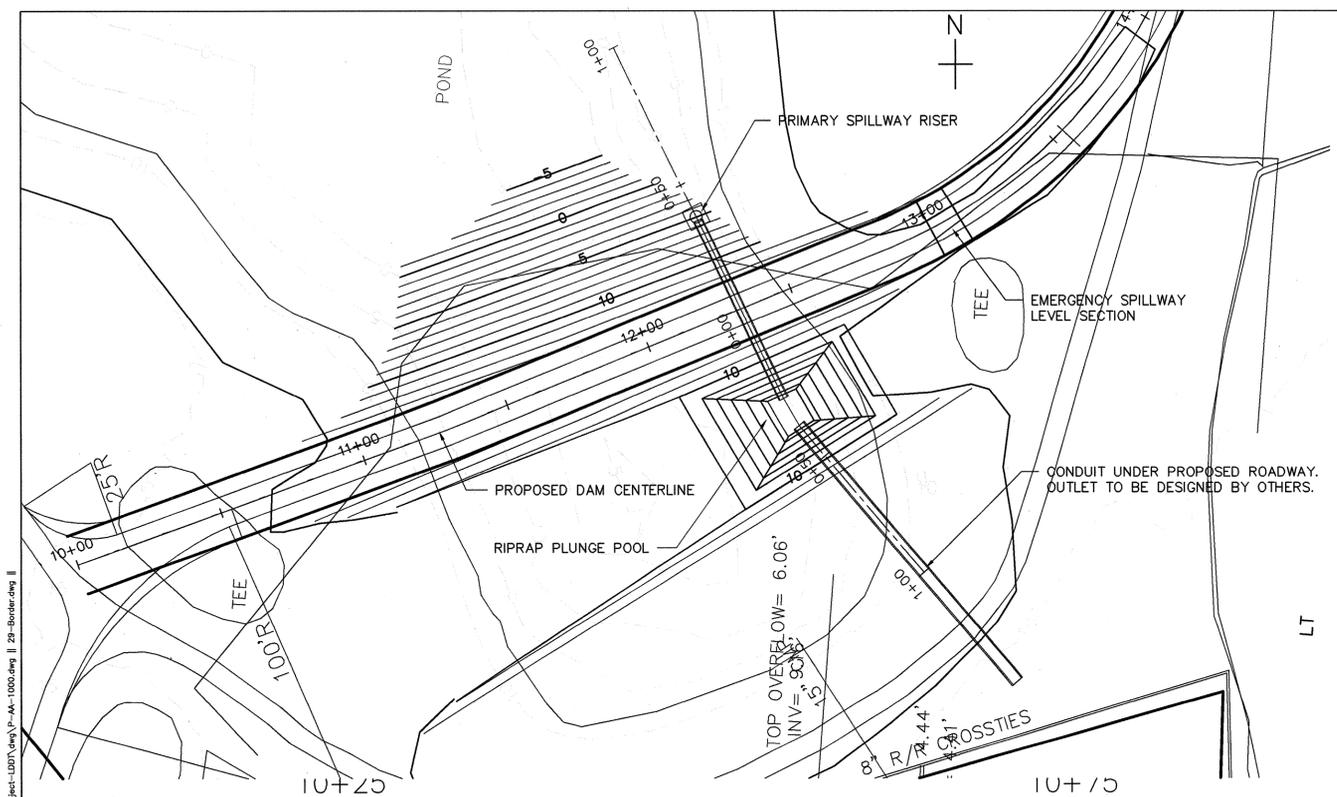


B-0682 SUNSET BEACH DAM
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SEDIMENT BASIN DETAILS

