Docusign Envelope ID: 332BD0E0-6729-4AEC-B803-192A1587D0CF

5/26/20

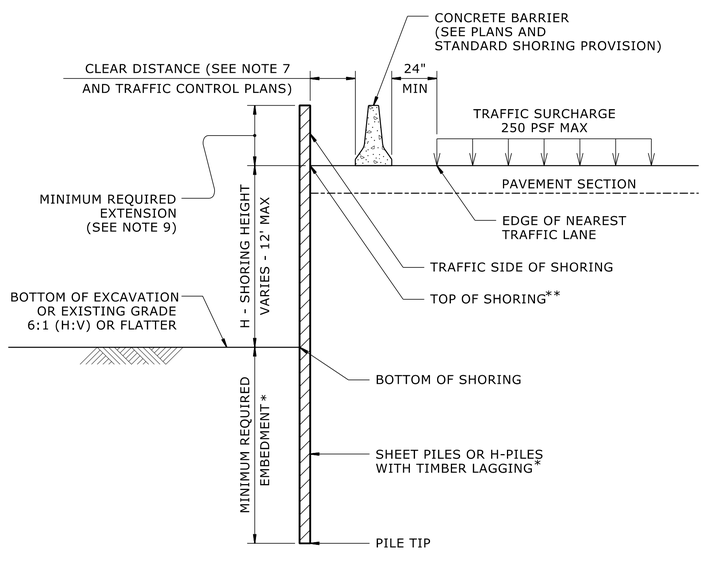
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN^3/FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)			MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN^3/FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)		
				HP 10x42	HP 12x53	HP 14x73			HP 10x42	HP 12x53	HP 14x73
GROUNDWATER ELEVATION BEWTEEN BOTTOM OF SHORING AND PILE TIP	< 6	11.5	4.5	11.5	11.5	11.5	16.0	12.0	13.0	13.0	13.0
	7	13.0	7.0	13.0	13.0	13.0	17.0	14.5	14.5	14.5	14.5
	8	15.0	10.0	--	15.0	15.0	18.0	17.0	--	15.5	15.5
	9	17.0	14.0	--	17.0	17.0	19.0	20.0	--	17.0	17.0
	10	18.5	19.5	--	--	18.5	20.0	23.5	--	--	18.5
	11	20.5	26.0	--	--	--	21.0	28.0	--	--	20.0
	12	22.5	33.0	--	--	--	22.0	33.0	--	--	21.5
GROUNDWATER ELEVATION BELOW PILE TIP	< 6	7.5	3.0	8.0	8.0	8.0	11.0	10.0	9.5	9.5	9.5
	7	8.5	4.5	9.5	9.5	9.5	12.0	12.0	10.5	10.5	10.5
	8	10.0	6.5	10.5	10.5	10.5	12.5	14.0	11.5	11.5	11.5
	9	11.0	9.5	--	12.0	12.0	13.5	16.5	--	12.5	12.5
	10	12.5	13.0	--	--	13.5	14.0	19.5	--	13.5	13.5
	11	13.5	17.0	--	--	14.5	15.0	22.5	--	--	14.5
	12	15.0	21.5	--	--	16.0	16.0	25.5	--	--	15.5

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

*DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".

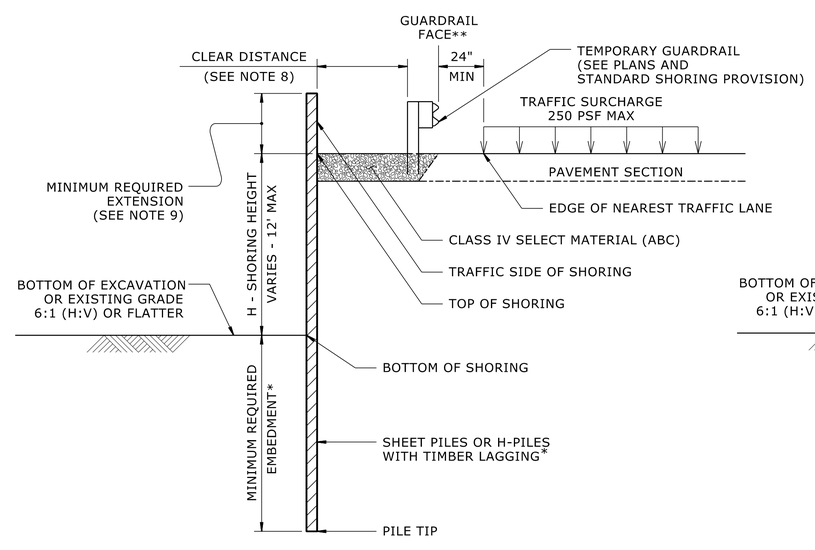
NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 PCF
   FRICTION ANGLE, φ = 30 DEGREES
   COHESION, c = 0 PSF
4. DO NOT USE STANDARD TEMPORARY SHORING IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS WITHIN THE EMBEDMENT DEPTH.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, USE "GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP" FOR GROUNDWATER CONDITION. DO NOT USE STANDARD TEMPORARY SHORING IF GROUNDWATER IS ABOVE BOTTOM OF SHORING.
7. AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN THE MINIMUM REQUIRED FOR CONCRETE BARRIER, SET BARRIER NEXT TO AND UP AGAINST TRAFFIC SIDE OF PILES AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
8. AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN 4' FOR TEMPORARY GUARDRAIL, ATTACH GUARDRAIL TO TRAFFIC SIDE OF PILES AS SHOWN IN THE PLANS AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
9. MINIMUM REQUIRED EXTENSION IS 6" FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32" FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".
10. MINIMUM REQUIRED EMBEDMENT FOR H-PILES WITH TIMBER LAGGING IS BASED ON DRIVEN H-PILES AT MAXIMUM 6' SPACING. AT THE CONTRACTOR'S OPTION, EMBEDMENT DEPTHS MAY BE REDUCED BY 25% FOR DRILLED-IN H-PILES.
11. SUBMIT A "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY SHORING CONSTRUCTION. UP TO 3 SHORING LOCATIONS MAY BE INCLUDED ON EACH FORM. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
12. CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.



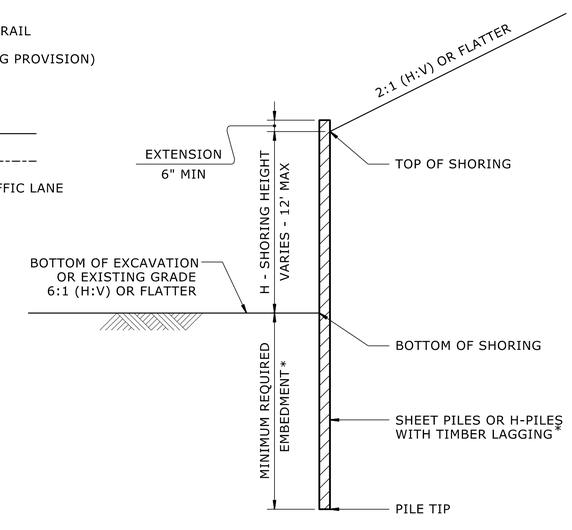
CONCRETE BARRIER

**TOP OF SHORING = EDGE OF PAVEMENT



TEMPORARY GUARDRAIL

**GUARDRAIL FACE = EDGE OF PAVEMENT



STANDARD TEMPORARY SHORING

(SLOPE CASE)
*SEE TABLE ABOVE.

STANDARD TEMPORARY SHORING

(SURCHARGE CASE)
*SEE TABLE ABOVE.

R-3300A
- | 2G-9

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039779 ENGINEER JEREMY R. HAMM

4/2/2025
DocuSigned by: Jeremy Hamm
9E2D2D3BE46A

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STANDARD DETAIL NO. 1801.01

GEOTECHNICAL STANDARD DETAIL FOR TEMPORARY SHORING

DATE: 02-18-2025

COMPUTED BY: STANTEC DATE: OCTOBER 2023
CHECKED BY: STANTEC DATE: APRIL 2025

PROJECT NO.	SHEET NO.
R-3300A	3B-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

Summary of Earthwork

Volumes in Cubic Yards

STATION	STATION	TOTAL UNCLASS.	UNDERCUT	EMBANK. +20%	BORROW	WASTE
-L1- 200+00.00	224+91.50	3,386		6,830	3,444	
-Y33RPCA- 16+50.00	30+67.73	150		175,226	175,076	
-Y33LPC- 9+37.80	19+16.14			49,845	49,845	
-Y33- 36+00.00	81+00.00	455		3,474	3,019	
-Y33- 91+00.00	102+50.00	187		10,393	10,206	
	SUBTOTAL	**4,178**		**245,767**	**241,589**	
-L1- 227+00.41	232+13.03	125		71,444	71,319	
	SUBTOTAL	**125**		**71,443**	**71,318**	
-L1- 233+31.49	263+50.00	35	5,222	414,353	414,318	5,222
-Y33RPCA- 44+41.73	59+50.00	152		194,164	194,012	
-Y33RPA- 14+50.00	27+00.00	278	9,508	160,335	160,057	9,508
-Y33RPB- 17+00.00	24+50.00	613	6,578	40,605	40,604	7,190
-Y33RPB- 15+50 & 18+60	DITCH FILL			1,275	1,275	
	SUBTOTAL	**1,078**	**21,308**	**810,731**	**810,265**	**21,920**
-L1- 263+50.00	293+50.00	2,019		141,434	139,415	
	SUBTOTAL	**2,019**		**141,433**	**139,414**	
-L1- 293+50.00	323+50.00	874		150,234	149,360	
	SUBTOTAL	**874**		**150,233**	**149,359**	
-L1- 323+50.00	353+50.00	26		126,109	126,083	
	SUBTOTAL	**26**		**126,108**	**126,082**	
-L1- 353+50.00	357+50.00			15,449	15,449	
-Y34- 11+50.00	23+21.98	2,073	584	103,504	101,431	584
-Y34- 25+35.48	36+20.00	518		68,789	68,271	
-SR1- 10+12.00	23+00.00	296		18,351	18,055	
-SR2- 10+12.00	16+00.00	74	586	2,253	2,179	586
-SR9- 10+95.00	15+39.11			5,106	5,106	
-Y34DET- 10+00.00	37+50.00	330	1,167	33,836	33,506	1,167
	SUBTOTAL	**3,291**	**2,337**	**247,287**	**243,996**	**2,337**
-L1- 357+50.00	383+11.45	3,227	2,572	111,619	108,869	3,049
	SUBTOTAL	**3,227**	**2,572**	**111,618**	**108,868**	**3,049**
-L1- 385+32.31	415+50.00	1,202		151,625	150,668	245
	SUBTOTAL	**1,202**		**151,625**	**150,668**	**245**
-L1- 415+50.00	426+17.54	575		62,646	62,187	116
	SUBTOTAL	**575**		**62,646**	**62,187**	**116**
-L1- 428+60.20	458+50.00	996	1,841	164,498	163,502	1,841
	SUBTOTAL	**996**	**1,841**	**164,497**	**163,501**	**1,841**
-L1- 458+50.00	488+50.00	85		132,886	132,801	
	SUBTOTAL	**85**		**132,886**	**132,801**	
-L1- 488+50.00	512+12.98	5,036	16,500	72,738	67,702	16,500
	SUBTOTAL	**5,036**	**16,500**	**72,737**	**67,701**	**16,500**
-L1REV- 512+12.98	542+00.00	1,341		165,365	164,024	
-Y35- 12+00.00	22+25.17	421		66,161	65,740	
-Y35- 24+31.17	37+25.00	473		40,904	40,431	
-SR3- 10+10.00	18+34.64	1,725		3,409	1,684	
-DRW1- 10+10.00	11+57.76	5		558	553	
-Y35DET- 12+10.00	19+00.00	850		1,236	386	
	SUBTOTAL	**4,815**		**277,632**	**272,817**	
-L1REV- 542+00.00	554+17.41	583		75,769	75,186	
	SUBTOTAL	**583**		**75,768**	**75,185**	
-L1- 554+42.49	578+00.00	624	6,959	172,899	172,275	6,959
	SUBTOTAL	**624**	**6,959**	**172,898**	**172,274**	**6,959**
Detour Removals						
-Y34DET-		34,556		356		34,200
-Y35DET-		1,303		518		786
	SUBTOTAL	**35,859**		**873**		**34,985**
TOTAL		64,593	51,517	3,016,182	2,988,025	87,952
MATERIAL FOR SHOULDER CONSTRUCTION				**57,500**	**57,500**	
LOSS DUE TO CLEARING & GRUBBING		-22,000			22,000	
ADDITIONAL UNDERCUT			12,000	15,000	15,000	12,000
SURCHARGE -GEOTECH		14,500		18,125	18,125	14,500
WASTE IN LIEU OF BORROW					-35,285	-35,285
PROJECT TOTAL		**57,093**	**63,517**	**3,106,807**	**3,065,365**	**79,167**
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT					153,268	
GRAND TOTAL		**57,093**	**63,517**	**3,106,807**	**3,218,633**	**79,167**
SAY		**59,000**			**3,300,000**	

UNCLASSIFIED EXCAVATION NOT SUITABLE FOR THE TOP 3 FT OF EMBANKMENT OR BACKFILL PER GEOTECH REC -L1- 367+00 TO 368+75 (300CY).

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY GROUP. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY CATLIN.

Note: Quantities are approximate only. The Resident Engineer will recross-section the work accurately when the project is staked out. These cross-section notes will be used in computing the final quantities for which the contractor will be paid.

EST. DDE = 39,550 CY
EST. UNDERCUT = 63,517 CY
EST. SHALLOW UNDERCUT = 1,000 CY
PAVEMENT STRUCTURE VOL = 7,700 CY

Docusign Envelope ID: 332BD0E0-6729-4AEC-B803-192A1587D0CF

COMPUTED BY:	STANTEC	DATE:	JUNE 2024
CHECKED BY:	STANTEC	DATE:	APRIL 2025

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
R-3300A	3B-2

GUARDRAIL SUMMARY

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL

G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL WIDTH	FLARE LENGTH		W		ANCHORS						IMPACT ATTENUATOR		REMOVE & RESET EXISTING GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	Type III	B-77	GREU, TL-3	GREU, TL-2	CAT-1	TES	G	NG			
L1	217+40.98	224+91.50	RT	737.5			218+41.00	224+91.50	12'	15'	50		1			1	1								
L1	221+90.00	224+91.50	MD RT	300			222+90.00	224+91.50	4'	7'	50		1			1	1								
L1	227+00.41	232+13.03	MD RT	509.75			227+00.41		4'	7'						2								50	SPAN CONNECTS TWO BRIDGES, REMOVE EXISTING TL-3
L1	227+00.41	232+13.03	RT	503.72			227+00.41		12'	15'						2									SPAN CONNECTS TWO BRIDGES
L1	228+47.27	232+17.02	MD LT	370.96			232+17.02		4'	7'						1							50	17.5	REMOVE EXISTING GUARDRAIL & TIE TO EXISTING GUARDRAIL/ KEEP M-350 ANCHOR UNIT
L1	231+55.54	232+17.02	LT	62.5			232+17.02		10'	13'						1			1						
L1	233+33.90	236+08.90	LT	275				233+33.90	12'	15'	50		1			1	1								
L1	233+33.90	236+33.80	LT	300				233+33.90	12'	15'	50		1			1	1								
L1	233+31.49	242+47.15	RT	900				233+31.49	12'	15'						1			1						
L1	245+47.66	253+50.06	RT	812.5			246+70.28		12'	15'	50		1				1		1						OVERHEAD SIGN INCLUDED
L1	253+07.64	262+56.66	LT	950			261+56.55		12'	15'	50		1				1		1						
L1	265+92.74	267+79.47	LT	187.5			266+08.49		12'	15'	50		1				1		1						
L1	278+88.76	284+76.15	RT	587.5			283+21.82		12'	15'	50		1				1		1						
L1	281+93.76	288+31.24	LT	637.5			283+69.51		12'	15'	50		1				1		1						
L1	291+87.77	302+04.38	LT	1012.5			301+04.38		12'	15'	50		1				1		1						
L1	301+89.14	306+09.41	RT	425			305+87.28		12'	15'	50		1				1		1						
L1	305+79.68	310+09.50	LT	425			306+10.68		12'	15'	50		1				1		1						
L1	377+37.53	383+20.42	LT	587.5			383+20.42		12'	15'						1			1						
L1	382+11.72	383+10.51	MD LT	100			383+10.51		4'	7'						1			1						
L1	380+75.10	383+00.55	MD RT	225			383+00.55		4'	7'	50		1			1	1								
L1	379+75.58	382+90.53	RT	312.5			382+90.53		12'	15'	50		1			1	1								
L1	385+20.68	389+07.57	RT	387.5			385+20.68		12'	15'						1			1						
L1	385+40.47	387+65.43	MD LT	225			385+40.47		4'	7'	50		1			1	1								
L1	385+50.37	391+01.68	LT	550			385+50.37		12'	15'	50		1			1	1								
L1	394+39.93	397+53.68	LT	312.5			395+55.00		12'	15'	50		1				1		1						
L1	421+81.16	426+38.53	LT	462.5			426+38.53		12'	15'						1			1						
L1	425+02.01	426+26.62	MD LT	125			426+26.62		7'	10'						1			1						
L1	423+78.27	426+16.50	MD RT	237.5				426+16.50	4'	7'	50		1			1	1								
L1	422+51.36	426+05.24	RT	350				426+05.24	12'	15'	50		1			1	1								
L1	428+48.25	429+74.50	RT	125			428+48.25		12'	15'						1			1						
L1	428+66.19	431+02.98	MD LT	237.5				428+66.19	7'	10'	50		1			1	1								
L1	428+76.13	438+52.69	LT	987.5				428+76.13	12'	15'	50		1			1	1								
L1	439+41.51	444+72.38	RT	525			443+40.61		12'	15'	50		1				1		1						
L1	441+84.00	446+53.75	LT	475			442+56.05		12'	15'	50		1				1		1						
L1REV	517+96.32	522+84.06	RT	487.5			522+14.91		12'	15'	50		1				1		1						
L1REV	523+84.40	549+50.84	LT	2600			524+13.44		12'	15'	50		1				1		1						
L1	559+51.94	570+18.19	RT	1075			567+80.86		12'	15'	50		1				1		1						
L1	562+42.36	571+02.65	LT	850			567+27.42		12'	15'	50		1				1		1						
Y33RPCA	22+66.19	30+63.25	RT	812.5				30+63.25	12'	15'	50		1			1	1								
Y33RPCA	27+05.35	30+75.41	LT	362.5				30+75.41	12'	15'	50		1			1	1								
Y33RPCA	44+41.50	44+78.55	RT	41.625			44+41.50		6'	9'						1			1						
Y33RPCA	44+41.46	50+07.73	LT	562.5			44+41.46		12'	15'						1			1						
Y33RPA	10+95.54	33+10.00	RT	2175			29+38.10		12'	15'	50		1				1		1						
Y33RPB	10+48.04	24+56.57	RT	1400			11+48.04	23+56.49	12'	15'	50		1				1		1						
Y33	74+09.11	76+03.66	MD LT	212.5				74+78.29	19'	22'	50					1	1						195		RESET & TIE TO EXISTING GUARDRAIL
Y33	74+09.11	75+76.65	MD RT	125			74+78.29		19'	22'						1			1				160		RESET & TIE TO EXISTING GUARDRAIL
Y33	80+11.00	81+20.00	LT	112.5			79+88.55		7' - 20'		50		1			1	1								
Y34	15+92.40	23+28.39	LT	737.5			23+29.89		8'	11'		50		1		1	1								
Y34	15+54.57	23+15.57	RT	762.5				23+17.06	8'	11'	50		1			1	1								
Y34	25+29.07	31+28.88	RT	600			25+29.07		8'	11'		50		1		1	1								
Y34	25+41.89	31+29.39	LT	587.5				25+41.89	8'	11'	50		1			1	1								
SR1	14+12.88	15+87.88	LT	175					4'	7'	25	25	0.5	0.5				2							
Y35	16+16.30	22+22.96	RT	612.5				22+22.96	8'	11'	50		1			1	1								
Y35	16+59.51	22+27.42	LT	562.5			22+27.42		8'	11'		50		1		1	1								
Y35	24+35.20	28+51.60	LT	412.5				24+35.20	8'	11'	50		1			1	1								
Y35	24+27.30	28+85.25	RT	462.5			24+27.21		8'	11'		50		1		1	1								
L1	353+27.38	354+96.02	MD LT	150			354+03.69									2						2			ATTENUATORS NOT COUNTED IN THE GUARDRAIL SPAN LENGTH
L1	353+27.38	354+96.02	MD RT	150			354+03.69									2									ATTENUATORS NOT COUNTED IN THE GUARDRAIL SPAN LENGTH
L1REV	522+30.00	523+70.45	MD LT	150			522+99.82									2						2			ATTENUATORS NOT COUNTED IN THE GUARDRAIL SPAN LENGTH
L1REV	522+30.00	523+70.45	MD RT	150			522+99.82									2									ATTENUATORS NOT COUNTED IN THE GUARDRAIL SPAN LENGTH
L1	222+60.00	224+89.68	LT	237.5				222+93.66	6'	12'						1			1						OVERHEAD SIGN
Y33RPB	6+03.75	7+41.25	RT	137.5			7+30.28		12'	15'	50		1				1		1						OVERHEAD SIGN
L1	257+86.00	260+11.30	RT	225			259+87.73		12'	15'	50		1				1		1						OVERHEAD SIGN
Y33	99+71.62	101+84.00	LT	212.5			100+00.00		12'	15'	50		1				1		1						OVERHEAD SIGN
L1	218+54.89	220+50.62	MD LT	145.75			219+30.00	219+76.00	19'	22'						2						1			ATTENUATORS NOT COUNTED IN THE GUARDRAIL SPAN LENGTH
L1	218+54.89	220+50.62	MD RT	145.75			219+30.00	219+76.00	19'	22'						2						1			ATTENUATORS NOT COUNTED IN THE GUARDRAIL SPAN LENGTH
Y33	75+42.00	79+08.00	RT	362.5			76+61.00	79+52.00	12'	15'	50		1			1	1								
Y8RPDB	36+10.00	39+18.83	RT	312.5			38+77.00	40+07.00	8.25'							2									STRUCTURE WALL
L1	199+57.06	203+57.00	MD LT/RT	650			201+72.06		12'													2			OVERHEAD SIGN, ATTENUATORS NOT COUNTED IN THE GUARDRAIL SPAN LENGTH
L1/Y8RPDB	1999+42.00	12+00.00	RT	262.5			11+74.72		12	15	50		1				1		1						OVERHEAD SIGN SEE SHEETS 2B6 & 2B7
Y35	24+96.00		RT	25																2					DEAD END ROADWAY
Y33	46+65.00	48+40.00	RT	150			48+15.00		12'	15'	50		1				1		1						OVERHEAD SIGN
Y33RPCA	17+11.00	19+98.10	RT	300			18+36.00		12'	15'	50		1				1								OVERHEAD SIGN; REMOVE EXISTING 350 ANCHOR UNIT / TIE TO EXISTING GUARDRAIL
Y8RPDB	68+36.93	69+86.93	RT	125			69+61.93		12'	15'	50		1				1		1						OVERHEAD SIGN SEE SHEETS 2B6 & 2B7
Y35	31+60.00		RT	25																2					DEAD END ROADWAY
Y33	36+55.00	39+05.00	LT	250			36+80.36		12'	15'	50		1				1		1						OVERHEAD SIGN SEE SHEETS 2B6 & 2B7
			SUBTOTAL =	35,117.555											0	56	50	2	36	4	0	8	405	67.5	
LESS DEDUCTIONS FOR ANCHORS		GREU, TL-3	50 @50' EA=	-2500.000																					
		GREU, TL-2	2 @25' EA=	-50.000																					
		TYPE III	@18.75' EA=	0.000																					
		B-77	56 @22.875' EA=	-1281.000																					
		CAT-1	36 @6.25' EA=	-225.000																					
			PROJECT TOTALS =	31,061.555																					
			SAY =	**31,075.00**			**ADDITIONAL POSTS=**	**10**																	

Docusign Envelope ID: 332BD0E0-6729-4AEC-B803-192A1587D0CF

COMPUTED BY: STANTEC DATE: OCTOBER 2023
CHECKED BY: STANTEC DATE: JANUARY 2025
REVISED BY: DATE:

PROJECT NO.	SHEET NO.
R-3300A	3B-3

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF CONCRETE BARRIER

(LENGTH IN FEET)

LINE	BEGIN STATION	END STATION	LOCATION	SINGLE FACE BARRIER	DOUBLE FACED TYPE T2	DOUBLE FACED TYPE III	DOUBLE FACED BARRIER	
-L1-	353+79.93	354+27.43	MED/LT	47.5				
-L1-	353+79.93	354+27.43	MED/RT	47.5				
-L1REV-	522+80.22	523+20.22	MED/LT	40				
-L1REV-	522+80.22	523+20.22	MED/RT	40				
-Y33-	74+28.29	74+68.21	MED/LT	40				
-Y33-	74+28.29	74+68.21	MED/RT	40				
-Y33-	79+71.86	80+11.86	LT	40				
-L1-	219+22.66	219+82.66	MED/RT	60				
-L1-	219+22.66	219+82.66	MED/LT	60				
-Y33-	79+08.06	79+58.06	RT	50				
-Y8RPDB-	39+18.83	40+07.16	RT	90				
			TOTALS	555	0	0	0	
			SAY	**560**			**0**	

