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8/17/99

REVISIONS

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www.wspgroup.com
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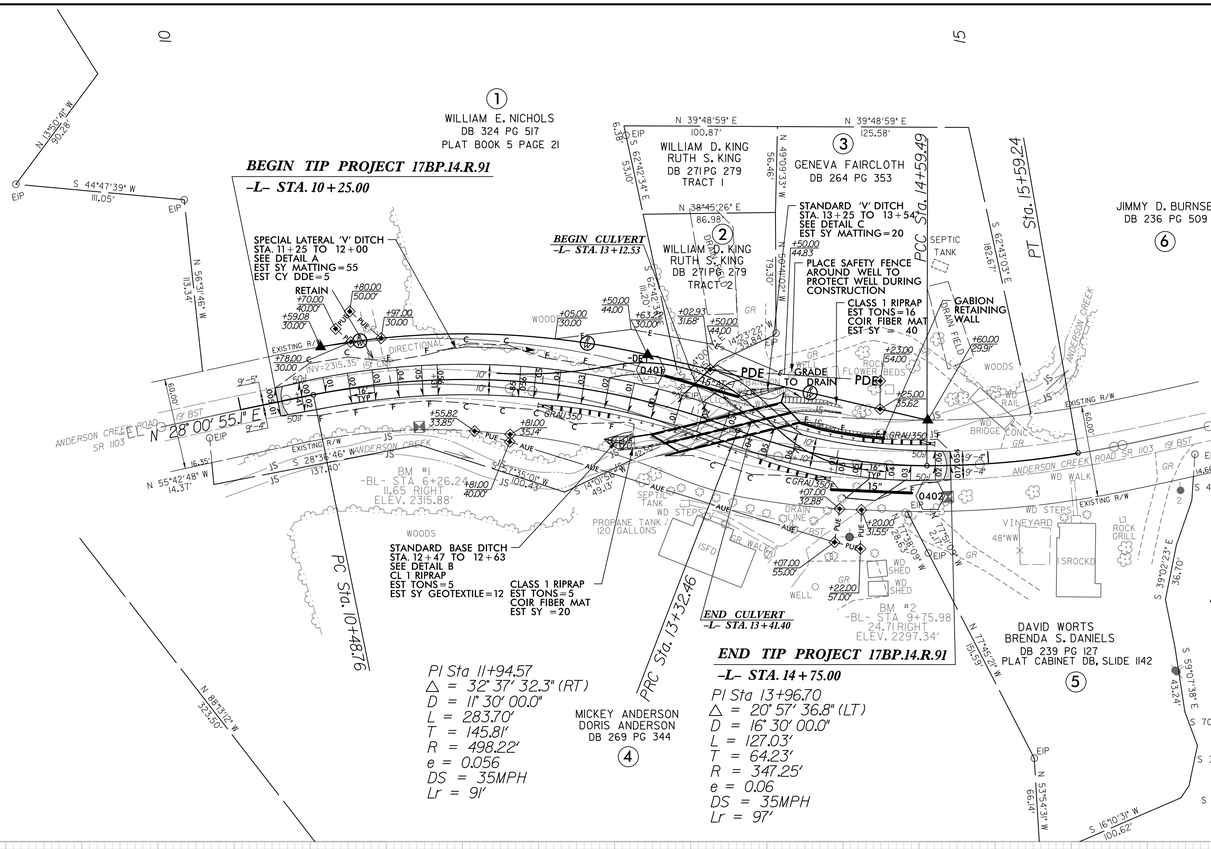
PROJECT REFERENCE NO.	SHEET NO.
17BP.14.R.91	4
R/W SHEET NO.	