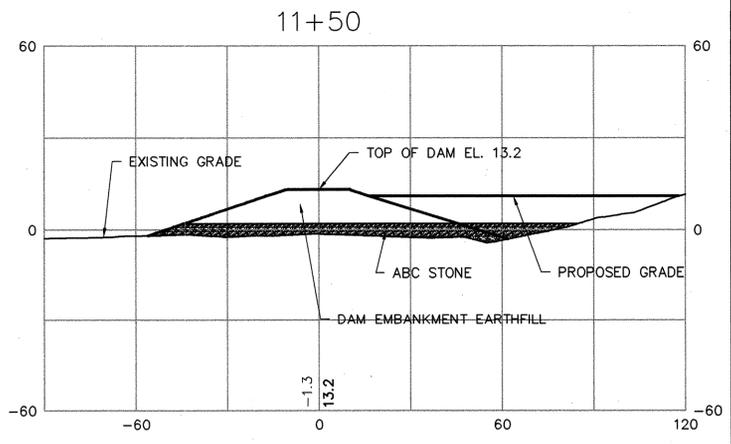
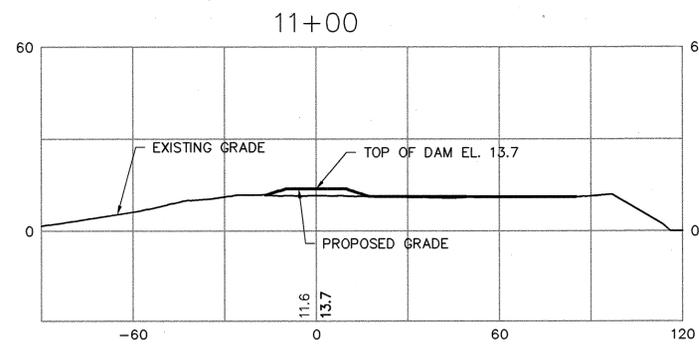
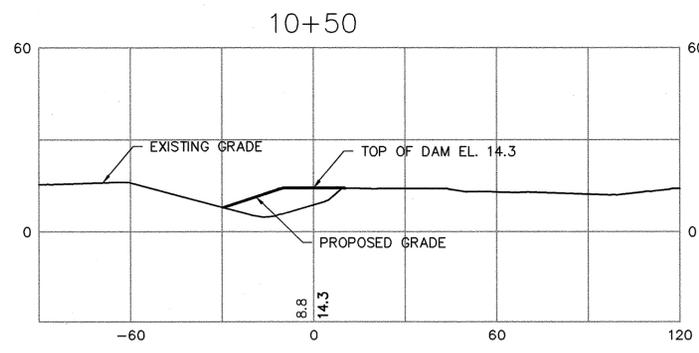
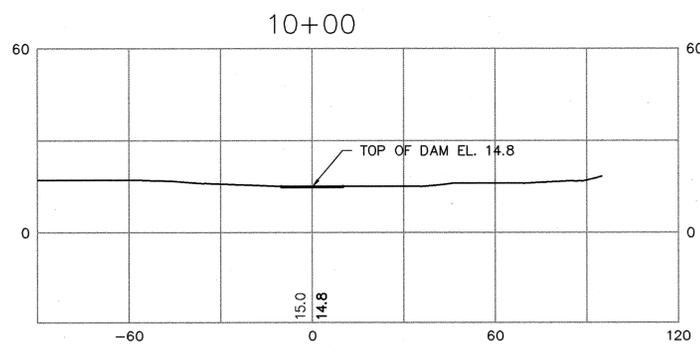
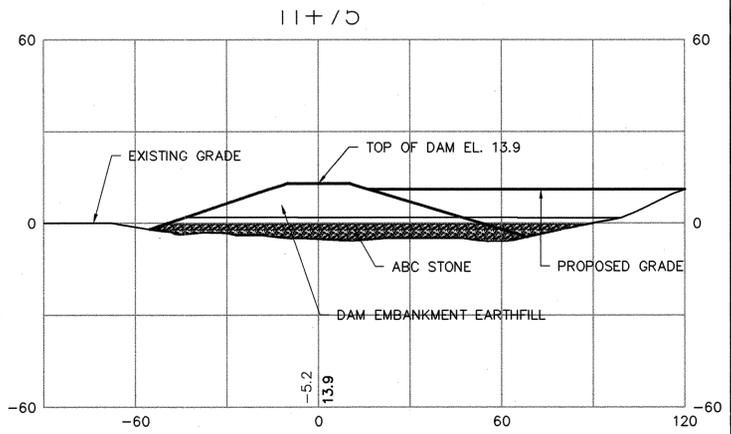
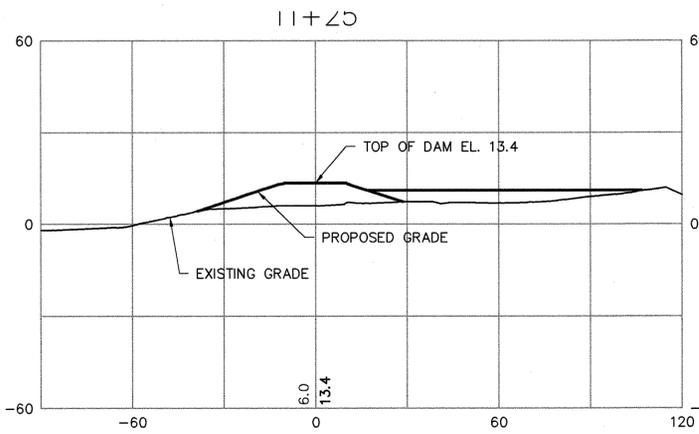
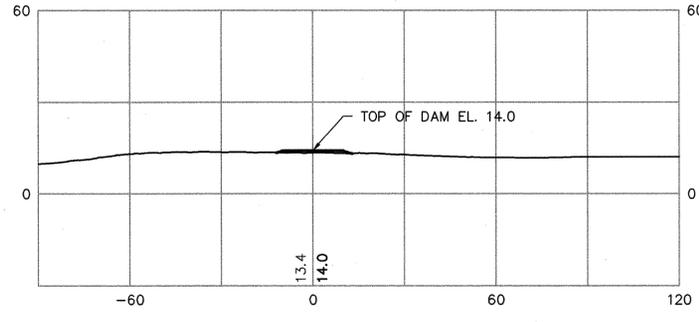
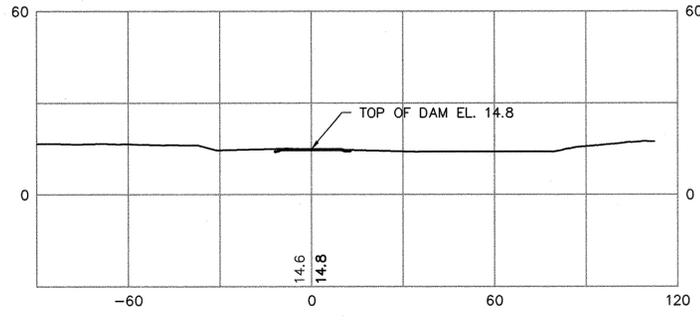
SCALE: AS SHOWN	DATE: 4/13/07	DRAWING NO. D-8	SHEET 1 OF 1
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SECTION A
ALONG CENTERLINE OF DAM
 SCALE: 1"=30'