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP
-Y34-	23+51.52	26+95.65	LT	1256	5641.44
-Y35-	14+05.00	35+00.00	CL	4892.38	
-Y35-	35+00.00	36+00.00	CL	222.9	
-Y34DET-	11+32.00	36+19.00	CL	7790.33	
-Y35DET	12+93.00	17+82.00	CL	1400.11	
		TOTAL:		15561.72	5641.44
		SAY:		15,600	5,700

CABLE GUIDERAIL SUMMARY

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL

G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL WIDTH	FLARE LENGTH		W				IMPACT ATTENUATOR		REMOVE EXISTING GUIDERAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	Terminal Anchors	Intermediate Anchors	G	NG		
-L1-	207+55.00	217+85.00	MED	1,031											2					
-L1-	234+00.00	243+40.00	MED	965											1	1				
-L1-	254+00.00	274+00.00	MED	2,050												2				
-L1-	274+00.00	294+00.00	MED	2,050												2				
-L1-	294+00.00	314+00.00	MED	2,052												2				
-L1-	314+00.00	334+00.00	MED	2,053												2				
-L1-	334+00.00	352+61.00	MED	1,888											1	1				
-L1-	355+60.00	375+70.00	MED	2,036											1	1				
-L1-	375+70.00	381+64.00	MED	621											1	1				
-L1-	385+98.00	405+98.00	MED	2,025											1	1				
-L1-	405+98.00	424+65.00	MED	1,893											1	1				
-L1-	429+01.00	449+01.00	MED	2,027											1	1				
-L1-	449+01.00	469+00.00	MED	2,050												2				
-L1-	469+00.00	489+00.00	MED	2,050												2				
-L1-	489+00.00	509+00.00	MED	2,050												2				
-L1-/-L1REV-	509+00.00	521+63.00	MED	1,288											1	1				
-L1REV-	524+36.00	544+52.00	MED	2,028											1	1				
-L1REV-	544+52.00	563+00.00	MED	1,875												2				
-L1REV-/-L1-	563+00.00	578+00.00	MED	1,579											1	1				
-L1-	199+57.06	207+79.00	MED												2				472.00	REMOVE EXISTING GUIDERAIL FOR SIGN SUPPORT
-Y33-	46+00.00	50+75.00	MED												2				520	REMOVE EXISTING RUN OF GUIDERAIL AND INSTALL ANCHORS
-L1-	221+20.00	222+58.00	MED	139											2					
-L1-	248+80.00	254+00.00	MED	545											1	1				
			SUBTOTAL =	34,295											**19**	**27**			**992.00**	
		LESS DEDUCTIONS FOR ANCHORS,	46 @25' =	-1,150																
			PROJECT TOTAL =	33,145																
			SAY =	**33,200**			**ADDITIONAL POSTS =**	**10**												

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COMPUTED BY: STANTEC DATE: OCTOBER 2023
CHECKED BY: STANTEC DATE:
REVISED BY: DATE:

PROJECT NO.	SHEET NO.
R-3300A	3B-4

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SHOULDER BERM GUTTER SUMMARY

LINE	Station	Station	LENGTH LF
-L1- RT	217+91.86	224+67.16	664.05
-L1- RT	227+24.74	231+88.70	456.24
-L1- LT MED	230+42.23	231+93.03	151.39
-L1- LT MED	233+57.90	235+83.94	225.82
-L1- RT	233+55.82	242+40.95	870.71
-L1- LT	245+87.00	246+68.13	81.25
-L1- RT	245+97.63	253+50.06	753.15
-L1- LT	253+13.76	262+06.86	893.75
-L1- RT	258+36.00	260+05.00	169.01
-L1- LT	265+98.96	267+25.00	126.53
-L1- RT	279+38.75	284+70.00	531.25
-L1- LT	282+00.00	287+81.25	581.25
-L1- LT	291+96.00	301+53.82	954.39
-L1- LT	305+85.99	309+58.92	368.92
-L1- RT	380+25.99	382+66.23	238.41
-L1- LT MED	382+18.01	382+86.27	68.55
-L1- RT	385+45.50	389+01.35	356.49
-L1- LT MED	385+65.12	387+15.49	150.40
-L1- LT	385+73.81	390+51.48	476.67
-L1- LT	394+46.20	397+03.48	256.29
-L1- LT MED	425+08.24	426+02.39	94.31
-L1- RT	423+01.89	425+80.80	275.99
-L1- LT MED	428+91.66	430+53.13	162.02
-L1- RT	428+74.05	429+68.34	93.31
-L1- RT	439+92.09	444+66.15	468.96
-L1REV- RT	518+46.42	522+78.13	431.38
-L1REV- LT	523+94.00	529+05.00	511.18
-L1- RT	560+01.93	570+12.02	1018.41
-L1- LT	562+48.63	570+51.77	794.12
-Y33- RT	47+14.66	48+34.00	120.87
-Y33- LT	99+77.82	101+33.82	156.15
-Y33RPCA- LT	30+03.32	30+49.20	45.04
-Y33RPCA LT	44+66.93	47+50.00	279.64
-Y33RPB- RT	10+98.34	20+92.00	988.27
-Y33RPA- RT	14+96.00	33+04.10	1774.81
-Y34- LT	22+70.04	23+14.15	44.11
-Y34- RT	22+70.00	23+02.81	32.81
-Y34- RT	25+43.94	26+14.00	70.06
-Y34- LT	25+55.27	26+14.00	58.73
-Y35- LT	17+10.02	22+12.81	498.77
-Y35- LT	24+48.81	28+01.10	348.80
		TOTAL:	16,644
		SAY:	**16,700**

HERB/082023

COMPUTED BY:	E. Estep	DATE:	8/8/2023 REV 1/10/2025
CHECKED BY:	A. Thompson	DATE:	8/8/2023 REV 4/7/2025

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3300A	3D-1

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

| LINE & STATION / SIZE / THICKNESS OR GAUGE | OFFSET | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Drainage Pipe (RCP, CAAP, HDPE, or PVC) 15 | 18 | 24 | 30 | 36 | 42 | 48 | DO NOT USE RCP | DO NOT USE CAAP | DO NOT USE HDPE | DO NOT USE PVC | C. A. A. PIPE 15 .064 | 18 .064 | 24 .064 | 30 .079 | 36 .079 | 42 .109 | 48 .109 | R. C. PIPE CLASS IV 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | R. C. PIPE CLASS V 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 24" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL | 24" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY | REINFORCED ENDWALLS CY | DRAINAGE STRUCTURE MASONRY CY | QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH | A 5' THRU 10' LIN. FT. | B 10' AND ABOVE LIN. FT. | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E | F | G | CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06 | C.B. STD. 852.05 | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATES STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24 | G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24 | G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29 | G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29 | DRIVEWAY D.I. STD. 840.30 | FRAME W/ GRATE FOR DRIVEWAY STD. 840.30 | J.B. STD. 840.31 OR STD. 840.32 | T.B.J.B. STD. 840.34 | T.B.D.I. FOR STEEL GRATES STD. 840.36 | STEEL FRAME WITH TWO GRATES STD. 840.37 | TEMP STEEL PLATE COVER MASONRY DRAINAGE | M.H. FRAME AND COVER STD. 840.54 | 30" PIPE ENDWALL w/ LOAD CARRYING GRATE | 36" PIPE ENDWALL w/ LOAD CARRYING GRATE | 42" PIPE ENDWALL w/ LOAD CARRYING GRATE | 48" PIPE ENDWALL w/ LOAD CARRYING GRATE | 18" DRAINAGE PIPE ELBOW | 24" DRAINAGE PIPE ELBOW | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---|---

HERB/082023

COMPUTED BY:	E. Estep	DATE:	8/8/2023 REV 1/10/2025
CHECKED BY:	A. Thompson	DATE:	8/8/2023 REV 4/7/2025

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3300A	3D-2

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CAAP, HDPE, or PVC) 15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
Y33RPCA 47+48	23 LT	0531		75.6														
		0531	0533		72.0	41.0	1.8		108						X			
Y33RPA 33+00	23 RT	0535		49.2														
		0535	0534		44.7	28.7				104					X			
Y33RPA 32+92	23 RT	0536		49.4														
		0536	0535		44.9	44.7												
Y33LPC 18+55	0	0538	0539		40.5	37.4												
Y33RPCA 47+40	23 LT	0532		75.7														
		0532	0531		72.2	72.0	1.2											
Y33 77+59	4 RT	0548		44.3														
		0548	0549		34.5	34.2												
Y33 77+59	101 LT	0549		42.8														
		0549	0550		34.2	34.1												
Y33RPB 11+00	23 RT	0601		52.8														
		0601	0600		49.3	39.5			40						X			
L1 250+00	0 CL	0603		39.0														
		0603	0602		35.4	31.8												
L1 244+54	0	0604	0605		35.5	28.0												
L1 250+00	91 RT	0606		39.9														
		0606	0607		33.5	30.3			32						X			
L1 249+35	94 RT	0608		39.9														
		0608	0606		35.4	33.5												
Y33RPB 7+33	23 RT	0609		43.8														
		0609	0610		39.2	36.8												
L1 258+24	0 CL	0701		39.1														
		0701	0700		29.9	27.6												
L1 257+00	0 CL	0702		38.6														
		0702	0701		34.5	33.9												
L1 258+27	113 RT	0703		34.0														
		0703	0712		30.8	30.5												
L1 258+38	82 RT	0712		40.3														
		0712	0701		30.5	29.9												
L1 263+34	100 RT	0704		35.3														
		0704	0705		33.8	31.2												
L1 262+46	0 CL	0705		42.0														
		0705	0706		31.2	28.5												
L1 266+83	0 CL	0707	0708		29.6	28.4												
L1 257+00	58 LT	0709		40.4														
		0709	0702		35.9	34.5												
L1 267+23	58 LT	0710		44.0														
		0710	0711		39.5	34.7			36						X			
L1 270+72	0 CL	0801		40.4														
		0801	0800		38.2	37.9												
L1 274+89	0 CL	0802	0803		35.5	34.5												
L1 276+48	128 RT	0804								36								
L1 283+81	0 CL	0901		33.8														
		0901	0918		29.3	28.6												
L1 288+05	0 CL	0902		36.9														
		0902	0909		29.8	28.5	0.7											
					SHEET TOTALS				216	140								

| LINE & STATION / SIZE / THICKNESS OR GAUGE | C. A. A. PIPE 15 .064 | 18 .064 | 24 .064 | 30 .079 | 36 .079 | 42 .109 | 48 .109 | R. C. PIPE CLASS IV 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | R. C. PIPE CLASS V 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 24" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL | 24" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY | REINFORCED ENDWALLS CY | DRAINAGE STRUCTURE MASONRY CY | QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH | A 5' THRU 10' LIN. FT. | B 10' AND ABOVE LIN. FT. | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E | F | G | CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06 | C.B. STD. 852.05 | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATES STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24 | G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24 | G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29 | G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29 | DRIVEWAY D.I. STD. 840.30 | FRAME W/ GRATE FOR DRIVEWAY STD. 840.30 | J.B. STD. 840.31 OR STD. 840.32 | T.B.J.B. STD. 840.34 | T.B.D.I. FOR STEEL GRATES STD. 840.36 | STEEL FRAME WITH TWO GRATES STD. 840.37 | TEMP STEEL PLATE COVER MASONRY DRAINAGE | M.H. FRAME AND COVER STD. 840.54 | 30" PIPE ENDWALL w/ LOAD CARRYING GRATE | 36" PIPE ENDWALL w/ LOAD CARRYING GRATE | 42" PIPE ENDWALL w/ LOAD CARRYING GRATE | 48" PIPE ENDWALL w/ LOAD CARRYING GRATE | 18" DRAINAGE PIPE ELBOW | 24" DRAINAGE PIPE ELBOW | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---

HERB/082023

COMPUTED BY:	E. Estep	DATE:	8/8/2023 REV 1/10/2025
CHECKED BY:	A. Thompson	DATE:	8/8/2023 REV 4/7/2025

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3300A	3D-3

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

| LINE & STATION / SIZE / THICKNESS OR GAUGE | OFFSET | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Drainage Pipe (RCP, CAAP, HDPE, or PVC) 15 | 18 | 24 | 30 | 36 | 42 | 48 | DO NOT USE RCP | DO NOT USE CAAP | DO NOT USE HDPE | DO NOT USE PVC | C. A. A. PIPE 15 .064 | 18 .064 | 24 .064 | 30 .079 | 36 .079 | 42 .109 | 48 .109 | R. C. PIPE CLASS IV 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | R. C. PIPE CLASS V 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 24" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL | 24" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY | REINFORCED ENDWALLS CY | DRAINAGE STRUCTURE MASONRY CY | QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH | A 5' THRU 10' LIN. FT. | B 10' AND ABOVE LIN. FT. | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E | F | G | CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06 | C.B. STD. 852.05 | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATES STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24 | G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24 | G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29 | G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29 | DRIVEWAY D.I. STD. 840.30 | FRAME W/ GRATE FOR DRIVEWAY STD. 840.30 | J.B. STD. 840.31 OR STD. 840.32 | T.B.J.B. STD. 840.34 | T.B.D.I. FOR STEEL GRATES STD. 840.36 | STEEL FRAME WITH TWO GRATES STD. 840.37 | TEMP STEEL PLATE COVER MASONRY DRAINAGE | M.H. FRAME AND COVER STD. 840.54 | 30" PIPE ENDWALL w/ LOAD CARRYING GRATE | 36" PIPE ENDWALL w/ LOAD CARRYING GRATE | 42" PIPE ENDWALL w/ LOAD CARRYING GRATE | 48" PIPE ENDWALL w/ LOAD CARRYING GRATE | 18" DRAINAGE PIPE ELBOW | 24" DRAINAGE PIPE ELBOW | PIPE REMOVAL LIN. FT. | REMARKS |
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HERB/082023

COMPUTED BY:	E. Estep	DATE:	8/8/2023 REV 1/10/2025
CHECKED BY:	A. Thompson	DATE:	8/8/2023 REV 4/7/2025

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3300A	3D-4

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

| LINE & STATION / SIZE / THICKNESS OR GAUGE | OFFSET | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Drainage Pipe (RCP, CAAP, HDPE, or PVC) 15 | 18 | 24 | 30 | 36 | 42 | 48 | DO NOT USE RCP | DO NOT USE CAAP | DO NOT USE HDPE | DO NOT USE PVC | C. A. A. PIPE 15 .064 | 18 .064 | 24 .064 | 30 .079 | 36 .079 | 42 .109 | 48 .109 | R. C. PIPE CLASS IV 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | R. C. PIPE CLASS V 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 24" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL | 24" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY | REINFORCED ENDWALLS CY | DRAINAGE STRUCTURE MASONRY CY | QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH | A 5' THRU 10' LIN. FT. | B 10' AND ABOVE LIN. FT. | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E | F | G | CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06 | C.B. STD. 852.05 | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATES STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24 | G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24 | G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29 | G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29 | DRIVEWAY D.I. STD. 840.30 | FRAME W/ GRATE FOR DRIVEWAY STD. 840.30 | J.B. STD. 840.31 OR STD. 840.32 | T.B.J.B. STD. 840.34 | T.B.D.I. FOR STEEL GRATES STD. 840.36 | STEEL FRAME WITH TWO GRATES STD. 840.37 | TEMP STEEL PLATE COVER MASONRY DRAINAGE | M.H. FRAME AND COVER STD. 840.54 | 30" PIPE ENDWALL w/ LOAD CARRYING GRATE | 36" PIPE ENDWALL w/ LOAD CARRYING GRATE | 42" PIPE ENDWALL w/ LOAD CARRYING GRATE | 48" PIPE ENDWALL w/ LOAD CARRYING GRATE | 18" DRAINAGE PIPE ELBOW | 24" DRAINAGE PIPE ELBOW | PIPE REMOVAL LIN. FT. | REMARKS |
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HERB/082023

COMPUTED BY:	LMJ REV - KAH	DATE:	4-12-19; REV 1/13/25
CHECKED BY:	WKJ REV - WHT	DATE:	4-12-19 REV 4/7/25

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3300A	3D-5

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

| LINE & STATION / SIZE / THICKNESS OR GAUGE | OFFSET | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Drainage Pipe (RCP, CAAP, HDPE, or PVC) 15 | 18 | 24 | 30 | 36 | 42 | 48 | DO NOT USE RCP | DO NOT USE CAAP | DO NOT USE HDPE | DO NOT USE PVC | C. A. A. PIPE 15 .064 | 18 .064 | 24 .064 | 30 .079 | 36 .079 | 42 .109 | 48 .109 | R. C. PIPE CLASS IV 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | R. C. PIPE CLASS V 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 24" WELDED STEEL PIPE 0.50" THICK, GRADE B IN SOIL | 24" WELDED STEEL PIPE 0.50" THICK, GRADE B NOT IN SOIL | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY | REINFORCED ENDWALLS CY | DRAINAGE STRUCTURE MASONRY CY | QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH | A 5' THRU 10' LIN. FT. | B 10' AND ABOVE LIN. FT. | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E | F | G | CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06 | C.B. STD. 852.05 | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATES STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24 | G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24 | G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29 | G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29 | DRIVEWAY D.I. STD. 840.30 | FRAME W/ GRATE FOR DRIVEWAY STD. 840.30 | J.B. STD. 840.31 OR STD. 840.32 | T.B.J.B. STD. 840.34 | T.B.D.I. FOR STEEL GRATES STD. 840.36 | STEEL FRAME WITH TWO GRATES STD. 840.37 | TEMP STEEL PLATE COVER MASONRY DRAINAGE | M.H. FRAME AND COVER STD. 840.54 | 30" PIPE ENDWALL w/ LOAD CARRYING GRATE | 36" PIPE ENDWALL w/ LOAD CARRYING GRATE | 42" PIPE ENDWALL w/ LOAD CARRYING GRATE | 48" PIPE ENDWALL w/ LOAD CARRYING GRATE | 18" DRAINAGE PIPE ELBOW | 24" DRAINAGE PIPE ELBOW | PIPE REMOVAL LIN. FT. | REMARKS |
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HERB/082023

COMPUTED BY:	LMJ REV - KAH	DATE:	4-12-19; REV 1/13/25
CHECKED BY:	WKJ REV - WHT	DATE:	4-12-19 REV 4/7/25

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3300A	3D-6

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

| LINE & STATION / SIZE / THICKNESS OR GAUGE | OFFSET | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Drainage Pipe (RCP, CAAP, HDPE, or PVC) 15 | 18 | 24 | 30 | 36 | 42 | 48 | DO NOT USE RCP | DO NOT USE CAAP | DO NOT USE HDPE | DO NOT USE PVC | C. A. A. PIPE 15 .064 | 18 .064 | 24 .064 | 30 .079 | 36 .079 | 42 .109 | 48 .109 | R. C. PIPE CLASS IV 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | R. C. PIPE CLASS V 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 24" WELDED STEEL PIPE 0.50" THICK, GRADE B IN SOIL | 24" WELDED STEEL PIPE 0.50" THICK, GRADE B NOT IN SOIL | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY | REINFORCED ENDWALLS CY | DRAINAGE STRUCTURE MASONRY CY | QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) A: 0' THRU 5' EACH | A: 5' THRU 10' LIN. FT. | A: 10' AND ABOVE LIN. FT. | B | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E | F | G | CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06 | C.B. STD. 852.05 | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATES STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24 | G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24 | G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29 | G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29 | DRIVEWAY D.I. STD. 840.30 | FRAME W/ GRATE FOR DRIVEWAY STD. 840.30 | J.B. STD. 840.31 OR STD. 840.32 | T.B.J.B. STD. 840.34 | T.B.D.I. FOR STEEL GRATES STD. 840.36 | STEEL FRAME WITH TWO GRATES STD. 840.37 | TEMP STEEL PLATE COVER MASONRY DRAINAGE | M.H. FRAME AND COVER STD. 840.54 | 30" PIPE ENDWALL w/ LOAD CARRYING GRATE | 36" PIPE ENDWALL w/ LOAD CARRYING GRATE | 42" PIPE ENDWALL w/ LOAD CARRYING GRATE | 48" PIPE ENDWALL w/ LOAD CARRYING GRATE | 18" DRAINAGE PIPE ELBOW | 24" DRAINAGE PIPE ELBOW | PIPE REMOVAL LIN. FT. | REMARKS |
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HERB/082023

COMPUTED BY:	LMJ REV - KAH	DATE:	4-12-19; REV 1/13/25
CHECKED BY:	WKJ REV - WHT	DATE:	4-12-19 REV 4/7/25

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3300A	3D-7

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

| LINE & STATION / SIZE / THICKNESS OR GAUGE | OFFSET | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Drainage Pipe (RCP, CAAP, HDPE, or PVC) 15 | 18 | 24 | 30 | 36 | 42 | 48 | DO NOT USE RCP | DO NOT USE CAAP | DO NOT USE HDPE | DO NOT USE PVC | C. A. A. PIPE 15 .064 | 18 .064 | 24 .064 | 30 .079 | 36 .079 | 42 .109 | 48 .109 | R. C. PIPE CLASS IV 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | R. C. PIPE CLASS V 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 24" WELDED STEEL PIPE 0.50" THICK, GRADE B IN SOIL | 24" WELDED STEEL PIPE 0.50" THICK, GRADE B NOT IN SOIL | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY | REINFORCED ENDWALLS CY | DRAINAGE STRUCTURE MASONRY CY | QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH | A 5' THRU 10' LIN. FT. | B 10' AND ABOVE LIN. FT. | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E | F | G | CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06 | C.B. STD. 852.05 | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATES STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24 | G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24 | G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29 | G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29 | DRIVEWAY D.I. STD. 840.30 | FRAME W/ GRATE FOR DRIVEWAY STD. 840.30 | J.B. STD. 840.31 OR STD. 840.32 | T.B.J.B. STD. 840.34 | T.B.D.I. FOR STEEL GRATES STD. 840.36 | STEEL FRAME WITH TWO GRATES STD. 840.37 | TEMP STEEL PLATE COVER MASONRY DRAINAGE | M.H. FRAME AND COVER STD. 840.54 | 30" PIPE ENDWALL w/ LOAD CARRYING GRATE | 36" PIPE ENDWALL w/ LOAD CARRYING GRATE | 42" PIPE ENDWALL w/ LOAD CARRYING GRATE | 48" PIPE ENDWALL w/ LOAD CARRYING GRATE | 18" DRAINAGE PIPE ELBOW | 24" DRAINAGE PIPE ELBOW | PIPE REMOVAL LIN. FT. | REMARKS |
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HERB/082023

COMPUTED BY:	LMJ REV - KAH	DATE:	4-12-19; REV 1/13/25
CHECKED BY:	WKJ REV - WHT	DATE:	4-12-19 REV 4/7/25

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3300A	3D-8

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

| LINE & STATION / SIZE / THICKNESS OR GAUGE | OFFSET | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Drainage Pipe (RCP, CAAP, HDPE, or PVC) 15 | 18 | 24 | 30 | 36 | 42 | 48 | DO NOT USE RCP | DO NOT USE CAAP | DO NOT USE HDPE | DO NOT USE PVC | C. A. A. PIPE 15 .064 | 18 .064 | 24 .064 | 30 .079 | 36 .079 | 42 .109 | 48 .109 | R. C. PIPE CLASS IV 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | R. C. PIPE CLASS V 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 24" WELDED STEEL PIPE 0.50" THICK, GRADE B IN SOIL | 24" WELDED STEEL PIPE 0.50" THICK, GRADE B NOT IN SOIL | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY | REINFORCED ENDWALLS CY | DRAINAGE STRUCTURE MASONRY CY | QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) A: 0' THRU 5' EACH | B: 5' THRU 10' LIN. FT. | B: 10' AND ABOVE LIN. FT. | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E | F | G | CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06 | C.B. STD. 852.05 | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATES STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24 | G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24 | G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29 | G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29 | DRIVEWAY D.I. STD. 840.30 | FRAME W/ GRATE FOR DRIVEWAY STD. 840.30 | J.B. STD. 840.31 OR STD. 840.32 | T.B.J.B. STD. 840.34 | T.B.D.I. FOR STEEL GRATES STD. 840.36 | STEEL FRAME WITH TWO GRATES STD. 840.37 | TEMP STEEL PLATE COVER MASONRY DRAINAGE | M.H. FRAME AND COVER STD. 840.54 | 30" PIPE ENDWALL w/ LOAD CARRYING GRATE | 36" PIPE ENDWALL w/ LOAD CARRYING GRATE | 42" PIPE ENDWALL w/ LOAD CARRYING GRATE | 48" PIPE ENDWALL w/ LOAD CARRYING GRATE | 18" DRAINAGE PIPE ELBOW | 24" DRAINAGE PIPE ELBOW | PIPE REMOVAL LIN. FT. | REMARKS |
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HERB/082023