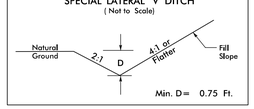
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33290 ENGINEER RONELLA A THURPEN
DocuSigned by: Ronyell Thurpen 9/8/2017

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 27876 ENGINEER RANA STANSELL
DocuSigned by: Rana Stansell 9/8/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

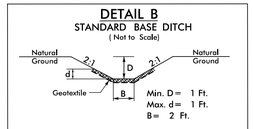


DETAIL A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 11+25 TO STA. 12+00 LT

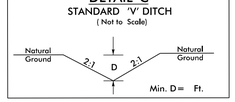
DETAIL B
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= CL 1 Rip-Rap

FROM -L- STA. 12+47 TO STA. 12+63 RT

DETAIL C
STANDARD 'V' DITCH
(Not to Scale)



FROM -L- STA. 13+25 TO STA. 13+54 LT

DETAIL D
SKEWED MULTI-BARREL CULVERT
LOW FLOW CHANNEL,SILLS
AND FLOOD PLAIN

*NOTES:

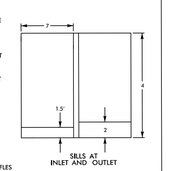
1) NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT BARREL PROVIDES A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM OR FLOOD PLAIN MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP-RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL(S). IF RIP-RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL(S), NATIVE MATERIAL SHOULD BE PLACED ON TOP OF THE RIP-RAP TO PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

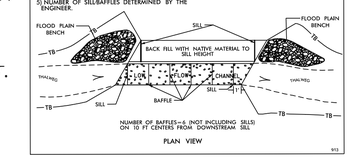
2) SILLS/BAFFLES ARE TO BE 1.0 FT WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

3) TOP OF LOW FLOW SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

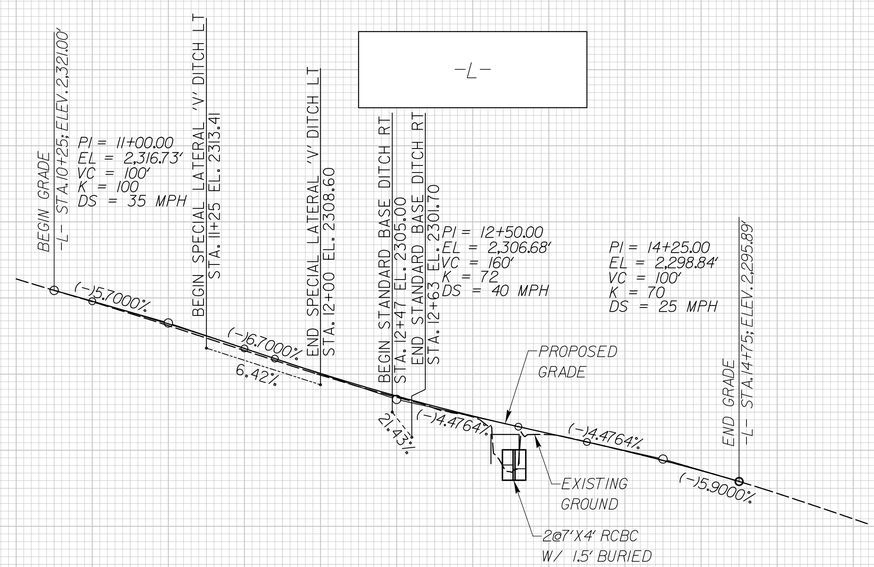
4) DO NOT SET ELEVATION OF HIGH SILL&BAFFLES ABOVE BANK FULL.

5) NUMBER OF SILL&BAFFLES DETERMINED BY THE ENGINEER.





NOTE:
REFERENCE CULVERT PLANS ON SHEETS C-1 THROUGH C-13.
REFERENCE DETOUR ON SHEET 2B-1.



BM #1: *8 INCH SPIKE SET IN BASE OF 36 INCH POPLAR TREE* 30.16' RIGHT OF -L- STA.11+17.08 11.65' RIGHT OF -BL- STA 6+26.24 ELEV: 2315.88'

BM #2: *8 INCH SPIKE SET IN BASE OF 24 INCH POPLAR TREE* 20.53' RIGHT OF -L- STA. 14+72.96 24.71' RIGHT OF -BL- STA 9+75.98 ELEV: 2297.34'

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 250	CFS
DESIGN FREQUENCY	= 5	YRS
DESIGN HW ELEVATION	= 2305.1	FT
BASE DISCHARGE	= 700	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2306.92	FT
OVERTOPPING DISCHARGE	= 280	CFS
OVERTOPPING FREQUENCY	= 5+	YRS
OVERTOPPING ELEVATION	= 2305.3	FT

9/7/2017
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USH 04407