NOTE: ABC STONE SHALL BE PLACED TO A MAXIMUM ELEVATION OF +2.0.



TYPICAL SECTIONS
 SCALE: 1" = 30'

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REV.	DESCRIPTION	DATE
3	ADDRESS NCDOT DESIGN COMMENTS	2-5-07
2	ADDRESS NCDOT DESIGN COMMENTS	1-24-07
1	ADDRESS NCDOT DESIGN COMMENTS	12-11-06



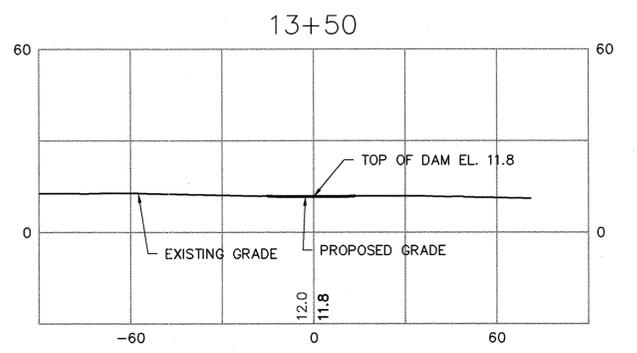
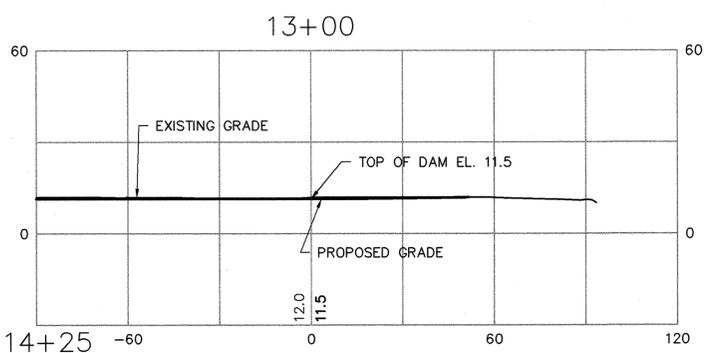