COMPUTED BY:	LMJ REV - KAH	DATE:	4-12-19; REV 1/13/25
CHECKED BY:	WKJ REV - WHT	DATE:	4-12-19 REV 4/7/25

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3300A	3D-9

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

| LINE & STATION / SIZE / THICKNESS OR GAUGE | OFFSET | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Drainage Pipe (RCP, CAAP, HDPE, or PVC) 15 | 18 | 24 | 30 | 36 | 42 | 48 | DO NOT USE RCP | DO NOT USE CAAP | DO NOT USE HDPE | DO NOT USE PVC | C. A. A. PIPE 15 .064 | 18 .064 | 24 .064 | 30 .079 | 36 .079 | 42 .109 | 48 .109 | R. C. PIPE CLASS IV 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | R. C. PIPE CLASS V 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 24" WELDED STEEL PIPE 0.50" THICK, GRADE B IN SOIL | 24" WELDED STEEL PIPE 0.50" THICK, GRADE B NOT IN SOIL | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY | REINFORCED ENDWALLS CY | DRAINAGE STRUCTURE MASONRY CY | QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH | A 5' THRU 10' LIN. FT. | B 10' AND ABOVE LIN. FT. | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E | F | G | CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06 | C.B. STD. 852.05 | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATES STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24 | G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24 | G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29 | G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29 | DRIVEWAY D.I. STD. 840.30 | FRAME W/ GRATE FOR DRIVEWAY STD. 840.30 | J.B. STD. 840.31 OR STD. 840.32 | T.B.J.B. STD. 840.34 | T.B.D.I. FOR STEEL GRATES STD. 840.36 | STEEL FRAME WITH TWO GRATES STD. 840.37 | TEMP STEEL PLATE COVER MASONRY DRAINAGE | M.H. FRAME AND COVER STD. 840.54 | 30" PIPE ENDWALL w/ LOAD CARRYING GRATE | 36" PIPE ENDWALL w/ LOAD CARRYING GRATE | 42" PIPE ENDWALL w/ LOAD CARRYING GRATE | 48" PIPE ENDWALL w/ LOAD CARRYING GRATE | 18" DRAINAGE PIPE ELBOW | 24" DRAINAGE PIPE ELBOW | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---|---

HERB/082023

COMPUTED BY:	LMJ REV - KAH	DATE:	4-12-19; REV 1/13/25
CHECKED BY:	WKJ REV - WHT	DATE:	4-12-19 REV 4/7/25

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3300A	3D-10

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

| LINE & STATION / SIZE / THICKNESS OR GAUGE | OFFSET | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Drainage Pipe (RCP, CAAP, HDPE, or PVC) 15 | 18 | 24 | 30 | 36 | 42 | 48 | DO NOT USE RCP | DO NOT USE CAAP | DO NOT USE HDPE | DO NOT USE PVC | C. A. A. PIPE 15 .064 | 18 .064 | 24 .064 | 30 .079 | 36 .079 | 42 .109 | 48 .109 | R. C. PIPE CLASS IV 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | R. C. PIPE CLASS V 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 24" WELDED STEEL PIPE 0.50" THICK, GRADE B IN SOIL | 24" WELDED STEEL PIPE 0.50" THICK, GRADE B NOT IN SOIL | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY | REINFORCED ENDWALLS CY | DRAINAGE STRUCTURE MASONRY CY | QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) A: 0' THRU 5' EACH | B: 5' THRU 10' LIN. FT. | B: 10' AND ABOVE LIN. FT. | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E | F | G | CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06 | C.B. STD. 852.05 | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATES STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24 | G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24 | G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29 | G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29 | DRIVEWAY D.I. STD. 840.30 | FRAME W/ GRATE FOR DRIVEWAY STD. 840.30 | J.B. STD. 840.31 OR STD. 840.32 | T.B.J.B. STD. 840.34 | T.B.D.I. FOR STEEL GRATES STD. 840.36 | STEEL FRAME WITH TWO GRATES STD. 840.37 | TEMP STEEL PLATE COVER MASONRY DRAINAGE | M.H. FRAME AND COVER STD. 840.54 | 30" PIPE ENDWALL w/ LOAD CARRYING GRATE | 36" PIPE ENDWALL w/ LOAD CARRYING GRATE | 42" PIPE ENDWALL w/ LOAD CARRYING GRATE | 48" PIPE ENDWALL w/ LOAD CARRYING GRATE | 18" DRAINAGE PIPE ELBOW | 24" DRAINAGE PIPE ELBOW | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---|---

HERB/082023

COMPUTED BY:	LMJ REV - KAH	DATE:	4-12-19; REV 1/13/25
CHECKED BY:	WKJ REV - WHT	DATE:	4-12-19 REV 4/7/25

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3300A	3D-11

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 54 INCHES & OVER)

| LINE & STATION / SIZE / THICKNESS OR GAUGE | OFFSET | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Drainage Pipe (RCP, CAAP, HDPE, or PVC) 54 | 60 | 66 | 72 | 78 | 84 | DO NOT USE RCP | DO NOT USE CAAP | DO NOT USE HDPE | DO NOT USE PVC | C. A. A. PIPE 54 | 60 | 66 | 72 | 78 | 84 | R. C. PIPE CLASS IV 54 | 60 | 66 | 72 | 78 | 84 | R. C. PIPE CLASS V 54 | 60 | 66 | 72 | 78 | 84 | 60" WELDED STEEL, PIPE 0.875" THICK, GRADE B IN SOIL | 60" WELDED STEEL, PIPE 0.875" THICK, GRADE B NOT IN SOIL | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY | REINFORCED ENDWALLS CY | DRAINAGE STRUCTURE MASONRY CY | QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) A: 0' THRU 5' EACH | B: 5' THRU 10' LIN. FT. | B: 10' AND ABOVE LIN. FT. | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E | F | G | CONCRETE TRANSITIONAL SECTION D.I. STD. 852.06 OR STD. 852.06 | C.B. STD. 852.05 | OPEN THROAT C.B. STD. 840.04 OR STD. 840.05 | CONCRETE BRIDGE APPROACH D.I. STD. 840.13 | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATES STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26 | G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24 | G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24 | G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29 | G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29 | J.B. STD. 840.31 OR STD. 840.32 | T.B.J.B. STD. 840.34 | T.B.D.I. STD. 840.35 | T.B.D.I. FOR STEEL GRATES STD. 840.36 | STEEL FRAME WITH TWO GRATES STD. 840.37 | TEMP STEEL PLATE COVER MASONRY DRAINAGE | M.H. STD. 840.51, STD. 840.52, OR STD. 840.53 | M.H. FRAME AND COVER STD. 840.54 | 54" PIPE ENDWALL w/ LOAD CARRYING GRATE | 60" PIPE ENDWALL w/ LOAD CARRYING GRATE | FLOWABLE FILL CY | CONCRETE COLLARS CL. "B" STD. 840.72 CY | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---|---

COMPUTED BY: Yinhui Liu DATE: 03-28-2025
CHECKED BY: Joseph L. Stone DATE: 03-28-2025

(2-3-23)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-3300A	3G-1

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
-Y34DET-	26+00	35+00	RT	SD	900
CONTINGENCY				SD	4000
				TOTAL LF:	4900

*UD = Underdrain
*BD = Blind Drain
*SD = Subsurface Drain

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Subgrade Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU(1)	12"	500	950	1500		
			TOTAL CY/TONS/SY:		500	950**	1500**	0	0

*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)
*AST = Aggregate Stabilization
**Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Subgrade Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

SUMMARY OF SURCHARGES AND SURCHARGE WAITING PERIODS

LINE	Station	Station	Surcharge Height FT	MONTHS	TOTAL WAITING MONTHS*
-L1-	227+00	229+80	2.0	1	2
-L1-	229+80	232+20	5.0	2	8
-L1-	233+25	240+50	5.0	3	9
-L1-	423+50	426+30	3.0	2	5
-L1-	428+60	440+50	3.0	1	4
-Y33RPCA-	44+45	50+50	5.0	1	2
-Y34-	17+00	23+30	2.0	2	4
-Y34-	25+30	30+50	2.0	2	3
-Y35-	18+00	22+30	5.0	1	3
-Y35-	24+25	26+50	5.0	1	4

* Total Waiting Includes All Waiting Period For Stage Construction, See Roadway Detail Sheets 2G-1 to 2G-4 for -L1-, 2G-5 and 2G-6 for -Y33RPCA-, 2G-7 for -Y34-, and 2G-8 for -Y35 -

SUMMARY OF SETTLEMENT GAUGES

Gauge No.	Line and Station	Offset	
		Distance FT	Direction LT/RT
SG-1	-L1- 224+65	55	RT
SG-2	-L1- 227+25	55	RT
SG-3	-L1- 231+90	60	LT
SG-4	-L1- 231+80	55	RT
SG-5	-L1- 233+60	60	LT
SG-6	-L1- 233+60	55	RT
SG-7	-L1- 235+00	60	LT
SG-8	-L1- 236+00	55	RT
SG-9	-L1- 237+50	60	LT
SG-10	-L1- 323+00	55	RT
SG-11	-L1- 329+00	55	LT
SG-12	-L1- 335+00	55	RT
SG-13	-L1- 382+80	55	LT
SG-14	-L1- 382+70	55	RT
SG-15	-L1- 385+70	55	LT
SG-16	-L1- 385+60	55	RT
SG-17	-L1- 424+95	55	LT
SG-18	-L1- 424+95	55	RT
SG-19	-L1- 425+95	55	LT
SG-20	-L1- 425+95	55	RT
SG-21	-L1- 429+00	55	LT
SG-22	-L1- 429+00	55	RT
SG-23	-L1- 430+10	55	LT
SG-24	-L1- 430+10	55	RT
SG-25	-Y33RPCA- 27+00	15	LT
SG-26	-Y33RPCA- 30+00	15	RT
SG-27	-Y33RPCA- 44+50	15	RT
SG-28	-Y33RPCA- 46+00	15	RT
SG-29	-Y33RPCA- 47+00	20	LT
SG-30	-Y33RPCA- 49+00	15	RT
SG-31	-Y34- 19+50	15	LT
SG-32	-Y34- 23+00	15	RT
SG-33	-Y34- 25+50	15	LT
SG-34	-Y34- 29+50	15	RT
SG-35	-Y35-19+00	15	LT
SG-36	-Y35- 22+00	15	RT
SG-37	-Y35- 24+50	15	LT
SG-38	-Y35- 26+00	15	RT
TOTAL GAUGES (EACH):			38

SUMMARY OF EMBANKMENT WAITING PERIODS

LINE	Station	Station	MONTHS
-L-	320+00	339+50	12
-L-	441+50	445+00	3
-Y33RPB-	12+00	18+50	6

SUMMARY OF BRIDGE WAITING PERIODS

Bridge Description	End Bent/ Bent No.	MONTHS	TOTAL WAITING MONTHS*
Bridge No.1 on -Y33RPCA- over -L1- & -Y33-	EB1	1	3
Bridge No.1 on -Y33RPCA- over -L1- & -Y33-	EB2	1	2
Bridge No.2 on -L1- over -Y33-	EB1	1	1
Bridge No.2 on -L1- over -Y33-	EB2	1	2
Bridge No.3 & Bridge No.4 on -L1-	EB1	2	8
Bridge No.3 & Bridge No.4 on -L1-	EB2	3	9
Bridge No.5 on -Y34- over -L1-	EB1	2	4
Bridge No.5 on -Y34- over -L1-	EB2	2	3
Bridge No.6 & Bridge No.7 on -L1-	EB1	2	2
Bridge No.6 & Bridge No.7 on -L1-	EB2	1	1
Bridge No.8 & Bridge No.9 on -L1-	EB1	2	5
Bridge No.8 & Bridge No.9 on -L1-	EB2	1	4
Bridge No.10 on -Y35- over -L1-	EB1	1	3
Bridge No.10 on -Y35- over -L1-	EB2	1	4

*Total Waiting Includes All Waiting for Stage Construction. See 2G-1 to 2G-8 for The Stage Construction.

Docusign Envelope ID: 332BD0E0-6729-4AEC-B803-192A1587D0CF

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PROJ. REFERENCE NO.	SHEET NO.
R-3300A	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	5,6,32,34	CORBETT INDUSTRIES INC
2	5,6,7,8,9,10	SIDBURY LAND & TIMBER LLC
3	6,7	CORBETT PACKAGE COMPANY
3A	10,11, 12, 13, 36	DEPARTMENT OF TRANSPORTATION
4	12,13,14,35	WCM ENTERPRISES, LLC.
5	OMITTED	OMITTED
6	27,38	JULIA S. JONES
7	35	EWELL D. SCALES, III, ET UX
8	35	CHARLES L. BRYANT, ET UX
9	14, 35	CATHERINE C. FULLERTON
10	27	WILLIAM J. VANTRAVIS, ET UX
11	14	LETICIA A. FOUQUET
12	14,15,36	FJH, LLC.
13	15,36	RONALD R. ENGEL, CO-TRUSTEE, ET AL
14	36	FRANCES H. HUBIS
15	36	ROGER G. VAN DE BERG, ET UX
16	OMITTED	OMITTED
17	OMITTED	OMITTED
18	36	RICHARD O. PARROTT, ET UX
19	14,15	J.W. COVIL, ET UX
20	15	CAROL D. HUNT
21	15,16	R.B. HUNT, ET UX
22	16,17,18,19,20	HANPEN LAND COMPANY, LLC
23	20,21,22,23,24	MH ISLAND LLC ET AL
24	24,25,26,27,37,39	CAMERON COMPANY LIMITED PARTNER
24Z	27,37	CAMERON COMPANY LIMITED PARTNER
25	26,27	JTV INVESTMENTS, LLC
25Z	26,27	JTV INVESTMENTS, LLC
26	37	DNG PROPERTIES, INC.
27	37	CLIFTON GAITHER ET AL
27A	37	GARRETT BUTLER, ET AL
27B	37	LAURIE G. PEREGOY
28	37	ISLAND CREEK BAPTIST CHURCH
29	27,28,29,37	PARKS FAMILY FORESTRY, LLC
30	27,38	WILLIAM VAN TRAVIS, ET UX
31	27,38	JESSIE G. HAMPTON
32	38	LAURA L. GRADY, ET AL
33	38	MARIE P. MILLER, ET AL
34	38	PETER A. LAWRENCE
35	38	LESTER SHUFORD
36	38,39	GERALD D. HARDISON, ET UX
37	38,39	RAYMOND H. SIDBURY
38	20, 21, 22, 23, 24	AMMO DUMP/LAKE+9 LLC
39	36	SEAGREEN LLC
40	29,30,31,38	GERALD D. HARDISON, JR., & HARDISON RENTALS, LLC.

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

Docusign Envelope ID: 6FED8231-8E71-4C7B-AE29-58498E14CC74

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6886
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
R-3300A	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAZEL	NORTH CAROLINA PROFESSIONAL SEAL 028933 ENGINEER ANDREA S. HAYDEN
Signature: Katrina N. Hazel	Signature: Andrea S. Hayden 4/21/2025
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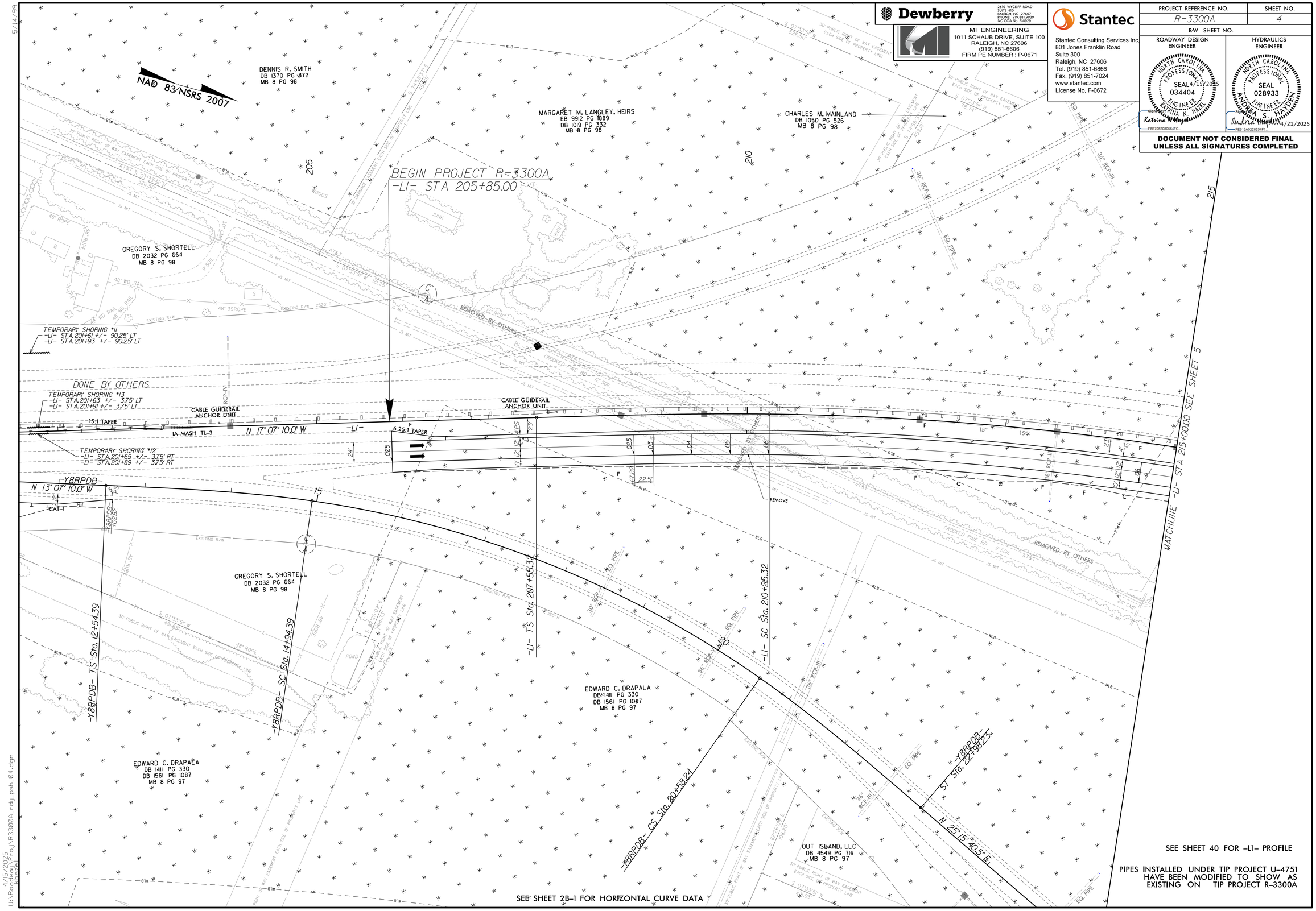
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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REVISIONS

Dewberry

Stantec

Stantec Consulting Services Inc.
801 Jones Franklin Road
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www.stantec.com
License No. F-0672

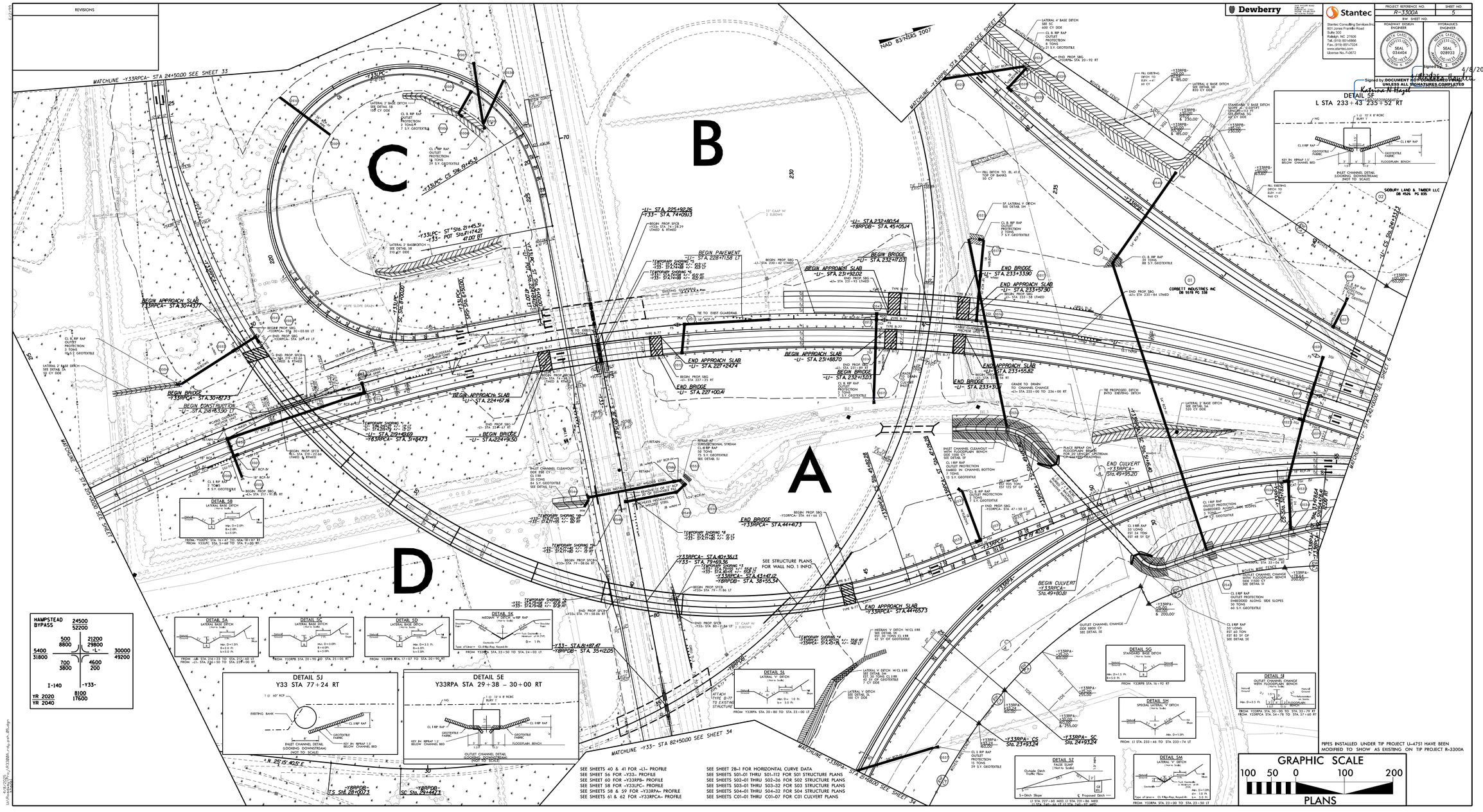
PROJECT REFERENCE NO.	SHEET NO.
R-3300A	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — PRELIMINARY NOT FOR CONSTRUCTION — SEAL 034404 — ENGINEERING — NORTH CAROLINA

HYDRAULICS ENGINEER — PRELIMINARY NOT FOR CONSTRUCTION — SEAL 028923 — ENGINEERING — NORTH CAROLINA

Signed by: 4/8/2025

Signed by: DOCUMENT NOT COMPLETE UNTIL ALL SIGNATURES COMPLETED



SEE SHEETS 40 & 41 FOR -L1- PROFILE
SEE SHEET 56 FOR -Y33- PROFILE
SEE SHEET 60 FOR -Y33RPB- PROFILE
SEE SHEET 58 FOR -Y33LPC- PROFILE
SEE SHEETS 58 & 59 FOR -Y33RPA- PROFILE
SEE SHEETS 61 & 62 FOR -Y33RPCA- PROFILE

SEE SHEET 28-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS S01-01 THRU S01-112 FOR S01 STRUCTURE PLANS
SEE SHEETS S02-01 THRU S02-36 FOR S02 STRUCTURE PLANS
SEE SHEETS S03-01 THRU S03-32 FOR S03 STRUCTURE PLANS
SEE SHEETS S04-01 THRU S04-32 FOR S04 STRUCTURE PLANS
SEE SHEETS C01-01 THRU C01-07 FOR C01 CULVERT PLANS

Docusign Envelope ID: 332BD0E0-6729-4AEC-B803-192A1587D0CF

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(919) 851-6606
FIRM PE NUMBER : P-0671

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Tel. (919) 851-6886
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
R-3300A	6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAGEL
Signed by: Katrina N Hagel
F8B7D5D8D0D8485...
5/14/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 028933 ENGINEER ANDREW C. VAN HAARLEM
FE616A02282544F1...
5/14/2025

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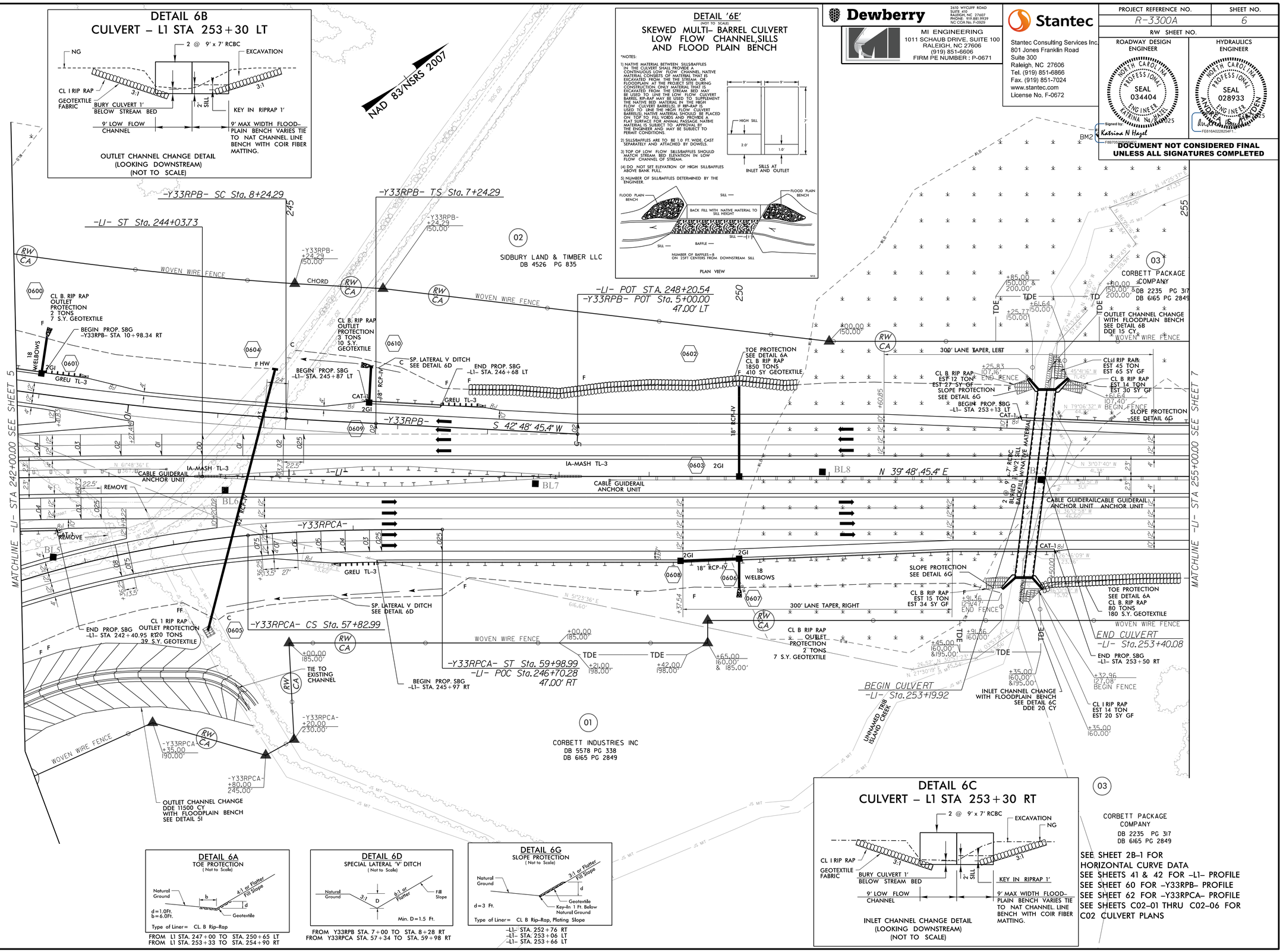

SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS 41 & 42 FOR -L1- PROFILE
SEE SHEET 60 FOR -Y33RPB- PROFILE
SEE SHEET 62 FOR -Y33RPCA- PROFILE
SEE SHEETS C02-01 THRU C02-06 FOR C02 CULVERT PLANS

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4/8/2025
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kthap

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SUITE 410
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NC COA No. F-0929

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(919) 851-6606
FIRM PE NUMBER : P-0671

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Suite 300
Raleigh, NC 27606
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Fax. (919) 851-7024
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PROJECT REFERENCE NO.	SHEET NO.
R-3300A	7
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAGEL
Signed by: Katrina N Hagel
F8B7D5D0D0D4E4...

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 028933 ENGINEER ANDREW G. MAYDEN
FE616A02282541...

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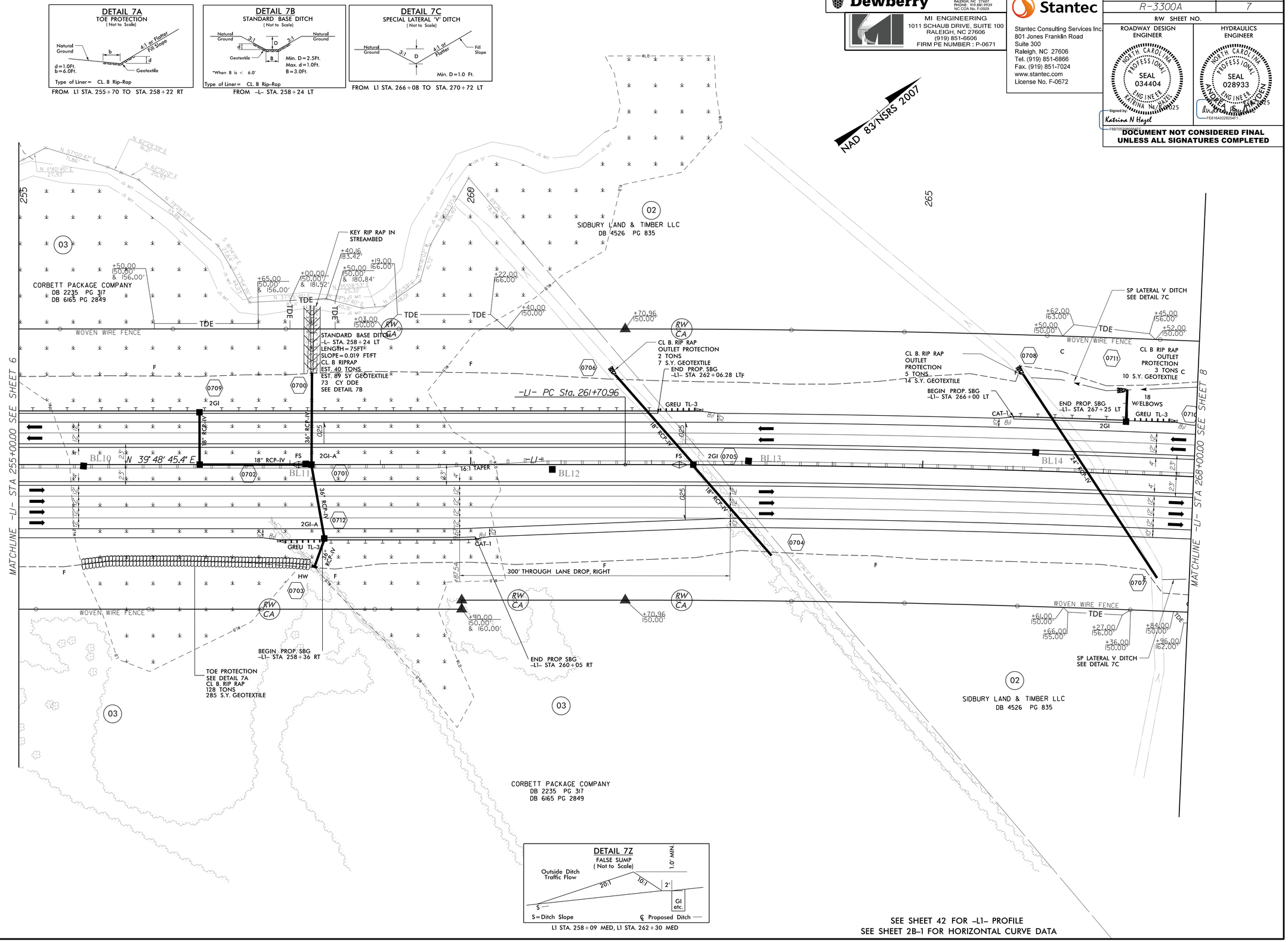

SEE SHEET 42 FOR -L1- PROFILE
SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA

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4/8/2025
10:42:25

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SUITE 410
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NC COA No. F-0929

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1011 SCHAUB DRIVE, SUITE 100
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PROJECT REFERENCE NO.	SHEET NO.
R-3300A	8
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAGEL
Signed by: Katrina N Hagel
F8B7D5D0D0F4E...

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 028933 ENGINEER ANDREW G. MAYDEN
FE616A022825411...

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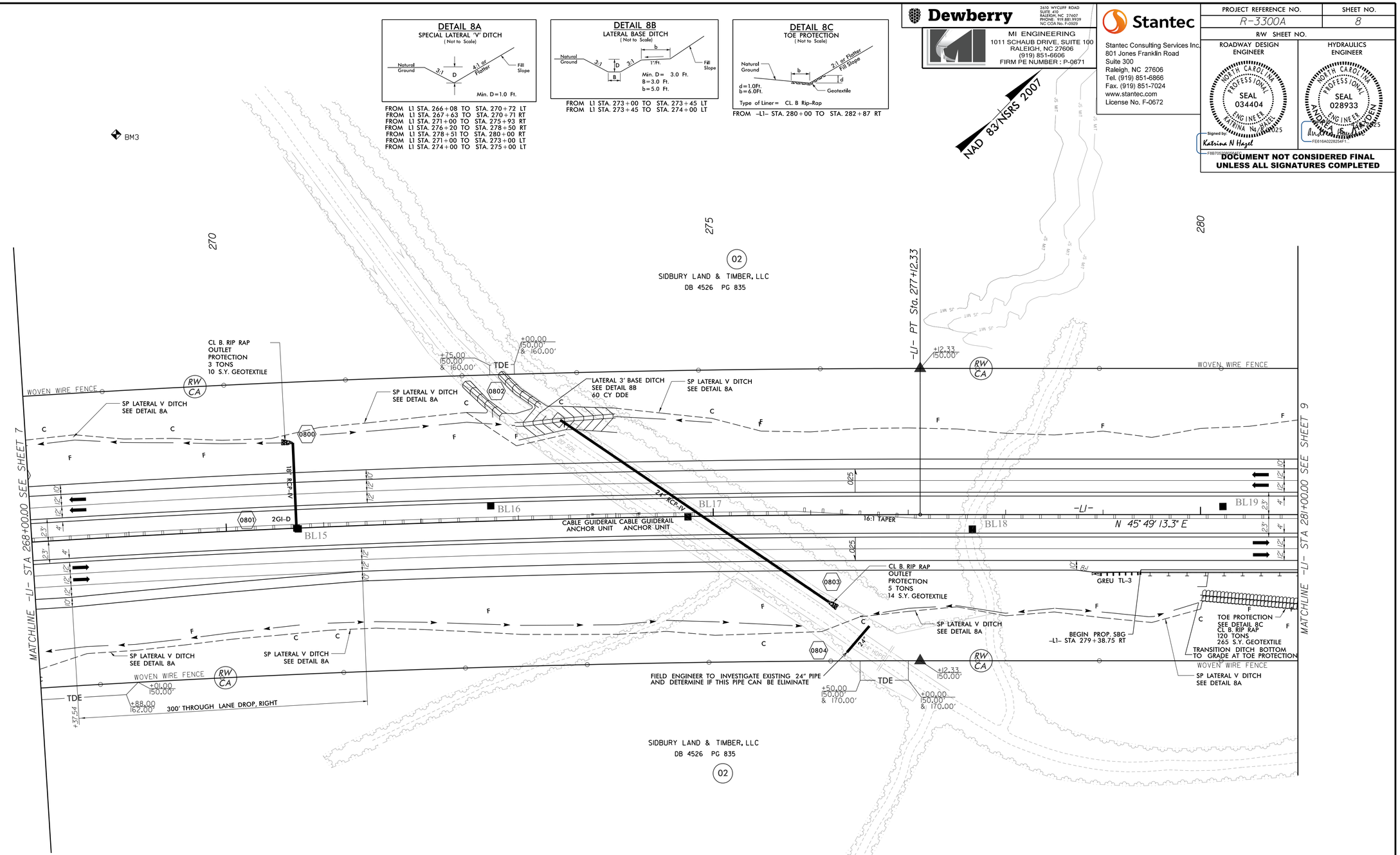

SEE SHEET 42 & 43 FOR -L1- PROFILE
SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA

4/8/2005
U:\Roadway\Proj\R3300A_rdy_psh_08.dgn
kbrady

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NC COA No. F-0929

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PROJECT REFERENCE NO.	SHEET NO.
R-3300A	9
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAZEL
Signed by: Katrina N Hazel
F8B7D5D0D0D4D4...
FE616A02282541...

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 028933 ENGINEER ANDREW G. MAYDEN
Andrew G. Mayden
4/8/2025

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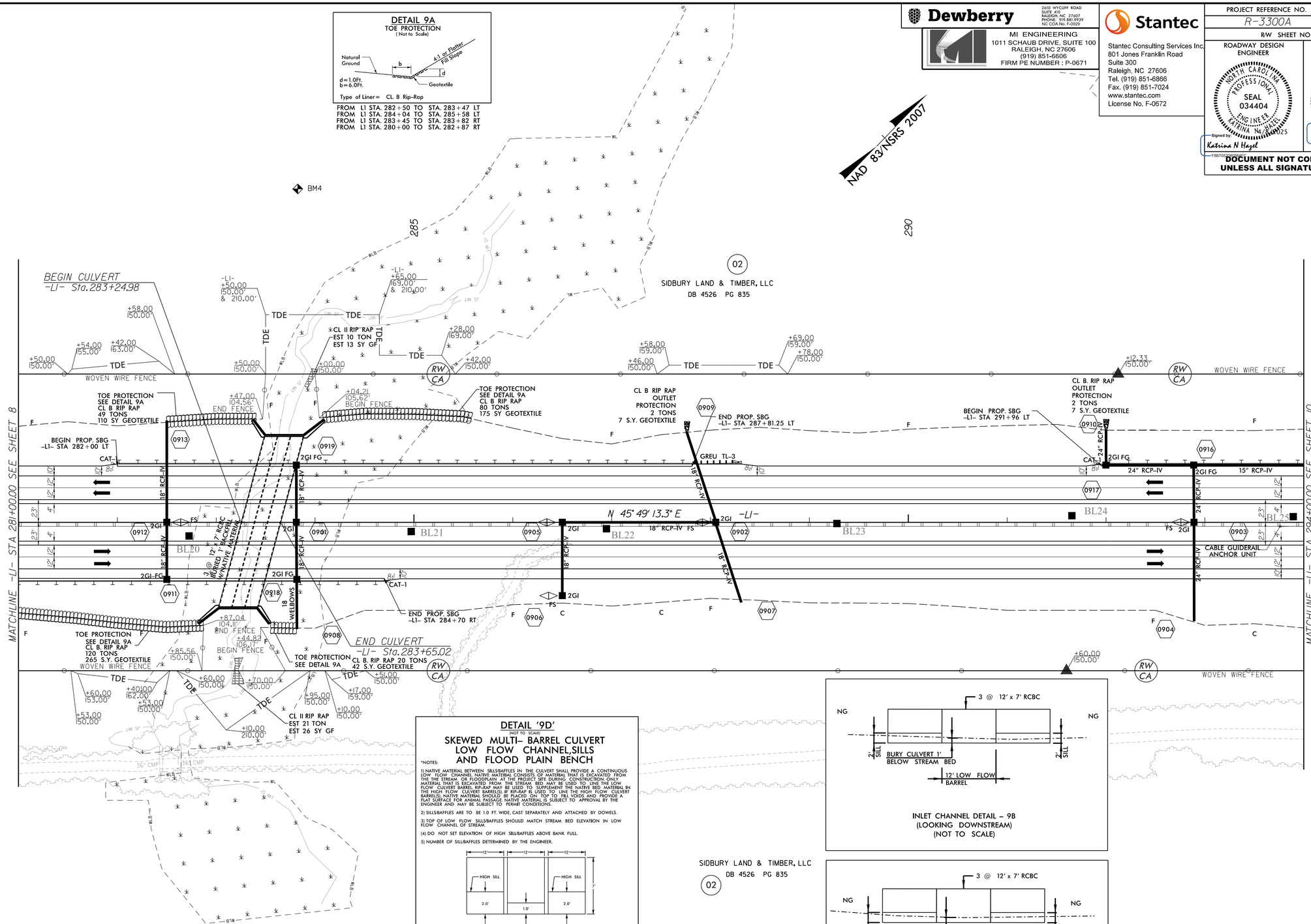


DETAIL 9A
TOE PROTECTION
(Not to Scale)

Type of Liner = CL. B Rip-Rap

FROM L1 STA. 282+50 TO STA. 283+47 LT
FROM L1 STA. 284+04 TO STA. 285+58 LT
FROM L1 STA. 283+45 TO STA. 283+82 RT
FROM L1 STA. 280+00 TO STA. 282+87 RT

DETAIL 9D'
(NOT TO SCALE)

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

*NOTES:

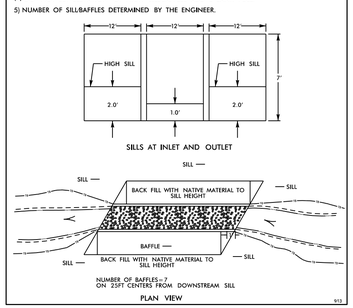
1) NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE THE STREAM, OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP-RAP MAY BE USED TO SUPPLEMENT THE NATIVE BED 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 TO FILL VOIDS AND 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.

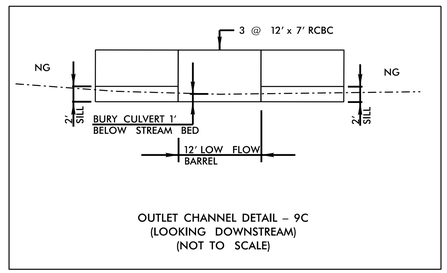
(4) DO NOT SET ELEVATION OF HIGH SILL/BAFFLES ABOVE BANK FULL.

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



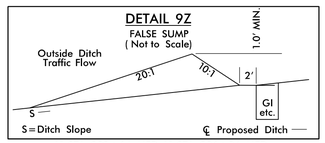
INLET CHANNEL DETAIL – 9B
(LOOKING DOWNSTREAM)
(NOT TO SCALE)

SIDBURY LAND & TIMBER, LLC
DB 4526 PG 835
02



OUTLET CHANNEL DETAIL – 9C
(LOOKING DOWNSTREAM)
(NOT TO SCALE)

DETAIL 9Z
FALSE SUMP
(Not to Scale)



L1 STA. 282+64 MED, L1 STA. 286+34 MED
L1 STA. 286+36 RT, L1 STA. 292+75 MED

SEE SHEET 43 FOR -L1- PROFILE
SEE SHEETS C03-01 THRU C03-06 FOR C03 CULVERT PLANS

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FIRM PE NUMBER : P-0671

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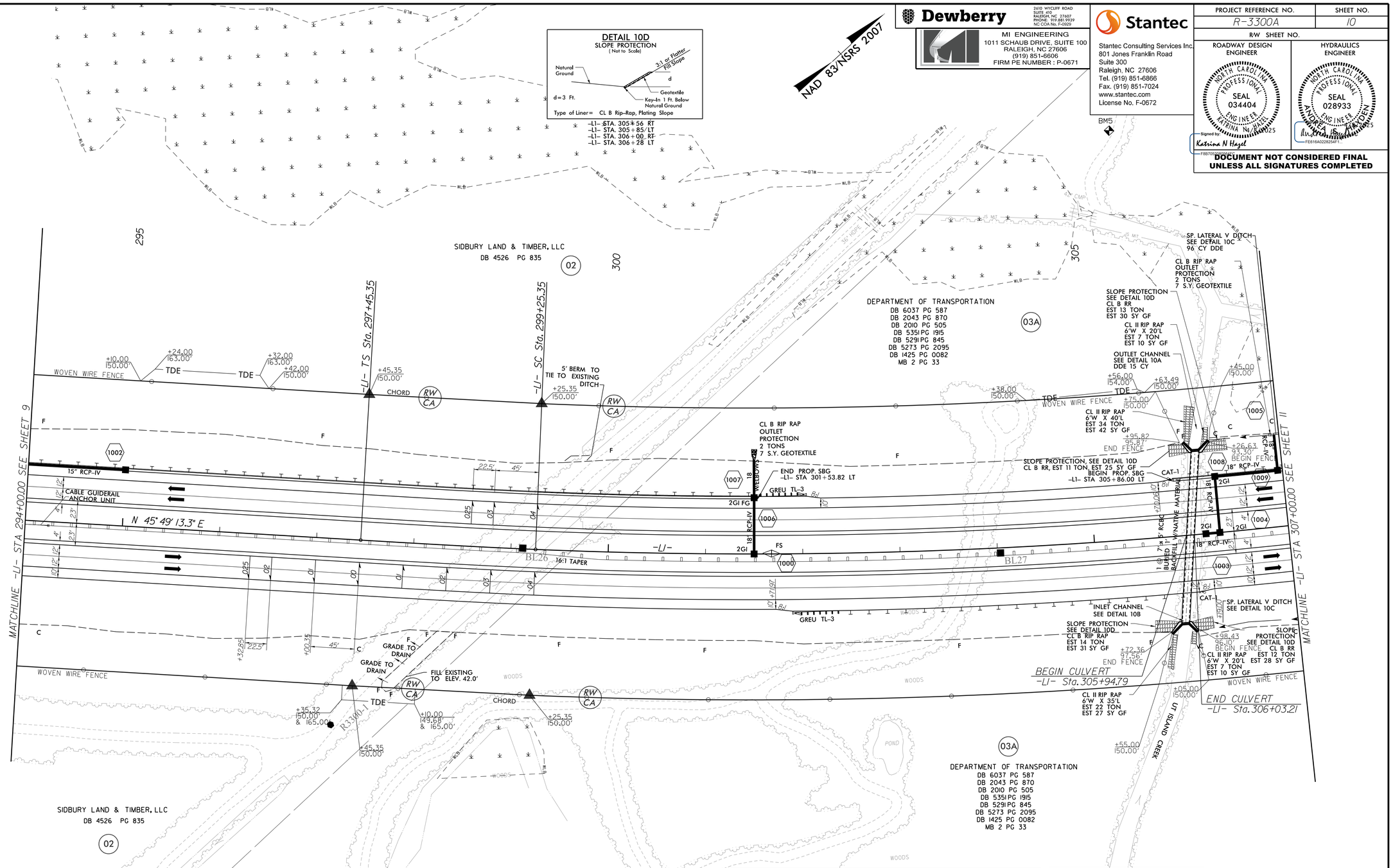
PROJECT REFERENCE NO.	SHEET NO.
R-3300A	10
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAGEL
Signed by: Katrina N Hagel
F8B7D5D0D0D4E4...

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 028933 ENGINEER ANDREW G. MAYDEN
FE616A02282541...

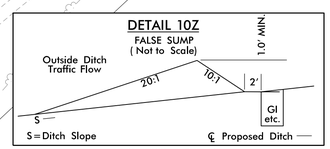
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DETAIL 10D
SLOPE PROTECTION
(Not to Scale)

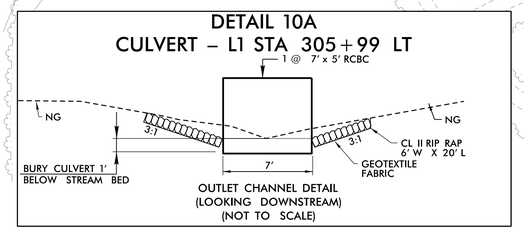
d = 3 Ft.
Type of Liner = CL B Rip-Rap, Plating Slope
-L1- STA. 305+56 RT
-L1- STA. 305+85 LT
-L1- STA. 306+00 RT
-L1- STA. 306+28 LT

DETAIL 10Z
FALSE SUMP
(Not to Scale)



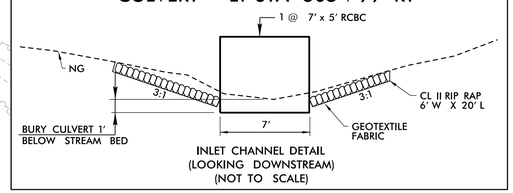
L1 STA. 301+67 MED

DETAIL 10A
CULVERT – L1 STA 305+99 LT



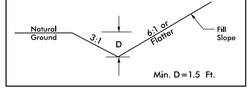
OUTLET CHANNEL DETAIL
(LOOKING DOWNSTREAM)
(NOT TO SCALE)

DETAIL 10B
CULVERT – L1 STA 305+99 RT



INLET CHANNEL DETAIL
(LOOKING DOWNSTREAM)
(NOT TO SCALE)

DETAIL 10C
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D = 1.5 Ft.