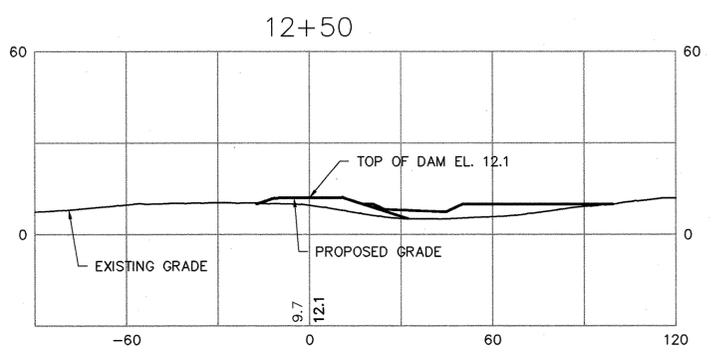
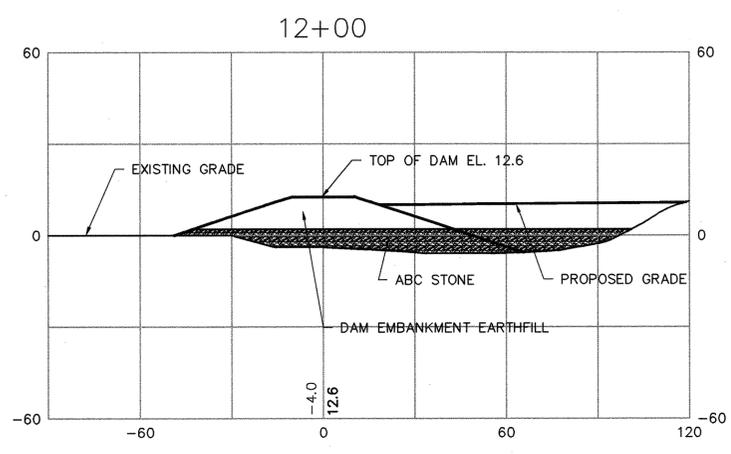
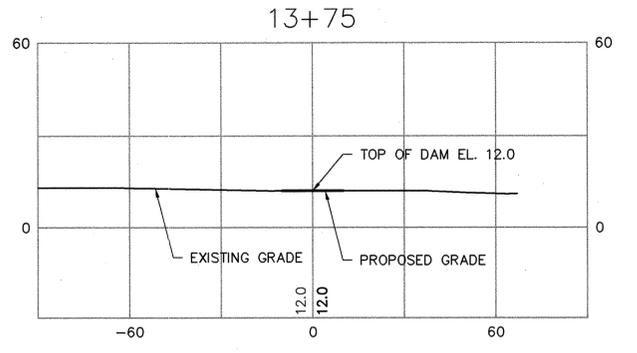
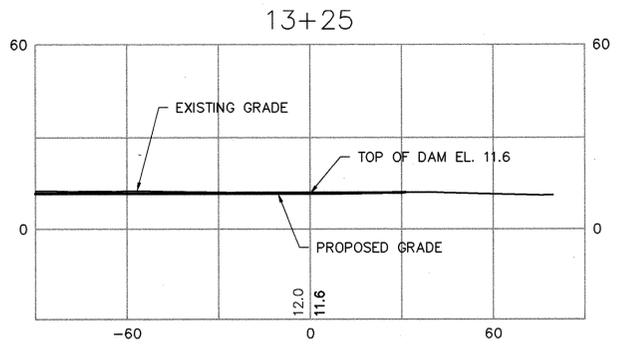
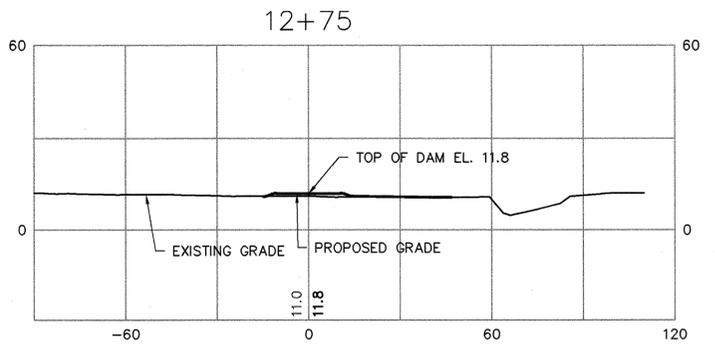
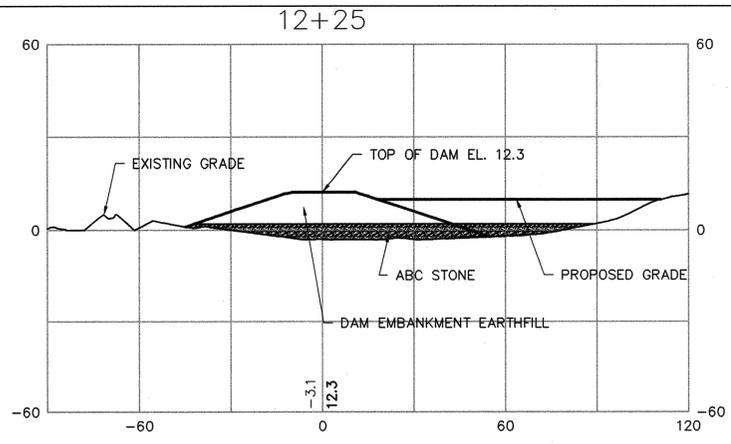
DESIGNED BY: HTM
 DRAWN BY: KFL/PK
 CHECKED BY: HTM
 H. TILLMAN MARSHALL, P.E.
 DATE: 4-13-07
 NC PROFESSIONAL ENGINEER NUMBER 024831