FROM -L1- STA. 306+27 TO STA. 308+50 LT
FROM -L1- STA. 306+00 TO STA. 309+50 RT

SEE SHEETS 43 & 44 FOR -L1- PROFILE
SEE SHEETS C04-01 THRU C04-06 FOR C04 CULVERT PLANS
SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA

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kthagel

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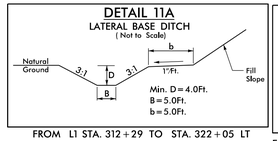
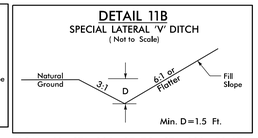
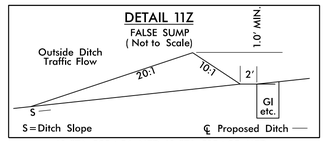


FROM L1 STA. 312+29 TO STA. 322+05 LT



FROM –L1– STA. 306+27 TO STA. 308+50 LT
FROM –L1– STA. 306+00 TO STA. 309+50 RT



L1 STA. 309+36 MED, L1 STA. 315+85 MED

03A

DEPARTMENT OF TRANSPORTATION
DB 6037 PG 587
DB 2043 PG 870
DB 2010 PG 505
DB 5351 PG 1915
DB 5291 PG 845
DB 5273 PG 2095
DB 1425 PG 0082
MB 2 PG 33

Dewberry
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NC COA No. F-0929

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PROJECT REFERENCE NO.	SHEET NO.
R-3300A	11
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAGEL
Signed by: Katrina N Hagel
F8B7D5D0D0D4D4...

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 028933 ENGINEER ANDREW G. MAYDEN
FE616A02282541...

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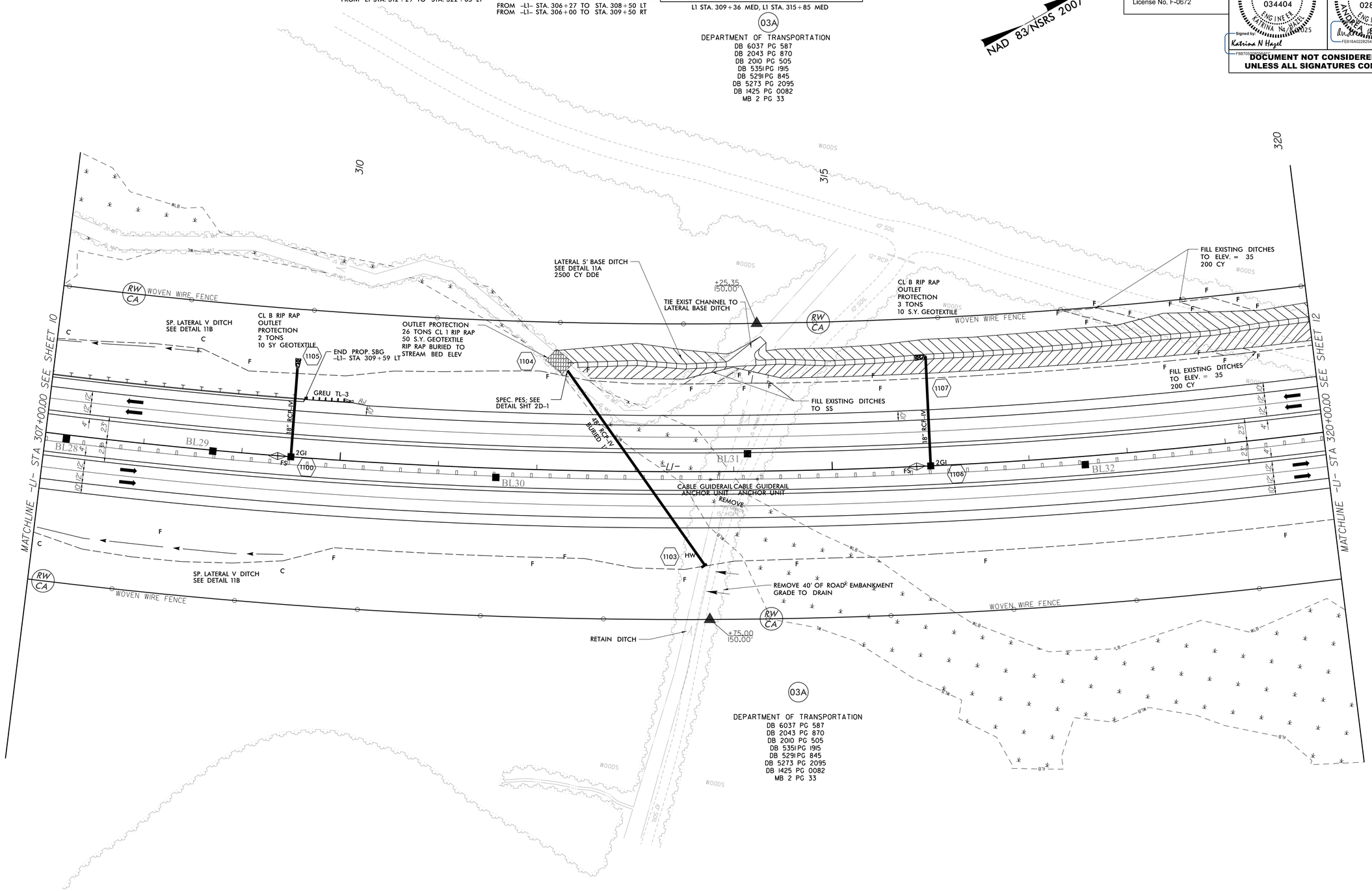

SEE SHEET 44 FOR –L1– PROFILE
SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA

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NC COA No. F-0928

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PROJECT REFERENCE NO.	SHEET NO.
R-3300A	12
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAGEL
Signed by: Katrina N Hagel
FB870520000F4AE...

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 028933 ENGINEER ANDREW C. MADDEN
FE616A022825 4F1...

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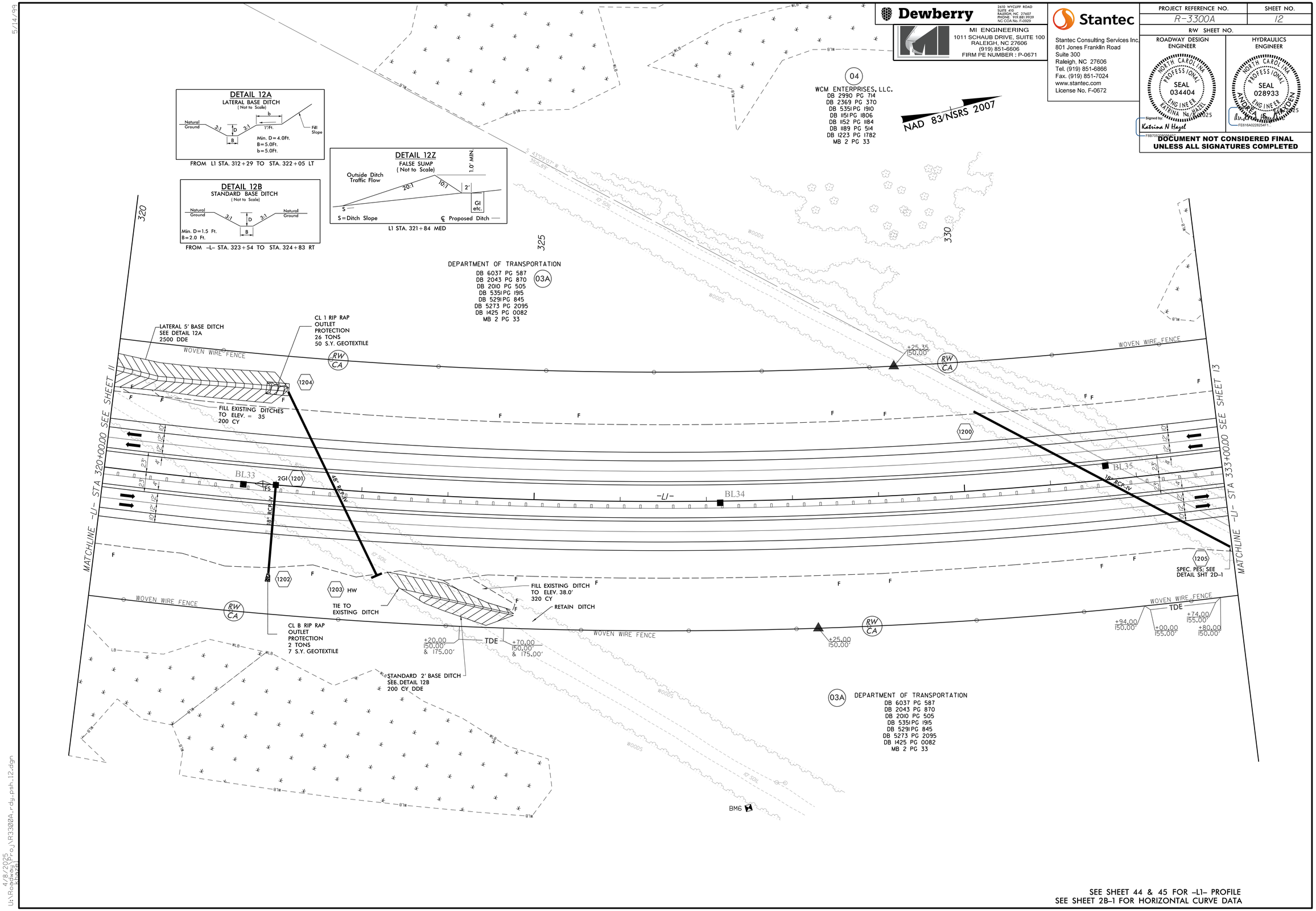

SEE SHEET 44 & 45 FOR -L1- PROFILE
SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA

4/8/2025
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RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

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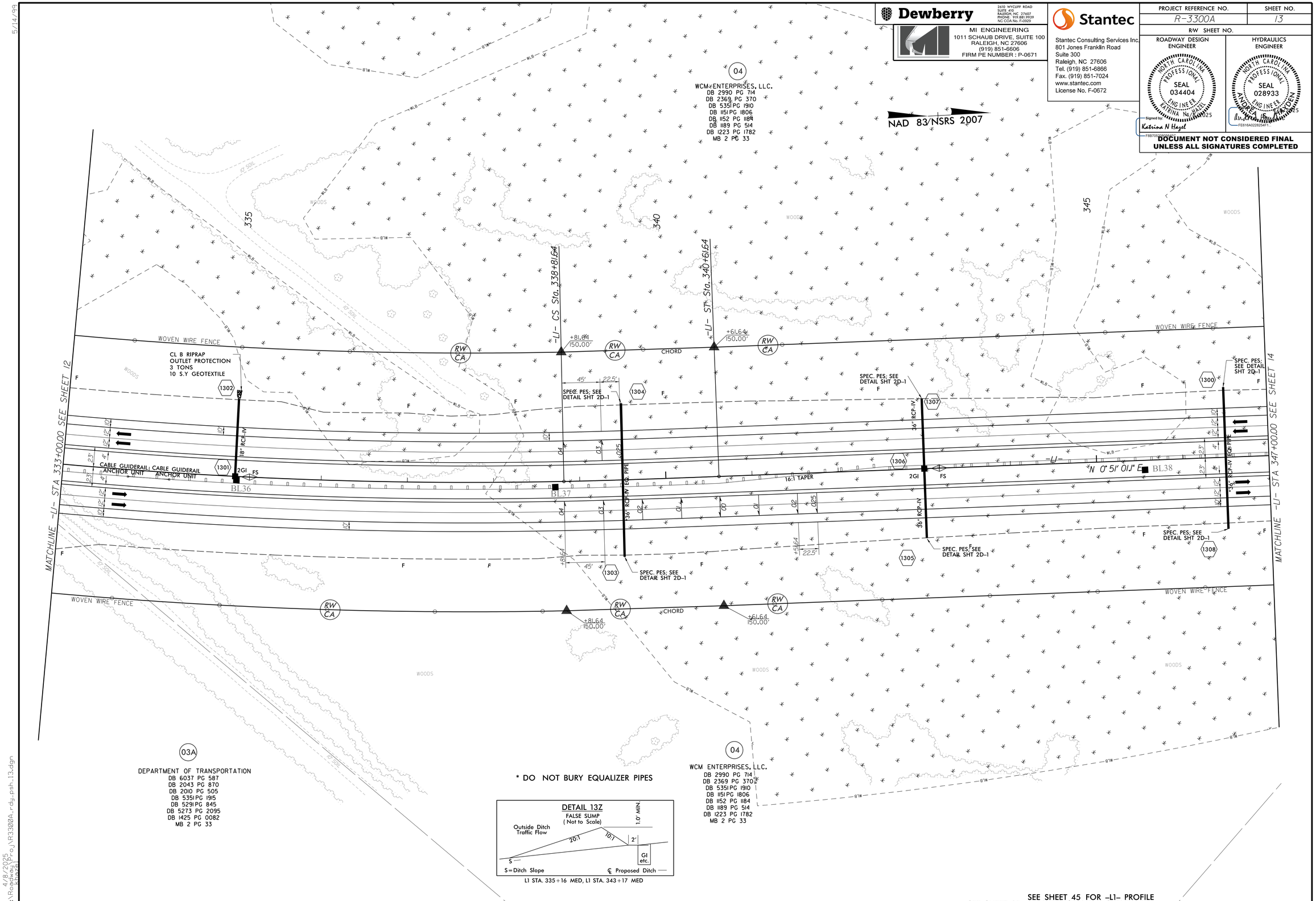
PROJECT REFERENCE NO.	SHEET NO.
R-3300A	13
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAGEL
Signed by: Katrina N Hagel
F8B7D5D0D0D4D4...

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 028933 ENGINEER ANDREW C. MALDEN
FE616A022B254F1...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SEE SHEET 45 FOR -L1- PROFILE
SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA

4/8/2025
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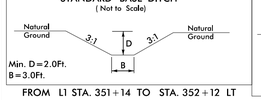
kharp

Docusign Envelope ID: 332BD0E0-6729-4AEC-B803-192A1587D0CF

5/14/99

DETAIL 14B
STANDARD BASE DITCH
(Not to Scale)



FROM L1 STA. 351+14 TO STA. 352+12 LT

DETAIL 14C
LATERAL BASE DITCH
(Not to Scale)

FROM Y34 STA. 20+04 TO STA. 22+84 RT

DETAIL 14D
SPECIAL CUT DITCH
(Not to Scale)

FROM Y34 19+50 STA. TO 23+63 LT

DETAIL 14E
LATERAL 'V' DITCH
(Not to Scale)

FROM Y34 STA. 26+00 TO STA. 33+14 LT

DETAIL 14I
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM -SR1- STA. 19+50 TO STA. 22+51 LT

NAD 83/NSRS 2007

Dewberry
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FIRM PE NUMBER : P-0671

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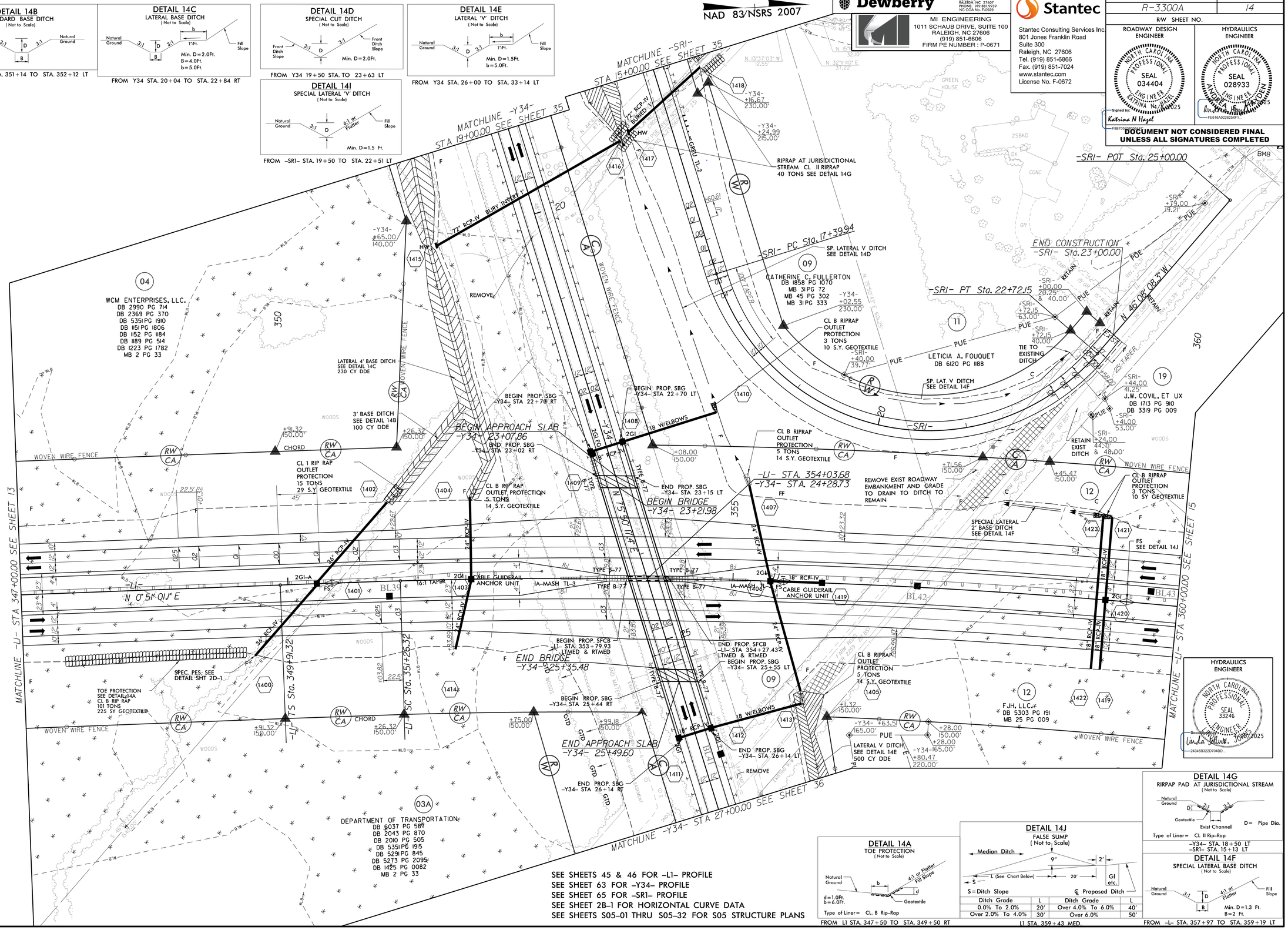
PROJECT REFERENCE NO.	SHEET NO.
R-3300A	14
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAGEL
Signed by: Katrina N Hagel
F8B7D5B0B0B04C...
FE616A022825 4F1...

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 028933 ENGINEER ANDREW G. MAYDEN
Docusigned by: Andrew G. Mayden
A7A0A0A0A0A0A0A0...
4/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33246 ENGINEER
Docusigned by: Linda Garvin
24345B32D704BD...
4/8/2025

SEE SHEETS 45 & 46 FOR -L1- PROFILE
SEE SHEET 63 FOR -Y34- PROFILE
SEE SHEET 65 FOR -SR1- PROFILE
SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS S05-01 THRU S05-32 FOR S05 STRUCTURE PLANS

DETAIL 14A
TOE PROTECTION
(Not to Scale)

d=1.0Ft.
b=6.0Ft.
Type of Liner= CL B Rip-Rap

FROM L1 STA. 347+50 TO STA. 349+50 RT

DETAIL 14J
FALSE SUMP
(Not to Scale)

S=Ditch Slope

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

L1 STA. 359+43 MED.

DETAIL 14G
RIRPAP PAD AT JURISDICTIONAL STREAM
(Not to Scale)

D= Pipe Dia.
Type of Liner= CL II Rip-Rap
-Y34- STA. 18+50 LT
-SR1- STA. 15+13 LT

DETAIL 14F
SPECIAL LATERAL BASE DITCH
(Not to Scale)

Min. D=1.3 Ft.
B=2 Ft.

FROM -L- STA. 357+97 TO STA. 359+19 LT

4/8/2025
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Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919 881.9939
NC COA No. F-0929

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

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PROJECT REFERENCE NO.	SHEET NO.
R-3300A	15
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAGEL
Signed by: Katrina N Hagel
F8B7D5D0D0D4D4...
4/8/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33246 ENGINEER LINDA SULLIVAN WILLIAMS
Docusigned by: Linda Sullivan Williams
2434583220704BD...
4/8/2025

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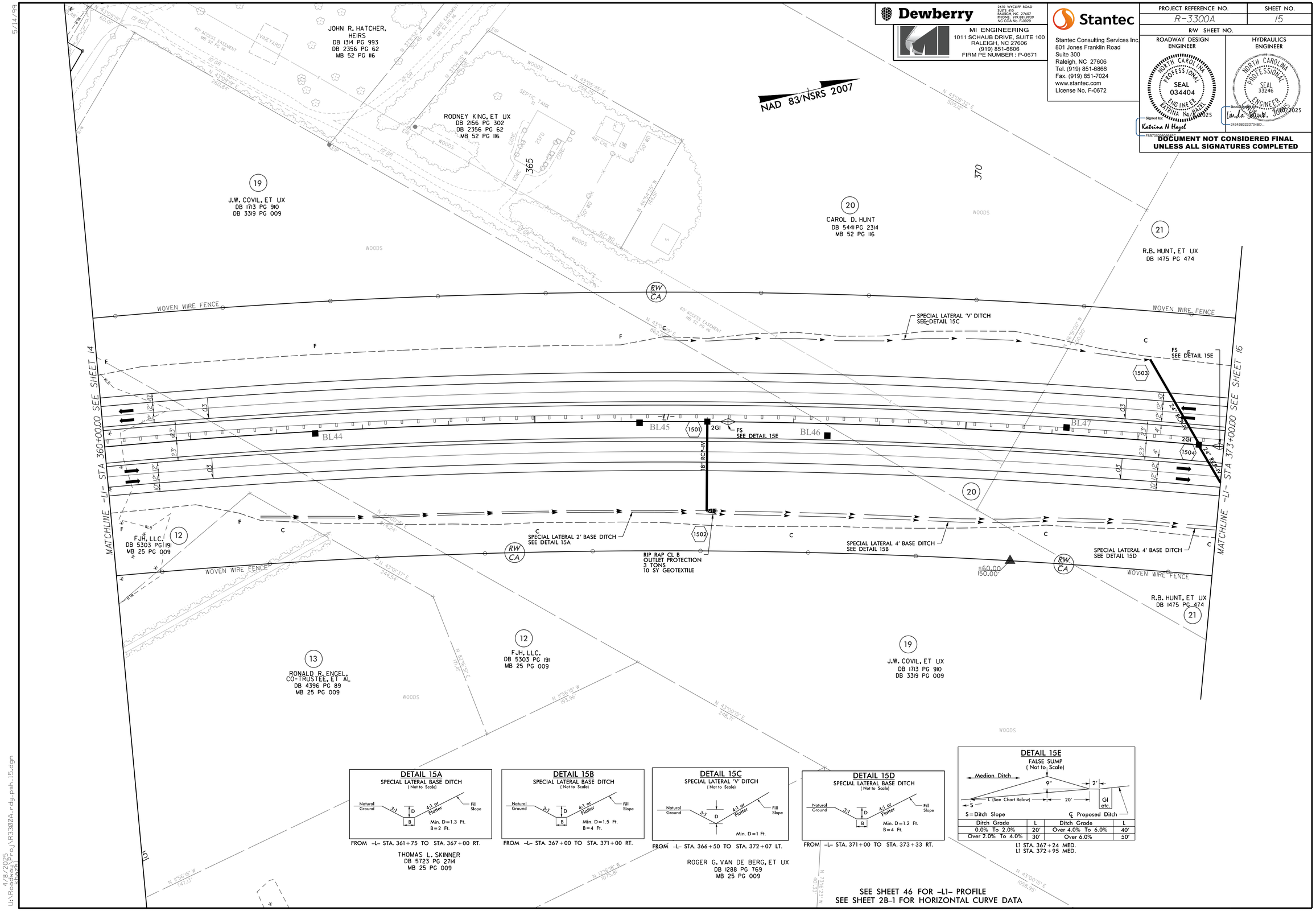

DETAIL 15A
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground — 3:1 — D — B — 4:1 or Flatter — Fill Slope
Min. D=1.3 Ft.
B=2 Ft.
FROM -L- STA. 361+75 TO STA. 367+00 RT.
THOMAS L. SKINNER
DB 5723 PG 2714
MB 25 PG 009

DETAIL 15B
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground — 3:1 — D — B — 4:1 or Flatter — Fill Slope
Min. D=1.5 Ft.
B=4 Ft.
FROM -L- STA. 367+00 TO STA. 371+00 RT.

DETAIL 15C
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground — 3:1 — D — 4:1 or Flatter — Fill Slope
Min. D=1 Ft.
FROM -L- STA. 366+50 TO STA. 372+07 LT.
ROGER G. VAN DE BERG, ET UX
DB 1288 PG 769
MB 25 PG 009

DETAIL 15D
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground — 3:1 — D — B — 4:1 or Flatter — Fill Slope
Min. D=1.2 Ft.
B=4 Ft.
FROM -L- STA. 371+00 TO STA. 373+33 RT.

DETAIL 15E
FALSE SUMP
(Not to Scale)
Median Ditch — 9" — 2' — L (See Chart Below) — 20' — GI etc. — S
S=Ditch Slope ℄ Proposed Ditch

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

L1 STA. 367+24 MED.
L1 STA. 372+95 MED.

SEE SHEET 46 FOR -L1- PROFILE
SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA

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4/8/2025
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NC COA No. F-0929

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1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

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PROJECT REFERENCE NO.	SHEET NO.
R-3300A	16
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAGEL
Signed by: Katrina N Hagel
F8B7D5D0D0D4D4...
5/14/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 35246 ENGINEER LINDA WILLIAM JONES
Docusigned by: Linda William Jones
2434583220704BD...
5/14/2025

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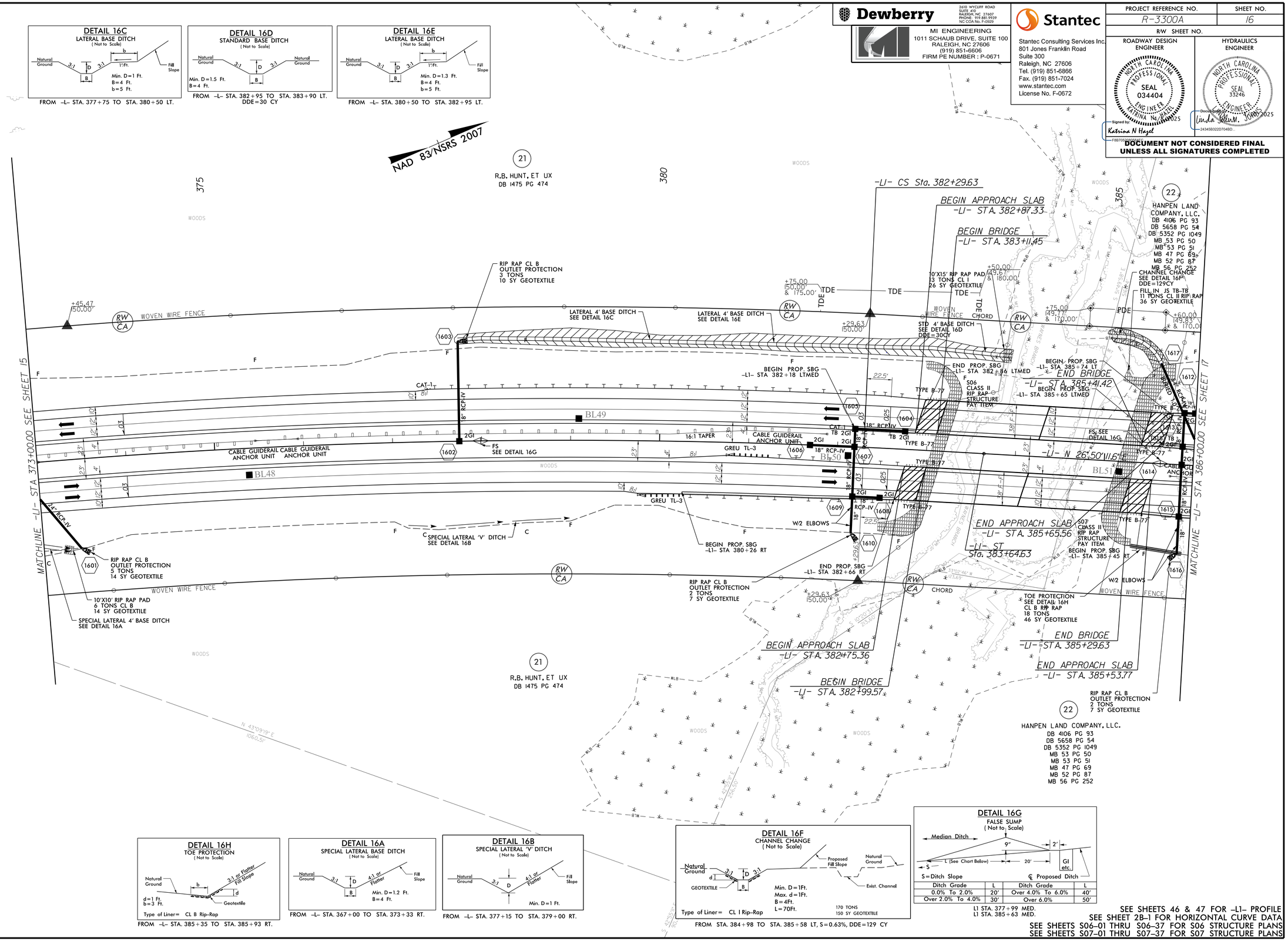

SEE SHEETS 46 & 47 FOR –L1– PROFILE
SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS S06-01 THRU S06-37 FOR S06 STRUCTURE PLANS
SEE SHEETS S07-01 THRU S07-37 FOR S07 STRUCTURE PLANS

4/8/2025
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PWD

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NC COA No. F-0929

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1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

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PROJECT REFERENCE NO.	SHEET NO.
R-3300A	17
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAGEL
Signed by: Katrina N Hagel
F8B7D5D0B0D4D4D...

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33246 ENGINEER LINDA W. SULLIVAN
Docusigned by: Linda W. Sullivan 4/8/2025
2434593220704BD...

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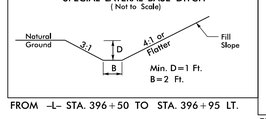
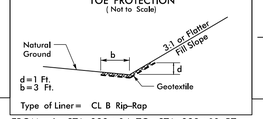
NAD 83/NSRS 2007

DETAIL 17C
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM –L– STA. 396+50 TO STA. 396+95 LT.

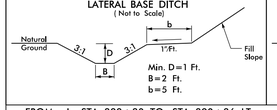
DETAIL 17D
TOE PROTECTION
(Not to Scale)



Type of Liner= CL B Rip-Rap

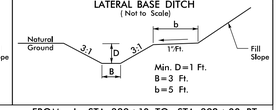
FROM –L– STA. 388+04 TO STA. 389+10 RT.

DETAIL 17E
LATERAL BASE DITCH
(Not to Scale)



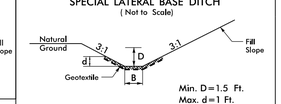
FROM –L– STA. 388+30 TO STA. 390+36 LT.
FROM –L– STA. 395+50 TO STA. 397+00 RT.
FROM –L– STA. 395+95 TO STA. 396+50 LT.

DETAIL 17F
LATERAL BASE DITCH
(Not to Scale)



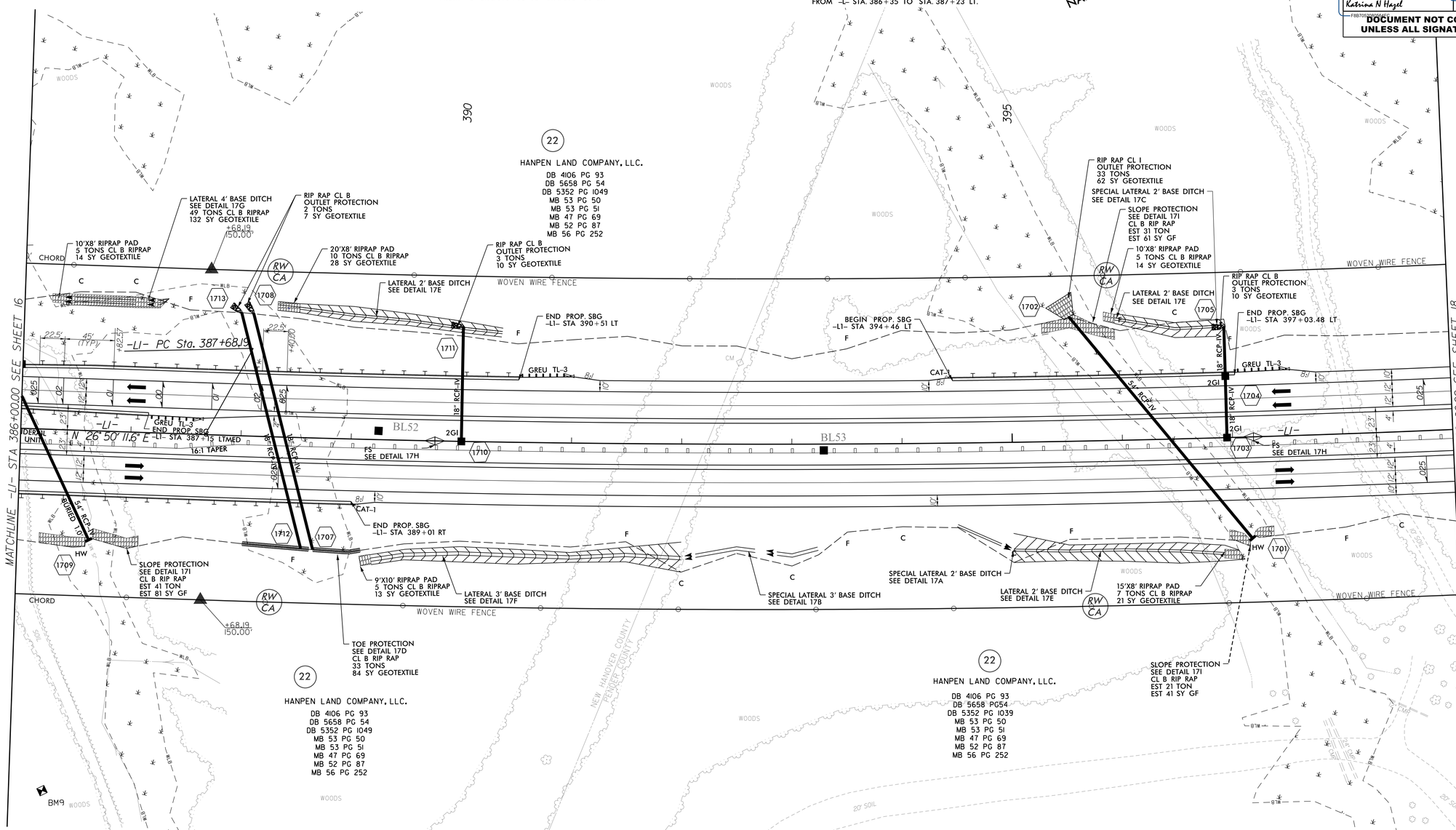
FROM –L– STA. 389+10 TO STA. 392+00 RT.

DETAIL 17G
SPECIAL LATERAL BASE DITCH
(Not to Scale)

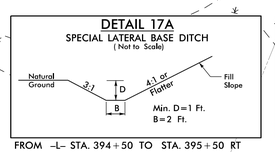


Type of Liner= CL B Rip-Rap

FROM –L– STA. 386+35 TO STA. 387+23 LT.

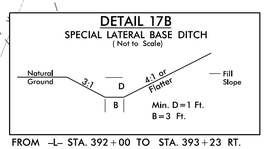


DETAIL 17A
SPECIAL LATERAL BASE DITCH
(Not to Scale)



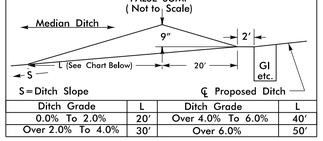
FROM –L– STA. 394+50 TO STA. 395+50 RT

DETAIL 17B
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM –L– STA. 392+00 TO STA. 393+23 RT.

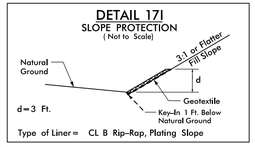
DETAIL 17H
FALSE SUMP
(Not to Scale)



Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

L1 STA. 389+76 MED.
L1 STA. 397+19 MED.

DETAIL 17I
SLOPE PROTECTION
(Not to Scale)



Type of Liner= CL B Rip-Rap, Plating Slope

FROM –L1– STA. 386+20 TO STA. 387+10 RT.
FROM –L1– STA. 395+28 TO STA. 395+95 LT.
FROM –L1– STA. 396+95 TO STA. 397+35 RT.

SEE SHEET 47 FOR –L1– PROFILE
SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA

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NC COA No. F-0929

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(919) 851-6606
FIRM PE NUMBER : P-0671

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PROJECT REFERENCE NO.	SHEET NO.
R-3300A	18
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAZEL
Signed by: Katrina N Hazel
F8B7D5D0D0D4DE...
4/08/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33246 ENGINEER LINDA SUMNER
Docusigned by: Linda Sumner
2434583220704B0...
4/08/2025

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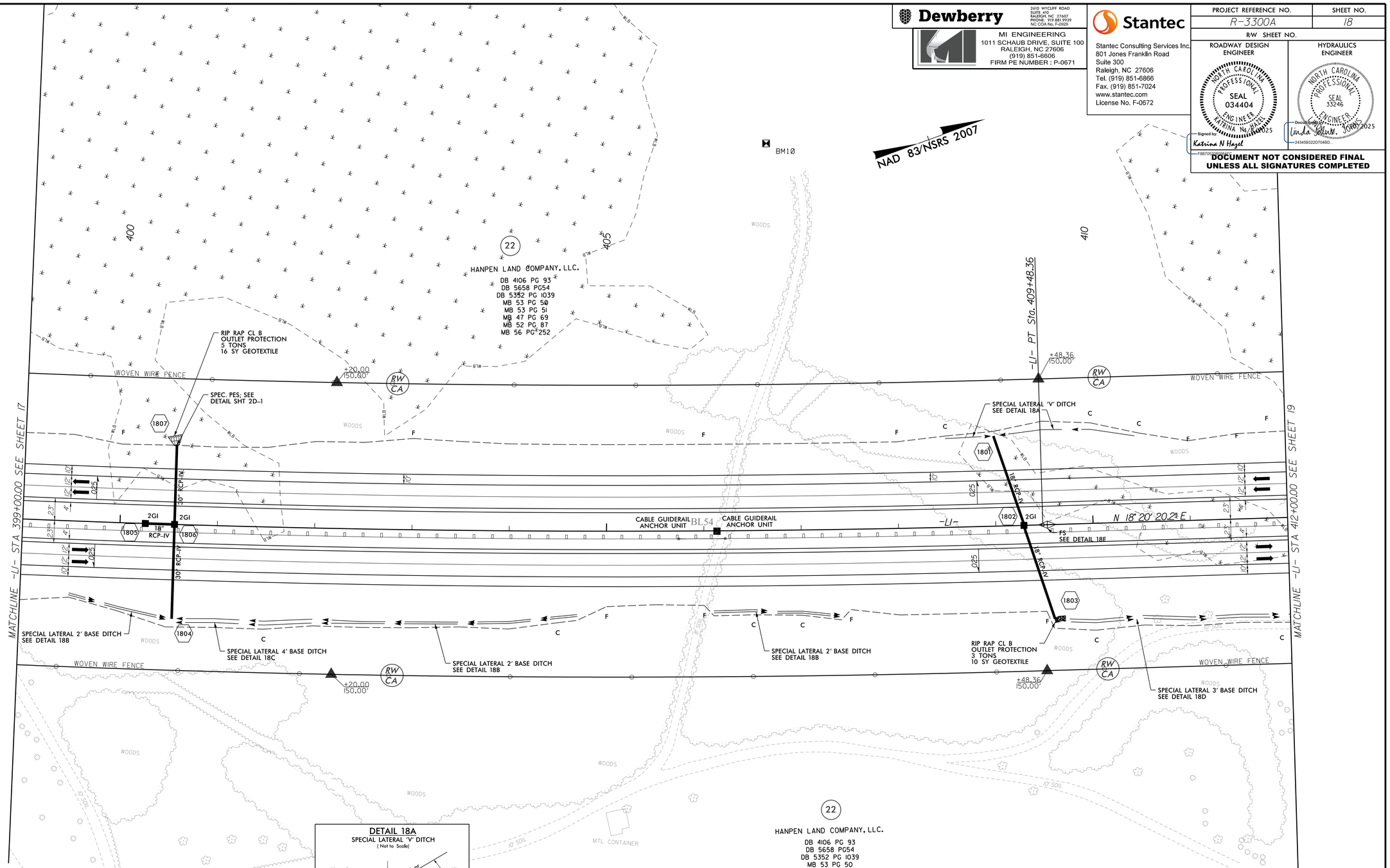
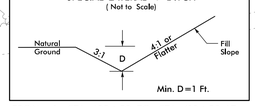
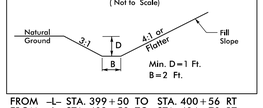


DETAIL 18A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



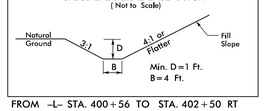
FROM -L- STA. 408+50 TO STA. 410+50 LT

DETAIL 18B
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM -L- STA. 399+50 TO STA. 400+56 RT
FROM -L- STA. 402+50 TO STA. 404+70 RT
FROM -L- STA. 406+10 TO STA. 407+40 RT

DETAIL 18C
SPECIAL LATERAL BASE DITCH
(Not to Scale)



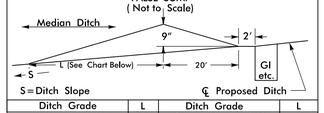
FROM -L- STA. 400+56 TO STA. 402+50 RT

DETAIL 18D
SPECIAL LATERAL BASE DITCH
(Not to Scale)

FROM -L- STA. 409+58 TO STA. 414+15 RT

22
HANPEN LAND COMPANY, LLC.
DB 4106 PG 93
DB 5658 PG54
DB 5352 PG 1039
MB 53 PG 50
MB 53 PG 51
MB 47 PG 69
MB 52 PG 87
MB 56 PG 252

DETAIL 18E
FALSE SUMP
(Not to Scale)



Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

L1 STA. 409+53 MED.

SEE SHEETS 47 & 48 FOR -L1- PROFILE
SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA

5/14/99

4/8/2025
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pwarg

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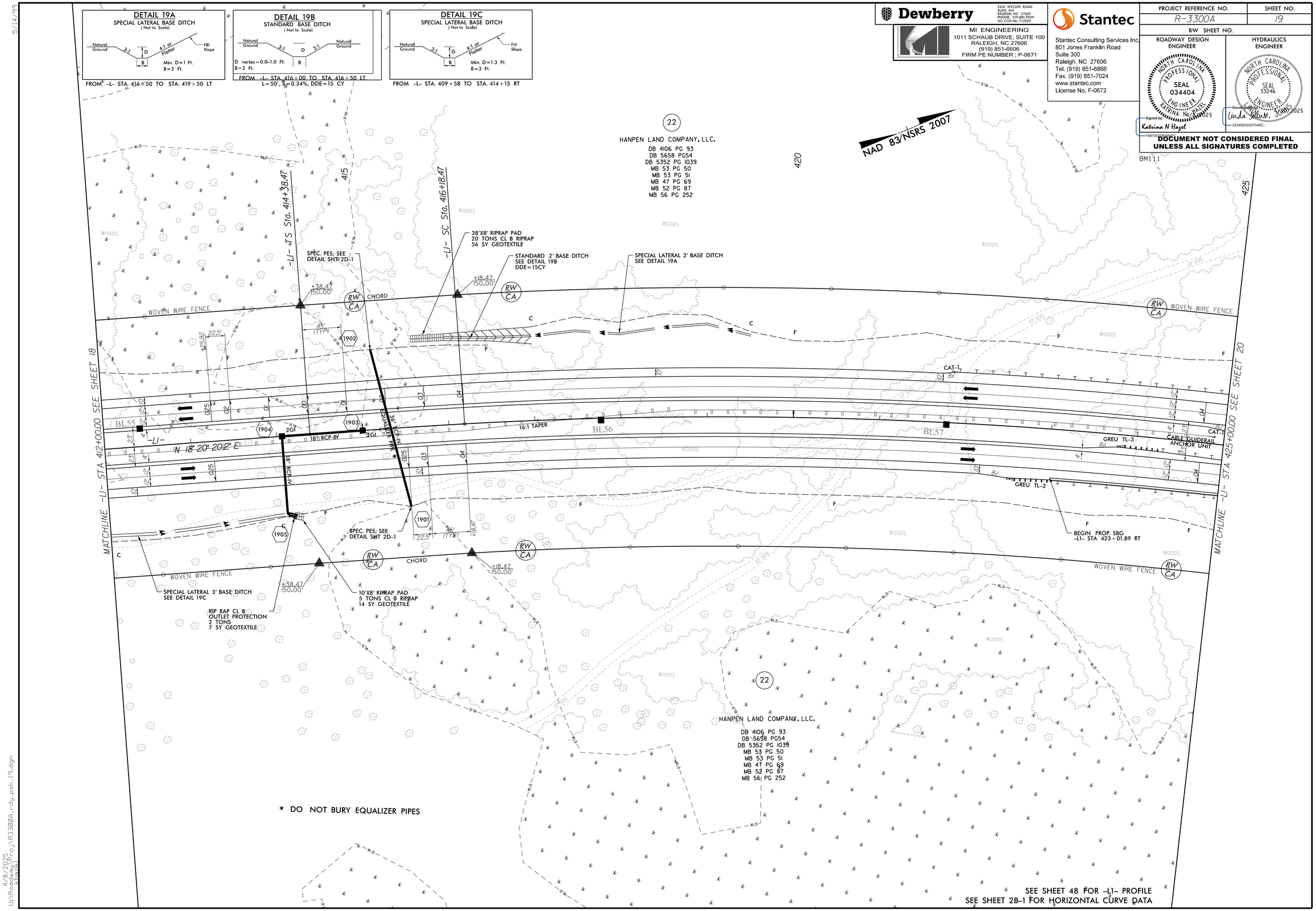

4/8/2025
U:\Roadway\proj\R3300A_rdy_psh_19.dgn
kthagel

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NC COA No. F-0929

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(919) 851-6606
FIRM PE NUMBER : P-0671

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PROJECT REFERENCE NO.	SHEET NO.
R-3300A	20
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAZEL
Signed by: Katrina N Hazel
Date: 4/8/2025
F88F0D0B0C8C4F...

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33246 ENGINEER LINDA M. JOHNS
Docusigned by: Linda Johns
Date: 4/10/2025
A6A0D0A0A0A0A0...

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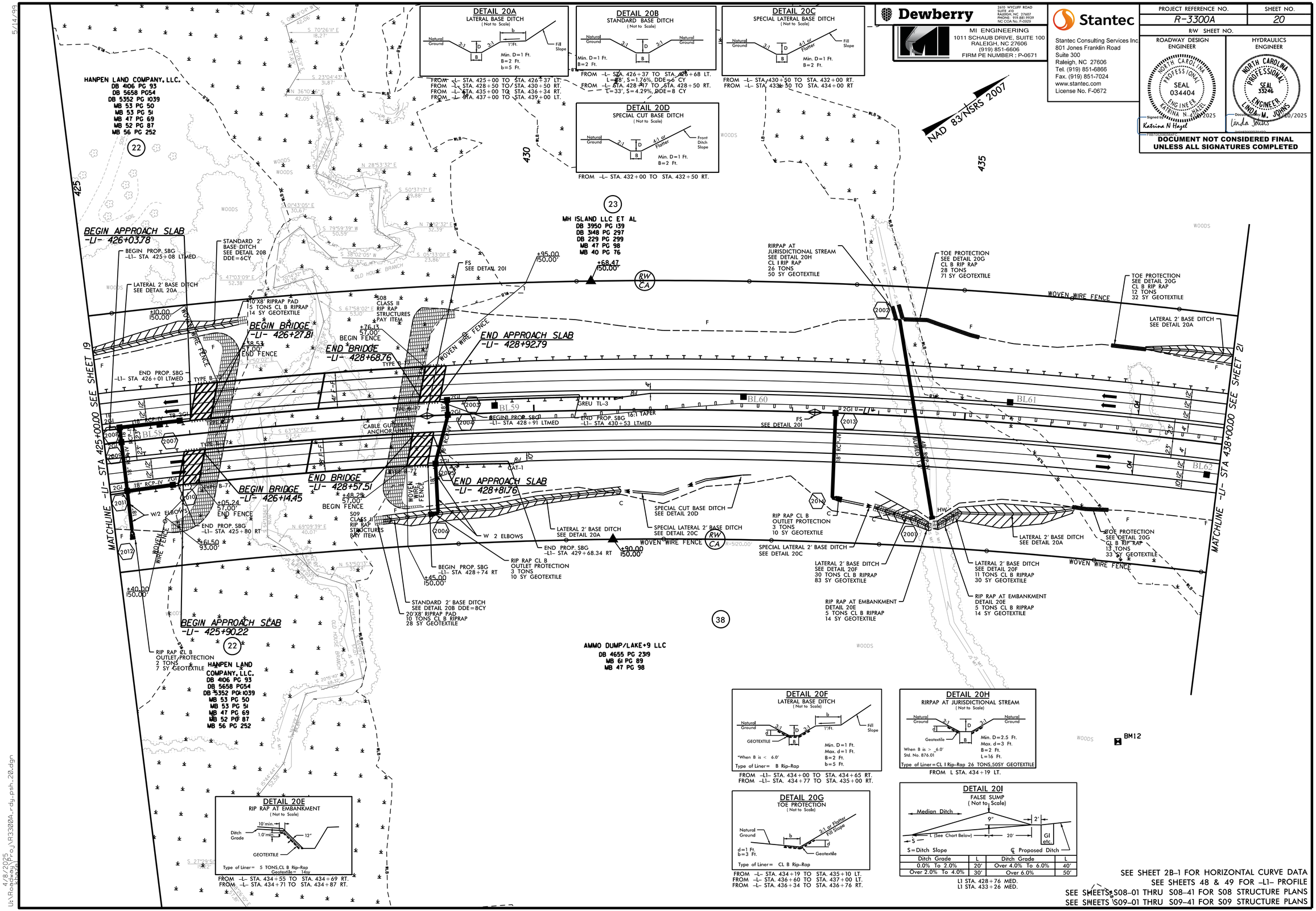

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4/8/2025
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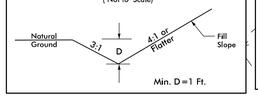
Docusign Envelope ID: 332BD0E0-6729-4AEC-B803-192A1587D0CF

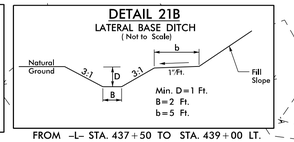
5/14/99

DETAIL 21A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



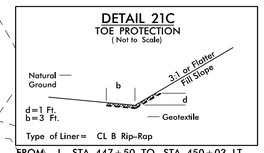
FROM –L– STA. 438+77 TO STA. 439+77 RT.
FROM –L– STA. 445+94 TO STA. 447+50 LT.
FROM –L– STA. 450+90 TO STA. 454+04 LT.
FROM –L– STA. 446+55 TO STA. 447+25 RT.