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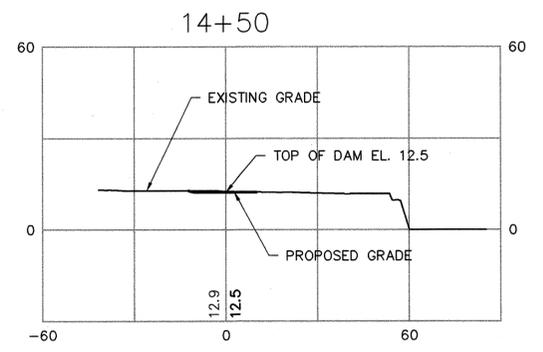
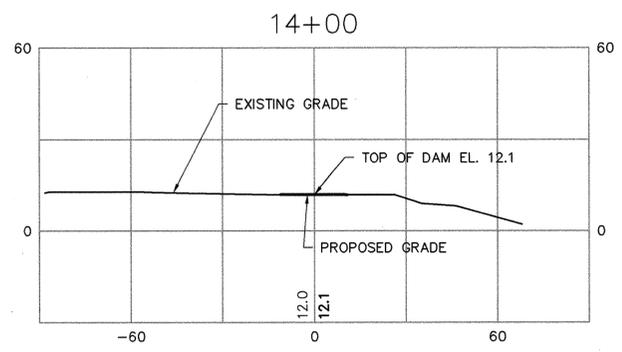
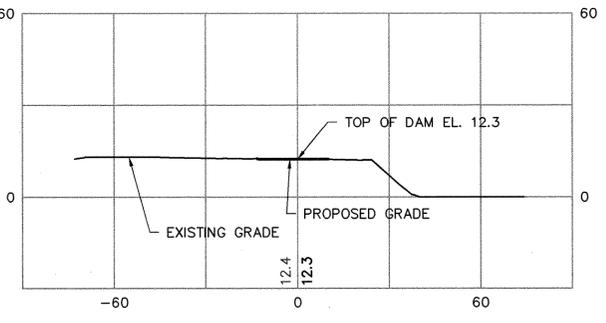
B-0682 SUNSET BEACH DAM
 BRUNSWICK COUNTY, NORTH CAROLINA
 N.C. DEPARTMENT OF TRANSPORTATION
 SCHNABEL PROJECT NUMBER
 05210014.02

PLAN, PROFILE AND CROSS SECTIONS OF DAM			
SCALE: AS SHOWN	DATE: 4/13/07	DRAWING NO. D-9	SHEET 1 OF 1

F:\0210014.02 (Sunset Beach Dam)\CAD\Land Project\DOT\Map\SB-Dam.dwg 4-13-07 xref: F:\0210014.02 (Sunset Beach Dam)\CAD\Land Project\DOT\Map\SB-Dam.dwg 4-13-07 xref: F:\0210014.02 (Sunset Beach Dam)\CAD\Land Project\DOT\Map\SB-Dam.dwg 4-13-07



TYPICAL SECTIONS
SCALE: 1" = 30'



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2	ADDRESS NCDOT DESIGN COMMENTS	1-24-07
1	ADDRESS NCDOT DESIGN COMMENTS	12-11-06



DESIGNED BY: HTM
DRAWN BY: KFL/PK
CHECKED BY: HTM
H. TILLMAN MARSHALL, P.E.
H. Tillman Marshall DATE: 4-13-07
NC PROFESSIONAL ENGINEER NUMBER 024831

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CROSS SECTIONS - ☉ OF DAM			
SCALE: AS SHOWN	DATE: 4/13/07	DRAWING NO. D-10	SHEET 1 OF 1