DETAIL 21B
LATERAL BASE DITCH
(Not to Scale)



FROM –L– STA. 437+50 TO STA. 439+00 LT.

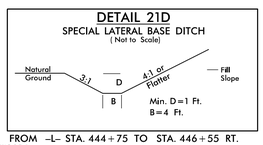
DETAIL 21C
TOE PROTECTION
(Not to Scale)



Type of Liner= CL B Rip-Rap

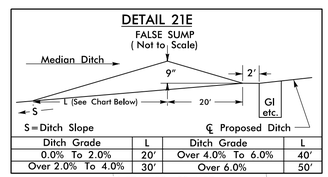
FROM –L– STA. 447+50 TO STA. 450+03 LT.
FROM –L– STA. 447+34 TO STA. 449+43 RT.

DETAIL 21D
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM –L– STA. 444+75 TO STA. 446+55 RT.

DETAIL 21E
FALSE SUMP
(Not to Scale)



Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

L1 STA. 439+58 MED.
L1 STA. 449+76 MED.

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919 881.9939
NC COA No. F-0929

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

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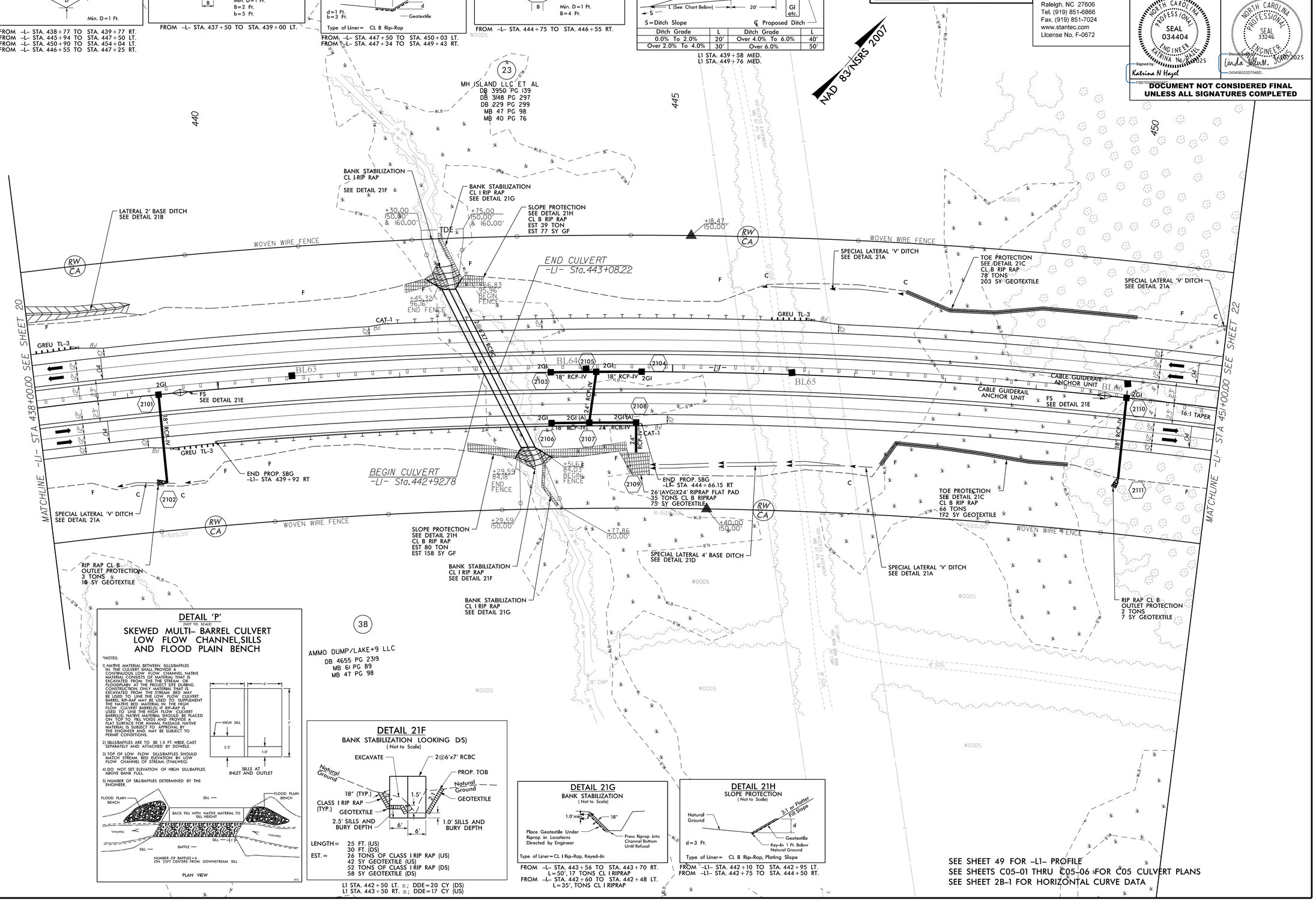
License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
R-3300A	21
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAGEL
Signed by: Katrina N Hagel
F8B7D5D0D0D4D4C...
4/08/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33246 ENGINEER LINDA SULLIVAN WILLIAMS
DocuSigned by: Linda Sullivan Williams
2434583220704BD...
4/08/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DETAIL 'P'
(NOT TO SCALE)
SKEWED MULTI– BARREL CULVERT
LOW FLOW CHANNEL,SILLS
AND FLOOD PLAIN BENCH

*NOTES:

1) NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE 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. NONE NATIVE MATERIAL SHOULD BE USED TO LINE THE LOW FLOW CHANNEL. RIP-RAP MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP-RAP MAY BE USED TO SUPPLEMENT THE NATIVE BED MATERIAL IN THE HIGH FLOW CULVERT BARRELS. IF RIP-RAP IS USED TO LINE THE HIGH FLOW CULVERT BARRELS, NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND 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.

DETAIL 21F
BANK STABILIZATION LOOKING D/S)
(Not to Scale)

LENGTH= 25 FT. (US)
30 FT. (DS)
EST.= 26 TONS OF CLASS I RIP RAP (US)
42 SY GEOTEXTILE (US)
52 TONS OF CLASS I RIP RAP (DS)
58 SY GEOTEXTILE (DS)

L1 STA. 442+50 LT. ±; DDE=20 CY (DS)
L1 STA. 443+50 RT. ±; DDE=17 CY (US)

DETAIL 21G
BANK STABILIZATION
(Not to Scale)

Type of Liner= CL I Rip-Rap, Keyed-In

FROM –L– STA. 443+56 TO STA. 443+70 RT.
L=50', 17 TONS CL I RIPRAP
FROM –L– STA. 442+60 TO STA. 442+48 LT.
L=35', TONS CL I RIPRAP

DETAIL 21H
SLOPE PROTECTION
(Not to Scale)

Type of Liner= CL B Rip-Rap, Plating Slope

FROM –L1– STA. 442+10 TO STA. 442+95 LT.
FROM –L1– STA. 442+75 TO STA. 444+50 RT.

SEE SHEET 49 FOR –L1– PROFILE
SEE SHEETS C05-01 THRU C05-06 FOR C05 CULVERT PLANS
SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA

4/8/2025
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kthagel

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PROJECT REFERENCE NO.	SHEET NO.
R-3300A	22
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAGEL
Signed by: Katrina N Hagel
F8B7D5D0D0D4DE...
4/8/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33246 ENGINEER
Docusigned by: Linda Sawyer, PE
2434583220D704BD...
4/8/2025

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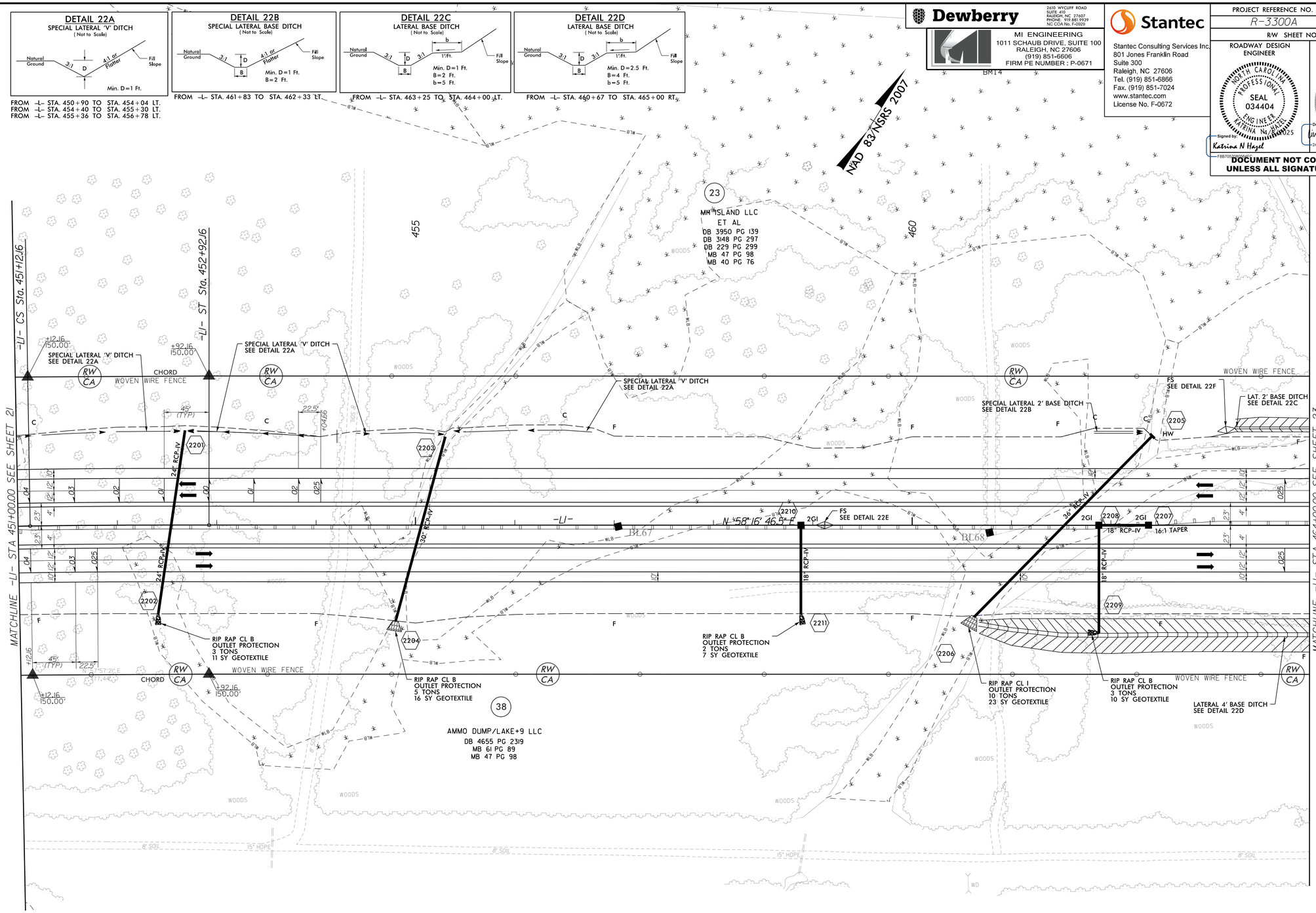
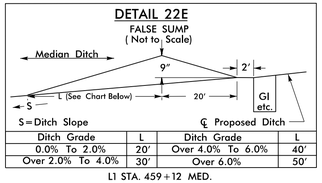
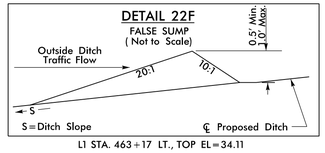




Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

L1 STA. 459+12 MED.



L1 STA. 463+17 LT., TOP EL=34.11

SEE SHEETS 49 & 50 FOR -L1- PROFILE
SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA

4/8/2025
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(919) 851-6606
FIRM PE NUMBER : P-0671

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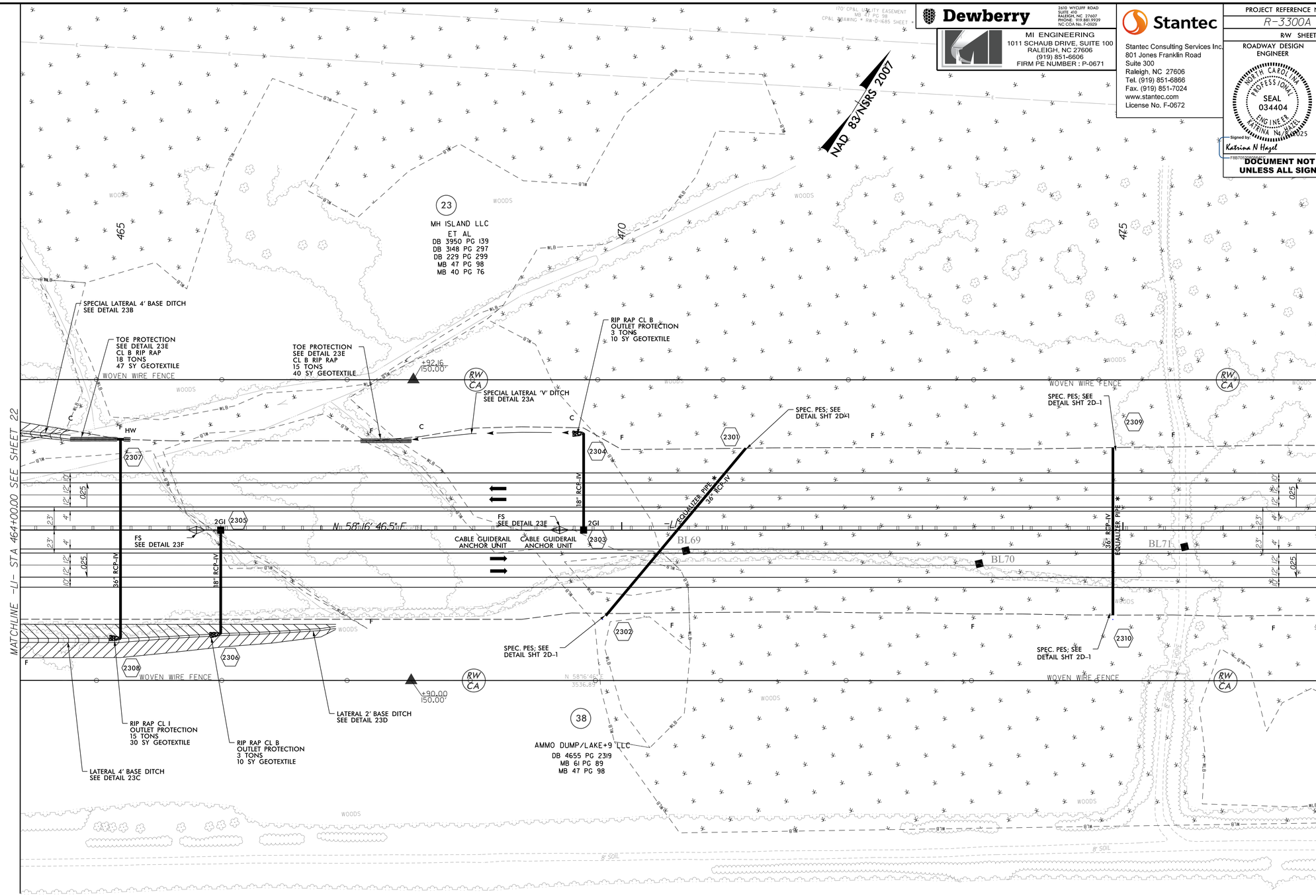
PROJECT REFERENCE NO.	SHEET NO.
R-3300A	23
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAGEL
Signed by: Katrina N Hagel
F8B7D5D0D0D4D4...
8/8/2025

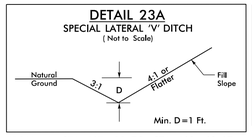
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33246 ENGINEER LINDA SULLIVAN
Docusigned by: Linda Sullivan
2434583220704BD...
8/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



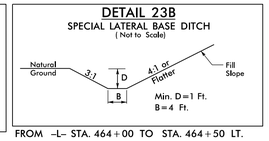
* DO NOT BURY EQUALIZER PIPES

DETAIL 23A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



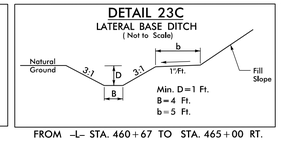
FROM -L- STA. 467+90 TO STA. 469+62 LT.

DETAIL 23B
SPECIAL LATERAL BASE DITCH
(Not to Scale)



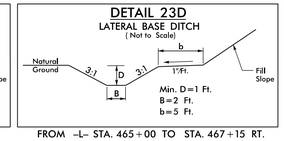
FROM -L- STA. 464+00 TO STA. 464+50 LT.

DETAIL 23C
LATERAL BASE DITCH
(Not to Scale)



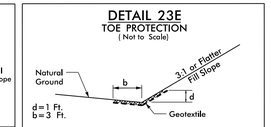
FROM -L- STA. 460+67 TO STA. 465+00 RT.

DETAIL 23D
LATERAL BASE DITCH
(Not to Scale)



FROM -L- STA. 465+00 TO STA. 467+15 RT.

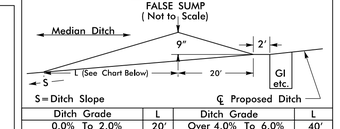
DETAIL 23E
TOE PROTECTION
(Not to Scale)



Type of Liner= CL B Rip-Rap

FROM -L- STA. 464+50 TO STA. 465+10 LT.
FROM -L- STA. 467+40 TO STA. 467+90 LT.

DETAIL 23F
FALSE SUMP
(Not to Scale)



S = Ditch Slope
℄ Proposed Ditch

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

L1 STA. 465+76 MED.
L1 STA. 469+38 MED.

SEE SHEET 50 FOR -L1- PROFILE

4/8/2025
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Chris Tyler

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PROJECT REFERENCE NO.	SHEET NO.
R-3300A	24
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAGEL
Signed by: Katrina N Hagel
F8B7D5D9D9D4D4...
5/14/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33246 ENGINEER LINDA W. JORDAN
Docusigned by: Linda W. Jordan
2434583220704BD...
5/14/2025

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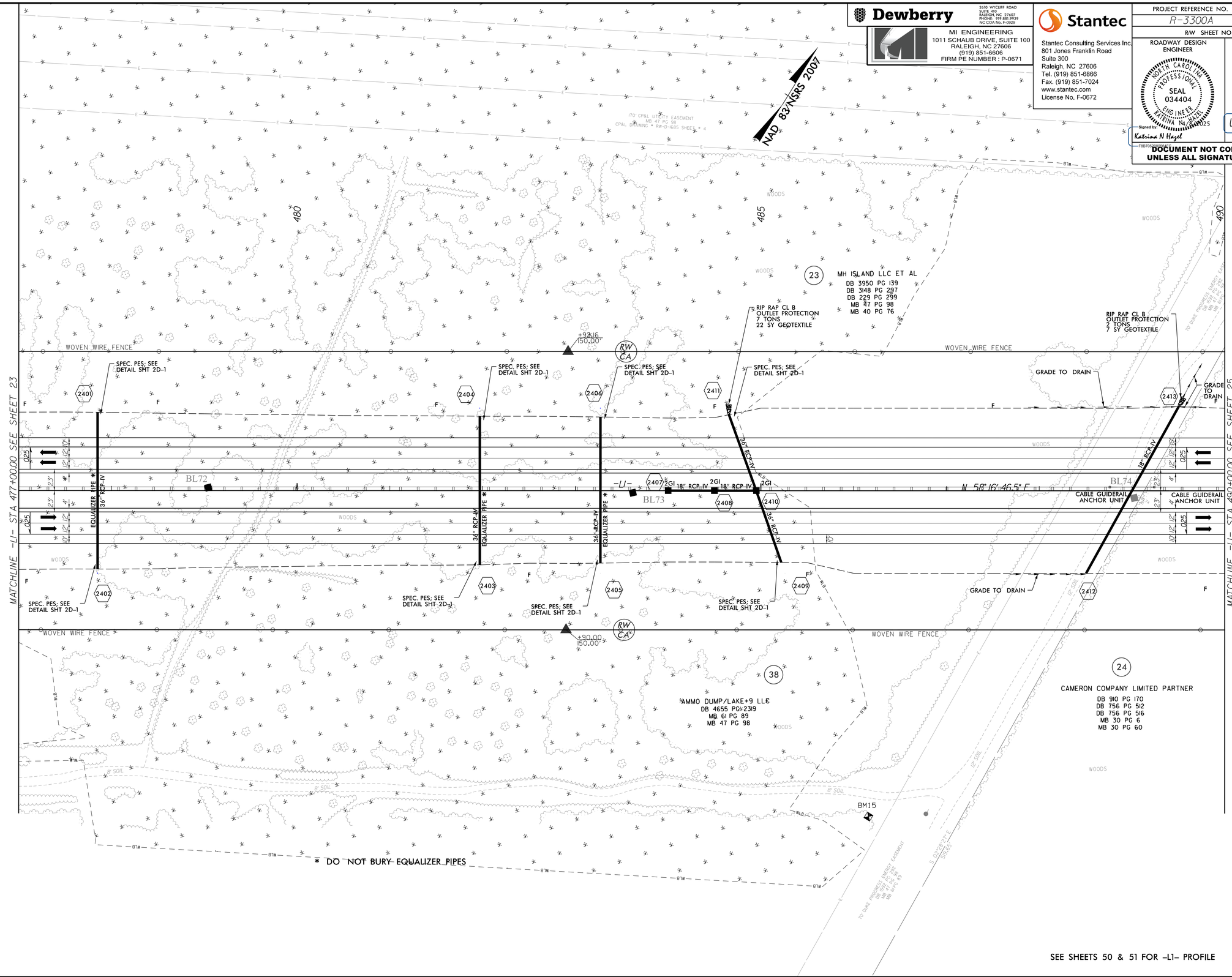

SEE SHEETS 50 & 51 FOR -L1- PROFILE

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PROJECT REFERENCE NO.	SHEET NO.
R-3300A	25

R/W SHEET NO.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAZEL
Signed by: Katrina N Hazel
F8B7D5D0D0D4D4...
4/28/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33246 ENGINEER LINDA SULLIVAN
Docusigned by: Linda Sullivan
2434583220704B0...
4/28/2025

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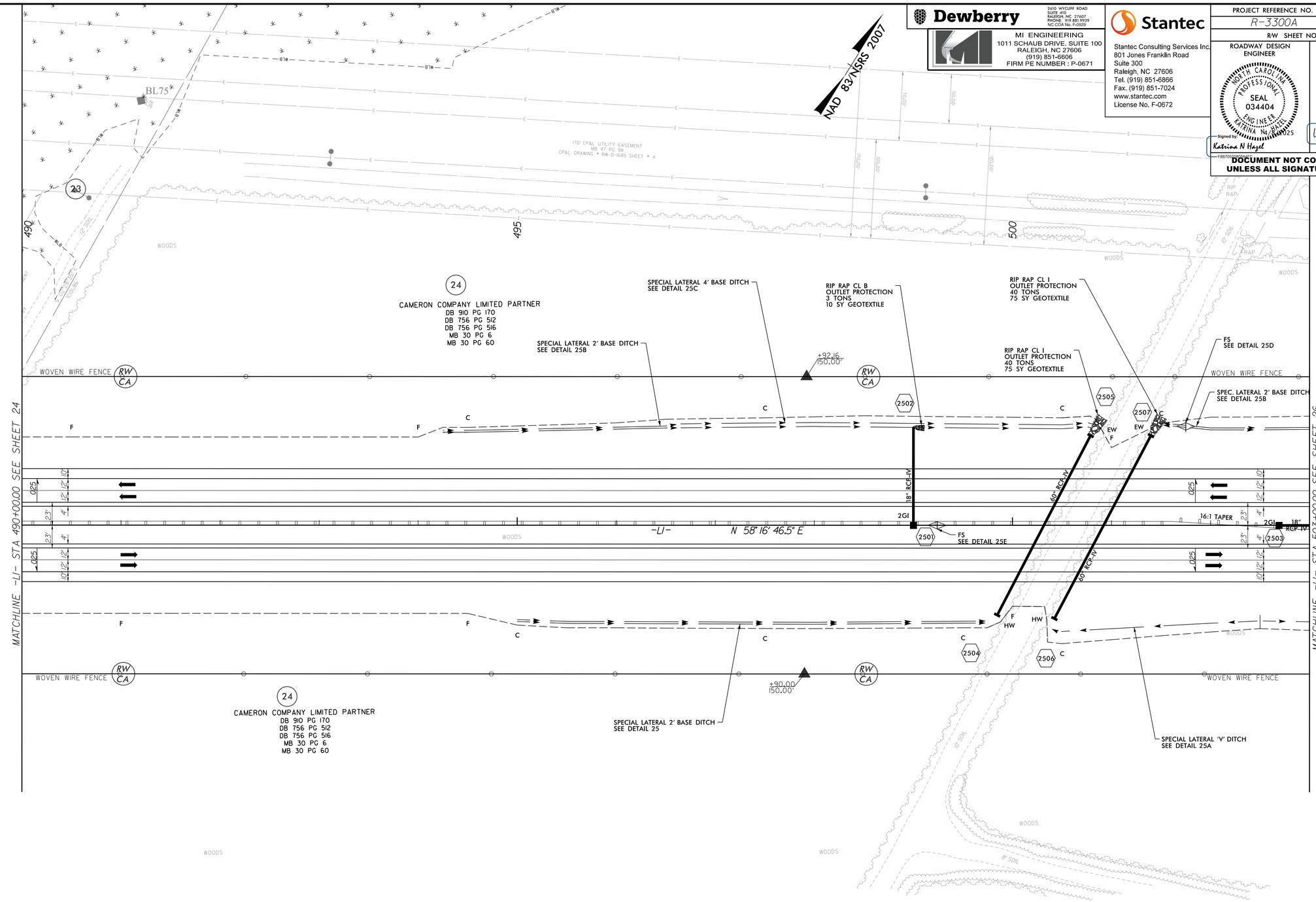
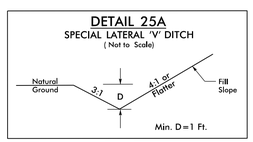
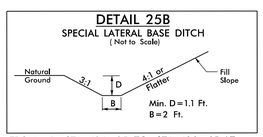


DETAIL 25A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



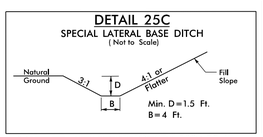
FROM -L- STA. 500+36 TO STA. 504+00 RT.

DETAIL 25B
SPECIAL LATERAL BASE DITCH
(Not to Scale)



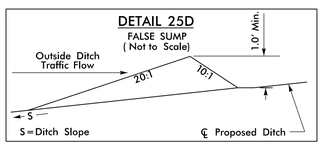
FROM -L- STA. 494+25 TO STA. 496+65 LT.
FROM -L- STA. 495+00 TO STA. 499+78 RT.
FROM -L- STA. 501+48 TO STA. 515+50 LT.

DETAIL 25C
SPECIAL LATERAL BASE DITCH
(Not to Scale)



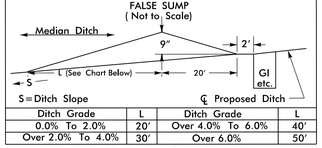
FROM -L- STA. 496+65 TO STA. 500+75 LT.

DETAIL 25D
FALSE SUMP
(Not to Scale)



L1 STA. 501+75 LT., TOP EL=35.71

DETAIL 25E
FALSE SUMP
(Not to Scale)



Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

L1 STA. 499+24 MED.

SEE SHEET 51 FOR -L1- PROFILE

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kmaze

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NC COA No. F-0929

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FIRM PE NUMBER : P-0671

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PROJECT REFERENCE NO.	SHEET NO.
R-3300A	26

R/W SHEET NO.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAZEL
Signed by: Katrina N Hazel
F8B7D5D0D0D4D4...
5/14/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33246 ENGINEER
Docusigned by: Linda Johnson
5/14/2025
2434583220704BD...

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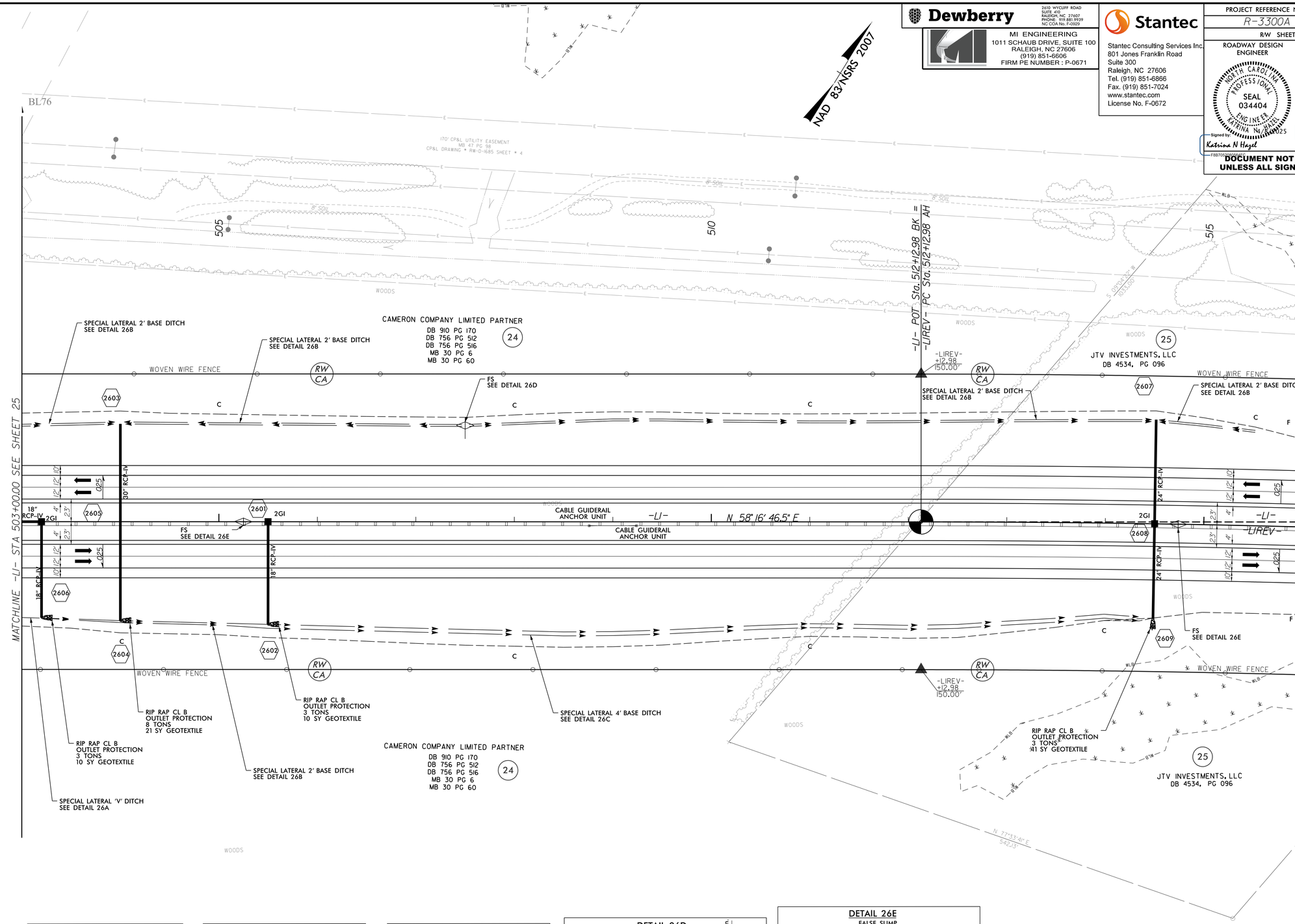
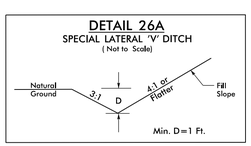
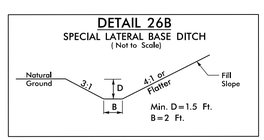


DETAIL 26A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



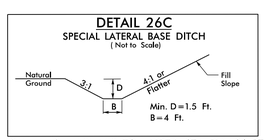
FROM –L– STA. 500+36 TO STA. 504+00 RT.

DETAIL 26B
SPECIAL LATERAL BASE DITCH
(Not to Scale)



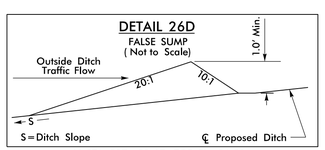
FROM –L– STA. 501+48 TO –L1REV– STA. 515+50 LT.
FROM –L– STA. 504+00 TO –L1REV– STA. 505+50 RT.

DETAIL 26C
SPECIAL LATERAL BASE DITCH
(Not to Scale)



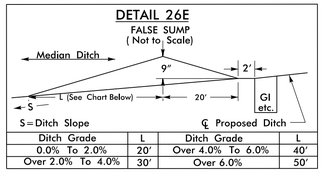
FROM –L– STA. 505+50 TO –L1REV– STA. 514+36 RT.

DETAIL 26D
FALSE SUMP
(Not to Scale)



L1 STA. 507+50 LT., TOP EL=36.50

DETAIL 26E
FALSE SUMP
(Not to Scale)



Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

L1 STA. 505+25 MED.
L1REV STA. 514+74 MED.

SEE SHEETS 51 & 52 FOR –L1– & –L1REV– PROFILE
SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA

4/8/2025
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kinge

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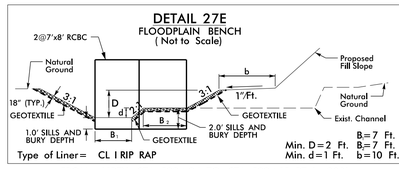
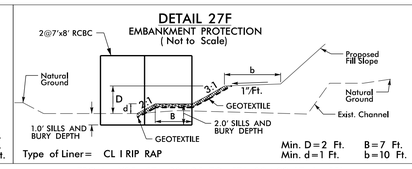
DETAIL 27E
FLOODPLAIN BENCH
(Not to Scale)



Type of Liner= CL I RIP RAP
Min. D=2 Ft. B=7 Ft.
Min. d=1 Ft. b=10 Ft.

FROM –L1REV– STA. 520+34 TO STA. 522+15 RT.,L=203'
DDE=1125 CY, 621 TONS RIP RAP, 1100 SY GEOTEXTILE
FROM –Y35– STA. 20+80 TO STA. 22+71 LT., L=191'
DDE=430 CY, 400 TONS RIP RAP, 700 SY GEOTEXTILE

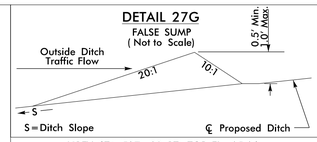
DETAIL 27F
EMBANKMENT PROTECTION
(Not to Scale)



Type of Liner= CL I RIP RAP
Min. D=2 Ft. B=7 Ft.
Min. d=1 Ft. b=10 Ft.

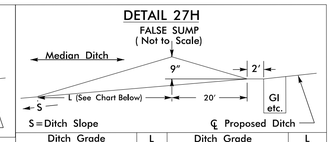
FROM –Y35– STA. 20+25 TO STA. 20+80 LT., L=55'
DDE=20 CY, 52 TONS RIP RAP, 105 SY GEOTEXTILE

DETAIL 27G
FALSE SUMP
(Not to Scale)



L1REV STA. 527+80 RT., TOP EL=35.86

DETAIL 27H
FALSE SUMP
(Not to Scale)



Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

L1REV STA. 528+23 MED.

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919 881.9939
NC COA No. F-0929

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

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License No. F-0672

PROJECT REFERENCE NO.	SHEET NO.
R-3300A	27
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAGEL
Signed by: Katrina N Hagel
F8B7D5D0D0D0D0...
4/8/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33246 ENGINEER LINDA GUINN JONES
Docusigned by: linda guinn jones
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4/8/2025

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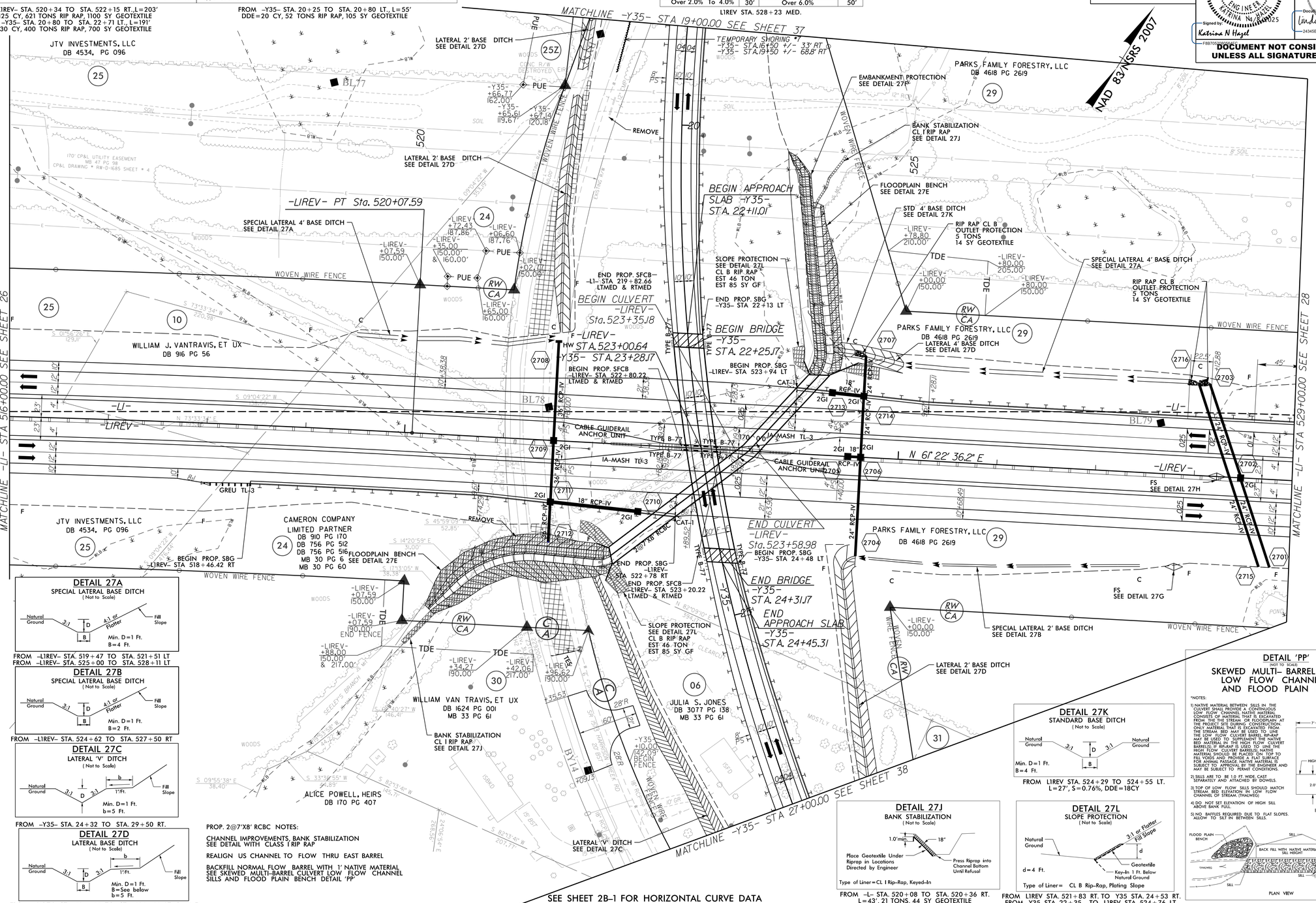


DETAIL 27A
SPECIAL LATERAL BASE DITCH
(Not to Scale)

FROM –L1REV– STA. 519+47 TO STA. 521+51 LT
FROM –L1REV– STA. 525+00 TO STA. 528+11 LT

DETAIL 27B
SPECIAL LATERAL BASE DITCH
(Not to Scale)

FROM –L1REV– STA. 524+62 TO STA. 527+50 RT

DETAIL 27C
LATERAL 'V' DITCH
(Not to Scale)

FROM –Y35– STA. 24+32 TO STA. 29+50 RT.

DETAIL 27D
LATERAL BASE DITCH
(Not to Scale)

FROM –L1REV– STA. 524+55 TO STA. 525+00 LT., B=4 Ft.
FROM –Y35– STA. 17+00 TO STA. 19+50 RT., B=2 Ft.
FROM –Y35– STA. 19+75 TO STA. 22+00 RT., B=2 Ft.
FROM –Y35– STA. 24+69 TO STA. 28+00 LT., B=2 Ft.

PROP. 2@7'X8' RCBC NOTES:

CHANNEL IMPROVEMENTS, BANK STABILIZATION SEE DETAIL WITH CLASS I RIP RAP

REALIGN US CHANNEL TO FLOW THRU EAST BARREL

BACKFILL NORMAL FLOW BARREL WITH 1' NATIVE MATERIAL SEE SKEWED MULTI-BARREL CULVERT LOW FLOW CHANNEL SILLS AND FLOOD PLAIN BENCH DETAIL 'PP'

DETAIL 27K
STANDARD BASE DITCH
(Not to Scale)

FROM L1REV STA. 524+29 TO 524+55 LT.
L=27', S=0.76%, DDE=18CY

DETAIL 27J
BANK STABILIZATION
(Not to Scale)

Type of Liner=CL I Rip-Rap, Keyed-In

FROM –L– STA. 520+08 TO STA. 520+36 RT.
L=43', 21 TONS, 44 SY GEOTEXTILE
FROM –Y35– STA. 20+28 TO STA. 20+93 LT.
L=68', 33 TONS, 70 SY GEOTEXTILE

DETAIL 27L
SLOPE PROTECTION
(Not to Scale)

Type of Liner= CL B Rip-Rap, Plating Slope

FROM L1REV STA. 521+83 RT. TO Y35 STA. 24+53 RT.
FROM Y35 STA. 22+35 TO L1REV STA. 524+76 LT.

DETAIL 'PP'
NOT TO SCALE
SKEWED MULTI- BARREL CULVERT LOW FLOW CHANNEL,SILLS AND FLOOD PLAIN BENCH

*NOTES:

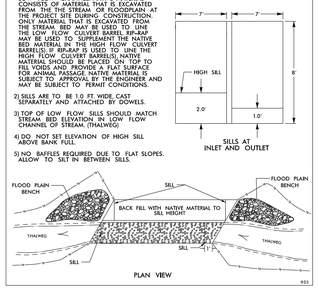
1) NATIVE MATERIAL BETWEEN SILLS IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE PROJECT SITE AND PLACED AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP-RAP MAY BE USED TO LINE THE LOW FLOW CHANNEL BED MATERIAL IN THE HIGH FLOW CULVERT BARRELS. IF RIP-RAP IS USED TO LINE THE HIGH FLOW CULVERT BARRELS, NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR AQUATIC PASSAGE. BY THE NATURE OF SUBJECT MATERIAL, SUITABILITY IS DETERMINED AND MAY BE SUBJECT TO PERMIT CONDITIONS.

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

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

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

5) NO BAFFLES REQUIRED DUE TO FLAT SLOPES. ALLOW TO SILT IN BETWEEN SILLS.



SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA
SEE SHEETS S10-01 THRU S10-39 FOR S10 STRUCTURE PLANS
SEE SHEETS C06-01 THRU C06-07 FOR C06 CULVERT PLANS

SEE SHEET 52 FOR –L1REV– PROFILE
SEE SHEET 64 FOR –Y35– PROFILE

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DETAIL 28A
TOE PROTECTION
(Not to Scale)

Type of Liner= CL B Rip-Rap

FROM –LREV– STA. 536+25 TO STA. 537+00 LT.

DETAIL 28B
LATERAL 'V' DITCH
(Not to Scale)

FROM –L1REV– STA. 537+00 TO STA. 537+50 LT.
FROM –L1REV– STA. 540+50 TO STA. 542+50 RT.

DETAIL 28C
LATERAL BASE DITCH
(Not to Scale)

FROM –L1REV– STA. 537+50 TO STA. 538+20 LT.

DETAIL 28D
LATERAL BASE DITCH
(Not to Scale)

FROM –L1REV– STA. 537+40 TO STA. 540+50 RT.

DETAIL 28E
FALSE SUMP
(Not to Scale)

S=Ditch Slope ℄ Proposed Ditch

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

L1REV STA. 532+90 MED.
L1REV STA. 540+26 MED.

Dewberry
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RALEIGH, NC 27607
PHONE: 919 881.9939
NC COA No. F-0929

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1011 SCHAUB DRIVE, SUITE 100
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FIRM PE NUMBER : P-0671

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License No. F-0672

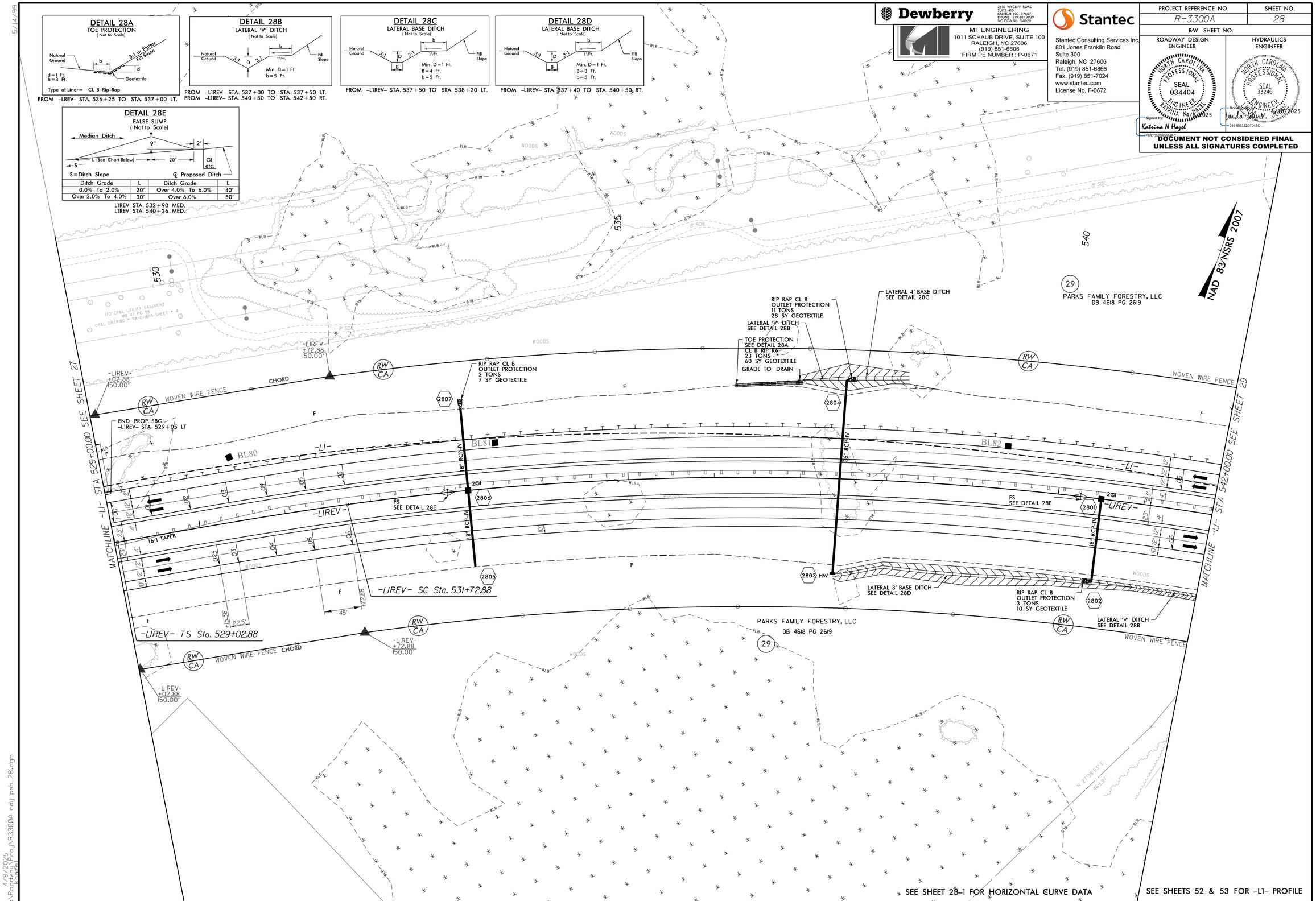
PROJECT REFERENCE NO.	SHEET NO.
R-3300A	28

R/W SHEET NO.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034404 ENGINEER KATRINA N. HAGEL
Signed by: Katrina N Hagel
F8B70D5D0D0F4C...
5/14/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33246 ENGINEER LINDA BROWN WILKINS
Docusigned by: Linda Brown Wilkins
2434583220704BD...
5/14/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SEE SHEET 2B-1 FOR HORIZONTAL CURVE DATA

SEE SHEETS 52 & 53 FOR –L1– PROFILE

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khwilkins